# FY2013 WORKPLAN

## FOOD AND ENTERPRISE DEVELOPMENT (FED)

## COVERING OCTOBER 2012–SEPTEMBER 2013

**DECEMBER 21, 2012 – FINAL SUBMISSION**

This publication was produced for review by the United States Agency for International Development. It was prepared by the Food and Enterprise Development (FED) Team.

# FY2013 WORKPLAN

## FOOD AND ENTERPRISE DEVELOPMENT (FED) PROGRAM

## COVERING OCTOBER 2012–SEPTEMBER 2013

| | |
|---|---|
| **Program Title:** | **Food and Enterprise Development Program** |
| **Sponsoring USAID Office:** | **USAID/Liberia** |
| **Contract Number:** | **Contract No.: 669-C-00-11-00047-00** |
| **Contractor:** | **DAI** |
| **Date of this revison:** | **February 11, 2012** |

The authors' views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

# CONTENTS


**CONTENTS** ..... I

**ABBREVIATIONS** ..... III

**EXECUTIVE SUMMARY** ..... 1

**OVERVIEW** ..... 3

**FED'S TWO GOALS AND TWO COMPLEMENTARY APPROACHES** ..... 3

**TWO-PRONGED SUCCESS THROUGH THREE COMPONENTS** ..... 4

**FED'S PROGRAMMATIC APPROACH/THEMES** ..... 5

**SECTION ONE A: FED FY 2013 IMPLEMENTATION STRATEGY – INTRODUCTION** ..... 9

**SECTION ONE B: FED FY 2013 IMPLEMENTATION STRATEGY – TACTICS AND APPROACH** ..... 13

**1.1: FED'S APPROACH TO ACCELERATING CHANGE IN AGRICULTURE** ..... 13

**1.2: STRATEGY AND TARGETING: THE FED OPERATING APPROACH** ..... 16

Cassava Interventions ..... 17

Vegetable Interventions ..... 18

Goat Interventions ..... 18

FY 2013 Priority Intervention Points by Value Chain and by Location ..... 19

**SECTION TWO: FED FY 2013 WORKPLAN ACTIVITIES** ..... 21

**COMPONENT 1: INCREASED AGRICULTURAL PRODUCTIVITY** ..... 21

Task 1.1: Input Supply System Interventions ..... 21

Task 1.2: Increased Production and Profitability of Quality Rice in Liberia ..... 32

Task 1.3: Increased Production/Profitability of Quality Cassava in Liberia ..... 42

Task 1.4: Improving the Quality and Quantity of Peri-Urban Vegetables in Liberia ..... 51

Task 1.5 Goat Interventions FY 2013 ..... 64

Task 1.6 Integrating Nutrition into all FED activities ..... 75

**COMPONENT 2: STIMULATE PRIVATE ENTERPRISE** ..... 83

Task 2.1 SME Development ..... 84

Task 2.2 Access to Finance ..... 93

Task 2.3 Use of ICTs in Stimulating Liberian Agri-Business ..... 102

Task 2.4 Enabling the Policy Environment for Private Sector Growth ..... 108

**COMPONENT 3: BUILDING LOCAL HUMAN CAPACITY** ..... 111

Task 3.1 Creating Centers of Excellence ..... 112

Task 3.2 STTA Support ..... 118

Task 3.3 Non Formal Education Activities ..... 119

**CROSSCUTTING ACTIVITIES ("COMPONENT 4")** ..... **120**
Task 4.1 Knowledge Management ..... 120
Task 4.2 Special Studies, Baseline Studies, Impact Surveys, M & E ..... 122
Task 4.3 Gender Related Priorities for Year 2 ..... 126

**SECTION THREE: PROGRAM MANAGEMENT** ..... **133**
**A. COMPONENT MANAGEMENT** ..... **133**
**B. ROLE OF MONROVIA AND COUNTY OFFICES** ..... **134**
Roles and Responsibilities of FED Staff ..... 134
**C. COORDINATION** ..... **134**
**D. COMMUNICATIONS** ..... **135**
**E. CAPACITY BUILDING** ..... **136**
**F. MANAGEMENT OF THE MARKET DEVELOPMENT FUND** ..... **136**
**G. OVERVIEW OF THE FED ENVIRONMENTAL MONITORING SYSTEM** ..... **137**

# ABBREVIATIONS

| | |
|---|---|
| AGRA | Alliance for a Green Revolution in Africa |
| AVRDC | Asian Vegetable Research and Development Center |
| AY | Accelerating Youth Program |
| BDS | business development services |
| BRAC | Bangladesh Rehabilitation Assistance Committee |
| BWI | Booker T. Washington Institute |
| CAADP | Comprehensive Africa Agriculture Development Program |
| CAF | Community Activity Facilitators |
| CAHWs | community animal health workers |
| CARI | Central Agricultural Research Institute |
| CBO | community-based organization |
| CFSNS | Comprehensive Food Security and Nutrition Survey |
| CoE | Center of Excellence |
| CPP | crop protection products |
| CRS | Catholic Relief Services |
| DCA | Development Credit Authority |
| DQA | Data Quality Assessment |
| ECOWAS | Economic Community of West African States |
| EHELD | Excellence in Higher Education for Liberian Development |
| EIA | Environmental Impact Assessment |
| EMMP | Environmental Mitigation and Monitoring Plan |
| ENA | Essential Nutrition Actions |
| EU | European Union |
| FAO | Food and Agriculture Organization of the United Nations |
| FBO | farmer-based organization |
| FED | Food and Enterprise Development Project |
| FSNS | Food Security and Nutrition Strategy |
| FSNTC | Food Security and Nutrition Technical Committee |
| FTF | Feed the Future |

| | |
|---|---|
| GAFSP | Global Agriculture and Food Security Program |
| GBCC | Grand Bassa Community College |
| GEMS | Governance and Economic Management Support |
| GIS | Geographical Information System |
| GIZ | German Technical Cooperation |
| GoL | Government of Liberia |
| GPS | global positioning system |
| HED | Higher Education for Development |
| HH | household |
| IBEX | Liberia Investing in Business Expansion program |
| ICT | Information and Communications Technology |
| IEE | Initial Environmental Evaluation |
| IEHA | Initiative to End Hunger in Africa |
| IFAD | International Fund for Agricultural Development |
| IFC | International Finance Corporation |
| IFDC | International Fertilizer Development Center |
| IITA | International Institute of Tropical Agriculture |
| IPM | integrated pest management |
| IQC | indefinite quantity contract |
| ISFM | integrated soil fertility management |
| IVR | Interactive Voice Response |
| IYCF | Infant and Young Children's Feeding |
| KM | knowledge management |
| LASIP | Liberia Agricultural Sector Investment Plan |
| LAUNCH | Liberian Agricultural Upgrading, Nutrition and Child Health |
| LCIP | Liberia Community Infrastructure Program |
| LEAP | The Liberia Energy Assistance Program |
| LESSP | Liberia Energy Sector Support Program |
| LISGIS | Liberia Institute of Statistics and Geo-Information Services |
| LPG | Loan Portfolio Guarantees |
| LMA | Liberian Marketing Association |
| LMDI | Liberia Media for Democratic Initiatives |

| | |
|---|---|
| LMEP | Liberian Monitoring and Evaluation Project |
| LMP | Legislative Modernization Plan |
| LoL | Land o'Lakes |
| LOP | Life of Program |
| LTTA | long-term technical assistance |
| MDF | Market Development Fund |
| MEAS | Modernizing Extension and Advisory Services |
| MFI | MicroFinance Institution |
| MIR | Marketing Inputs Regionally |
| MIS | management information system |
| MoA | Ministry of Agriculture |
| MoCI | Ministry of Commerce and Industry |
| MoEd | Ministry of Education |
| MoGD | Ministry of Gender and Development |
| MoHSW | Ministry of Health and Social Welfare |
| MoPW | Ministry of Public Works |
| MOU | memorandum of understanding |
| MoY&S | Ministry of Youth &Sports |
| MSME | Micro and Small Medium Enterprises |
| MYAP | Multi-Year Assistance Program |
| NAGA | Nutrition Assessment and Gap Analysis |
| NGO | nongovernmental organization |
| NIC | National Investment Commission |
| PASS | Program for Africa's Seeds System |
| PERSUAP | Pesticide Evaluation Report & Safer Use Action |
| P4P | Purchase for Progress |
| PHC | Project Healthy Children |
| PMP | Performance Monitoring Plan |
| PMU | Project Management Unit |
| PPE | Personal Protective Equipment |
| PPP | public-private partnership |
| PPR | Petite Peste de Ruminants |

| | |
|---|---|
| PROSPER | People, Rules and Organizations Supporting the Protection of Ecosystem Resources |
| PUA | Peri-Urban Agriculture |
| ROI | returns on investment |
| SADP | Smallholder Agriculture Development Project |
| Sida | Swedish International Development Cooperation |
| SME | small and medium-sized enterprise |
| SMS | Short Message Service |
| SPS | sanitary and phytosanitary systems |
| SR | small ruminant |
| STTA | short-term technical advisor |
| SWOT | Strengths, Weaknesses, Opportunities, Threats |
| TAMIS | Technical and Administrative Management Information System |
| TPC | Technical Program Coordinator |
| TOT | Training of Trainers |
| TPC | Technical Program Coordinator |
| UDP | urea deep placement |
| UGP | Urban Gardens Program |
| UL | University of Liberia |
| UNICEF | United Nations International Children's Education Fund |
| USAID | United States Agency for International Development |
| USDA | Unites States Department of Agriculture |
| USSD | Unstructured Supplementary Service Data |
| VEO | Vocational Education Officer |
| VoAg | vocational agricultural |
| VSLA | village savings and loans associations |
| VTES | Vocational Technical Education Specialist |
| VTNFES | Vocational Training and Non-Formal Education Specialist |
| WASH | Water, Sanitation and Hygiene |
| WFP | World Food Programme |
| WHH | Welthungerhilfe |
| WHO | World Health Organization |
| WQAP | Water Quality Assurance Plan |

# EXECUTIVE SUMMARY

The Food and Enterprise Development Project (FED) is the U.S. Agency for International Development (USAID)/Liberia's main Feed the Future (FTF) project. Feed the Future is a whole-of-U.S. Government (USG) effort to reduce poverty and hunger sustainably. The FTF approach aligns the resources of all appropriate agencies of the USG, in cooperation with its development partners. FED is working with USG partners, the Liberian public and private sectors, and other donors to invest in agriculture with a focus on four value chains selected as having the greatest potential to alleviate poverty and end undernutrition—rice, cassava, vegetables, and goats. FED's primary goals are to commercialize these four value chains and improve rural household food security.

The project is focused geographically, on corridors and high potential locations—in Lofa, Nimba, Bong, Grand Bassa, Margibi, and Montserrado—and technically, addressing the major bottlenecks along the value chain. FED is strengthening the value chains from input supply to production/productivity to post-harvest processing and trade/marketing in order to increase the sustainable and economic production of food in Liberia. FED's targeted nutrition activities will increase the use of diversified food by Liberians by increasing food access, which provides Liberian households the food with which to promote increased food consumption (quantity and quality). Crosscutting activities are capacity building, knowledge management, extension/communication, information and communications technology (ICT), policy, gender, and the environment.

FED's programs are locally driven, often small in scale initially in order to test approaches, aim to address the issues of sustainability and environment impact, and strongly focus on the rural poor. We continue to fine tune specific to each value chain, collaborate with a wide range of public and private partners, and look at ways to encourage access to FED programs for women and youth.

Rapidly identifying sustainable and affordable technologies, communicating them, building local capacity, and shaping the enabling environment to allow Liberians to adopt these innovations are all requirements for FED's success. Piloting and testing ideas is one major area of FED investment; collecting the basic data, financials, and technical information to evaluate them is another. We are implementing a wide range of special studies, assembling a knowledge management unit, engaging in widespread demonstrations and multilocational trials, and providing technical and management training to a wide range of partners and organizations, our change agents in the value chain.

To hasten learning, accelerate change, and increase the diffusion of new technologies and approaches, FED is taking a learning-by-doing approach, combined with three tiers of field interventions. The first tier is a small set of intensively managed complex demonstrations that test promising innovations, showcase new technology, and gather data (practical learning laboratories). The second tier is a larger set of related lead farmer or business activities, managed by FED staff or local nongovernmental organizations (NGO) partners. The final tier is a large group of FED village-level facilitators who provide our entry point to communities; serve as a source of information to villagers about demonstrations, markets, training, input sources, and more; and serve as a source of input and information to FED, the Ministry of Agriculture (MoA), the Ministry of Commerce and Industry (MoCI) and others on rural prices, techniques, constraints, and so on.

FED has three interrelated technical components. The first has a productivity/profitability focus; activities aim to improve agricultural technologies and techniques, such as improved varieties and seed, more and better fertilizer use, mechanization, expanded extension services, integrated pest management (IPM) in vegetables, better water management in lowland rice, and other improvements

to production, post-harvest, processing, and marketing to improve household incomes and nutrition. The second component complements the first by focusing on enterprise development—strengthening agribusinesses by improving their access to affordable and appropriate inputs, agriculture finance, and markets and by training and working with individuals and groups of entrepreneurs to improve their skills in business management, marketing, and use of modern technologies to add value and increase profits. The third component involves work with the vocational agriculture schools and other related institutions on workforce development, improving the skill sets of the current and the next generation of individuals who will engage in agribusiness, public or private sector, whether they be farmers, enterprise employees, extension workers, educators, or business owners.

Nutrition, gender, knowledge management, ICT, and environment are crosscutting FED themes and all have implications and impact across the three components and the four value chains. For example, wetland development for lowland rice has environmental, gender, and social issues such as site ownership, health, and disease management, and land tenure, that must be addressed.

FED works closely with private sector partners and a range of Government of Liberia (GoL) partners—including the MoA, the MoCI, the Ministry of Education (MoEd), the Ministry of Health and Social Welfare (MoHSW), the Ministry of Youth & Sports (MoY&S), and the Ministry of Gender & Development (MoGD)—to identify areas where capacity development and improvements in the infrastructure and enabling environment, along with policy development, reform, and implementation, would help promote the accelerated growth of the agricultural economy and improve food availability in Liberia, plus improve the Liberian people's access to and utilization of food.

Feed the Future is not meant to be business as usual. One of its goals is to put itself out of business. As a result, FED has to build sustainable systems, driven by the private sector, which will generate growth in the agricultural economy permanently. This is a major challenge given the current nascent development stage of rural enterprises. Not only does it have to reverse the effects of several generations of limited investment in the rural sector on entrepreneurial interest in commercial agriculture, but also it needs to shift the mindset in Liberia from relief to development. FED will continue to take risks, test ideas, and search for appropriate, sustainable cost effective interventions to scale-up. It will seek and engage in collaborative partnerships, and will not dole out unlimited free inputs. To cause the behavior changes needed, and to achieve broad impact, FED works with a wide range of partners, individuals, companies, NGOs, churches, institutions, and multinationals to test approaches, technologies, and development hypotheses. To identify winners quickly, FED is continually listening, evaluating, discussing, making rapid changes in direction when necessary, and retooling systems and staffing as needed.

To this end, in FY 2013, FED will continue and expand its focus on a core set of activities related to data, assessments of technology, and the economic and social environment by staffing up and developing systems to allow the expansion of Liberia's knowledge base. Knowledge will come from partners, focus groups and a series of trials and special studies on a variety of topics to fill the data gap, along with expanded monitoring and evaluation of all the FED activities under Components 1, 2, and 3. FED's knowledge management unit will build a cost-effective data collection, storage, and dissemination system, working with the MoA and Liberian ICT service providers to make long-term sustainable information technology (IT) solutions for the private sector and MoA and MoCI staff for a wide range of data.

# OVERVIEW

This document presents the Fiscal Year (FY) 2013 workplan for the Liberia Food and Enterprise Development Program (FED). FED is Liberia's primary U.S. Government (USG) Feed the Future (FTF) initiative. Activities began in October 2011 and will continue until October 2016.

FED is a United States Agency for International Development (USAID)-funded project that works with the Government of Liberia (GoL), other USAID and donor projects, civil society, communities, associations, farmers groups, and private entrepreneurs. The project intends to create farm-to-market linkages; increase productivity, profitability, and access within the rice, cassava, vegetable, and goat value chains; improve nutrition and strengthen food security; and expand rural Liberians' access to inputs, services, and incomes. The goals are increased incomes and improved access to and consumption/utilization of a more diversified household diet, particularly among women and youth. FED focuses on four main counties (Grand Bassa, Bong, Nimba, and Lofa) and two secondary counties (Margibi and Montserrado).

FED seeks to identify and work with change agents. These partners range from individuals, farmer organizations, communities, enterprises, colleges, local nongovernmental organizations (NGOs), multinational companies and donors, and all levels of government, who collaborate together to restore and strengthen Liberia's agriculture sector. We are not the first or the only people looking for ways to encourage agricultural sector growth and improve food security. By cooperating with all parties involved, building on previous investments, emphasizing Liberian-led efforts, and facilitating and catalyzing improvements, FED is supporting the expansion of rural incomes, locally driven sustainable agribusiness, and employment.

## FED'S TWO GOALS AND TWO COMPLEMENTARY APPROACHES

The FED program has two overlapping goals: commercializing agriculture and increasing food security. In the long run, a flourishing commercial agricultural sector will produce more food. However, in the short run—with population growth soaring, a large percentage of the population living on less than $750/year, and too many unemployed/underemployed youth—commercialization will not supply the markets with the amounts needed at prices that low-income rural and urban Liberians can afford or are capable of competing with cheaper imports. For this reason, FED has one set of activities aimed at commercializing the production of a small, but growing number of entrepreneurs. FED works to improve their productivity, reduce losses, and build sustainable systems that create a growing number of jobs and improve national food supply. The program's second set of activities focus on helping rural people to use more sustainable and more efficient production systems that grow more food, including more diverse food for home consumption. These activities will reduce the pre-harvest period of food shortages, increase food security, and help to reduce the number of chronically malnourished young children and the number of farmers that have to short sell assets per-harvest—all of which will make more time available for other activities such as education.

One set of FED programs/activities encourages individual and collective entrepreneurship, working intensively with FED client partners through demonstrations, testing of technologies, capacity development, mentoring, exposure to successful models elsewhere, and improving access to finance, land, and business support systems. The other set are community-focused activities that work at the interface among agriculture, nutrition, environment, and labor availability. These activities seek to find simple solutions to local problems; allow rural families, to grow, keep, and use more food;

change their behaviors; and link them into health and other services such as education. This two-pronged approach influences both subsistence-level households and more commercial households.

FED clusters the commercial interventions along Liberia's growth corridors to increase impact and incomes, creating scale and employment and tackling key bottlenecks to growth along each value chain to accelerate impact. The local food security interventions target communities in need to increase the food security for rural households, improve household nutrition, and create time for off-farm activities.

## TWO-PRONGED SUCCESS THROUGH THREE COMPONENTS

In addition to classic interventions in productivity, marketing, and improved nutrition, FED will build on infrastructure investments made by others (especially roads, corporate social responsibility programs, and private sector investment), promote cost effective ways to sustainably manage natural resources, and reduce the environmental impact of increased production. At the same time, the program will build a policy and business environment that encourages women and youth, creates jobs, and supports widespread agricultural growth, appropriate skill training, and education programs.

Component 1's assistance to households and small commercial farms aims to increase incomes, produce more food for home consumption, and support improved nutritional and health outcomes. It is focused on improving access to inputs, providing production and post-harvest information through both the public and private sector, and introducing innovative technologies. A particular re-focus in FY2013 will be on knowledge, best practices, nutrition, new technologies, and marketing.

Component 2 focuses on financing and enterprise development. This will include linking entrepreneurs to finance; providing technical assistance to selected lending institutions to design agricultural loan products, loan officer training, and outreach activities to expand credit from both microfinance institutions (MFIs) and banks to underserved markets; and improving borrower readiness to utilize and benefit from credit. FED performs all of these activities with the collaboration, support, and participation of the Liberia Investing in Business Expansion program (IBEX) and other entities more directly involved in finance. The enterprise development thrust of Component 2 follows two themes/tracks: transaction-based assistance and enterprise support along the value chains. FED is profiling commercial buyers, lead producers, farmer-based organizations (FBOs), and larger enterprises, linking these change agents and value chain participants with business networking/ linkages and trade fairs, designing enterprise development/business plans with them, and providing targeted technical support to them in close collaboration with other project activities within the four value chains to catalyze change.

Component 3 works directly in partnership with the Booker T. Washington Institute (BWI) and other vocational agriculture institutions, appraising and upgrading their curricula, helping them move toward an Economic Community of West African States (ECOWAS)-compliant curriculum, improving student programs, modernizing library facilities, providing resources for practical training, assessing staff training needs, and developing training plans and training. Component 3 also supports FED's own training programs by planning a wide range of informal training across the targeted counties and the value chains. These training sessions will be conducted directly by FED staff and through local partners with the aim of increasing the skills of all the players along the value chain. We will target both existing enterprises and potential new entrants, including innovative and flexible job placement/internship programs tailored to a particular student's/employer's needs.

## FED'S PROGRAMMATIC APPROACH/THEMES

FED is a both food security and an agricultural productivity project. We have incorporated the lessons learned from our start-up year, FY 2012, into this FY 2013 workplan. These include the challenge of recruiting qualified candidates to staff the program, both expatriate and Liberian; a severe deficit of good data for decision making; very limited infrastructure for business development; and a shortage of serious committed change agents. All of the lessons and setbacks in year one stemming from these challenges have helped to both inform our strategic approach and to better target our FY2013 priorities. Our chosen tactics are driven by FED's overall operating context.

Hundreds of millions of dollars have been spent since 2003 on recovery and re-development, with little visible impact. In 2011/2012 alone, the Ministry of Agriculture (MoA) and donors budgeted more than $60 million to be spent on agriculture. The war destroyed and looted much of the Liberia's previous infrastructure and capital investments. Institutions collapsed and many intellectuals left for America and Europe. Now there is a growing discontent—stemming from lack of access to opportunities and the slow pace of change—from young people. Something different must be done. FED has been given the resources to do more than just more of the same. We plan to seize this opportunity and do things differently, building on the massive investments already made to achieve visible impacts swiftly. Based on our experience to date, we will hire and engage large numbers of Liberians using the Market Development Fund (MDF) and assign specific staff to refine our systems to allow more youth and women to access and benefit from FED services.

In keeping with and fully supporting the GoL's stated policy, FED avoids giveaway programs and challenges our clients, beneficiaries, and partners to do the same. Through an iterative learning process, we hope to demonstrate how, in time, entrenched market distortions can be overpowered by market incentives to produce change capable of driving widespread and equitable social and economic innovation, opportunity, prosperity, and improved nutrition. We are working with the GoL and the private sector to create the environment for these market incentives. To do so, we will first construct a solid foundation:

- Building economies of scale;
- Focusing on positive deviance and high-impact opportunities;
- Testing, adapting, and developing appropriate and innovative technologies in targeted locations, including technologies for better marketing, adding postharvest value, and unlocking production potential;
- Strengthening human and institutional capacity;
- Incubating high-potential keystone businesses; and
- Supporting strategic policy reform as directed by the Mission.

To commercialize the target value chains, FED is working with its partners to find well-connected individuals, groups, and companies who are innovators with a capacity for risk taking. Once identified, FED will help these change agents solve their supply chain, business management, and financial problems to meet market demand while integrating smaller participant enterprises into their value chains/supply chains. FED and the GoL are working with these disaggregated small players to increase and aggregate their output and reduce their marginal costs, expand their revenue, and improve their returns on investments. In partnership with the GoL—particularly the MoA, but also the Ministry of Commerce and Industry (MoCI), the Ministry of Education, and the Ministry of Health and Social Welfare (MoHSW)—FED is encouraging appropriate applications of government policy and intervention support for the agricultural economy through capacity building and support to better

policy implementation. All FED activities evaluate the opportunity to scale up and improve systems in order to ensure long-term sustainability, increase employment, and prepare Liberians for satisfying agricultural careers.

By commercializing Liberian agriculture, over time, the efficiency and the quantities of food produced and distributed locally will increase. In the process, demand will be created for improved inputs from smallholders, as well as new services and products to support commercialization of the value chains. As a result of these gains in productivity and efficiencies in distribution, an expansion of the economic base should occur. Eventually, as employment expands around the value chains, the increased incomes and product availability will lead to an increase in the accessibility and diversity of food at the rural household level.

To achieve this shift in agriculture in Liberia—to not only commercialize in a manner that results in equitable growth, but also improve the availability of food for undernourished subsistence households—FED is working with the GoL, other donors, and its private sector partners to:

- Create equitable, widespread access to the technology, services, training, finance, and markets necessary for all Liberians—regardless of gender and age—to allow them to imagine, execute, and upgrade their best business worthy ideas both on and off the farm.
- Target rural subsistence production systems to increase their outputs, move toward self-sufficiency and surplus, and change behavior to enhance nutrition and improve dietary diversity.
- Identify change agents from the private and public sectors and educational institutions, challenging them to design and pilot innovative, appropriate, market-driven business initiatives in our target sectors and, through the MDF, providing them with the tools and resources to refine and scale up those ideas with high potential for equitable economic growth.
- Revive the market channels and traditional structures necessary for all Liberians—especially women and youth—to access and utilize the food they need and to be able to participate in the economic opportunities that will be created by this paradigm shift.

FED aims to be a testing ground for innovation, both for USAID's FTF and for the Liberian economy as a whole. The FED team is dedicated to consistently documenting and building on our successes and failures through our expanding knowledge management systems. Over the life of the project, FED will work closely with the GoL and the private sector to document and identify best practices by creating a toolbox of interventions, approaches, and technologies. We will emphasize lessons learned in how best to engage women and youth as producers, value adders, marketers, and consumers of food, particularly in distorted post-conflict economies.

The obstacles to FED achieving its goals and succeeding are not trivial. Liberia's 3.1 percent population growth alone requires an additional 11,000 metric tons (MT) of rice per year. A laborer employed for 100 days a year at current prices earns just enough to buy the annual rice needs for three people but the average household includes five to seven people. The economic challenges of encouraging entrepreneurial activity along value chains that hardly exist and where low producer prices; inadequate or predatory marketing systems; poor or non-existent extension services; lack of investment in rural areas, especially roads; and shortages of credit facilities are immense. These discourage people from intensifying efforts and entering commercial production, leaving low-input, low-output subsistence systems the norm. Further, the technical challenges of improving agriculture in low pH, nutrient depleted soils; in a climate with rainfall that can exceed 2,00 centimeters[1]; in a

[1] It is no accident that successful agriculture in Liberia is based on vegetative cover and tree crops.

system of confused land tenure systems discouraging plot investments; and in a space with a widespread lack of improved tested technologies and necessary inputs are serious, but we remain committed.

While improvements in the rural sector are certainly possible, the desire to be self-sufficient in rice and other food crops and keep down prices for urban populations has to be tempered by these economic and technical realities. Without ignoring the real economic and political realities; FED aims to assist Liberia to improve its food security; increase incomes, especially among youth and women; and reduce the political uncertainty that a dependence on imported staples causes. FED will make the most of several developments as it seeks to achieve its goals: positive improvements are being seen in investments in roads, a key influence on the sector; Liberia's yields, well below West African averages, mean percentage improvements are comparatively easier; and both the GoL and donors have prioritized the success of the sector. After one year of experience, we remain cautiously optimistic about Liberian smallholder agriculture.

> "…the poor are no less rational than anyone else—quite the contrary. Precisely because they have so little, we often find them putting much careful thought into their choices: They have to be sophisticated economists just to survive. … It is not easy to escape from poverty, but a little bit of well-targeted help (a piece of information, a little nudge) can sometimes have surprisingly large effects."
>
> —Ahbijit Banerjee and Esther Duflo, *Poor Economics*

# SECTION ONE A: FED FY 2013 IMPLEMENTATION STRATEGY – INTRODUCTION

As the U.S. Agency for International Development's (USAID) flagship food security project, the Food and Enterprise Development Program (FED) team works with government departments, farmers, agribusinesses, farmer-based organizations (FBOs), and nongovernmental organizations (NGO) to increase rural household income, improve nutrition, and enhance agricultural development in the six target counties. FED resources are being used to identify strategic opportunities, locations, and change agents and refine specific technical interventions that will address systemic issues to help unlock pathways out of poverty. Freed pathways will lead to profitability and prosperity resulting in increased food availability, improved access to food, and better food utilization. FED and the Government of Liberia (GoL), led by the Ministry of Agriculture (MoA) and local entities, are developing an integrated package of technical services and creative market-driven solutions tailored to local conditions to increase agricultural productivity and production. FED's FY 2013 implementation strategy and value chain focus is shown geographically in the map at the end of this section.

FED takesa whole-of-government approach, collaborating closely with other U.S. Government activities such as the U.S. Department of Agriculture (USDA) Food for Progress Goat Program, and with USAID's and other donors' activities and initiatives including the Liberian Agricultural Upgrading, Nutrition and Child Health (LAUNCH), the Liberia Energy Support Sector Program (LESSP), the Development Credit Authority (DCA) loan portfolio guarantees (the Liberia Investing in Business Expansion program [IBEX]), the Governance and Economic Management Support project (GEMS), the Liberian Monitoring and Evaluation Project (LMEP), the Excellence in Higher Education of Liberian Development project (EHELD), the Accelerating Youth Program (AY), USAID's Farmer to Farmer, Africa LEAD, USAID's People, Rules and Organizations Supporting the Protection of Ecosystem Resources (PROSPER) program. From theses program s, we gratefully take lessons learned and continually explore possibilities for partnership and collaboration. FED's commitment to local capacity building with local NGOs aligns with the USAID Forward policy.

While a major focus is on the private sector, it alone will not be the game changer that Liberia needs. The nonconcession private sector is small and in an infancy stage. It is not ready to tackle the structural issues on its own. FED will work with local organizations to multiply the program's impact, increase the chance of success, and to build sustainable, long-term solutions. As part of FED's strategy in FY 2013 to scale-up, it will become an investor in promising not-for-profits.

By investing in both private sector entrepreneurs and local organizations, FED can reduce its direct project staff, can capitalize on local expertise and networks in the counties, and, instead, focus on higher-level issues, including capacity building, knowledge management, and strategy setting. The process of identifying promising organizations and entrepreneurs is underway and we will work hard with them in FY 2013 to help pioneer a new way of doing donor business in Liberia.

FED will also capitalize on all previous investment, building on what remains. We will seek ways to use some of the other large donor inputs, which have been necessary but not sufficient, supporting existing and prior activities from the government, donors, and the private sector. Examples include continuing activities that started well, but have no more funding; picking up groups that have

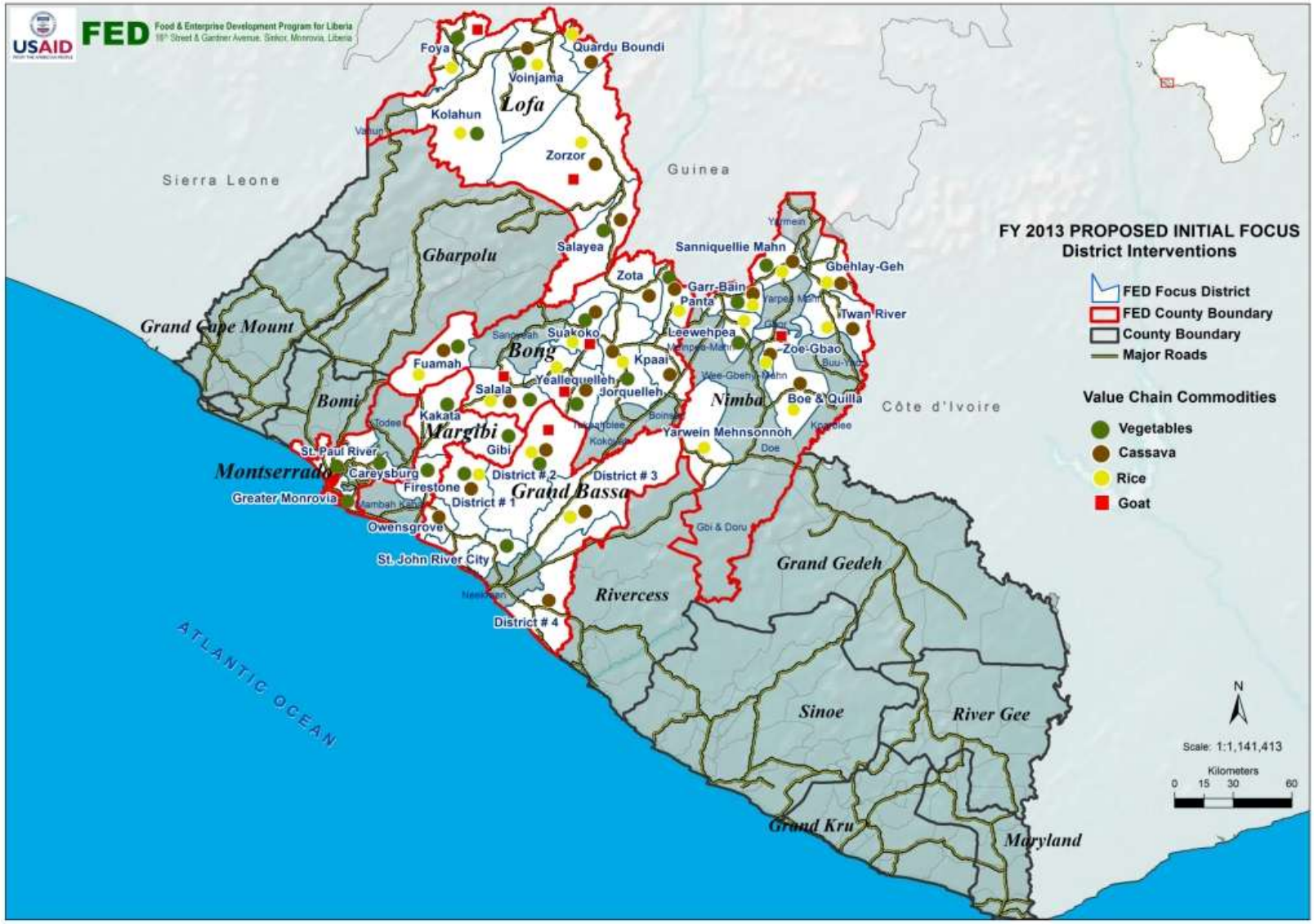
graduated from a program but need help getting to the next level; working with farmers and farmers' groups that have already received some training but need continuing help; providing training and enabling inputs for equipment that was supplied but is not being used. While it may not seem revolutionary, these acts are simple ways to increase FED's impact, to learn from others mistakes, and, most importantly, to build on and capitalize on previous investments.

The MDF is the engine of FED. FED will use the MDF to fund innovation and sustainable, system-wide improvements. The MDF will act as a venture investment arm that will use, when possible, "data-based" decision making to select ventures with the highest social and economic returns. The innovation funding will occur through our learning laboratories, selected field sites, and enterprises throughout the counties that rapidly test, pilot, and demonstrate new ideas, approaches, and technologies. We will conduct this work in collaboration with farmers, cooperatives, researchers, extension personnel, other projects, input suppliers, manufacturers, and processors. At these locations, FED will fund pilots and trials, sharing risk and, in some cases, bearing all the risk. Once a winning approach is identified, scaling up will occur rapidly.

Across all its activities, FED programs pay special attention to comparative advantage and price parities, regional nuances, gender and household dynamics, and the various risk factors that impinge on food security in order to tailor tactics and improve the effectiveness of project implementation. We do not have a cookie-cutter approach, and continually attempt to develop flexible local interventions that build on experience and success from Liberia and other parts of Africa, are appropriate to the situation and the problem, and respond to particular needs. Our experience has shown that very few commercial participants currently operate in the four value chains. So FED is putting more emphasis on preparing new graduates to enter the sector, mentoring and encouraging new entrants, and piloting potential commercial activities that need testing. This shift means that our view requires a more distant horizon, but has clear implications for sustainability and successful behavioral change.

Another set of interventions to increase impact will focus on creating an interactive and results-focused forum and building a common local agenda for collaborative interventions. Based on the experience of our first 12 months, we intend to further shift our center of gravity to the field. We will we use existing informal structures to bring together knowledgeable and engaged individuals at the county level to refine our plans and tailor our tactics. In addition complementing other existing GoL forums, working through our county offices, we will engage the county officials and the communities, the projects, business people, and local concessions, seeking input from everyone that is involved in or affected by funding activities in the county. These forums could bring together road building, policy reform, financing, training and other project and government interventions to help forge a more unified agenda, focusing on common physical locations and specific choke points in the various value chains. In the longer term, this local-level problem solving and planning will be integrated with national programs and the GoL's decentralization efforts. This large set of inputs could help better coordinate all current activities in a county. For instance, where a road goes directly affects markets and prices as transport is a key part of the cost of a product and directly affected by bad roads. At the county and community levels, we will expand our outreach, contributing to existing structures, and encouraging new forums for discussion and collaboration. Map of project sites in FY 2013 follows.

At the national level, the MoA cannot plan for agriculture alone; Planning and Finance and Public Works and Commerce and Industry all have projects that influence agriculture. The GoL needs a platform that cuts across ministries and has a real common agenda for the agriculture sector that builds on and takes into account all of the other sector plans and strategies. This is one of the ministers' priorities. Liberia's Agricultural Sector Investment Plan is an existing avenue that could lead to better coordination. As well as USAID, the Food and Agriculture Organization of the United Nations (FAO) and the World Bank are supporting efforts to improve coordination within agriculture.


USAID
FED
Food & Enterprise Development Program for Liberia
FY 2013 PROPOSED INITIAL FOCUS
District Interventions
FED Focus District
FED County Boundary
County Boundary
Major Roads
Value Chain Commodities
Vegetables
Cassava
Rice
Goat
Sierra Leone
Guinea
Côte d'Ivoire
ATLANTIC OCEAN
Foya
Quardu Boundi
Voinjama
Lofa
Kolahun
Zorzor
Salayea
Gbarpolu
Grand Cape Mount
Bomi
Bong
Margibi
Montserrado
Grand Bassa
Rivercess
Grand Gedeh
Sinoe
River Gee
Grand Kru
Maryland
Nimba
Sanniquellie Mahn
Gbehlay-Geh
Zota
Garr-Bain
Panta
Twan River
Suakoko
Leewehpea
Zoe-Gbao
Fuamah
Kpaai
Salala
Yeallequelleh
Jorquelleh
Boe & Quilla
Kakata
Gibi
Yarwein Mehnsonnoh
St. Paul River
Careysburg
Firestone
District # 1
District # 2
District # 3
District # 4
Greater Monrovia
Owensgrove
St. John River City
Todee
Doe
Gbi & Doru
N
Scale: 1:1,141,413
Kilometers
0 15 30 60

# SECTION ONE B: FED FY 2013 IMPLEMENTATION STRATEGY – TACTICS AND APPROACH

Liberian agriculture has changed very little in the last 20 years. As a result, experienced entrepreneurs and successful agriculture enterprises are scarce, but the opportunities for improvement are large. Realistically, wide adoption of modern technologies is likely to be slow, and mainly by more favored individuals. Even small increases in on-farm production and small reductions in post-harvest losses of impoverished rural households, however, can play an important role in filling the "hungry gap" that many Liberian rural households face every year. The extent of chronic malnutrition in Liberia has also changed very little in the last 20 years, suggesting that structural change is needed. Collaborating with other USG and donor initiatives will help achieve this. To achieve its food security and nutrition goals, FED plans to piggyback on other health and nutrition projects, complementing their activities.

To make informed, targeted investments into the commercialization of Liberian agriculture, FED will continue to take a making markets work for the poor (M4P) value chain approach to all four of its target commodities. M4P has four principles: systemic action, that is, identifying where systems are failing and acting; sustainable change, that is, aligning markets and players with incentives and capacity; large-scale impact, that is, selecting interventions that benefit the largest numbers; and a facilitative role, that is, being catalytic, not replacing market functions of players. FED's value chain approach starts not with production but with demand. FED will look at the market and then work back through the chain to determine how the specific commodity in demand can be moved up along the chain to the consumers. Besides the sustainability of a revitalized commercial value chain, new employment opportunities are generated all along it, not just on the farm.

## 1.1: FED'S APPROACH TO ACCELERATING CHANGE IN AGRICULTURE

FED's aims to catalyze change by being a learning organization and communicating what we learn. We test innovations, gather information, communicate what we have learned, and build capacity across the team, our partners, and the communities we work with to create sustainability and forge partnerships. One of FED's challenges is how to cost effectively identify and test profitable new technologies and approaches in a way that adapts local experience; provides a wide range of training to FED staff, its partners in the public and private sector, and value chain change agents; and share and communicate its findings widely.

To identify new technologies and approaches, FED will engage more directly and systematically in villages and communities through its expanded county staff to better understand their farming system constraints and opportunities. FED's county-level Extension Officers and the new long-term technical assistance (LTTA) Community Mobilizer, Gwendolyn Armstrong, will continue to collaborate at the county and district level with the County Agricultural Coordinators and the County Agricultural Coordination Committees, and will continue to attend the Rice, Cassava, Peri-Urban Vegetable, and Livestock Sector Coordination Committees in Monrovia. FED will also aggressively seek out and collaborate with other donor projects engaged in the FED value chains.

Lead firms, such as processors, wholesalers, and retailers, often act as change agents and play the key role of communicating to traders and farmers product volume and quality demands, which then drive farmers' investments. These firms can also provide access to inputs and processing technology such as rice threshers and cassava graters. One lesson learned in 2012 is that, in Liberia, there are very few active larger players in the agricultural sector outside of the concessions. A profiling exercise is underway in the target counties to identify more potential change agents outside of Monrovia, closer to FED's farmer clients. A mentoring approach to existing and new entrants into the agricultural sector has also been adopted to nurture and build the number of these future FED partners.

### Tool 1.1a: Testing Innovations

Examples of the technical services, best practices, and market-driven solutions that FED is and will continue to pilot, test, and support include the following.

- Continuing development of a local capacity for soil testing and fertilizer recommendations (allowing the more cost effective use of expensive fertilizer inputs).
- Working toward an improved understanding and use of sustainable, lower-cost soil fertility interventions such as compost and better use of nitrogen through urea deep placement (UDP).
- Promoting improved household rice processing and storage to reduce losses and improve marketability, integrated pest and disease management (such as for rice caseworm).
- Identifying best practices with the MoA and producing manuals (for example, on vegetable pests and diseases).
- Introducing, testing, and applying financial analysis to labor-saving appropriate technologies such as rotary weeders, power tillers, driers, impact rice dehullers, and cassava graters.
- Expanding micro and small enterprise (MSE)-oriented food processing, preservation, and fortification to add value and take advantage of the rising demand in the urban areas for processed foods.

Almost 40 percent of Liberia's entire population lives in urban centers and the country has a fast-growing middle class, including returned expatriate Liberians, who want better quality food products and are willing to pay for them. Food shortages, gluts, and losses are common in Liberia. Processing enterprises could save the food wasted during the low price period, contribute to increased food availability out of season, preserve food quality over a longer period (post-harvest), reduce the time constraints on women who do most of the agricultural and household work, reduce price fluctuations, and enhance dietary diversity through increased access to more nutritious foods. More specifics of the type and range of pilots testing innovations in 2013 are provided hereafter in the activity descriptions.

### Tool 1.1b: Knowledge Gathering

Effective knowledge management (KM) and transfer are integral to the success of FED. Determining successful production, processing, and marketing strategies and sharing them widely—along with improving access to technologies and inputs—will increase the productivity improvements and the rate of growth of the four targeted value chains. Building a sustainable, cost-effective, pluralistic extension system is a challenging task. In Year 2, recurrent short-term technical advisor (STTA) Margaret Orwig, a KM specialist, will set up a FED unit focused just on KM. She will train FED's Liberian staff so that as requests for information are received they can be serviced rapidly, and as successful activities are identified, they can be expanded quickly and adopted more widely. All training, across all components, will be part of a FED training plan, managed under the KM unit, which will report to the Deputy Chief of Party - Technical, Agnes Luz, who will link the value chains

and all their various participants. The participants will all be included in the KM database. The KM unit will store and analyze information and develop improved methods, such as radio, to better disseminate information to rural areas. All FED technical staff will be charged with a mentoring role and with gathering information that can be shared by the FED KM unit. All FED STTA will have some dedicated training responsibilities during their trip.

Everyone involved in modernizing Liberian agriculture needs better data, financial, economic, and social analysis. The expanded and refocused FED KM unit will work with the large amounts of existing data and collect new data, providing up-to-date information and analysis for decision makers. The KM unit will focus its efforts on the county level. FED will identify partners at the county level to help, using a range of forums to partner with county GoL offices or private sector actors.

### Tool 1.1c: Extending information

FED will support the establishment of a network of information partners in the FED counties, including input supply agents, Community Activity Facilitators (CAFs), and MoA extension agents. Selected by their communities, CAFs will use traditional methods of sharing information, including town criers. National- and county-level Agricultural Development Coordination Committees can also serve as forums for discussing best practices and potential innovations. Farmer's field days, demonstrations, trade shows, training events, and village-level forums are other venues to learn and to share information. Given the dispersed rural population and the poor road access, we will also use radio and other information and communications technology (ICT) mechanisms to provide information to our partners. FED will pilot a number of innovative, nontraditional approaches to knowledge transfer. All of the pilots, demonstrations, and trials will be linked directly to the extension training programs. A model that has worked elsewhere in Africa is focus groups of knowledgeable individuals who come up with "best practices." A selected number of the main constraints and the best practices to alleviate those constraints become an integral part of the extension training package.

It is not just agricultural information that FED needs to collect and share. Good nutrition requires more than just having enough to eat. Based on the results of the Nutrition Assessment and Gap Analysis (NAGA), FED's communication and outreach team and its extension and curriculum development teams will support the MoA and the MoHSW to adapt pertinent informational materials (disseminated through Liberian print, radio, and electronic media) to help raise nutritional awareness and educate households on essential nutrients, food safety, and health and sanitation best-practices. These will contribute to good nutritional outcomes and improved household health and nutrition. Radio Specialists have already been hired to work with Component 1 and Component 2 staff.

### Tool 1.1d: Capacity Building and Training

FED recognizes that the ability to achieve long-term impact and sustainable change depends upon the ability of a broad group of Liberian farmers to access the training they need in technical and business skills, along with sustainable market access to affordable and appropriate inputs and other services including transport, equipment, and market information. Therefore, an important part of our overall assistance in 2013 will be to continue to identify the potential sources of these services, supporting their expansion and addressing the main constraints preventing farmers from accessing these services directly themselves.

It will do this in three ways: by training individuals directly; by working through local organizations, such as business development services (BDS) providers and vocational agricultural colleges; and by partnering with the MoA in revitalizing its extension service and with local organizations to provide appropriate and effective capacity building.

We will support public and private agricultural extension to advise farm families on production techniques, processing and marketing, natural resource conservation, food utilization, and the formation of producer groups to facilitate access to markets and inputs. FED will also support village organizations to help rural residents lobby and tackle local development problems themselves. Finally, it will assist local communities and local organizations to become more active and effective, and expanding targeted agricultural support to community-based health and nutrition efforts.

The MoA is critically important to the modernization of Liberian agriculture. FED's model is a pluralistic extension system that works with the MoA, private sector partners, and projects such as USAID's Strengthening Agricultural Extension and Advisory Services (SEAS) and other donors, such as FAO, to establish sustainable systems able to provide the full range of technical support that Liberian farmers need. The energy, local knowledge, and resources of Liberia's agricultural researchers, vocational centers, NGOs, agribusinesses, and farmer entrepreneurs, as well as nontraditional partners such as churches, will be engaged to deliver appropriate technical assistance, training, and technology. The MoA is actively recruiting field officers to provide extension services and put more staff out into the counties. The goal is to have a County Agricultural Officer and a subject matter specialist in all the counties and district agriculture officers in all the districts. FED is working closely with the MoA Extension Department and the Modernizing Extension and Advisory Services (MEAS) to plan for skills updating and the production of technical tool kits. FED has field offices in Bong, Lofa, Nimba, Margibi, Montserrado, and Grand Bassa alongside or with the MoA, and MoA field staff already participate in FED field days, training and more.

### Tool 1.1e: Partnerships

Reaching large numbers of small farmers is always a challenge. This task is compounded in Liberia by the poor road infrastructure. Farmers' associations or cooperatives in various states of functionality are found throughout the six FED counties. In 2013, the best of these will serve as another entry point and node for FED interventions, permitting better outreach, increased scale of impact, and improved economies of scale. Community-based organizations (CBOs), associations, and cooperatives can collectively invest in upgrading strategies such as the bulk purchasing of improved inputs (such as seeds and fertilizer), mechanized land tillage, more efficient processing on a fee-for-service basis, and acting as the aggregator of a product for improved marketing. For example, STTA Tony Babb will work with selected cooperatives and the Cooperative Development Society on upgrading cooperative management and establishing a revolving fund for expanded rice production and processing. This is being linked into the World Bank's work on rural credit, and additional linkages into the upcoming International Fund for Agricultural Development (IFAD) project will be explored when it becomes fully operational in 2013.

To the fullest extent possible, we will conduct all demonstrations and training in combination and collaboration with other value chains and other projects, such as ACDI/VOCA's LAUNCH project, which also has a nutrition and agriculture focus. For example, we will work with Samaritan's Purse's restocked graduated goat groups, Catholic Relief Services' (CRS) historic rice farmers groups in Bong and Nimba, and FAO's certified seed producers in Bong, Lofa, and Montserrado.

## 1.2: STRATEGY AND TARGETING: THE FED OPERATING APPROACH

In FY 2013, we will have both a geographic and a technical focus. We also aim to increase productivity primarily through intensification rather than expansion.

A geographic focus allows us to go to where the opportunities are. Site selection criteria include access to markets, strong lead farmers, and cohesiveness of the community/group for aggregation and processing purposes. The geographic focus will enable us to deliver proof of concept, though even in the best locations it will be challenging to get a viable business model going. Intermediary organizations are still needed between the farmers, even when organized into groups, and the brokers. Leverage points will be selected or created. Currently, the most common marketing business model has large numbers of small brokers. As production increases, our emphasis is not just on increasing yield and volumes, but getting quality right first, and then increasing volumes of that quality. Increasing the level of quality is the outcome of activities all along the value chain—from the inputs (certified seeds) to correct post-harvest handling (a uniform paddy rice harvest). This may require one or two partially subsidized seasons below minimum transaction volumes to achieve scale. After which, larger players could enter the market.

The food security impact on the rural population will come both from the spillover from getting the commercial model going (increased supply, job creation) and direct interventions. FED activities will concentrate in both the more favored location/s near a road or a population center to that will produce enough to encourage commercial scale transactions (500 ton plus of rice) and produce enough upland rice and cassava in more dispersed locations to reduce the hungry gap and chronic malnutrition. The more distant markets will be a key focus only in the latter case. Enough people still go hungry in the countryside that the extra production of upland rice and cassava will be consumed by the 40 percent in those households without significant incomes who are still chronically malnourished.

FED's rice interventions will aim primarily at increasing productivity, rather than significantly expanding the area in which it is produced—whether in upland fallows or lowland environments. Improved productivity and aggregation, with drying, one-pass milling, and destining, probably through a cooperative, is one potential model for creating commercial rice sales. Over time, we will work with the larger processors to brand quality rice, developing a complementary promotional strategy through the Liberian Marketing Association and others.

Another FED rice intervention aims to improve the efficiency of fertilizer use. In the West African region, typically a minimum of 20-30 percent of the production costs of irrigated rice are fertilizer, as local prices for fertilizer are the highest in the region and prices for rice are the lowest in the region, one of FED's activities will be examining the viability of fertilizer use and improving the efficiency of use We are focusing on urea deep placement (UDP) for lowland rice, and on line planting and weeding using the modified Madagascar weeder. Detailed Nigerian studies have shown 27 percent of the lowland rice labor costs are associated with weeding, so we are encouraging in line planting and weeding using the modified Madagascar weeder. The same studies showed 30 percent of the labor costs are from harvesting and processing. We intend to capture the "lost" bags—losses accrued during harvesting, storage and processing—with improvements in these areas. See Section 1.2 for details.

## CASSAVA INTERVENTIONS

FED's cassava interventions aim to increase yields by disseminating improved varieties and adding value and reducing transport costs through processing. Prices vary considerably, suggesting both seasonal shortages and that supply to the urban markets at certain times of the year is close to demand (the arrival of another truck on the Red Light market destroys the price). This is in contrast to the small local or regional markets where prices fluctuate, but fresh cassava usually clears the market. Indeed cassava left in the ground is seen as a source of small cash for school fees. Prices will vary by distance from the population centers and market, accessibility, and season. This price volatility generates a large range in potential gross margins.

FED's comparative advantage, due to the scale of our operations, is on local-level variety testing and propagation of clean seed. Numerous new varieties are available, but distribution of cuttings over wide distances is difficult and farmers usually secure their cuttings, often diseased, from neighbors.

FED will continue to work with the MoA, National Cassava Sector Coordinating Committee,Welt Hunger Hilfe, the European Union (EU), and others to test cassava processing. Processing into gari is only an attractive option when you can access quantities of low-priced fresh cassava—low prices caused by the season or the location. With conversion rates of 3:1 for gari and 5:1 for flour, and gari retailing in April 2012 at LRD 1,200, raw cassava needs to be at the low end of the market (about LRD 250) to make gari economic.

## VEGETABLE INTERVENTIONS

The markets for fresh and dried vegetables are growing as urbanization and incomes increase in Liberia. Taste changes are occurring in the urban settings and rising incomes are increasing the market for vegetables. For some crops (including bitterball, okra, eggplant, watermelon, and cabbage), demand is being met primarily by local production. For other crops (including pepper and onion), demand is being met by a combination of local production and imports. The local supply of exotic vegetables has not yet become competitive with the regional imports or returned to pre-war levels or quality. Diseases and a lack of locally adapted varieties are significant constraints to expanded production of exotic vegetables.

FED will focus on the vegetable value chains in the greater Monrovia area of Liberia—urban markets and production areas within a 25 kilometers radius of Monrovia. Some work will be done with existing growers in the growth corridor that leads into Bong and Nimba counties along the Ghanta-Monrovia highway. That highway will soon be resurfaced. In addition, this geographic focus will take advantage of the slightly better soils and different season in that corridor. Further, land is more available there than it is in Monrovia, where leased land and uncertain tenure is the norm. Work in Monrovia will use that city's comparative advantage with leafy greens like spinach and sweet potato greens since they require swampy land, which Monrovia has to offer, and are difficult to transport.

Collaboration will also continue with CARE (on management information systems [MIS] and village savings and loans), Welthungerhilfe (on extension materials for leafy vegetables and marketing), Bangladesh Rehabilitation Assistance Committee (BRAC) (on seedling production and commercial vegetable seed production, with the help of Agro-Experience), ACDI/VOCA (on Farming as a Business and farmer accounts), the private sector (on inputs, including seed, specialty fertilizer, insecticides, and fungicides); MoA (on best practices, extension, and PUA group coordinating actors), and the World Bank (on its horticulture sector project). FED has just signed a memorandum of understanding (MOU) with New Generational Women that has received $93,000 from Chevron, contingent on FED support. This women's group has 75 acres of land and intends to grow up to 25 acres of commercial vegetables and 50 acres of cassava for sale in Monrovia. In the longer-term, Chevron is interested in sourcing fresh produce for its growing labor force.

## GOAT INTERVENTIONS

FED intends to recruit master goat farmers and establish a "pass on" scheme for goats. We will also engage in animal health, nutrition, and management improvements. We will work with restocked graduated goat groups from Samaritan's Purse. These groups, already involved in goat production, will be trained and supported by FED to take them to the next level of marketing, business planning, management, and herd expansion/intensification of production. Working with the Land O'Lakes (LoL) USDA Goat project, and the MoA, FED will assist with the importation of improved goats

from The Gambia over the next two years, creating an improved genetic basis for the FED health, nutrition, and management interventions.

## FY 2013 PRIORITY INTERVENTION POINTS BY VALUE CHAIN AND BY LOCATION

In Greater Monrovia, Montserrado County has a population of approximately 1.3 million. Per capita, this population has more purchasing power than populations in the rural areas. This urban population's demand for vegetables and other food products can be supplied by FED's small farmers (many of whom could be young people), trained to be commercial growers. Currently, much of the vegetable, rice, and cassava production is on leased or community land, which discourages intensification, with few truly commercial growers. Table 1.1 presents FED's FY2013 priority intervention points by value chain. The locations for these activities are mapped out on Page 12.

### TABLE 1.1 PRIORITY INTERVENTION POINTS AND FOCUS WITHIN AND ALONG THE FOUR FED VALUE CHAINS

| Value Chain | Focus within Value Chain | | | | | | |
|---|---|---|---|---|---|---|---|
| | Production | | | Processing | Marketing | | |
| | Germplasm /Breed | Techniques | Management/ Mechanization | Machinery | Product | Access | Policy/ Prices |
| Rice | ++++ | +++ | ++++ | +++ | ++ | +++ | +++ |
| Cassava | ++ | ++ | ++ | ++++ | ++++ | ++ | ++ |
| Vegetables | ++++ | ++++ | +++ | ++ | ++ | + | ++ |
| Goats | ++ | ++ | ++ | | + | + | + |

Table 1.2 overleaf shows the revised priority districts and the priority value chains selected within those counties. To accelerate the dissemination of new approaches and speed up the data collection and learning process, the bulk of FED Component 1 activities in FY 2013 will be concentrated within districts and at locations where two to three value chain activities can occur concurrently. The goal of this concentration on a subset of districts is to 1) focus further our efforts, 2) reduce management and travel costs, 3) improve coordination across the value chain components, and 4) target those areas where the opportunities are greatest for rapid success.

**TABLE 1.2: PRIORITY LOCATIONS AND VALUE CHAIN FOCI: TO REACH A MAXIMUM NUMBER OF STAKEHOLDERS. (FY 2013)**

| County | District | Population* | District Market Size | Rice | Cassava | Vegetables | Goats |
|---|---|---|---|---|---|---|---|
| Bong | Fuamah | 28,823 | Small | √ | √ | √ | |
| | Jorquelleh | 79,129 | Big | √ | √ | √ | |
| | Kpaii | 25,949 | Small | | √ | | |
| | Panta | 16,473 | Small | √ | √ | √ | |
| | Salala | 43,617 | Big | √ | √ | √ | √ |
| | Zota | 30,330 | Big | | √ | | |
| | Suakoko | 29,180 | Big | √ | √ | √ | √ |
| | Yellequelleh | NA | Big | √ | √ | √ | √ |
| Grand Bassa | District # 1 | 24,612 | Small | √ | √ | √ | |
| | District # 2 | 25,722 | Small | √ | √ | √ | √ |
| | District # 3 | 49,525 | Small | √ | √ | | |
| | District # 4 | 16,583 | Small | | √ | | |
| | Owensgrove | 13,914 | Small | | √ | | |
| | St. John River City | 10,010 | Small | | | √ | |
| Lofa | Foya | 73,312 | Big | √ | | √ | √ |
| | Kolahun | 60,557 | Big | √ | | √ | |
| | Salayea | 23,578 | Medium | | √ | √ | |
| | Voinjama | 42,790 | Big | √ | √ | √ | |
| | Quadu-Gboni | 8,926 | Medium | √ | √ | | |
| | Zorzor | 40,704 | Big | √ | √ | | √ |
| Nimba | Garr Bain | 61,225 | Medium | √ | √ | √ | |
| | Gbehlay- Geh | 32,176 | Medium | √ | √ | | |
| | Leewapea | 24,157 | Big | √ | | √ | |
| | Sanniqquellie Mahn | 25,370 | Big | √ | √ | √ | |
| | Yarwein Mehnsonnoh | 25,584 | Big | √ | | | |
| | Zoe-Geh | 29,372 | Small | √ | √ | | √ |
| | Zoe-Gbao | 13,837 | Medium | √ | √ | | √ |
| | Boe & Quilla | 9,014 | Big | √ | √ | | |
| | Twa River | 19,458 | Small | √ | √ | | |
| Margibi | Kakata | 44,327 | Big | | | √ | |
| | Gibi | 6,696 | Medium | | | √ | |
| | Firestone | 28,757 | Big | | | √ | |
| Montserrado | Greater Monrovia | 519,887 | Big | | | √ | |
| | Careysburg | 14,459 | Big | | | √ | |
| | St. Paul River | 30,596 | Medium | | | √ | |

*The source of the population numbers is the Republic of Liberia: 2008 Population and Housing Census Final Results, May 2009.

# SECTION TWO: FED FY 2013 WORKPLAN ACTIVITIES

## COMPONENT 1: INCREASED AGRICULTURAL PRODUCTIVITY

### TASK 1.1: INPUT SUPPLY SYSTEM INTERVENTIONS

Agricultural production activities in Liberia are mainly subsistence oriented. The economic infrastructure supporting agribusiness is poorly developed and farming communities are weakly organized leading to a limited trade in inputs. Distribution of free inputs by the GoL and donors is still distorting markets. FED is supporting the development of a private sector network of agro-input dealers that provides high quality, competitively priced inputs (tools, seed, fertilizer, crop protection products, and equipment) as well as technical information and services to farmers, primarily those growing lowland rice, cassava, and vegetables, or rearing goats in market corridors. Productivity and profitability will be improved through improved availability of inputs, along with better crop management and the expansion of extension support. FED's public and private sector partners will catalyze local entrepreneurship, link input supply businesses into the value chains, and integrate scattered producers to gain economies of scale and provide enhanced market access for quality inputs.

FED approach, using International Fertilizer Development Center (IFDC) STTA expertise in collaboration with FED and MoA field teams is to facilitate the testing, diffusion, and use of improved technologies for production, processing, and marketing and to support rural enterprises to supply these technologies. The input supply specialist will support the FED demonstrations by monitoring the adoption of the demonstrated technologies by farmers on their own fields. All FED demonstration sites will have soil tests prior to the demonstration.

Public and private sector actors and farming communities must work together to ensure farmers get appropriate, high-quality inputs at the right time and at acceptable costs for profitable use to improve productivity of their on-farm production systems. The economic viability of the input sector depends greatly on the expected return on investment, especially for poor and risk-averse farmers. Typically, a value/cost ratio of two or more is needed for adoption. Economic and financial analysis of the value chains and field surveys will be used to collect the data needed to identify profitable winning strategies. Further, the field trials and demonstrations of best practices in farmer fields should convince FED's partners (farmers, transporters, manufacturers, importers, and dealers) to engage and invest in the import, manufacture, storage, sale, and use of inputs. Market opportunities for the FED commodities, as well as the importance of these commodities in the farming system also influence the readiness of producers to invest in input supplies. Thus, both output and input marketing initiatives (dealt with under Component 2) are needed before the input suppliers will see viable opportunities to establish or expand their supply operations and outreach to the rural areas.

The underdeveloped input supply systems in Liberia combined with the weakly organized producer organizations require an initial emphasis on capacity building of farmers, agro-dealers, and input suppliers to help establish their position in the targeted value chains. These activities and technical support to test Integrated Soil Fertility Management (ISFM) and UDP and pilot a market smart voucher program, are the four main input supply interventions in FY 2013.

FED, in collaboration for the MoA and the Centers of Excellence (see Component 3), will develop, apply, and widely disseminate training materials in appropriate languages and formats. FED extension

staff, STTA Doe Adovor, agents and technicians from the MoA and the VoAg institutions, and Central Agricultural Research Institute (CARI) researchers will be involved in development of the best practices training materials, as well as the field-based testing and trials of ISFM and UDP.

With the recent launch of the USAID West Africa Fertilizer Program[2], IFDC will also support FED in policy-related efforts at the national level and ensure that they are consistent with ECOWAS regional regulations.

For input supply system accomplishments in 2012, please see the FED 2012 Annual Report.

In FY 2013, FED interventions to improve access to quality agro-inputs and test new technologies include:

- Smallholder capacity building;
- Agro-dealer capacity strengthening;
- Input vouchers;
- Improved appropriate technologies (UDP and ISFM); and
- Agricultural extension and curriculum development support.

At the end of this discussion of Task 1.1, a table presents each activity, major constraints, proposed solutions, and expected impact/outputs. Following that, we include a list of expected targets, listed by activity.

### Activity 1.1.a: Smallholder Capacity Building

During FY 2013, producer organizations and cooperatives that have shown an interest in investing in inputs will act as change agents, and new and appropriate farming technologies tested by the FED program will be our initial entry points for input supply assistance and linkages with input dealers. FED long-term staff and STTA Tony Babb will work with these change agents to aggregate demand for inputs and supply of products, to more easily influence market dynamics and have greater impact, putting organized farmers in a better negotiating position with other value chain actors. Rural women engaged in agricultural production, processing, and marketing activities will receive special attention with respect to access to inputs. Two of the cooperatives targeted in FY 2013 are led by women: the Dokodan cooperative in Gbendin/Nimba County and the Intorfawor multipurpose farmers' cooperative in Foyah/Lofa County.

Capacity building activities for smallholder farmers and their groups in FY2013 will create awareness of and increase knowledge and interest in agro-inputs for improving the rice, cassava, vegetable, and goat value chains. Collaboration with these groups provides local agro-input dealers with an opportunity to link more directly to their clientele, thus, strengthening their businesses and interface with farmers, cooperatives and associations. Special attention will be given to female farmers and women-led groups or enterprises, to allow them to benefit from all the smallholder capacity building activities. Environmental issues will be integrated into all FED training and FED will coordinate with organizations which have established successful farmer-based organizations (FBOs) such as–

[2] USAID's West Africa Fertilizer Program will increase the regional availability and use of appropriate and affordable fertilizers through increased regional supply and distribution of fertilizers by the private sector; increased knowledge and use of agricultural technologies and methods; improved efficiency of regional market transactions; and an improved enabling environment for fertilizer policy and regulatory frameworks.

Agricultural Relief Services (ARS), Nimba; Rural Agricultural Alternatives, Lofa; TECURD, Grand Bassa; CATALYST, upper Bong and ODAFARA, lower Bong and Nimba.

Capacity building activities include:

1. Training on planning for the agricultural season/ defining input needs.
2. Training on linking farmers to input and output markets, (with value chain managers and small and medium-sized enterprises [SME]).
3. Training on pooling input demand to cooperatives and groups.

In addition to the capacity-building activities proposed above, FED will work with smallholders in the targeted cooperatives on the testing and introduction of two new technologies: UDP and ISFM.

### Activity 1.1.b: Agro-Dealer Capacity Strengthening

Actors in the input supply chain include 1) agro-input suppliers based in Monrovia; 2) local agro-dealers based at the county level; 3) farmers' cooperatives; and 4) individual farmers and members of farmers' cooperatives and associations in the communities—the end users of agro-inputs. A rapid overview of the main actors, their capacities, and products currently available for distribution in Liberia follows. These change agents form the initial target group for our interventions. Opportunities for expansion of the distribution network and identification of new input supply enterprises continue.

**Agro-Input Suppliers**

Miagro has been creating awareness on the use of agro-chemicals through demonstrations in rural counties. It deals in agro-chemicals to control weeds and insect pests on cocoa, coffee, rice, vegetables, and cotton. It has no distribution points in FED operational areas and relies heavily on purchases from donor agencies, government, and some large farms.

Gro-Green sells seeds (vegetables and maize), tools and equipment, and fertilizers (NPK, Urea). The company plans to establish a laboratory to conduct soil analysis and assess fertilizer quality (nutrient analysis). Its main customers are also government, donor agencies, NGOs, and large commercial farms.

Greenfields deals in seeds (vegetables and maize), tools and equipment, and fertilizers (NPK, Urea). Its main customers are government, donor agencies, NGOs, and large commercial farms. It does not have any distribution points in FED operational areas.

Wienco is the only input supply company that has established distribution points in the FED operational areas. It has warehouses with agro-chemicals and fertilizers for cocoa plantation and food crops. Wienco employs agronomists and 13 extension officers across Liberia.

Arjay Farms produces rice seeds under an outgrower scheme and sells to farmers, NGOs and the donor agencies. FED is supporting an expansion of its outgrower scheme to supply more improved rice seed to farmers.

**Agro-Input Dealers (Stockists)**

Aloysius Sumo Business Center sells building materials and tools and equipment for agriculture, including agro-chemicals and fertilizers. Fertilizers are repackaged into smaller units for LRD 15.00 to meet the needs and purchase abilities of smallholder farmers. The company is located in Gbarnga in the Bong County.

The Agricultural Material Business Center is located in Gbarnga, Bong County. It deals in fertilizers, seeds (vegetables), agro-chemicals, personal protective equipment (PPE), and tools and equipment. It

intends to build a warehouse to stock fertilizers and other agro-inputs. It sells to smallholder farmers and occasionally to rubber/cocoa plantation farmers. The company currently finds that agro-chemicals from Guinea are cheaper than in Monrovia.

**Potential Expansion of Retail Outlets**
Farmer's cooperatives present an opportunity to deliver agro-inputs at the doorstep of smallholder farmers. These cooperatives provide services such as processing rice, storing materials, and linking the members to the input and output markets. In 2013, Kokoyah farmers' cooperative, Foyah Intorfawor multipurpose farmers' cooperative, and Dokodan farmers' cooperative will partner with FED on expanding input supply. With Component 2, businesses will be assisted in FY 2013 to help expand farmers' access to agro-inputs.

**Responsibilities**
Support for the implementation of this activity is provided by the input supply specialist, STTAs, and the FED and MoA field teams. In 2013, FED county teams will continue working with MoA county teams to promote market-oriented agricultural production activities and address food security stability.

**Profiling and Needs Assessment**
FED's Enterprise Development team is profiling the actors in all the value chains. After this profiling and needs assessment, in FY 2013, FED will strengthen the capacity of 10 agro-dealers that have already been identified, as well as newly identified agro-dealers. Input suppliers will expand their services to the smallholder farmers in the rural communities through an expanded network of organized agro-dealers who will receive assistance where they currently most lack skills (still to be identified through the detailed needs assessment). Specific training materials will be developed and tailored to their specific needs.

**Training for Agro-Input Dealers and Suppliers on Technical Knowledge and Business Management**
Capacity building and training needs for agro-input dealers and input suppliers will include enterprise development as well as technical input supply skills. The FED SME component will assist agro-input dealers and suppliers to develop bankable business plans to attract loans from the commercial banks. Additionally, we will provide support for improved enterprise management practices, including financial and administrative skills (including record keeping and accounting), employee and resource management, and so on.

The agro-input specialist and STTAs Brain Kiger, Constant Dangbegnon, and Fofana Bdjokazo will train participants on input demand planning and creation, stock planning and input shop management (reviewing quality and safety standards and norms), training on safe handling and use of agro-inputs, and promotion and outreach so that agro-dealers and suppliers can become viable enterprises and improve service delivery of inputs to producer organizations. IFDC has a series of dealer training modules on expanding dealer business, including the technical aspects of various inputs, IPM, ISFM, safe use of crop protection products (CPP), and business, marketing, extension, and other services, such as soil testing. These in-house training materials will be adapted for Liberian conditions.

In addition to agro-dealers, cooperatives are interested in similar training activities in order to provide input supply services to their members. A tangible contribution from the partner will be expected before entering a training agreement.

**Expand Input Supply Access Points**
FED will support agro-input suppliers and dealers to open sales new points in rural areas to reduce the distance farmers' must travel to access agro-inputs. The network of input supply shops needs to be

expanded; one way to do it is to expand access via cooperatives. Cooperatives can provide input supplies as a service to their members. STTA Tony Babb, a rice cooperative specialist, will return to work with rice cooperatives to develop and expand this model.

In collaboration with the FED SME component, through business idea competition events, FED will provide incentives to existing entrepreneurs and youth interested in opening agro-input dealer sales points in rural areas. FED will help develop business plans and facilitate access to finance for new entrepreneurs. The input supply specialist will link the current importers of inputs or input suppliers to county- or district-level input dealers so that the rural distribution network has access to quality inputs.

FED will identify 12 more cooperatives and up to 20 new agro-dealers in FY 2013.

**Input and Output Market Events**
To stimulate exchange, discussion, and information sharing among the actors involved the agricultural sector; FED will organize and facilitate a number of specific events:

- Agricultural campaign pre-season and pre-harvest planning events
  - Pre-season events will include all value chain actors in discussions on input needs based on potential output markets, as well as training needs, financial assistance, partner collaboration, and so on. Understanding the demand for and timing of supply of specific types and volumes of inputs will help define additional FED technical assistance to agro-input suppliers and dealers.
  - Pre-harvest events would enable all actors to review planning for the harvest, including logistics for market distribution, aggregation, and storage and processing. These events also include a review of loan repayments for input supplies.
- Input Supply Fairs
  - These fairs will be organized around the FED trials and demonstration activities and in collaboration with other FED components. FED will involve VoAg center students/interns to assist and be promoted through radio, TV, newspapers, etc. Based on the interest, training and support activities with agro-inputs supply chain actors, around the ISFM and UDP trials, will be organized in the FED counties to bring stakeholders together.
  - These fairs will include all actors involved in the inputs supply chain: suppliers to present and promote (new) products and farmers and input suppliers to liaise on needs and negotiate deals.

### Activity 1.1.c: Input Vouchers

The FED input voucher program is intended to support selected farmers trained by FED and encourage them to test and apply new technologies on their own fields. The vouchers will target those with limited resources (women's associations and youth). Beneficiary selection will be based on agreed-upon criteria at the community level. Voucher programs introduce new inputs and technologies to beneficiaries at a reduced cost while providing sellers with an incentive to supply products to new markets by guaranteeing specific sales—linking a supplier directly to the beneficiary.

This activity is being planned and organized by STTA Brian Kiger together with FED and MoA field teams. The voucher program will be carried out to support rice, cassava, vegetable, and goat farmers' adoption/application of recommended technologies on their own farms. MoA county teams will continue to mobilize farmers in the communities and, together with the FED county teams, continue demonstrations of STTAs' contextualized recommendations. The input voucher program is associated with activities implemented by other components: 1) identification of stakeholders in the value chains;

2) profiling; 3) capacity building through training and demonstrations; and 4) adoption of the technologies proposed.

From the demand side, cooperative farmers who can sell their crop production are typically willing to invest in agro-inputs. Targeted farmers and cooperatives in the FED program will be introduced not only to best production practices, but also to improved and quality inputs, including high yielding and disease resistant seed and plant material varieties, crop protection methods and products, and fertilization practices, including different chemical fertilizers and briquetted urea for irrigated rice production.

Agro-input suppliers and dealers will demonstrate and make available agro-inputs in affordable packages that respond to farmer and crop need at the appropriate time and location. The proposed smart voucher program helps respond to both input access and affordability both concerns and an obstacle.

A pilot voucher program will be launched for 1,000 farmers in the main counties of Bong, Nimba, Lofa, and Grand Bassa, with a minimum involvement of three responding input dealers/suppliers. In the selecting farmers and agro-input dealers/suppliers participating in the voucher program, we will pay special attention to the inclusion of women and youth producers and women-led enterprises.

Selected farmers will be eligible to purchase two vouchers at 50 percent of their value—for example, one valued at $20 for tools or equivalent value for veterinary supplies, and one valued at about $35 for 17.5 kilograms (kg) of improved rice and vegetable seed and/or an equivalent value of fertilizer. The farmers participating in this pilot will be required to repay the $10–$27.50 subsidy value after commodity harvest/sales time. Distribution of vouchers will be done through the cooperatives mentioned above, targeted FBOs, local NGOs, and partner projects such as LAUNCH. After sales and submission of the vouchers to the FED project office in the county, the suppliers would receive full payment.

Based on these basic elements, a full pilot voucher program will be designed in detail by STTA in January 2013. Close collaboration with all value chain program activities will be essential during this phase to ensure that the voucher program responds to the specific needs of actors in each of the targeted value chains.

One round of voucher distribution will be organized in FY 2013. For rice and cassava, the voucher program will take place in from March–May 2013 after UDP demonstrations have been conducted for rice and cassava. For goats, the voucher program in FY 2013 will cover veterinary drugs (1 voucher), shelter and fence construction materials (1 voucher), and goats (1 voucher). The voucher program will be held around March-April 2013 for goats. For vegetables, a voucher program in March–April will cover seeds (1 voucher, or equivalent for crop protection products or fertilizers), tools (1 voucher). The vegetable voucher program will focus on the locations where demonstrations are conducted, including Montserrado and Margibi, so that it can support the use of new technologies on farmers' own fields.

Assuming the voucher pilot program is successful; it will be scaled up in Year 3 and expanded to cover greater quantities and other inputs in demand by farmers. The FED-supported dealers would be among those eligible to apply for MDF support, in the form of subcontracts, to ensure their ability to carry out their commercial activities.

### Activity 1.1.d: Improved Appropriate Technologies – UDP and ISFM

Activities planned in 2013 will address training and demonstrations on UDP and ISFM and the extension support needed for the adoption of the associated technologies. The activities will be

initiated by two STTAs from IFDC, Constant Dangbegnon and Fofana Bdjokazo, and continued by FED and MoA field teams.

**Urea Deep Placement (UDP) Technology**

In FY 2013 FED will introduce UDP technology in Liberia through training and demonstrations. A successful trial in 2013 will help create a demand for UDP technologies and create farmers' interest in and capacity to use UDP technologies. In late FY 2013, FED will develop the local dealers' capacity to supply this new market demand with high-quality inputs (seeds, fertilizers, urea briquettes, etc.) and equipment, and engage in promotional activities to stimulate demand for UDP. All this will be closely linked to the results of the demonstrations, which should show that the use of UDP is far more efficient than applying urea through broadcasting. The latter has a direct effect on the costs of applying urea. Deep placement of urea increases the crops' uptake efficiency, which results in increased productivity. Lowland rice needs a minimum of 50–100 kg of nitrogen (N) per ha to give high yields. Assuming 200 kg/ha urea, which costs more than $200, but has little residual effect, yields have to increase by at least 500 kg of paddy just to break even. Using urea briquettes, the price increases to $220 and up and requires another 11 labor days for application. However, due to placement near the roots, application rates can be reduced and the pH around the briquette increases, so nitrification slows. A residual effect of up to three seasons has been seen.

The successful technical and economic trial of this new technology will warrant investment in the procurement of urea briquettes-making machines to make UDP interventions even more cost effective. Currently, there are no briquette-making machines in Liberia; the briquettes need to be imported. FED will explore the development of business plans for selected seed suppliers and input dealers (in the FED major rice production counties) to invest in briquette machines as a way to expand their agricultural enterprise, enabling them to supply improved seed and urea briquettes as a "package deal."

UDP demonstrations will be conducted for lowland rice on a pilot basis, in collaboration with five agro-input suppliers, 12 agro-input dealers, and up to 1,000 farmers on the FED inland valley swamp areas were developed in 2012 (23 sites for lowland rice). In addition to the sites covered by FED demonstrations, additional sites cultivated by members of cooperatives such as Kokoyah farmers' cooperative/Bong County; Dokodan farmers' cooperative/Nimba County, and Foyah Interfawor multipurpose farmers' cooperative/Lofa County will be targeted. The participating farmers will purchase improved rice seed, and the project will supply 100 bags of urea briquettes and demonstrate their proper application. ISFM practices will also be applied on the UDP demonstration sites to present farmers the full package of technologies and practices.

The input supply specialist and the two STTA will collaborate with the Centers of Excellence, as well as MoA extension services and CARI, to ensure that UDP and ISFM are reviewed and added to their curriculum and extension messages as appropriate. Demonstration sites at the colleges will allow for this new technology to be included in students' ongoing lesson plans and proposed services projects.

Methodology: Crop: Lowland rice

- Treatment-1: 20x20 meter plot with UDP (N=46 percent)
- Treatment-2: 20x20 meter plot with ordinary broadcasted urea (N=46 percent)
- Treatment-3: No urea.

**Integrated Soil Fertility Management**

ISFM is a way to increase agricultural productivity while protecting the environment and maintaining the soil resource base. ISFM strategies emphasize the combined use of mineral fertilizers and locally

available organic materials (crop residues, compost, and green manure) to replenish lost soil nutrients. This improves both soil quality and the use efficiency of fertilizers and other agricultural inputs (seeds, crop protection products, and water). In addition, ISFM promotes improved crop management practices, including measures to control erosion and leaching (35 percent of the nitrogen lost) and techniques to improve the maintenance of soil organic matter.

Farmers who have adopted ISFM technologies elsewhere in Africa have doubled their agricultural productivity and increased their farm-level incomes by 20 to 50 percent. The inputs used include Triple Superphosphate (TSP), Potassium chloride, and NPK fertilizers in different combinations for cassava and rice. The value-cost ratios of adopted ISFM options are well above two elsewhere.

FED will promote ISFM technologies and practices heavily in upland rice and cassava plots, in combination with any rotational crops produced in the upland farming systems. The aim is to make these systems more sustainable—encouraging producers to farm more intensively on the same fields but preserving the nutrients in them instead of continuing their destructive shifting cultivation practices. The ISFM will be integrated with the other compost, legume and organic matter activities.

In FY 2013, the STTA and FED field teams will conduct farm-based field trials on ISFM techniques on cassava and upland rice for up to 1,000 farmers in the four main FED counties. FED has already trained farmers in establishing nurseries for the production of cassava cuttings on all 22 demonstration sites where cassava is growing, thus providing a basis for immediate ISFM demonstrations.

Methodology:

- Cassava pure crop - Treatment: 60x40 meters plot NPK and KCL + line planting + erosion control system
- Upland rice pure crop -Treatment: 60x40 meter plot NPK and TSP + line planting + erosion control system

### Activity 1.1.e: Agricultural Extension and Curriculum Development Support

FED is working with the MoA to promote a pluralistic agricultural extension and advisory system. To increase the use of agro-inputs and application of appropriate technologies and best practices by Liberian smallholder farmers, training and extension materials needed to be developed for capacity building efforts. FED extension officers and partners (MoA, cooperatives, private farms) also required training. FED will perform these input supply activities in close collaboration with value chain leaders and the VoAg centers for an improved agricultural college curriculum and extension approach.

The input supply specialist will work with the STTA extension specialist, Doe Adovor, and the KM unit to liaise with input dealers and suppliers, farmer cooperatives, agricultural extension agents, research institutions, and professors and students at the Centers of Excellence to collect best practices and develop appropriate extension and training materials. FED will conduct an extensive review of the existing materials and develop new materials that include new technologies, improved practices, appropriate approaches, and methodologies that respond to the specificities of the variables in Liberia's agricultural sector. These best practices will then be translated into the appropriate languages and media for dissemination.

## FIGURE 1.1.A: COMPONENT 1 -IMPROVING THE QUALITY AND QUANTITY OF INPUT SUPPLY IN LIBERIA FY 2013

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| **Activity 1.1.a: Smallholder Capacity Building** | | | |
| Limited smallholder farmers' capacity to consolidate input demand:<br>1. Farmers' associations and cooperatives are not organized to access inputs;<br>2. Farmers' associations and cooperatives are not linked to supplies of agro-inputs at acceptable costs;<br>3. Farmers' associations and cooperatives are not trained in input demand pooling | Farmers' capacity building for campaign preparation and local resources pooling:<br>Facilitate restructuring of farmers' associations and cooperatives: leadership training, production planning, clear objectives, input needs, market opportunity identification, resource mobilization, increased benefits to individual members | 1. Training on campaign planning and inputs needs assessment;<br>2. Training on linking farmers' associations and cooperatives to Agro-dealers and suppliers;<br>3. Training farmers' associations and cooperatives on inputs demand pooling | 1. 60 percent farmers trained by FED through their associations and cooperatives are able to consolidate purchase of inputs;<br>2. 60 percent farmers trained by FED increase agro-inputs use on their own fields |
| **Activity 1.1.b: Agro-Dealer Capacity Strengthening** | | | |
| Limited agro-dealers capacity for strengthening business:<br>1. Limited capacity for input handling and input shop management;<br>2. Limited linkages with farmers' associations and cooperatives;<br>3. Limited presence on the local rural markets;<br>4. Limited linkages with Agro-input suppliers | Support for establishing sales points:<br>1. Matching fund to assist in the establishment of new agro-input dealer sales points;<br>2. Incentives to existing agro-input dealers and especially youth to open agro-input dealer sales points in the rural areas.<br>3. Start-up capital to new agro-input dealers, | 1. Capacity building for shop keeping & management;<br>2. Training in safe handling of agro-inputs;<br>3. Training in demand planning<br>4. Support for promotion and outreach<br>5. Business planning | 1 More Agro-inputs sales points ;<br>2 Women trained by FED to establish input shops;<br>3. Records on agro-input demand at the sales points set up by 12 agro-dealers trained by FED<br>4. Agro-inputs promotional and extension materials available at shops;<br>5. Business plans, sales forecasts and signed agreements. |
| **Activity 1.1.c: Input Vouchers** | | | |
| Limited access to agro-inputs by farmers:<br>1. Smallholder farmers have limited knowledge of agro-inputs, no clear production, investment and marketing objectives;<br>2. The demand for agro-input is limited because of the above situation | Capacity building for campaign planning:<br>1. Assessment of seasonal input demand;<br>2. Identification of farmers willing to pay 50 percent of the market price for the inputs they need | Voucher program:<br>1. Identify products not available locally;<br>2. Identify beneficiaries willing to cost share;<br>3. Identify rural input suppliers;<br>4. Train voucher program facilitators;<br>5. Organize input fairs | 1. Up to 60 percent of the targeted beneficiaries trained by FED for rice, cassava, vegetables and goats have purchased and used agro-inputs needed for rice, cassava, vegetables and goats productions. |

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| **Activity 1.1.d: Improved Appropriate Technologies - UDP/ISFM** | | | |
| Limited knowledge of UDP/ISFM technologies:<br>1. Farmers unaware of UDP/ISFM benefits;<br>2. No local capacity for producing Urea briquettes;<br>3. Limited understanding of soil fertility management and little or no crop rotation using legumes. | UDP/ISFM training and demonstrations:<br>1. Diffusion of UDP/ISFM technologies<br>2. Facilitate local production of Urea briquettes. | 1. Conduct UDP/ISFM demonstrations for farmers' groups, and input dealers<br>2. UDP/ISFM training for extension, VoAG, and research institute | 1. Urea briquettes/UDP are produced locally and used by 60 percent farmers trained by FED;<br>2. ISFM understood, diffused by Extension agents and used by 60 percent farmers trained by FED |
| **Activity 1.1.e: Agricultural Extension and Curriculum Development Support** | | | |
| Limited Extension support to farmers:<br>1. Knowledge gaps with respect to UDP and ISFM at all levels of the 4 VC actors: producers, scientists, Extension personnel, agro-dealers;<br>2. Lack of extension materials on crop rotation, UDP and ISFM for rice, cassava, and vegetables;<br>3. No private sector extension for UDP and ISFM | Capacity building for Extension upgrading in VoAG institutions:<br>1. Training of Extension and Agro-dealers on crop rotation and the diffusion of UDP and ISFM Technologies;<br>2. Extension materials diffused on UDP and IFSM technologies among farmers by the private sector;<br>3. Internship programs on UDP/ISFM for students | 1. Production of extension materials, and revised VoAG curriculum on agricultural input & technology practices;<br>2. Internship program and VoAG training in agro-input supply and agro-input use strategies to improve VC production. | 12 Agro-dealers and Extension personnel are using appropriate extension materials for the adoption of crop rotation, UDP and ISFM technologies among farmers;<br>24 VoAG interns are trained in the use of and diffusion of UDP and ISFM technologies as well as the benefits of crop rotation. |

### Expected Performance Results/Targets – Input Supply System Interventions

**Activity 1.1.a: Smallholder Capacity Building**

- Ind. # 1A: Gross margin per unit of land under UDP rice or ISFM rice/cassava still to be calculated.
- Ind. # 1.1.1: 1,200 farmers (assume 60 percent among those trained, 1,000 for lowland rice and 1,000 for upland rice and cassava) will adopt ISFM and UDP technologies.
- Ind. # 1.1.1: 200 others trained by these first adopters will apply ISFM and UDP technologies.
- Ind. #1.1.2: 480 hectares are demonstrated to farmers using ISFM (2, 60 X 40 meters plots per farmer)
- Ind. #1.1.2: 600 hectares are cultivated by farmers using ISFM technologies (1 hectare per farmer)
- Ind. #1.1.2: 80 hectares are demonstrated using UDP technologies (2 20 X 20 meter plots per farmer)
- Ind. #1.1.2: 300 hectares are cultivated using UDP technologies (1/2 hectare per farmer)
- Ind # 1.2.1: A minimum of three cooperatives received USG assistance.
- Ind # 1.2.2: 1,400 enterprises applied new technology.
- Ind. # 3.1.1: 2,200 farmers trained in UDP and ISFM techniques.

**Activity 1.1.b: Agro-Dealer Capacity Strengthening**

- Ind. # 1.1.2: 12+ agro-dealers applying good business management practices.
- Ind. # 1.1.2: At least three cooperative management teams applying good business management practices.
- Ind. # 3.1.1: 12+ agro-dealers and 5+ suppliers received productivity training.

**Activity 1.1.c: Input Vouchers (Counted separately from value chain targets)**

- Ind. # 1.1.1: Approximately 300 rice farmers trained by FED accessing inputs (seed, fertilizer);
- Ind. # 1.1.1: Approximately 600 cassava farmers trained by FED accessing inputs (fertilizer);
- Ind. # 1.1.1: Approximately 96 goats' farmers trained by FED accessing veterinary drugs, animals, shelter and fence construction materials through the voucher program;
- Ind. # 1.1.1: Approximately 267 vegetable farmers trained by FED, accessing inputs (seeds, crop protection chemicals, tools) through the voucher program;

**Activity 1.1.d: Improved appropriate technologies - UDP/ISFM**

- Captured in Activity 1.1.a targets.

**Activity 1.1.e: Agricultural Extension.**

- Captured under other activities.

## TASK 1.2: INCREASED PRODUCTION AND PROFITABILITY OF QUALITY RICE IN LIBERIA

FED rice interventions in 2013 will build on the 2012 experience and range from intensive, commercially focused activities with groups to more subsistence-focused activities with individuals. The scale and number of activities per county will depend on the opportunity, the cost, and the likely long-term returns. Appropriate varieties, water management, organization for timely planting and bird and weed control, processing, and policy are all critical to expanded local rice production.

The benefits of organic matter management and good seed will be promulgated in the upland rice sites, mainly with individual growers. Groups and cooperatives will be encouraged to expand their lowland sites, and helped with the investment costs of the infrastructure improvements needed for that expansion. This work will be combined with demonstrations of cost-effective fertilizer use, new varieties, double cropping, and water management in selected lowland sites, plus expanded post-harvest, drying, and milling procedures in the villages and marketing improvements through larger groups and cooperatives. Vegetables that are grown between rice crops (catch cropped) will also be added to the lowland systems where and if appropriate. A wide range of rice-related activities will be implemented in 2013 with an increased emphasis on profitable production, investment in water management, demonstration and adaptation of new technologies, improved food security, and expanded marketing.

In FY 2013, activities in lowland rice will include expanding the rehabilitation and improvement of existing swamps primarily in Nimba, Lofa, and Bong combined with teaching improved water management. FED will pilot paddies with fish where appropriate, starting with the learning laboratory at Nimba County Community College. FED will continue working with the group locations from FY 2012 activities and expand support to communities operating swamps and other existing large producers such as the Dokodan Farming Cooperative in Gbedin, Nimba County, which produces, mills, and bags rice for sale to traders and the World Food Programme's (WFP) project.

Capacity building is one focus of the FED rice activities. First, FED will directly train farmers, lead farmers, local NGOs, and input and equipment suppliers. Second, these suppliers, NGOs, and lead farmers will train additional farmers. Furthermore, continuing demonstrations of new techniques and technologies is another important aspect of the 2013 program. A third focus will be on supporting local groups that want to invest in expanded production to rehabilitate and improve their water management. A final focus will be on expanded certified seed production by local growers.

For Year 1 rice achievements, please see the FY 2012 Annual Report.

In Year 2, FED will build on the lessons learned in Year 1, including the importance of timely implementation of cultural activities; the need for specialized expertise to develop water control structures; the large investment costs in labor and tools required to rehabilitate a swamp; better organization of producer groups for lowland rice development in relation to other farming activities, especially at time-sensitive periods (such as during transplanting); and the need to facilitate the adoption and transfer of improved practices and technologies to farmers' fields. We will focus on four areas:

- Continued varietal testing and certified rice seed production.
- Infrastructure rehabilitation and improved water management in lowland irrigated swamps.
- Improved production practices and technologies for lowland and upland rice.
- Post-harvest processing and marketing.

Out of 104 sites planned, 79 will be lowland and 25 upland with an improved crop area of approximately 365 lowland hectares and 70 upland hectares. Seventy-seven of these will be new sites and 27 will be sites that received support in Year 1. Approximately 550 lowland hectares and 140 upland hectares will be affected when we include the area improved by farmers themselves, assisted by lead farmers, who are replicating improved practices to their plots and paying for the services provided by commercial power tiller operators and improved rice seed.

Every attempt will be made to create geographic overlap between rice production activities and other FED activities, especially with the activities of the vegetable value chain. A number of rice sites have been tentatively identified that meet this criterion. Possibilities include Yealequelleh, Jorquelleh, Salala, Panta, and Suakoko in Bong County; Sanniquellie Mahn and Bain-Garr in Nimba County; Districts 1 and 2 in Grand Bassa; and, Foya and Zorzor in Lofa County.

At the end of this discussion of Task 1.2, a table presents each activity, major constraints, proposed solutions, and expected impact/outputs. Following that, we include a list of expected targets, listed by activity.

### Task 1.2.a: Varietal Testing and Certified Rice Seed Production

Low yielding local rice seed, often varietal mixtures and sometimes displaying low germination rates, contributes to the limited production experienced by Liberian farmers. There is a need to stimulate the production of higher-quality rice seed and to continue to test and introduce new varieties. About 25 percent of the 2013 sites will include adaptive research trials to assess the performance of improved varieties against local varieties. Following the rice harvest in October/November, FED will assess the yields of the Nerica and other improved varieties tested in FY 2013 to determine which lines performed the best and were most preferred by farmers. Based on this feedback from farmers, FED will continue to work with local seed producers—including Arjay Farms, Mohammed Kamara, Harriet Larway, as well as some other farmers trained in Year 1—and use foundation seed sourced from CARI and STTA seed specialist Aline Funk to increase and multiply rice seed in up to 22 locations. FED's input supply specialist team will work closely with the rice value chain to develop links with the Africa Rice Center and CARI's breeder and foundation rice seed multiplication programs, which are finally getting underway. These emerging seed dealers will be helped to market and promote their products through Component 2 trade fairs.

Decentralized production of rice seed by strategically located small seed multipliers can also be promoted. We will begin with a market study by STTA Mimi Gaudret that will bring together small farmers in each of the project counties, including lead farmers from this year's rice program, and take into account the results of the adaptive rice research conducted this year. The study will identify the rice varieties most preferred by farmers. FED will then train individual rice seed multipliers at selected sites chosen based on the following criteria: prior experience producing and marketing rice seed, proximity to areas known for innovation-adopting farmers and/or displaying high densities of surplus-producing rice farmers, and more. The model for this activity is the ongoing vegetable seedling production work. FED's role will include:

- Providing instruction in the techniques and technologies for improved rice seed production.
- Supplying foundation rice seed, tools, and fertilizer as well as cover crop seed.

The seed multiplier will:

- Provide her/his labor and land of appropriate quality for the production of rice seed, which will be preferably located at a site visible to prospective seed buyers.

- Promote and sell the seed.
- Collect the names, addresses, telephone numbers, and quantity of seed bought by each person.

### 1.2.b: Infrastructure Improvement

In Year 2, FED, MoA, and its local NGO partners will improve and rehabilitate a number of additional lowland sites and demonstrate improved water management. Lowland rice rehabilitation sites have not always been properly developed and many are in need of re-design and repair, with most farmers still untrained in even basic maintenance and water management. The existing rice sites suffer from a multitude of structural problems including improperly constructed bunds and canals; poor design, resulting in some sites being plagued with waterlogging or inadequate water supply (with both design/water management issues); and imperfectly leveled plots, so that some plants receive too much water and others not enough. FED is recruiting irrigation expertise and the Swiss Development Corporation to share their engineering expertise in Lofa and Nimba counties.

The 27 existing lowland sites will have their production area expanded by approximately 1-2 hectares. In the first quarter of Year 2, communities will be visited and up to 60 potential new sites will be identified for expanded swampland rehabilitation. According to the area available and the number of interested households in the village, groups of at least 50 members will be enrolled for the primary purpose of receiving training in lowland rice production. Each group will be assisted in the establishment of up to 5 hectares of lowland rice. FED will cover part of the infrastructure rehabilitation costs of these expansions in area by providing food for group members engaged in heavy manual labor. More than 1,000 person-days are needed to rehabilitate a hectare. Farmers will be expected to contribute their labor for all other phases of the lowland rice scheme development, including nursery preparation and management, transplanting, weeding, bird scaring, harvesting, threshing, etc. The sites, the beneficiaries, and the actual areas to be expanded will be selected based on defined criteria. The long-term goal is to create sustainable, profitable swamp systems.

The rice value chain team will also collaborate with local NGOs to build the capacity of communities to increase their rice production on larger swamps where the whole community is engaged. Criteria for selecting local NGOs include experience training farmers in improved rice production practices, an established presence in the county where the work is to be performed, and a record of training rice producers that has resulted in increased yields. One or more NGOs will be chosen through a competitive process for specialized tasks such as the design and supervision of the rehabilitation and layout of the lowland rice schemes.

All of these lowland sites will be used for training farmers in improved water management and production practices and demonstrating new technologies. Approximately 25 percent of the locations will have trial plots that will receive intensive management and a variety of treatments, rice varieties, fertilizer, etc. Most of the rice plots in the FED schemes will just receive seed, fertilizer, and tools with simple treatments, such as line planting, and be managed day to day by lead farmers under the supervision of FED staff or local NGOs. FED has also had a number of enquires about adding fish farming to rice paddies. With Contracting Officer's Representative approval to add this activity, we will work with USAID's Ken Hasson and the Bureau of National Fisheries to develop a strategy to work with local NGOs to incorporate fish farming, as appropriate, into some FED lowland rice sites in FY 2013. This addition dovetails nicely with the new focus on water management in FY 2013.

Improved water management will be accomplished through several steps. First, supported by the FED Rice Officer and Environmental Officer, FED extension agents will identify up to 60 new lowland sites for expansion of production and/or rehabilitation, and include 25 of the existing lowland rice demonstration sites from Year 1 for further development. Using global positioning system (GPS)

technology, county extension agents will precisely measure all these sites and calculate the investment needed by FED to both rehabilitate additional area and support expanded rice production at each of these sites. Engineers with drafting skills will develop a basic layout plan of each site and suggest improvements. Implementation of the improved design, including repair and installation of diversion weirs, irrigation and drainage canals, and all necessary bunds will be performed by rice producer group members under the direction of FED's county extension agents. An independent supervisor will oversee this work in each county. FED's Environmental Officer will provide overall supervision. Farmer involvement in the laying out process will result in the development of critical capacity for future maintenance and potential expansion. Finally, during the course of the rainy season and, in some cases, during the ensuing dry season, if irrigation is possible, FED extension agents will demonstrate how to regulate the amount of water flowing to each plot. Supported by the FED Rice Officer and Component 2 staff, the independent supervisors, who will oversee the installation of the infrastructure and the laying out of the sites, will also train a water management committee at each site to ensure that the diversion weirs and canals allow irrigation water to be distributed equitably.

The implementation approach of the upland rice program will work through individuals as well as groups, and provide seeds and tools, plus training in:

- Improved soil management, including the introduction of cover crops.
- Improved rice seed.
- Crop rotation and intercropping to include other crops (e.g., legumes such as peanuts and cowpeas), which will not only enrich the soil but also improve dietary diversity and household nutrition.
- Proper land preparation and sowing techniques.
- Improved storage and processing of rice.

### 1.2.c: Production Practices and Technologies

Improved rice production practices in need of demonstration, testing and development include mechanical tilling, straight-row planting, application of chemical or organic fertilizers (including use of non-invasive cover crops), and the use of improved rice varieties. These practices will be tested and disseminated through training at the 100 plus lowland and upland sites and supported by lead farmers, replicated to individual farms by community facilitators.

On the intensive management portions of about 20 selected sites, FED and its MoA and NGO partners will conduct adaptive trials to test hypotheses about the impact of varieties, fertilizer use, water management, UDP, ISFM, etc. Farmers will observe and be trained in these improved practices and have a chance to observe the impact on yields, labor time, and costs, allowing them to make decisions about adoption. Led and supervised by FED, MoA, and NGO extension officers, regular training and oversight will be performed by selected lead farmers and community facilitators, who will also ensure that practices demonstrated at these centrally located plots are transferred to the individual lowland and upland plots of participating farmers. Village-level facilitators and input supply specialists will follow-up with the farmer at her/his own rice plot to reinforce the extension messages and support adoption of the technology.

FED will build the capacity of the participating farmers and other key stakeholders through farmer field days at selected intensively managed sites. These gatherings will focus on specific interventions such as water management; seed production and variety choice; fertilizer use, including organic technologies and UDP; integrated pest management; and processing. These training activities will also be integrated with the learning laboratories and the regular instruction and activities at BWI and the

VoAg programs at the community colleges supported by FED, with specific field-based trainings used to strengthen information received in class and/or extracurricular farming activities implemented in some cases by school 4H or other clubs. BWI and the VoAg community colleges supported by FED's Component 3 will also be encouraged to place students as interns to learn how to develop expertise in site, layout, water management, seed production etc. If possible, staff from the community colleges will be used for training.

### Task 1.2.d: Mechanical Aids

Manual tilling is one of the most time-consuming and labor-intensive aspects of rice production and constitutes a major bottleneck to expanding the cropped area of lowland rice production. To perform to their optimum, the improved varieties require better tillage than the local varieties. Mechanical tilling with power tillers addresses this bottleneck, allowing for expanded surface areas and improved tilling quality. These result in greater production through both increased surface areas and yields. Instead of approximately 28 person-days per hectare, a power tiller can till the same hectare in 2 person-days. If lowland rice production expands, demand for mechanical tilling may grow if the investment costs and returns justify their use over manual labor. This will vary with a number of factors, including the local opportunity cost of labor, operating, and maintenance costs, and the area tilled by each tiller during the season. The Component 2 team will explore the viability of mechanical tillers as a custom enterprise.

Weeding by hand is very time consuming, which discourages farmers from carrying out this task regularly, resulting in reduced yields. A rotary weeder prototype will continue to be demonstrated to farmers and, assuming continued positive responses, local metal workers already equipped with an arc welder and a pair of shears will be trained to manufacture this relatively simple, but effective technology for wider adoption. FED will facilitate the adoption by purchasing weeders for use and demonstration on its lowland sites.

FED will document the results of these demonstrations and make them available to sources of financing (e.g., Afriland and Africa Lead), which may be interested in providing loan capital to entrepreneurs producing equipment, including improved hand tools or providing custom services.

## Task 1.2.e: Post-Harvest and Marketing

Lack of processing capacity presents a significant bottleneck to expanded rice production. Most rice hulling is still done by hand by women and girls in Liberia. The time-consuming and arduous nature of traditional processing limits local capacity to process significant increases in production, thereby constraining expanded production. As the value of labor increases, moreover, manual processing becomes less and less economical and unattractive to women with more remunerative activities to pursue. FED will test and demonstrate rice processing equipment for small-scale service processing and, at the same time, seek to connect potential investors in technologies with sources of financing. Local metal workshops will be trained to produce equipment once the market for the technology has been confirmed.

High capital and operating costs and lack of portability of processing equipment make investment in currently available de-hulling equipment unprofitable in most locations. Impact rice dehullers can significantly reduce processing time, removing one post-harvest constraint, which may lead to greater rice production and consumption. Because this technology does not polish rice, the final product will be more nutritious but may not be acceptable to consumers. FED will test the viability, estimate the costs and returns to a number of milling alternatives, demonstrate them to raise the awareness, test local acceptability of the product, and, if appropriate, build the capacity to manufacture it locally.

Currently, rice processing equipment breaks down frequently and local drying, cleaning, storage and parboiling can all be improved, along with maintenance of the equipment. Working with FED staff from Components 1 and 2, Rama Vellanki, in a series of short-term assignments starting in January 2012, will work to minimize post-harvest losses though improved drying, storage, and milling technologies. Dr. Vellanki will identify a number of different simple methods to improve postharvest operations, suggest suitable methods and equipment for demonstration, and prepare training materials and training for farmers, farm women and women traders, and small-scale rice millers. By adopting improved practices, postharvest losses could be reduced by about 10 percent. By using improved parboiling practices, local processors will be able to produce better quality milled rice with less broken rice. The wider use of de-stoners and drying mats can also significantly increase market acceptability of local rice.

These processing enterprises will benefit from business management training supplied by FED's Component 2. Students enrolled at the educational institutions supported by Component 3 could also intern with the various rice-processing enterprises. Other larger-scale rice processing and marketing activities could be conducted through and with change agents such as Fabrar Liberia, Inc., which is processing local rice and targeting supermarkets, or Fouta Corporation, Liberia's largest rice importer and a major wholesaler/retailer with interest in buying/distributing country rice if their quality and volume requirements can be met over time.

As rice production increases, a surplus will be created that could be marketed. In the case of groups that have generated a significant surplus, FED will assist them in developing market linkages, connecting them with groups already marketing a rice surplus. This will reduce risk and allow group leadership to gain marketing experience. Longer term, depending on their assessment of the indirect experience, the same groups may want to market directly. STTA Tony Babb will work with local cooperatives in FY 2013 to improve their processing and marketing. Groups may want to consider adding value to their production by investing in the low-cost processing technologies promoted by FED. Component 1 will collaborate with Component 2 to assist qualified groups with rice marketing as required.

All of the rice activities described here will be scaled up over time in four basic ways:

- Farmers will expand production on their individual farms applying improved practices and technologies as they observe the positive results achieved on the central demonstration plots.
- Some farmers not participating directly in the training provided by FED might copy improved practices they observe on the farm of a neighbor, who has benefited from FED training.
- In response to increasing market demand, cooperatives will expand production and marketing, and input and equipment suppliers and service providers will expand sales products and services.
- FED will also train additional rice value chain participants in Year 3.

In the case of the highest economic impact practices and technologies, it is expected that scaling up will occur over time. The project's job will be to identify and work with partners to expand these favored activities rapidly to other geographic areas where receptivity is likely to be high.

Policy: See Task 2.4.

## FIGURE 1.2.A: COMPONENT 1 -IMPROVING THE QUALITY AND QUANTITY OF RICE IN LIBERIA FY 2013

| Major constraints | Specific solutions | Activities addressing constraint | Intended Beneficiaries | Expected impact / output |
|---|---|---|---|---|
| **Task 1.2.a. Increased Rice Seed Production** | | | | |
| Insufficient knowledge about site specific varietal performance. | -Multi-locational variety trials<br>-Farmer field days. | - Learning laboratories, plots in selected visible locations.<br>- Farmer field days to allow them to evaluate varietal performance. | Farmers, researchers, other NGO's | Site specific data on performance of traditional versus introduced varieties.<br>Farmer input into selection |
| Lack of farmer awareness of improved rice varieties; | -Demonstration plots.<br>-Farmer field days.<br>- Radio programming.<br>- Seed selection training. | - Demonstration plots in selected visible locations.<br>- Farmers assess different varieties in one site and learn seed selection and storage.<br>- Radio programs publicizing the information. | Farmers, other NGO's | - Increase in knowledge base re improved seed varieties in farming system.<br>- Increased knowledge of and demand for better rice varieties.<br>- Farmers saving improved seed. |
| Limited access to improved foundation seed of farmer preferred varieties. | - Links to the Africa Rice Center and CARI's breeder and foundation seed multiplication programs.<br>- Local seed producers and foundation seed sources assisted to multiply rice seed of preferred varieties. | - Multi-locational tests of new varieties.<br>- Foundation seed supply improved.<br>- Farmers trained in certified seed multiplication. | Farmers,<br>Seed multipliers | - Variety testing and foundation seed multiplication systems improved.<br>- Improved supply and greater access to foundation seed.<br>- Increased production of improved rice seed and sale to farmers. |
| Limited certified seed production capacity. | - Train additional certified seed multipliers at number of decentralized locations | -Training of selected farmers in rice seed multiplication; seed selection, production practices, and seed marketing | Seed multipliers,<br>Farmers | - Increased numbers of certified seed producers |
| Weak commercial linkages between certified seed producers and farmers. | - Link seed multipliers with larger input suppliers and cooperatives with greater outreach and demand. | - Train seed multipliers<br>- Publicity through demo plots, field days, and radio. | Seed multipliers,<br>Farmers | - Access to improved seed facilitated. |
| **Task 1.2.b. Improved Water Management** | | | | |
| Limited local expertise in lowland rice water management | - Training of farmers in improved water management | - Identify and hire local experts to train in improved water management techniques.<br>- Instruct farmers in construction, use, maintenance, and expansion of physical control structures. | Farmers, Communities, Groups | - Farmers trained in the construction of lowland rice schemes and improved water management.<br>- Physical irrigation |

| Major constraints | Specific solutions | Activities addressing constraint | Intended Beneficiaries | Expected impact / output |
|---|---|---|---|---|
| | | | | structures improved.<br>-Better water management.<br>-Improved yields.<br>- Best practices identified. |
| Lack of awareness of the impact of good water management on rice production. | - Farmer field days.<br>-Radio messaging. | - Organize farmer field days at the end of the production cycle to demonstrate the production impact of water management<br>- Air radio programs to further inform farmers of the impact of good water management. | Farmers, Communities, Groups | - Expanded knowledge of impact of water management on yield.<br>- Increased interest in good water management and an eagerness to learn how to construct improved water control structures weirs, canals, bunds. |
| **Task 1.2.c. Improved Production Practices and Technologies** | | | | |
| Lack of knowledge of improved production practices and technologies | - Training of farmers in improved practices at intensive management learning laboratories and also as demonstration sites, allowing them to assess impacts on yields, labor time and costs, when different input combinations are used, and to decide whether to adopt a practice | - Training and oversight at demonstration sites performed by lead farmers who will also ensure that practices demonstrated at central demonstration plots are transferred to the individual plots of participating farmers by community facilitators | Farmers<br>Input suppliers (indirectly) | - Improved practices adopted, leading to improved yields and increased food security and income source |
| Limited awareness of the impact on yields and costs and returns of improved production practices and technologies. | - Farmer field days.<br>- Radio programs | - Organize farmer field days to demonstrate the impact of improved production practices.<br>- Air radio programs to further inform farmers of the impact of improved production practices.<br>- Collect cost and returns data | Farmers<br>Input and equipment suppliers (indirectly) | - Increased interest in improved production practices and technologies.<br>- Increased demand for technologies.<br>- Expanded knowledge of the costs and returns to improved techniques and technologies. |
| **Task 1.2.d. Expanded Diffusion of Commercial Power Tilling** | | | | |
| Limited access to affordable mechanized tilling | - Pilot test and introduce expanded commercial power tilling operations for rice.<br>- Train entrepreneurs in maintenance and use. | - Financial business feasibility assessment of power tilling.<br>- Compare performance data of tiller developed by IRRI with alternates.<br>- Promote power tillers to entrepreneurs.<br>- Link entrepreneurs to vendors of | Power tiller operators<br>Vendors, Entrepreneurs | - Increased availability of appropriate tilling equipment.<br>- Cadre of trained operators.<br>- Vendors supplying power tillers. |

| Major constraints | Specific solutions | Activities addressing constraint | Intended Beneficiaries | Expected impact / output |
|---|---|---|---|---|
| | | appropriate power tillers. | | - Reduced labor input.<br>- Increased surface area of rice and other crops. |
| Lack of financing for mechanized tilling businesses | - Connect promising mechanized tilling business people to finance sources. | - Assist in the development of business plans.<br>-Submit to finance sources. | Power tiller operators<br>Vendors, Enterprises | - More power tilling businesses.<br>Increased financing for investment in mechanized power tilling businesses |
| **Task 1.2.e. Improved Post-Harvest Processing** | | | | |
| Quality of rice produced Lack of low-cost, and/or portable processing equipment. | Drying floors and parboilers. Introduce impact rice dehullers mounted on motorbikes. Import one pass mills with destoners | - Identify and field and market test range of post-harvest processing technologies STTA by Dr. Vellanki | Processors,<br>Farmers, Consumers | - Increased knowledge and use of alternative technologies for processing rice. |
| Limited capacity to manufacture, market and maintain rice processing equipment. | Train local metal workers to fabricate impact rice dehullers and other equipment. Train local maintenance of processing equipment | - Select qualified metal workshops<br>- Train in manufacturing, use, maintenance, repair, and market development.<br>Work to develop machinery dealer and maintenance network | Metal workshops,<br>Processors and farmers (indirectly) | - Improved accessed to higher capacity mechanical processing.<br>- Reduced labor time removing one bottleneck to increased rice production |
| Lack of financing for rice processing businesses. | - Connect promising mechanized commercial processors to sources of financing | - Assist with business plans and submitting to sources of financing. | Processors,<br>Manufacturers and farmers (indirectly) | - Increased financing for investment in rice processing businesses.<br>-Improved processed rice yields. |

### Expected Performance Results/Targets by Indicator, Task 1.2

The proposed rice workplan will benefit approximately 11,700 farmers this year, approximately half of whom will be women, and bring improved cultural practices to approximately 900 hectares.

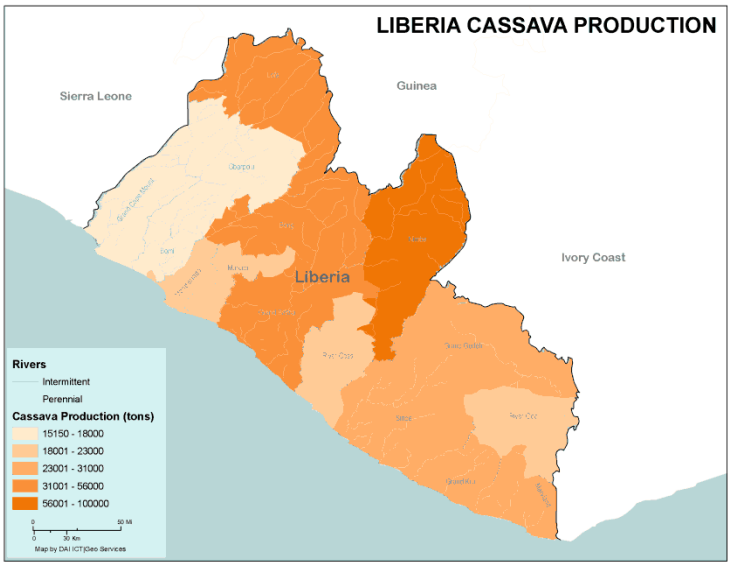
Please reference Annex I for the Rice Value Chain Matrix.

- Ind. # 1A: Gross margin per unit of land under rice to be calculated. Target 5 percent.
- Ind. #1E: 5,500 rural households benefitting directly from USG assistance.
- Ind. #1.1.1: 4,480 farmers applying new technologies (improved seed, power tillers, and mills) and improved rice production management practices on lowland and upland areas.
- Ind. # 1.1.1: 448 others trained by these first adopters will apply new technologies.
- Ind. #1.1.2: 580 hectares under improved technologies or management practices.
- Ind. #1.1.2: 365hectares are demonstrated to lowland rice farmers.
- Ind. #1.1.2: 36 hectares are cultivated by adopting lowland rice farmers.
- Ind. #1.1.2: 625 hectares are demonstrated to upland rice farmers.
- Ind. #1.1.2: 120 hectares are cultivated by adopting upland rice farmers.
- Ind # 1.2.1: A minimum of three cooperatives received USG assistance.
- Ind # 1.2.2: 143 farmers/groups and enterprises applied new technology.
- Ind. # 3.1.1: 4,300 farmers trained in water management and improved rice production techniques.
- Ind. #1.2.1: 15 private enterprises and producer groups receiving USG assistance.
- Ind. #1.2.2: 15 private enterprises and producer groups applying new technologies or management practices.
- Ind. #2A: Approximately $22,000 in new sales will be recorded.
- Ind. #2B: Approximately $30,000 in equipment and the use of equipment.
- Ind. #2C: 50 new workers employed to operate equipment.
- Ind # 2D: 145 public-private partnerships formed with producer groups.

## TASK 1.3: INCREASED PRODUCTION/PROFITABILITY OF QUALITY CASSAVA IN LIBERIA

Cassava is Liberia's second most important food crop and is grown throughout the country although the area varies considerably by county. Unlike rice, cassava can be planted year round, the time of harvest is not critical, and it can be stored in the ground reducing loss. It is important for food security, especially since it can be planted as a follow-on crop after upland rice on poor soils.

Cassava is a major agriculture contributor to Liberian GDP and food security, with an estimated 550,000 MT produced in 2007 (nearly $40 million value). 130,000 households in the four priority counties produce cassava. In Nimba, 316,000 households (43 percent of the total) belong to farming households that produces cassava, in Bong 174,000 (24 percent), in Grand Bassa 126,000 (17 percent), and Lofa, approximately 112,000 people (15 percent). The majority of this cassava is consumed locally either as fresh roots or as traditional processed products. Production can be improved through better varieties and crop management, and yields of up to 40 ton/ha are possible, but even in Nigeria which has focused research and extension efforts on cassava; average yields are usually closer to 10 ton/ha. In Liberia, the yields are about 2-3 metric tons/ha. With increased production, processing is critically important because of the location of the production, often at a distance from the road and the perishability of the fresh root which restricts marketing. There appears to be a growing urban market for processed cassava.




FY 2013 Strategy/Approach: Production-Cassava cultivation is a business like any other that is focused on the making of profit on an investment put into growing cassava for leaves, stems and roots but farmers in Liberia do not get good returns due to lack of inputs, markets and clean planting materials.

FED in FY 2013 will work with major stakeholders including the Ministry of Agriculture, Central Agriculture Research Institute (CARI) and existing cassava farmers and select additional partners for demonstrations and multiplication of clean planting materials at the district level. In order to expand FED's extension capacity at the community and village levels, current Lead Farmers will work with neighboring farmers in the adaption and multiplication of new and improved cassava varieties and subsequently set up a network of improved cassava cutting multiplication in the communities.

**Objective and Expected Outcome of the strategy**

The approach mentioned above will support both the research and technological needs of the strategy. This will be centered on boosting varietal development, improving crop management techniques and Improving production, on-farm propagation and distribution of clean planting materials.

| Objective of the strategy |
|---|
| **Improved varieties and crop management packages** |
| **Expected outcomes** |
| Appropriate varieties and crop management packages are adapted and disseminated among farmers and farming groups |
| Exchange of improved stock/cuttings<br>Participatory planting materials production system established at the community/village level |

Processing- This strategy is to adopt a market-driven approach by ensuring that cassava supply is aligned with norms, standards and specific market requirements. The processing strategy is equally envisaged to promote the establishment of commercially driven regional bulk purchase centers to facilitate market connection between farmers, processors and distributors. These centers will collect fresh cassava using a two tier approach close to areas where production happens. The centers will also encourage cassava production by insuring a market, by providing cash payments to farmers upon delivery, by providing training, technical assistance and agronomic support for production and processing.

| Objective of the strategy | Expected outcomes |
|---|---|
| Ensure cassava supply is aligned with processing sector requirement | Processors are adequately supplied in quality and quantity |
| Improve access to technology for processing | Existing processing methods on the quality of primary products for the target markets of the strategy as a baseline determined |
| Develop quality processing standards | Quality standards set as a result of market study review |

Marketing-FED will endeavor to empower smallholder farmer organizations and foster an entrepreneur mindset. To achieve this FED will conduct a training needs assessments based on market requirements, organize training for farmers and other stakeholders along the value chain, provide training in good agronomic practices to extension workers, farmers and processors.

| Objective of the strategy | Expected outcomes |
|---|---|
| Training needs assessment of market requirements | Training needs are clearly identified based on market requirements |
| | Farmer organizations, cooperatives and others identified considering gender mainstream |

FY 2012 Targets and Achievement: See Annual Report

Cassava: the three main focus areas that FED will catalyze:

- Demonstration and Multiplication of improved varieties
- Improved Crop Management and inputs supply
- Processing & Marketing

FED Cassava - Initial Focus Locations

A. Zoe-Geh, Gbelay-Geh, Sanniquellie-mahn (Nimba)

B. Fuamah, Salala (Bong)

C. District 3 and District 2 (Grand Bassa)

D. Salala, Voinjama (Lofa)

- *Production* - Cassava production remains traditional with virtually no use of inputs. The crop is tolerant of neglect and is often planted as the last crop in the rotation before the fallow, in poor soils with little management or other inputs.
- *Post-harvest* – Although cassava roots survive well underground, this method is inefficient and requires land to remain unproductive. In addition the roots can turn woody and the sweeter varieties may be eaten by animals or stolen.
- *Fresh Cassava Value Chain* - Inefficiencies in the marketing chain (such as transport bottlenecks and repeated transactions) are very costly given fresh cassava is highly perishable (2-4 day shelf life). The bulkiness and low value of fresh cassava means transaction and transport costs become a large share of the market price, and a lower margin accrues to the farmers. Currently there are limited bulk purchasers of fresh cassava in the local markets. Fresh cassava is often used as a source of quick income, as it can be stored in the ground until school fees etc. are needed, but fresh cassava returns can be very low. The income of Liberia's cassava farmer's will rise when there is demand from established processors to whom they are able to guarantee sufficient volumes of production or when farmers can process their cassava into quality products with a long shelf-life.
- *Processed Cassava Value Chain* - Requires the development of processing service providers, and the perishability and bulkiness of fresh cassava means this processing should be close to the production. *Any* reliance on sun-drying for processing cassava for chips, gari or flour creates volume and scale issues. *Liberia's climate and relative humidity is not conducive to unassisted sun drying.* Processing in volume will require the testing of and increased availability of small and medium scale processing equipment as farmers cannot efficiently and effectively chip, grind and dry cassava in any volume by hand.
- *General marketing constraints* - Include poor coordination among all the actors in the value chain and a lack of quality product and of grades and standards; there appears to be potentially a high return to well-graded, high quality processed cassava. The Minister of Commerce told FED gari was recently imported into Liberia from Sierra Leone, like the other TED target commodities there is a clear need for better information on market prices, imports, production, potential demand etc.

At the end of this discussion of Task 1.3, a table presents each activity, major constraints, proposed solutions, and expected impact/outputs. Following that, we include a list of expected targets, listed by activity.

### Activity 1.3.1: Increasing and improving cassava production, processing, marketing

#### Activity 1.3.1a: Development of a local, private sector, elite cutting supply system

i. Multiplication of "best" existing cassava varieties through FED partners in Nimba, Bong etc. Working through Community Agricultural Facilitators, identify varieties in demand and determine their characteristics, being aware that the "best" variety will vary by farmer and from location to location. Through farmers networks distribute informally cuttings of the "best" existing varieties.

ii. Multiplication of new varieties coming from CARI under IITA GASFP funded program. Collaborate with the MoA cassava working group to assist in the testing and dissemination of new elite varieties.

iii. Testing of new varieties from other locations. For example, India has 56 varieties available, including some high in β-carotene. India has the highest per hectare cassava production in the world at 28 MT/hectares. Zanzibar has four cassava clones resistant to cassava brown streak disease. High nutritional value cassava has been introduced by Gates and IITA into Nigeria, while high yielding (compared to traditional varieties), the yields for these nutritionally improved varieties are about 25 percent lower than other new high yielding varieties. The high nutritional varieties are being distributed primarily to poor and nutritionally deprived HH, for consumption, not for sale. IITA's experience is that these cuttings need to be handled very carefully or they will be damaged, so you cannot mass multiply and then transport the cuttings to the end users. Therefore they are multiplying very close to the end market, so FED will work with CARI on local small scale multiplication and testing.

iv. Establishment of a source of the new cassava clones in demand: Once a variety has been identified as in demand, the mother stock maintained at the Research station or elsewhere can be used to provide farmers with high quality, virus free planting materials for multiplication. These pilot farmers are selected to be the source for the multiplication and delivery of the elite cassava planting materials to other farmers. They will be selected in conjunction with the MoA extension staff and local leaders at the village and district levels. With time each district may need up to 5-6 pilot farmers. The selection criteria for pilot farmers is based on experience in cassava production, availability of land for production and their readiness to sell their planting materials after multiplication. FED will assist in the design, organization and implementation of a training program to pilot farmers on multiplication, packing, transport and dissemination of quality planting material and related business and entrepreneurship skills. The planting materials from the research station will be given to the pilot farmers free of charge. In return they will be required to sign a contract, which requires them to multiply and then disseminate planting materials to their immediate neighbors.

#### Activity 1.3.1b: Building the linkages from cutting producers to cassava farmers

i. Work with the existing Lead Farmers and Farmer Associations interested in cassava to aggregate their demand and thus reduce the supply and transport costs for improved planting material for their members. The orientation, training and recruitment of the Lead Farmers and Farmers Associations will begin the first quarter of FY 2013. This will be followed by site selection and the signing of a Memorandum of Understanding between the Farmer Associations and FED stating clearly the role of each party. In addition to the MoU, the Farmer Associations will be requested to provide a documentation stating the ownership of the land that will be cultivated.

ii. Use unpaid Farmer Leaders and Community Agriculture Facilitators (CAF’s) to provide farmers with cassava cuttings for trial, along with extension information and to point farmers to other sources of improved inputs, such as dealers.

iii. Demonstration plots: Establish plots on farmer’s fields to demonstrate new techniques and varieties especially in areas with few or no pilot farmers, the management of the demonstrations to be done by farmers, under the supervision of FED county staff, the MoA and private sector partners.

iv. Awareness program: Use radio, newspapers, informal and social gatherings along with the MoA and other interested partners to create awareness on the availability, performance and characteristics of improved cassava planting materials and the production/processing possibilities.

v. Monitoring and supervision: Regular field monitoring and follow up visits will be conducted to monitor the quality of planting materials, dissemination of planting materials (selling), the field acceptance of new varieties and other farmers activities, such as processing. Before selling the nursery stock will be checked for quality, and the grower will be trained in how to inspect the product, recognize healthy planting material and deal with common problems such as transit mold.

### Activity 1.3.1c: Training: FED Partners along the cassava value chain

i. Working with the long term curriculum advisor under Component 3 and the staff and students at VoAg schools, to prepare and give appropriate training in the husbandry, business, marketing and processing of cassava. Prepare a cassava toolkit for extension staff.

ii. Linking into the IITA program at CARI, elite cutting producers will be trained in varieties, husbandry and marketing of cassava planting material.

iii. In collaboration with the pluralistic extension program supported by Component 1, farmers through Farmer's Field School's (FFS), demonstrations, extension materials and information technology will be given information about varieties, husbandry, post-harvest handling, processing, and marketing of improved cassava.

iv. Working with the private sector, Component 2 staff and specialized STTA, existing and potential processors will be educated on market characteristics, market demand, processing technology, storage, packing, branding etc. of value added cassava products.

Activity 1.3.1d: Farmers Field Day, Farmers Exchange Visits, and training materials on cassava

i. *Farmers district exchange visits and farmer field* days will be organized as needed to create awareness of new lines and techniques, and to exchange knowledge, ideas and experiences on multiplication of improved planting materials, husbandry, processing, markets and related issues.

ii. *FED will assist the MoA and its private sector partners to develop appropriate toolkits*, with modern educational materials in a variety of media for change agents along the cassava value chain.

### Activity 1.3.2: Processing cassava working with FED partners (existing processors, associations)

i. Our initial focus will be on identifying and testing small scale processing options at the village and district level and then on a larger scale at the county and regional level as overall production increases and local transportation improves with time.

ii. Along with Component 2, we will link willing producers to willing processors, and

iii. Link processors to a range of markets for their products, local and regional

Activity 1.3.3: Improving the marketing of cassava.

Activity 1.3.4a: Feasibility studies of the Economic, Financial, and Social aspects of cassava

i. Evaluate the various systems; e.g. cuttings for sale in Nimba, cassava root in Bong, gari in G. Bassa.

ii. Partners activities; establishing/refining business plans, or enterprise plans. (with Component 2)

### Activity 1.3.4b: Access to capital (working and investment) along the value chain.

i. Working with Component 2 and FED partners we will guide those requiring finance for contract growing of new lines for multiplication or processing equipment etc. to appropriate funding sources.

ii. Through the MDF, FED partners will pilot processing equipment for adding value, and after a successful pilot we will link new processors to appropriate finance sources for establishing modernized processing operations at an appropriate scale.

Collaboration with the Public and Private sector, other donor projects on cassava

i. Encouraging supporting infrastructure such as: RISE, SIDA feeder road program, WB.

ii. Working closely with other donors in the cassava sector on complementary activities such as: the European Union (EU), African Development Bank (AfDB), Food and Agriculture Organization (FAO) and International Fund for Agricultural Development (IFAD), the Global Agriculture and Food Security Program (GAFSP).

Costs and returns of FED cassava intervention

Duke Burruss, cassava STTA will work with Boima Bafaie and county field staff to design a small-scale processing project at the village and district levels. The approach is to validate and adapt production and processing technologies in the field, while assessing markets for raw and processed cassava products. This approach calls for research on cassava production, processing and marketing. FED will attempt to link different entities according to their comparative advantages and mandate, and thus support the cassava sector, which can be a potential example of sustainable rural development, e.g. the joint venture between Community, Chevron and FED at the Clay Ashland site.

## FIGURE 1.3.A: ACTIVITY CONSTRAINT TABLE

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| **Activity 1.3.1 Increased Cassava Production** | | | |
| Traditional cassava production is low yielding and uses virtually no inputs. The crop is tolerant of neglect and is often planted as the last crop in the rotation before the fallow, in poor soils with little management or other inputs | - Improved disease-free varieties will be demonstrated and multiplied<br>- FED Inputs Supply LTTA identifies Lead Farmers to pilot legume cropping strategy and soil management best practices at selected demonstration sites | - Demonstration of a number of improved varieties, establishment of local nurseries, GAP: intercropping with leguminous crops and use of nitrogen enriching soy flour | - Knowledge of variety performance around program area.<br>- Cutting of disease-free elite varieties available locally.<br>- Farmers trained and able to use integrated soil fertility practices |
| Inappropriate fertilizers used | - Using outputs from soil testing service to develop crop appropriate guidelines for fertilization | - Awareness of service<br>- Using soil test information<br>- Develop more soil tests | Farmers increasing production and profits,<br>Soils laboratories developing capacity<br>Recommendations for cassava production |
| **Activity 1.3.2 Improved Post-Harvest Handling and Processing** | | | |
| Cassava stores well underground, but the land is unproductive. Roots can turn woody and sweeter varieties may be eaten by animals or stolen by humans. | - FED partnership with the Liberia Marketing Association (LMA) to assess the need for and the locations for storage and their capacities. | Post-harvest study to assess the storage and processing needs at the market | - Post-harvest storage and processing needs identified<br>- Action taken to address constraint |
| Inefficiencies in the marketing chain (such as transport) are very costly as fresh cassava is highly perishable (2-4 day shelf life). The bulkiness and low value of fresh cassava means transaction and transport costs become a large share of the market price, and a lower margin accrues to the farmers. Fresh cassava is often used as a source of quick income, as it can be stored in the ground until school fees etc. are needed. | - Small-scale market driven cassava processing projects to reduce bulkiness before transport | - Pilot testing of small-scale cassava processing at the village and district levels through a variety of partners. | -Bulkiness of fresh cassava reduced thereby reducing the transport cost<br>- Improved shelf life/perishability<br>-Utilizes low priced gluts and holds for market upswings as fresh cassava returns can be low.<br>- Income of Liberia's cassava farmer's will rise when there is demand from established processors and when they are able to guarantee sufficient volumes of production or when farmers can process their own cassava into quality products with a long shelf-life. |

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| | | | |
| **Activity 1.3.3 Enhanced Cassava Marketing** | | | |
| Include poor coordination among all the actors in the value chain and a lack of quality product and of grades and standards. The MoCI states gari was recently imported. Need for better information on market prices, imports, production, potential demand etc. | FED LTTA Business Enabling Environment Specialist conducts a detailed cassava market survey of both the local and regional market for cassava products | Detailed market survey with the Liberian Marketing Association (LMA) and others re market for cassava products | - Local and regional markets identified for raw and processed cassava.<br>- Better understanding of the markets and the economics of cassava production and processing |
| **Task 1.3.4 Increase access to finance for cassava value chain improvements.** | | | |
| Access to Finance- Access to capital is a constraint for developing the cassava sector. | FED Component 2 will train and support farming groups to develop savings and loan schemes to become more formalized with competitive interest rates and possibly serve as a bridge to commercial loans. | - Small and Medium Enterprise trainings to selected cassava producers and processors | - Savings and village loan schemes by farming communities developed.<br>- Expansion of cassava production and processing.<br>- Increased returns to cassava. |

FED staff to manage and implement the cassava activity

The cassava activity will be managed by Franklin Henries, FED Cassava Program Coordinator assisted by Marketing Specialist Ame Atsu and STTA Duke Buruss in the case of processing and marketing. The field activities will be implemented by the county extension officers supervised by the County Managers in Bong, Nimba, Lofa, and Grand Bassa counties.

For the Cassava Value Chain Matrix, please reference Annex I.

Expected Performance Results/Targets, Activity 1.3

Indicator # 1.1.1: Up to 2,500 farmers trained in the application of new technologies and management practices

Indicator # 1.1.2: Up to 648 hectares cultivated under improved technologies

Indicator # 1.2.1: At least 100 private enterprises and/or producer organizations, women's groups trained

Indicator # 1.2.2: Up to 100 private enterprises, women's groups' trade and business associations trained to apply new technologies

Indicator # 3.1.1: Up to 2,500 individuals trained by FED in short-term agricultural sector productivity and food security

Indicator 1E: Up to 550 households directly benefiting from cassava interventions.

## TASK 1.4: IMPROVING THE QUALITY AND QUANTITY OF PERI-URBAN VEGETABLES IN LIBERIA

Introduction: The peri-urban vegetable value chain in Liberia suffers from a lack of knowledge of improved cultural practices and inputs as well as low investment in irrigation and processing technologies. Farmers lack the capacity to obtain good quality locally adapted seed or seedlings. They are also ill-informed as to basic agronomy and crop input options including crop protection remedies, fertilizer, and vegetable market prices at regional markets. With few exceptions, vegetable crops, when irrigated, are watered by hand using only a bucket and drying is done in the open air, requiring a week or more to complete the process, resulting in losses and poor quality of the final dried product. Little investment has been made in adaptive on-farm research which has led to limited interaction in the past between extension agents and farmers in developing appropriate peri-urban farming systems. FED will interactively train farmers in improved practices and the importance of respecting the horticultural calendar, provide best practices, including the appropriate seed, fertilizer, and pesticide to use, and connect them with suppliers of these inputs and irrigation and drying equipment, resulting in increased yields and surface areas. Marketing of production will be a priority of the FY 2013 activities.

Strategy/Approach: The approach has three main thrusts: awareness raising of the highly productive and transformative innovations promoted by the project; capacity building of farmers, processors, input suppliers, and marketers; and, the catalyzing of commercial linkages between input suppliers and farmers and between farmers, processors, and markets. Awareness raising interventions will include mass media campaigns to broadcast information about value chain economic opportunities as well as technical advice regarding improved production, processing, and marketing. Community leaders will also be contacted to recruit program partners and disseminate information about the economic returns of improved rice production and necessary base conditions. Production and post-harvest technologies will also be demonstrated to groups of farmers. Numerous demonstration plots will also be established to raise awareness regarding state-of-the-art production practices. Training will be dispensed in two ways. First, FED will directly train farmers, lead farmers, local NGOs, input and equipment suppliers, and MoA personnel. Second, suppliers, NGOs, MoA staff, and lead farmers will train farmers. The second type will, in many cases, continue well after the end of the project, ensuring the sustainability of what FED is beginning. All beneficiary categories will receive business training. Commercial linkages will be developed between farmers and markets and between input and equipment suppliers and farmers.

FED will work through local NGOs and its own and MoA extension staffs to raise awareness, build capacity, and develop commercial linkages. Collaboration will also be strengthened with other programs such as LAUNCH, CARE, and German Agro-Action seeking to complement their peri-urban value chain work. As such, directly or indirectly through private sector actors, services such as processing, irrigation, and integrated soil management, plus site visits and demonstrations will be organized.

FED activities will be transitioned to GoL or private sector entities at the end of the project by making them integral parts of the activities during project implementation. In the case of the private sector partners, they will be trained in appropriate production, marketing, and management practices. FED will also build the capacity of MoA to continue implementing the activities initiated by FED. This will occur through training and mentoring of MoA field staff by having them work directly together with FED field staff. Building the capacity of MoA in these ways will prepare the institution to implement programs.

Year 1 Achievements: See Annual Report

**FIGURE 1.4A: VEGETABLE YEAR 1 TARGETS AND ACHIEVEMENTS**

| Targets | Year 1 Targets | Year 1 Achievements | Year 2 Targets |
|---|---|---|---|
| Number of demonstration sites | NA | 20 | 34 |
| Number of beneficiaries | 200 | 442* | 736 |
| Number of hectares | NA | 8 (approx.) | 25 |

*Approximately 509 beneficiaries if the metal workshop workers, well drillers, and vegetable seedling producers trained by FED are also counted.

Proposed Year 2 Activities: In Year 2, FED will build on the achievements and the lessons learned from Year 1 work in peri-urban vegetables to catalyze three technical areas:

- Awareness raising
- Capacity building of farmers and equipment and input suppliers
- Commercial linkage development and marketing

Ensuring that costs and returns to farmers/producers are sufficient to ensure sustainability of the proposed initiatives has guided the selection of the activities in the peri-urban agriculture value chain. Farmer inputs are designed to be minimal, at little or no cost and self-produced where possible. Many poor women engage in Peri-Urban Agriculture so all activities described in this Task primarily benefit this group. Close liaison with other peri-urban actors (government, donor community, and local partners) is planned. Information on pests and diseases and their management is already shared with other donors and, in return, FED has received information on soil fertility, marketing, varieties and other areas. Coordination is through the Urban & Peri-Urban Agriculture Technical Working Group of which FED is a pro-active member.

Scaling up in FY 2013 will be primarily via;

- Production of specific inputs and making them available – notably good quality seed.
- Development of tested agronomic guidelines for soil and crop management.
- Expanded training of extension agents, students, MoA officials, Lead Farmers and farmers.
- Marketing is a specific emphasis of Activity 2.5 and will be significantly expanded in FY2013.

In Year 1 rural communities in Montserrado and Margibi counties were targeted. In Year 2 activities will be extended to peri-urban areas in Bong, Nimba, Grand Bassa and Lofa counties. Districts will include:

- Lofa County – Zorzor and Voinjama
- Bassa County – Compounds 1 and 2
- Nimba County – Sanniquellie Mahn and Saclapea Mahn
- Bong County - Central Gbarnga, Jorquelleh and Suakoko

These districts are near or contain major markets that are accessible by road.

At the end of this discussion of Task 1.4, a table presents each activity, major constraints, proposed solutions, and expected impact/outputs. Following that, we include a list of expected targets, listed by activity.

### Activity 1.4a: Awareness raising

In collaboration with MoA field staff, local community leaders, equipment manufacturers, processors, and input suppliers, awareness was raised in Year 1 in the periurban vegetable groups with regard to the FED project's approaches to increasing vegetable productivity and profitability. Outcomes were achieved through trainings in improved production practices and the promotion of the production and sale of appropriate production inputs and productive irrigation and processing equipment. Twenty communities in Montserrado and Margibi counties were recruited as FED partners and in the peri-urban agriculture program. MOUs were signed and trainings in improved vegetable production held during the second half of the dry season (January-May) and during the rainy season (June-September). In all, 442 farmers were trained.

In Year 2, awareness will continue to be created about the FED peri-urban agriculture program and the opportunities it offers Liberian producers. This objective will be achieved through the following:

- Face-to-face contact with producer groups, individual farmers, processors, and metal workers
- Improved production and equipment demonstrations
- Radio, and other promotional devices

Demonstration of improved practices and technologies will be through a variety of events such as farmer field days. Based on criteria developed in consultation with the MoA, the FED Peri-Urban Agriculture team, and the FED County Managers, farmer groups will be contacted to inform them of the FED peri-urban agriculture program and to gauge their interest and capacity to participate and learn from the adaptive on-farm training program. In all, 34 groups, of about 25 plus members or approximately 850 farmers, will be selected for training in improved vegetable production practices. Vegetable production at four to five adaptive on-farm research sites will serve to demonstrate improved practices and technologies and serve as learning laboratories. Farmer field days will be organized at these sites, inviting neighboring farmers to attend, thus, increasing the number of farmers who will benefit from the peri-urban agriculture activity by a factor of approximately two. The plan is that these complex demonstrations at these four sites will be intensively managed by the FED staff, while a number of simpler demonstrations on communally farmed land at the other 30 groups will be managed by FED staff (15) and local NGO's (15). Diffusion from these 30 sites to adopting farmer's own fields will be facilitated by lead farmers (1 per site/group) and by village level facilitators in each major community nearby. To the fullest extent possible, demonstrations and field days will be conducted in collaboration with other value chains and with other projects, and linked into the other components of the FED program.

Field days (another 4,000 beneficiaries) and training sessions for processors, seed/seedling suppliers and metal workers will focus on their market opportunities and those for growers/producers on production and marketing and capital inputs that are available to them. Equipment demonstrated will include irrigation and vegetable drying equipment. The peri-urban component will participate in the Component 2 trade fairs. Selected manufacturers of improved equipment, such as the irrigation and processing technologies, will be promoted through publicity organized by FED-trained manufacturers.

Mass media extension campaign; Radio, newspapers and other promotional devices, such as extension material in the form of guides and leaflets will be used to disseminate information. FED's private sector partners will run a mass media campaign promoting products that appeal to urban dwellers with links to the project area's rural sector. Advertisements supported by the project will be run for the treadle pump and vegetable dryer, and possibly the hand-augured tube well. Following this and catalyzed by the ads, individual manufacturers will run their own ads on local and possibly national radio stations to indicate to the listening public where they can find these products. Promotions could

include linking trial loans of equipment, commissions, bundled products (pump with tube well and water distribution system) etc., plus similar activities for other agro-inputs and services as capacity to supply develops.

### Activity 1.4b. Capacity building

Improved practices in which farmers were trained in year 1 included the use of elevated beds for seedling production, raised beds for water drainage, aeration, controlled traffic, and nutrient management, compost production and use, biochar production and use for reduced water use and increased effectiveness of applied nutrients and appropriate pesticide use based on correct pest, identification, cultural and natural remedies backed up by PERSUAP approved remedies. FED will deliver cost effective horticultural solutions accessible to large numbers of households including developing a network of input and equipment suppliers with the capacity to deliver the right inputs and equipment of a sufficiently high quality and the right price to vegetable producers.

The main focus of the capacity building program will be as follows:

- Main focus on corn, chili peppers, bitterball and okra, as adapted to climate and pest/diseases;
- Inputs available to growers at zero or at low opportunity cost (information, mulch, compost, biochar, vetiver grass, alley trees, cover crops, homemade crop protection remedies, etc.);
- Facilitate the supply of affordable and good quality inputs (seed, simple fertilizers, basic crop protection chemicals such as sulfur, copper oxide, treadle pumps, tube wells, dryers, etc.)

Capacity will continue to be created in four main ways:

- Reinforcement of the training received in Year 1, using lead farmers from the twenty original sites to follow-up with the group members on their individual plots.
- Training of approximately 750 new farmers in improved production practices through the use of lead farmers trained by FED and MoA extension staff, community college staff, private sector partners (manufacturers, input suppliers), local NGO's[3] and community facilitators.
- Adaptive on-farm research plots on Community College land used as part of their practical training curriculum.

Training of equipment and input producers in the manufacture of improved technologies

In Year 2, Capacity Building in the peri-urban agriculture program will continue as follows:

- Development of four to five adaptive on-farm research plots with selected institutions and growers groups to test and extend proposed solutions. The goal is to demonstrate and disseminate improved vegetable production practices, with those trained at the communally farmed land and central hub replicating at their own vegetable gardens what they learned at the central adaptive on-farm research site, thus, increasing significantly the total surface area under improved cultural practices.
- Selection of best performing local and regional cultivars. Many locally adapted variants of the focus crops exist and there are some attempts at their collection and propagation. FED will support and expand these activities and use these as primary sources of seed for the adaptive on-farm research plots. Regionally developed improved cultivars will be developed such as the Asian

[3] A number of local NGOs specialized in vegetable production will be recruited via a competitive process.

Vegetable Research and Development Center (AVRDC) chili pepper lines which are highly resistant to viruses.

- Improvements in seed production and supply chain. Seed in Liberia is often of poor quality with low vigor and germination. Simple techniques (please provide examples) will be extended to develop better seed production and handling systems by seed suppliers to overcome these problems.
- Using outputs from soil testing services to develop crop appropriate guidelines for fertilization. Soil tests indicate that Liberian soils have multiple deficiencies and poor physiochemical characteristics. Some of these can be corrected by a variety of interventions, but commercially available fertilizers lack many of the elements necessary for optimum crop performance. Standard soil sampling in the cropping cycle will be introduced for all the peri-urban adaptive on-farm research sites as well as project beneficiaries and corrections made to recommended inputs as well as better guidance to input providers on product mixes.
- Development of appropriate soil management guidelines to address limitations (soil chemical and physical limitations). Use of soil physiochemical testing as well as field studies and tests will be used in an interactive way with growers to ensure that inputs (together with chemical fertilizers) are used in an integrated way to optimize root growth, minimize soil borne diseases and pests and, thus, improve crop potential. Examples include, alley and cover cropping, use of biochar, composting using generally available and specifically produced ingredients, vetiver for contour planting to reduce sheet erosion, use of vetiver for soil mulching, specially developed crop rotations etc.
- Soil management guidelines appropriate to Liberian conditions co-developed with growers, extension agents and MoA personnel.
- Developing affordable irrigation with treadle pump and tube well manufacturers/providers working on low cost field water reticulation and distribution systems to capitalize on the advantages of growing on beds together with more labor efficient watering of crops. Develop simple water distribution systems (stand pipes, micro drip systems) using as much locally available materials as possible.
- Develop affordable in-field produced soil mulching systems. Soils in Liberia undergo significant changes in chemical, physical and biological properties when cleared for cultivation. Plant derived mulches ameliorate the problems and a specific activity will be the development of appropriate systems for producing long lasting mulch in-field through a range of interventions (vetiver and selected alley crops).
- Integration of crop specific recommendations into specific guidelines for each PUA (peri-urban agriculture) focus crop. In addition to crop protection and soil management guidelines specific crop guides will be developed starting with planning and production calendars, as well as tailored production recommendations. Co-developed with MoA and FED staff through an interactive and iterative process using the adaptive on-farm sites as one basis for generating information on best practices. Local forums of experts will help develop crop guides and farmers will be consulted during the process.
- Two Monrovia metal workshops and a total of six workers were trained in forced-air dryer fabrication in October 2012. Training of processors in dryer use has just started. Component 3 will recommend metal working students from BWI or one of the community colleges to be trained in the fabrication of treadle pumps and dryers, with the possibility they might intern with one of the manufacturers and eventually become agricultural equipment manufacturers themselves.

- Training of nurseries / seedling producers in good practice – This is a notably growing medium, which promotes good seed and pest and disease management. In addition to using the seed, compost, and bio-pesticide on her/his own seedling bed, some seedling producers will also sell these products to other farmers. The more entrepreneurial and higher capacity seedling producers will be introduced by FED to the equipment manufacturers to act as sales agents for the manufacturers.
- In addition to technical knowledge, vegetable growers, pump and dryer manufacturers, tube well installers, and seedling producers were introduced to very basic business principles, including pricing, marketing, and the importance of location for a business. The best of these producers will be considered for more in-depth training provided by Component 2.
- With USAID Contracting Officer's Representative approval to add this new commodity, to take further advantage of this nursery platform for improved technology dissemination, starting in January 2013 (activity preparation to start in October 2012), FED could train the best performing, highest capacity vegetable seedling producers to produce fruit tree seedlings, including grafted varieties (e.g., mango, citrus, avocado).

Training will expand the number of beneficiaries from approximately 440 in Year 1 to 1,200 during the dry season of Year 2, combining Year 1 farmers with new ones. During the rainy season, another 800 farmers will be trained. Producer groups will be chosen on the basis of their ability to carry out both dry season and rainy season vegetable production. Greater focus will be placed on the individual plots of group members. In addition to the training at (4-5) central demonstration plots of 0.5 hectares, and the 40 simpler demonstrations on group land managed by local NGO's, FED staff, and lead farmers, and community level facilitators in the surrounding communities, farmers will transfer the cultural practices to their own plots, with trainees equipped to develop their own gardens from trainings at the four learning laboratories and the local NGO/FED run trial plot trainings. FED support for this village level expansion will require construction of raised beds – 1 meter by 10 meters – on their own plots, and participation in FED's marketing programs. FED-trained producers and school staff will provide training to community college students in improved vegetable production practices and be introduced to low-cost, transitional technologies.

A number of cross cutting activities complement the Capacity Building subcomponent. These are:

National pest list for horticultural crops. Specialist taxonomists will carry out preliminary surveys of pests and diseases of peri-urban crops in conjunction with Liberian institutions (MoA and Universities). The aim is that such institutions will continue such work and link to international taxonomic services in a process of continuous updating of the national pest list.

Develop a handbook/database of Liberian beneficial organisms and cultural practices. A systematic attempt to catalogue these and develop systems of agriculture that would promote their importance in agricultural production. A necessary first step is to catalogue the more common species via the help of specialist taxonomists working through and with local institutions.

List of crop protection remedies. Crop protection guidelines for FED extension staff are based on the PERSUAP. The MoA has asked for assistance in developing best practices packages and FED is assisting in this effort and the development over time of a formal national crop protection database of registered chemicals and registrations through ECOWAS structures.

During 2012 a private soil chemical testing laboratory was started through FED. The laboratory will be fully operationalized by its active use by FED and FED's partners.

### Activity 1.4c. Commercial linkage development

- In Year 2, commercial linkages between input and equipment suppliers and farmers and between farmers and markets will be developed. The training of new commercial vegetable gardeners will stimulate the demand for inputs and equipment, and this new demand will likely outstrip the existing commercial supply system. FED and MoA staff will work with newly trained input and equipment suppliers and identify vendors (e.g., vegetable seedling producers) potentially interested in capitalizing on the expanding farm inputs market, and partner with them.
- Setting up of basic grading and crop handling practices can enhance incomes through both higher prices and reduced wastage. – Examples include use of better packaging such as woven baskets to protect produce and better field collection practices for tender crops such as okra.
- Integrating the technical developments proposed for PUA so that the benefits and costs are fully understood and that applications for crop financing are properly formulated.
- Assist with business planning to procure inputs. Under Component 2, FED will link microfinance providers with PUA partners. Peri-urban training activities will focus on markets and marketing, and on post-harvest storing, handling, packing, transport and processing.
- Developing links with PUA groups and urban markets. PUA groups will be taught to identify market and price cycles and what to plant at what times to maximize returns. Collective marketing and negotiation with buyers on market prices helps growers optimize their share of retail prices.
- Regular service in cold chain and logistics linkages to final markets. Ways will be explored to reduce post-harvest losses and reducing time from harvest to market as well as other options including bulking in production areas. These will be examined as to cost and effectiveness and interactively developed with growers, transporters and marketers.
- Necessary assistance to develop appropriate transport and/or post-harvest loss mitigation strategies. In partnership with Component 2, credit-worthy merchants will be connected to local sources of loan capital. FED and MoA personnel will, in turn, direct farmers toward participating merchants for the purchase of their inputs, forming a durable linkage to input supply.
- Work with input providers (notably marketing outlets) on appropriate post-harvest handling methods that can be passed on to their suppliers as well as indirect beneficiaries of FED production guidance to reduce post-harvest losses.

### Activity 1.4d: Higher level policy/regulatory developments with the Ministry of Agriculture

- Proposing and formulating a draft Agricultural remedy law / Act. With USAID's approval, FED will interact with the MoA to assist with policy formulation and legislation.
- National crop protection bodies set up (PPP) Knowledge of practices and technologies. The MoA needs significant capacity building in resolving crop protection threats.
- Develop draft Pesticide Law / Regulations. Draft regulations need discussion with the public and private sector in parallel with the development of a crop remedy policy and legislation.
- FED will assist the MoA to develop Risk Assessment methods for plant material and apply these for specific requests for Plant Import Permits for seed and plant material inputs.

Development of guidelines for importation of plant material and seed based, in part, on a list of pests and diseases present in Liberia and countries of origin. Risk Assessment is, in part, based on the National Pest List. For FED peri-urban crops such a pest list is being developed in cooperation with the MoA.

## TABLE 1.4B: IMPROVING THE QUALITY AND QUANTITY OF PERI-URBAN VEGETABLES IN LIBERIA (FY 2013)

| Major constraints | Specific solutions | Activities addressing the constraint | Intended Beneficiaries | Expected impact / output |
|---|---|---|---|---|
| Activity 1.5.1 Awareness raising | | | | |
| Knowledge of improved practices and technologies | - Demonstration of the improved practices and technologies in a variety of ways across a number of sites. | - Learning laboratories<br>- Field days<br>- Road and trade shows<br>- Selected training sessions at demonstrations | Farmers | - Increased knowledge through direct experience with equipment, inputs and services. |
| Lack of knowledge about FED's PUA activities and how these impact on value chain actors | - Radio, newspapers and other promotional devices | - Specific ideas for promotion<br>- Promotion campaigns | Farmers,<br>Input suppliers,<br>Service providers | - Development of more sophisticated marketing of outputs and increased demand / sales. |
| Activity 1.5.2 Capacity building | | | | |
| Lack of cultivars (adapted) | - Selection of best performing local and regional cultivars | - Identify seed suppliers<br>- Identify good local cultivars<br>- Arrange for contract growing and seed handling/marketing | Farmers,<br>Seed multipliers.<br>Seedling producers | - Good quality seed available of locally adapted cultivars. |
| Poor seed quality | - Improvements in seed production and local supply chain | - Implementation of good seed and seed handling practices with seed suppliers and farmers | Farmers,<br>Seed multipliers,<br>Seedling producers | - Supplies of seed in selected PUA crops available via input providers. |
| Inappropriate fertilizers used | - Using outputs from soil testing service to develop crop appropriate guidelines for fertilization | - Awareness of service<br>- Using soil test information<br>- Develop more soil tests | Farmers,<br>Soils laboratories | - Fertilizers and soil amendments developed by input providers specific to veg. crops. |
| Little or no soil management | - Development of appropriate soil management guidelines to address soil chemical and physical limitations | - Alley and cover cropping<br>- Use of biochar<br>- Composting<br>- Vetiver for erosion<br>- Vetiver for soil mulching | Farmers,<br>Input suppliers | - Reduced soil loss.<br>- Improved soil properties.<br>- Lessons learned - Handbook for extension agents. |

| Major constraints | Specific solutions | Activities addressing the constraint | Intended Beneficiaries | Expected impact / output |
|---|---|---|---|---|
| | | - Crop rotations | | |
| Watering by hand limits productivity, lack of affordable irrigation | - Identify cost effective, efficient water distribution systems | - Examination / evaluation of simple water distribution systems.<br>- Work with input suppliers | Farmers,<br>Metal workshops | - Model of productivity gains and costs.<br>- Inputs available |
| Chemical, physical and biological properties of soils change when cleared. | - Affordable crop coverings / mulches<br>- Plant derived mulches ameliorate the problems | - Use of vetiver and cover crop trimmings as mulches<br>- Training in compost use | Farmers,<br>Input suppliers | - Improved soil characteristics with corresponding yield benefits. |
| Limited information on Good Agricultural Practices | - Integration of crop specific recommendations into specific guidelines for each PUA focus crop | - Development of crop specific guide books (including optimum types and levels of inputs for each crop) | Farmers,<br>Extension agents,<br>Input suppliers | - Timely, appropriate and economic management of PUA crops. |
| Limited adaptive on-farm research of potential proposed solutions | - Development of a series of adaptive research plots- learning laboratories - with selected institutions and growers groups to test and extend proposed solutions. | - Adaptive research plots established<br>- Adaptive on-farm research in wide range of sites<br>- Assistance to cassava, goat and rice farmers interested in vegetables | Farmers,<br>Extension agents,<br>Input suppliers | - Identification of general and site specific issues facing PUA in Liberia and interactive demonstration of problem solving in practice. |
| Availability of good disease-free seedlings of selected varieties | - Training of nurseries / seedling producers in good practice – notably growing medium, good seed and pest and disease management, marketing | - Training of high potential vegetable seedling producers to supply superior products<br>- Link seedling producers with input providers | Farmers,<br>Nursery operators | Increase in quality of seedlings of chili and bitterball.<br>Expanded production of Moringa and vetiver material during 2013. |
| No pest listing for horticultural crops | National pest list for horticultural crops | Targeted STTA for pest, disease and beneficial organism identification | Farmers,<br>Input suppliers | List of organisms and field ID handbook. |
| Information on beneficial organisms and practices for integrated pest and disease control | Develop database of Liberian beneficial organisms and cultural practices handbook | STTA by relevant specialists and ensure farmers use integrated pest management using the PERSUAP as the basis | Farmers,<br>Input suppliers | List of beneficial organisms associated with main pests and diseases of FED crops. |
| Crop protection, inputs | - List of crop protection remedies | - STTA by relevant foreign and Liberian specialists<br>- Development of Crop Protection Handbook | Farmers,<br>Input suppliers | - First edition crop protection remedy handbook for FED crops.<br>- MoA expands to cover all Liberian crops. |

| Major constraints | Specific solutions | Activities addressing the constraint | Intended Beneficiaries | Expected impact / output |
|---|---|---|---|---|
| No or poorly utilized soil testing services | - Operationalize soil testing services | - Ensure that Good Agricultural Practice soil testing is made a routine management practice | Farmers,<br>Soils labs | - Appropriate correction of soil chemical imbalances.<br>-More economic input use. |
| Activity 1.5.3 Commercial linkage development | | | | |
| On-farm produce handling practices and pre-grading lead to wastage at urban markets | - Setting up of basic grading and crop handling practices | - Use of better packaging<br>- Better field collection and handling practices. | Farmers,<br>Consumers | - Reduced wastage, better market prices. |
| Access to finance | - Benefits and costs are fully understood and applications for crop input financing are properly formulated<br>- Assist with business planning to help procure | - Develop an understanding of the economic models including opportunity costs of all technical interventions in the PUA VC. | Farmers,<br>Input and equipment suppliers,<br>Processors,<br>Marketers | - All technical interventions have associated CB impact analysis (coordinated with Component 2).<br>- Assist with business planning to help procure inputs. |
| Market linkages | - Developing links with PUA groups and urban markets | - Working with country buyers, transporters and market vendors to identify improved linkages to markets | Farmers,<br>Consumers | - Reduced marketing costs with potential value adding activities assessed. |
| Packaging, preservation / processing | - Regular service in cold chain and linkages to final markets<br>- Necessary assistance to develop appropriate transport, post-harvest loss mitigation strategies | -Improved post-harvest processing (e.g. grading, drying, packaging) | Processors,<br>Consumers | - Reduced post-harvest losses together with opportunities for value addition. |
| Develop strong private sector-led technical guidelines and support services | - Input providers enlisted as purveyors of technical and economic advice | - Extending guidelines developed in other subcomponents to input providers through training.<br>- Making selected guides available through vendors | Farmers,<br>Consumers | - Appropriate marketing of agricultural inputs that are fit for purpose. |
| Activity 1.5.4 Policy development | | | | |

| Major constraints | Specific solutions | Activities addressing the constraint | Intended Beneficiaries | Expected impact / output |
|---|---|---|---|---|
| Plant material importation guidelines needed | - Development of guidelines for importation of plant material and seed based on list of pests and diseases present in Liberia and country of origin | - Assist the MoA to develop guidelines for Plant Import Permits for PUA crops and companion species (alley crops, cover crops, beneficial organisms) | Farmers, Consumers, MoA | - Plant Import Risk Assessments and import guidelines completed for crops of interest to PUA. |
| No Pesticide Law / Regulations | - Agricultural remedy law / Act | - Facilitate the drafting of a Crop Protection Remedies Act | Farmers, Consumers | - Draft Act |
| Limited information available on pesticide use | - National crop protection bodies set up (PPP) | -Develop Crop Protection Remedies Act | Farmers, Consumers | A draft statutory instrument based on the proposed Crop Protection Remedies Act |

Peri-Urban Agriculture Value Chain Program Collaboration with Component 2 and Component 3

The peri-urban value chain will collaborate across components. For example, Component 2 will train a number of different peri-urban agriculture partners in improved business management practices, including equipment and input suppliers, processing enterprises

In addition, Component 2 will facilitate access of farmers, processors, and manufacturers to financing, introducing them to appropriate financial institutions, instructing them in the advantages and potential pitfalls of loan taking, and, in the case of viable loan applicants, assisting them with applying for loans. Component 3 will also assist in exploring the possibility of developing marketing activities with change agents such as Sangay Farms, which has expressed interest in undertaking contract farming with women's groups in and around the confines of the farm.

In the case of FED's Component 3, BWI and the VoAg community colleges supported by Component 3 will be encouraged to place students as interns to learn how to develop commercial and subsistence vegetable production, including important soil fertility management. Students enrolled at the educational institutions supported by Component 3 could also intern with the horticulture enterprises partnering with FED.

**Figure 1.3c: Indicators and Year 2 Targets**

| No. | Indicator | Assumptions | Year 2 Targets |
|---|---|---|---|
| 1A | Gross margin per unit land/animal (*) | | |
| 1E | Number of rural households benefiting directly from USG interventions | Each of the 34 groups will have at least 25 participating members, each representing a household. In addition, 4,200 farmers will participate in farmer field days. | 5,050 |
| 1.1.1 | Number of farmers and others who have applied new technologies or management practices as a result of USG assistance (*) | About half of the total participating members in the 34 groups will adopt at least a portion of the improved methods for vegetables production. Another 910 farmers will adopt improved vegetable seedlings, invest in improved irrigation equipment, and use vegetable processing equipment. | 1,335 |
| 1.1.2 | Number of hectares under improved technologies or management practices as a result of USG assistance (*) | A total of approximately 20 hectares will be generated by farmers replicating improved practices to their own fields Another 140 hectares will come from farmers investing in vegetable seedlings (5 ha), fruit seedlings (95 ha), and irrigation equipment (40 ha). | 160 ha |
| 1.2.1 | Number of private enterprises, producer orgs, women's groups, trade and business associations and community-based-organizations (CBOs) receiving USG assistance (*) | Enterprises and producer organizations will participate in the FED Peri-urban agriculture value chain program. The enterprises have been enumerated above (1C). In addition, all of the producer organizations to be trained (34) can be counted. | 500 |

| | | | |
|---|---|---|---|
| 1.2.2 | Number of private enterprises, producer orgs, women's groups, trade and business associations and community-based-organizations (CBOs) that applied new technologies or management practices as a result of USG assistance (*) | 2,809 private enterprises and producer groups applying new technologies or management practices disaggregated as follows: 34 groups, 425 individual farmers transferring new technologies and practices to their own fields, 17 vegetable seedling producers, 15 fruit seedling producers, 6 irrigation equipment manufacturers, 2 dryer manufacturers, and 2,310 investors in and users of project-promoted technologies. | 2,809 |
| 1.3.2 | Number of households using improved food processing technologies | 400 households using improved vegetable drying technologies | 400 |
| 2A | Value of incremental sales (*) | Approximately $22,000 in new sales will be recorded | $70,000 |
| 2B | Value of new private sector investment (*) | Approximately $40,000 in equipment and the use of equipment | $40,000 |
| 2C | Number of jobs attributed to FtF implementation (*) | Assumes 95 workers employed to operate equipment and produce rice seed – one to operate each of seventeen vegetable nurseries (17), two to operate each of fifteen fruit tree nurseries (30), one new job in each of eight new shops manufacturing irrigation and drying equipment (8), and two new jobs in each of twenty new vegetable drying businesses (40) | 95 |
| 3.1.1 | Number of individuals who have received USG supported short-term agricultural sector productivity or food security training (*) | 850 individuals from the 34 producer groups trained in improved rice production practices | 850 |

## TASK 1.5 GOAT INTERVENTIONS FY 2013

Introduction: FED undertook an in-depth assessment of the Goat Value Chain from February through April of 2012. The assessment concluded there is a growing lucrative market for goat meat in Liberia and currently this market is met primarily through the importation and sale of goats from neighboring countries, primarily Guinea, Sierra Leone, and Ivory Coast. The primary constraint to Liberian farmer's participation in this growing market is the inadequate/low productivity of indigenous Liberian goat herds on Liberian farms. Therefore, there is a priority in the FED Strategy to increase the production and marketing of Liberian Goats in order to capture this growing domestic market. This will not only require improving the management practices and marketing strategies of Liberian goats but the replenishment of the goat herds of households who lost their animals during the war. Goats are extremely prolific when managed properly and can provide a critical livelihood and nutrition resource for small holders throughout Liberia.

A major campaign aimed at restocking small animal farm livestock (e.g. chickens, ducks, pigeons, fish and sheep/goats), implemented primarily by NGOs in Liberia, has been underway since the end of the war. Restocking campaigns to replenish goat breeding stock began with the purchase and importation of goats from surrounding countries, but this process has been problematic. Preferred healthy, goat breeding stock of reproductive age (6-8 months) are not available in adequate numbers. Most animals normally present in livestock markets of bordering countries (Guinea, Sierra Leone, Mali) are older adults destined for slaughter rather than as breeding stock. In addition, many of the goats purchased in border country markets carry and spread illnesses. This has resulted in high mortality rates (>40 percent) and cases of disease transmission to indigenous livestock.

**Strategy/Approach:** In early FY2012, FED organized a joint review/field assessment of constraints to the livestock sector with Land O'Lakes (LOL) and MoA personnel. The joint field assessment team focused on primary border entry posts, reviewing livestock imports and sanitary/phyto-sanitary inspection & quarantine capacities, together with livestock slaughter and meat marketing facilities across the country. Following these assessments, FED assisted the MoA in organizing and executing a Technical Consultative Workshop focused on the review of all current livestock interventions in Liberia, which included the MoA, FED, NGOs, USDA, LOL, FAO, Donors, and various critical regional organizations (OIE, etc.).

These joint livestock sector assessments and consultative reviews have resulted in a revised **FED Goat Sub Sector Value Chain Strategy** aimed at addressing critical gaps. The aim is to focus the unique comparative advantage of each United States Government (USG) funded development partner (USDA/LOL&USAID/DAI) on addressing the most critical constraints in the sector as a whole. With the LOL Program focusing on upgrading critical slaughter facilities and cross border animal disease surveillance/quarantine capacities, the FED strategy will focus on increasing production/survival rates of indigenous sheep &goats through improved management practices in conjunction with animal health services. Overall targets of the strategy include increased productivity and reduced mortality rates while strengthening the national MoA capacity for animal disease vaccination and endemic disease diagnosis and surveillance.

Strategic interventions in the Goat value chain in FY 2013 include;

- Assist/train MoA in the execution of National Livestock Vaccination Campaigns. (Significant amounts of Petite Peste de Ruminant (PPR) vaccines provided by EU/AU/IBAR remain unused due to closure of the program and annual PPR vaccination is critical for national herd survival.)
- Expand Community Goat Pass-on Schemes implemented through "Lead" Liberian Farmer Goat Producers and/community-based organizations (CBOs). (Restocking efforts based on animal

importation have been problematic and growing goat meat markets in Liberia are being primarily met by livestock importation from bordering countries.)

- Promote Veterinary Pharmaceutical outlets in the rural areas together with training veterinary pharmacists to staff the veterinary pharmaceutical outlets created to advise producers on appropriate drug uses, etc. (Veterinary pharmaceutical availability is a primary constraint to livestock production in Liberia.)
- Improve national disease surveillance/diagnostic capability of the MoA National Veterinary Diagnostic Laboratory. (Diagnostic capability of the national laboratory is a critical link in overall national disease surveillance capability along with proper handling/disposal of human transmittable disease materials such as pneumonia, tuberculosis, etc.)
- Assist MoA with the development of National Livestock Policy Guidelines. (The strategic use of limited resources to support a growing Livestock sector in Liberia will be more and more critical in the future.)
- Work with LOL to import up to 20,000 disease tolerant improved goats from Gambia.

At the end of this discussion of Task 1.5, a table presents each activity, major constraints, proposed solutions, and expected impact/outputs. Following that, we include a list of expected targets, listed by activity.

### Activity 1.5.1: National Livestock Vaccination Campaigns

As part of Component 1 and 3, providing practical hands-on training to the MoA while executing the annual 2013 National PPR vaccination campaign is designated by the FED Goat Sub sector Value Chain Strategy as a top priority. Peste des Petits Ruminants (PPR), also known as Goat Plague, is the most damaging disease in sheep and goat populations in Africa. The disease is highly contagious and is rapidly fatal resulting in up to 90 percent herd loss. PPR causes severe economic losses for pastoralist and agro-pastoralist households and dramatically reduces their food security. The EU, through the African Union Inter-African Bureau for Animal Resources (AU/IBAR), has funded National trans-boundary animal disease control vaccination campaigns to address PPR disease control in the region. PPR vaccination must be implemented on an annual basis in order to maintain protection of the national herd. The EU/AU/IBAR Program came to a close in December 2011 and the MoA had not been able to implement a campaign since the program's closure. FED in 2012 worked with the MOA and BRAC to vaccinate a sub-set of the national herd, 125,000 small ruminants in Bong, Nimba, Grand Bassa and Lofa counties. Failure to vaccinate animals against PPR in 2013 will put the entire national herd of sheep and goats in Liberia at risk.

The NGO BRAC has been and is currently the most active NGO in the Livestock Sector in Liberia. A major focus of BRAC's past and present projects targeting development of the livestock sector in Liberia has been animal health related interventions. Private Community Animal Health Workers (CAHWs) have been trained under these programs in the diagnosis, treatment and prevention of animal diseases in various parts of the country. FED, in conjunction with the MoA, intends to utilize BRAC and its CAHWs in the implementation of the 2013 PPR national vaccination campaign as a follow on to the one completed in 2012. Through active participation with BRAC in campaign execution, both MoA County Livestock Agents and MoA Trans-boundary disease control personnel will receive practical hands-on training in logistical planning and execution strategies for future national vaccination campaigns.

### Activity 1.5.2: Community Goat Pass-on Schemes through "Lead" Farmers or CBO's

As part of Component 1, there is a need to increase the production and sale of goats from Liberian farmers. This will primarily require the restocking of farming households who lost their animals during the war, while improving the management practices and marketing strategies of these animals. Market demand for goat meat is increasing dramatically and is no longer limited to holiday seasons and festivals. The current market is primarily being met through importation of slaughter animals from neighboring countries. A major campaign aimed at restocking small animal farm livestock, implemented primarily by NGOs in Liberia, has been underway since the end of the war. Past restocking efforts for goat breeding stock relied on the purchase and importation of goats from surrounding countries and were problematic in that preferred healthy, breeding stock goats of reproductive age (6-8 months) were not available in adequate numbers. The majority of animals normally found in livestock markets of the bordering countries; Guinea, Sierra Leone, Mali, are older adult animals destined for slaughter purposes rather than breeding stock. In addition, many of the goats purchased in border country markets brought illnesses acquired in the larger livestock markets of surrounding countries where they were purchased and resulted in high mortality rates and disease transmission to indigenous livestock in Liberia.

Joint (FED, Land O'Lakes) review assessments revealed impressive instances of relatively successful private sector led "community" restocking efforts going on outside of the classic NGO restocking efforts seen under current restocking programs in the country. Although somewhat limited, these are instances where a neighbor farmer and/or CBO, having several goats for example, are in a position and willing to lend several female animals to an adjacent neighbor, while sharing one or two bucks, for the period of time necessary for kidding to occur. At the end of kidding and weaning cycles, the animals are either returned to the owners and/or kids are passed on to other neighbors willing and interested in acquiring animals in the community. In those cases where this has occurred, extremely successful rates of animal restocking have been achieved with relatively insignificant mortality rates occurring when compared to the larger NGO restocking campaigns importing animals from neighboring countries and counties within Liberia. Although relatively limited in occurrence around the country, these Community Goat Pass-on Schemes represent outstanding examples of sustainable restocking strategies and approaches potentially achievable.

The FED, in partnership with USDA LOL Livestock Program personnel, intends to expand the Community Goat Pass-on Scheme methodology within the four target counties of Nimba, Lofa, Bong, and Grand Bassa. The Community Goat Pass-on Schemes will strategically place intense emphasis on the initial selection process of current goat producer farmers interested and capable of initiating goat pass-on schemes in their communities. The intent is to recruit "Lead" Farmer Goat Producers and/or CBOs already implementing and/or capable of implementing such "community" restocking campaigns that can do the following in response to the current situation:

- Provide breeding stock to be distributed to small holders who have lost their animals in the war.
- Successfully select appropriate, motivated (serious), small holder farmers who are willing and capable of participating in a "community" goat restocking campaign.
- Provide a forum for training in improved management practices to community goat restocking campaign participants.
- Field test improved management practices in the field among participants receiving animals under the scheme.

- Work with MoA, LOL and BRAC Livestock Programs extension personnel in the execution and training under the program specifically to capture lessons learned relative to potential extension of the program to other Districts and Counties.

Once identified, FED will provide Lead Farmer Goat Producers and/or CBOs with the necessary inputs; management training, fencing, animal shelters, feed supplements, veterinary pharmaceuticals, etc., required to intensify the production of their existing herds.

A critical component of intensification of Liberian goat herd productivity will be the introduction of improved, performance-proven, breeding stock into existing Liberian goat herds. Intensive, performance-based selective breeding efforts in West African Dwarf goats have been going on in the Gambia under the International Trypanotolerance Center (ITC). FED, in conjunction with LOL, intends to import improved genetic breeding goats from the Gambia program in order to introduce improved performance genetics (frequency of triplets, disease resistance, etc.) into Liberia. This will dramatically increase goat herd productivity together with improved production practices.

Individual farmer interests within targeted communities of intervention will be reviewed by the Lead Farmer Goat Producers and/or CBOs (with assistance of both FED & USDA LoL personnel) in order to identify Community Pass-on Recipient Farmers. Recipient farmers will be organized into farmer committees and tasked with prioritizing interested participant farmers among themselves for the initial receipt of animals. All farmer committee members cannot receive starter animals as some must wait the kidding and pass-on scheme progress from fellow members. Initial recipient farmers are selected by the committee based on need, i.e. most often female heads of households and/or families which may have lost the male head of household in the war. Farmer contribution qualifications to receive a pair of female animals will be the construction of an animal shelter together with fabrication of a mineral salt lick block according to the instructions of the Lead Farmer Goat Producer. Once the selected farm family has successfully completed these tasks they are eligible to receive the animals. Each community pass-on recipient farmer must pay-back two offspring to the pass-on scheme program before eligible to begin to market animals produced.

### Activity 1.5.3: Veterinary Pharmaceutical outlets in the rural areas

In addition, one individual per pass-on scheme will be selected for Para-veterinary training in animal health disease diagnosis and treatment. The CAHW will be required to be from the specific target community, literate and capable of successfully completing the required para-vet training. The CAHWs will be trained with the assistance of USDA LoL Livestock Program personnel. Following training, each CAHW will be provided a stock of basic necessary veterinary pharmaceuticals and equipment that will be sold, thereby, initiating a revolving fund for ongoing animal health care needs.

Under traditional management practices sheep and goat researchers in Liberia & West Africa consistently report 40-60 percent mortality rates among newborn animals and young in the first year of life. It is believed that the application of select improved management practices could significantly reduce these mortality rates, particularly in the offspring's first year of life to as low as 10-15 percent. It therefore appears that with the proper training of goat producers in selected improved management techniques and practices the national herd could be significantly increased with resulting increased food security and incomes of small producers.

As an integral part of Goat Pass-on Schemes, both business management and marketing training will be provided under FED Component 2. For example, following the successful progression of a goat pass-on scheme, various methods of market promotion will be investigated such as goat fairs, etc., in order to identify/promote market opportunities for producers. In addition, basic business management

skills such as farm budgeting, etc., will be designed and provided to producers aimed at ensuring sustainability of these new goat production enterprises.

Lead Farmer Goat Pass-on Producers.

- Five Lead Farmer Goat Producers and/or CBOs identified in each county; Bong, Nimba, Lofa, & Grand Bassa.
- Budgets for inputs required for intensification of goat production developed (shelters, feeders, fencing, vet pharmaceutical supplies, goats, etc.)
- MOU signed with Lead Farmers and/or CBOs.
- Inputs required for intensification procured & delivered.
- Intensification of herd production begins.
- (support from USDA LoL's Food for Progress Livestock Program, ACDI/VOCA Farmer to Farmer Programs, and/or BRAC/NGO livestock personnel)

Community Pass-on recipient farmers.

- Each Lead Farmer identifies three community pass-on recipient farmers willing to begin goat production.
- Training needs of community recipient farmers identified.
- Train community recipient farmers.
- Recipient farmers complete requirements to receive goats (improved mg, goat shelter, salt lick, feed source, etc.)
- Recipient farmers receive 2 nanny goats each. (Sharing a billy for each 10 nannys).
- Recipient farmer's payback with initial 2 kids produced.

### Activity 1.5.4: Improve national disease surveillance/diagnostic capabilities

Extensive field site visits during the joint livestock sector assessment exercise revealed animal disease diagnostic and surveillance capacity to be grossly lacking. Border posts frequented by livestock importers from neighboring countries do not have quarantine facilities and/or Phyto-sanitary and Zoo sanitary inspection capacities or adequately trained personnel. Veterinary diagnostic laboratories of the National Program under MoA are in need of equipment and upgrading to support the livestock sector. The National laboratory currently focuses on diagnoses of individual disease cases submitted by county livestock agents in the field. A National Animal Health Laboratory facility should be concerned with surveillance of potential epidemic animal disease threats on a national level rather than incidental diagnosis of common routine animal diseases. A National Laboratory such as this should be focused on the detection and monitoring of "reportable" diseases such as Foot & Mouth Disease (FMD), Peste des Petits Ruminants (PPR) and Pleuro-pneumonia with a national/regional animal disease threat perspective. The Laboratory currently is powered by a diesel generator. Given budget constraints of the MoA this is not sustainable and the cost effectiveness of alternative energy sources, i.e. solar, etc., will be investigated.

While the USDA LoL Livestock Program will focus on the development of quarantine and disease surveillance capability, including satellite diagnostic laboratories at border posts, FED will focus on developing the capacity of the MoA National Veterinary Diagnostic Laboratory supporting

surveillance diagnostic needs. As part of Component 3, FED will focus on assessing endemic disease diagnostic capability of the MoA National Veterinary Diagnostic Laboratory. Based on the results of the assessment, FED will equip and train staff of the laboratory to perform the role of national disease surveillance, including proper handling/disposal of zoonotic disease materials (i.e. contagious pleura-pneumonia and tuberculosis that can be transmitted from animals to humans).

### Activity 1.5.5: Assist MoA with the development of National Livestock Policy Guidelines

There is a need for a National Livestock Policy, which will provide basic guidance on the following: MoA county and district level support services, the import/export of livestock, livestock products, and livestock production support requirements including veterinary related services, materials, pharmaceuticals, etc. The draft National Livestock Policy will be the subject of a regional conference, organized by the MoA with FED support, aimed at providing feedback from both animal health and animal production participants in Liberia and the region. The purposes of the conference will be not only to review the draft Liberia Policy but to establish a network forum for livestock producers and traders in the region to focus on constraints/opportunities for expansion of livestock production and trade.

### Activity 1.5.6: Assist LoL to import improved bloodlines of West African Dwarf goats

The LoL implemented USDA Project is to undertake a massive restocking exercise involving some 20,000 head of goats, while the FED intervention is to improve productivity of existing flocks of sheep through improvement in management (nutrition, breeding, housing, health, marketing, etc.).

Buying 20,000 goats from the existing 120,000 head of Liberian goats would not increase the Liberian flock and might actually reduce it as new farmers may record heavy mortalities following restocking. Past importations from Guinea and Mali were not that successful because of high mortalities among the imported animals in their new locations. This was due to importation of elderly and weak animals destined for slaughter and animals which were not genetically adapted to the environmental conditions of Liberia (possible introgression of Sahelian goat's genes, making animals more susceptible to Liberian diseases, including high internal parasite loads and trypanosomiasis).

The MoA has agreed that buying Trypanotolerant West Africa Dwarf goats from the catchment areas of the International Trypanotolerance Centre Open Nucleus Breeding Scheme located in the Gambia is a good idea. Over time, 20,000 breeding age females and males will be available as confirmed by Gambian small ruminant's experts, Mr. Nerry Corr and Dr. Bakary N. Touray, a Vet/former Director at ITC.

### FIGURE 1.5.A: IMPROVING THE QUALITY AND QUANTITY OF GOATS IN LIBERIA FY 2013

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| MoA capacity to execute national vaccination campaigns. | Assist MoA in 2013 national PPR vaccination campaign as learning exercise. | FED TA & USDA, LoL, BRAC, execute 2013 PPR vaccination campaign with MoA. | National small ruminant (SR) herd protected against potential PPR epidemic causing 90 percent mortality. |
| Liberian goat producers unable to meet growing market demand. (Imports introducing disease.) | Intensify" indigenous" goat production by Lead Farmers to extend to others through Goat Pass-on Schemes. | Improved Mgt practices (health, shelter, feeding, and performance proven goats) extended in Pass-on Scheme. | 168 improved Goat producer enterprises supplying local market demand. |
| Veterinary drugs unavailable/unused by goat producers | Promote rural veterinary drug outlets capable of supplying/advising | Provide Veterinary drugs to producers with training & establish rural veterinary | Accelerated herd growth due to reduced mortality rate of newborn |

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| resulting in high (46 percent) mortality rates, especially among newborn yearlings. | producers. | drug outlets. | yearlings from 30 percent to 10-15 percent. Rural veterinary outlets established advising producers in drug use. |
| National endemic animal disease diagnostic/ surveillance capacity nonexistent. | Develop capacity of the MoA in animal disease diagnostic/surveillance capacity. | Assess & provide diagnostic equipment & training to National Animal Disease Diagnostic Laboratory (Fendell). | Secure National herd through detection & timely response to potential endemic diseases. |
| Development resources limited & livestock priorities unclear. | Assist MoA with National Livestock Development Policy/guidelines. | Provide TA for drafting of National Livestock Policy/guidelines. | More effective use of limited development resources. |

Results FY2013 Task 1.5 Improved Goat Production

- Minimum of 20 Lead Farmer goat producers producing goats under intensified production systems.
- In 2013, 60 community pass-on recipient farmers (3 per Lead farmer) will receive goats from Lead farmers and begin production.
- Approx. 122,000 goats vaccinated against PPR.

Result Linkages to Component 2 FY2013

- 80 Goat producer enterprises established in 2013.
- 4 input supplier enterprises selling goat production supplies; fencing, shelter materials, veterinary pharmaceuticals, etc.
- 8 Community Animal Health Worker enterprises established. (2 per county)
- Promote Veterinary Pharmaceutical outlets in the rural areas.
- Assuming establishment of 5 goats/HH, 122,000 goats vaccinated against PPR/5 goats per HH=24,400 goat producer HHs assisted.

Linkages to Component 3 FY2013

- National Lab. development in surveillance capacity and training of staff.
- Train Veterinary Pharmacists to staff the Veterinary Pharmaceutical outlets created to advise producers on appropriate drugs, etc.
- Identify"intern" opportunities for high school and university students among all these activities.
- Help to develop curriculums for livestock production.

Please refer to Annex I for the Goat Value Chain Matrix.

Component 1- Year 2 Indicators and Targets – Task 1.5

Ind. #1A: Up to 30 percent increase in Gross margin in goat value chains

| | |
|---|---|
| Ind. #1E: | Up to 24,492 rural households benefiting directly from USG interventions |
| Ind. #1.1.1: | Up to 80 goat farmers have applied new technologies because of USG assistance |
| Ind. #1.2.1: | Up to 24,492 private enterprises, producer organizations, women's groups, trade and business associations and CBOs receiving USG assistance |
| Ind. # 1.2.2: | Up to 24,492 private enterprises, producer organizations, women's groups, trade and business associations and CBOs that applied new technologies or management practices as a result of USG assistance |
| Ind. #2A: | Up to $1,600 in value of incremental sales |
| Ind. #2B: | Up to $4,000 in value of new private sector investment |
| Ind. #2C: | Up to 48 jobs attributed to FTF implementation |
| Ind. #3.1.1: | Up to 89 individuals that have received training on agricultural productivity. |

**FIGURE 1.3: RELATIONSHIP BETWEEN FED'S COMPONENTS, YEAR 2 ACTIVITIES, AND VALUE CHAINS**

| Component | Rice Value Chain | Cassava Value Chain | Vegetables Value Chain | Goats Value Chain | Partners/Stakeholders |
|---|---|---|---|---|---|
| **Component 1**<br><br>**Increased Agriculture Productivity** | Input supply system interventions<br>Rice seed production and selection training<br><br>Trainings on production practices and technologies<br><br>Post-harvest processing<br><br>Establish learning laboratories<br><br>Host farmer field days to allow farmers to evaluate varietal performance<br>Farmers trained in certified seed multiplication<br><br>Train in improved water management techniques (construction, use, maintenance, and expansion of physical control structures)<br>Pilot test /expand commercial power tilling operations for rice/ train entrepreneurs in maintenance and use<br><br>Identify and field and market test range of post-harvest processing technologies<br><br>Train local metal workers to fabricate impact rice dehullers and other equipment | Demonstrate use of improved varieties, establish nurseries, promote good agriculture practices<br><br>Post-harvest study to assess storage and processing needs at markets<br><br>Pilot small-scale cassava processing at the village/ district levels<br><br>Multiplication testing<br>Develop a cassava toolkit for extension staff<br>Host Farmers Field Day, Farmers Exchange Visits, and develop training materials on cassava<br>Input supply system interventions | Establish earning laboratories<br><br>Organize road and trade shows<br><br>Selected training<br>sessions at demonstrations<br><br>Implementation of good<br>seed handling practices with seed suppliers and farmers<br><br>Use outputs from soil testing service to develop crop appropriate guidelines for variety selection and fertilization<br><br>Develop appropriate soil management guidelines to address soil chemical and physical limitations<br><br>Examination/evaluation of simple water distribution systems<br><br>Work with input suppliers<br><br>Use of vetiver and cover crop trimmings<br><br>Training in compost use<br>Develop of crop specific guide books (including crop | Assist MoA in 2013 national PPR vaccination campaign as learning exercise<br>Intensify" indigenous" goat production by Lead Farmers to extend to others through Goat Pass-on Schemes<br><br>Provide Veterinary drugs to producers with training & establish rural veterinary drug outlets | MoA staff, lead farmers, Cassava, Vegetable, and Rice National Coordination Committees, CARI, Farmer Associations, CAF, FAO, USDA, orphanages,<br>RISE, SIDA feeder road program, World Bank, EU, AfDB, IFAD, GAFSP, LoL, LAUNCH. BRAC |

| Component | Rice Value Chain | Cassava Value Chain | Vegetables Value Chain | Goats Value Chain | Partners/Stakeholders |
|---|---|---|---|---|---|
| | | | protection)<br><br>Adaptive research plots established<br><br>Assistance to cassava, goat and rice farmers interested in vegetables<br><br>STTA for pest, disease and beneficial organism identification<br><br>Operationalize soil testing services | | |
| **Component 2**<br><br>**Stimulate Private Enterprise** | Support enterprises with business and technology in harvesting; post-harvest (grading, sorting processing, pack houses), business skills training, market linkages and information, and agro-input dealers.<br>Conduct rice market studies (lowland and upland)<br>Promote power tillers to entrepreneurs; link entrepreneurs to vendors<br><br>Connect promising mechanized commercial processors to sources of financing<br><br>Provide policy advocacy support to improve the commercialization of the rice value chain. | SME trainings to selected cassava producers and processors<br>Market survey in partnership with other stakeholders in the cassava value chain to identify the market for cassava products<br><br>Assist cassava producers with access to finance for contract growing of new lines for multiplication or processing equipment<br>Train existing and potential processors on market characteristics, market demand, processing technology, storage, packing, branding etc. of value added cassava products | Develop understanding of the economic models including opportunity costs of all technical interventions in the PUA VC.<br><br>Develop links with PUA groups and urban markets<br>Improved post-harvest processing (e.g. grading, drying, packaging)<br><br>Extend guidelines developed in other subcomponents to input providers through training<br><br>Assist the MoA to develop guidelines for Plant Import Permits for PUA crops and companion species<br><br>Facilitate the drafting/develop a | Provide TA for drafting of National Livestock Policy/guidelines<br>Provide business skills training/business plan assistance for lead goat farmers looking to expand their herbs | MoA, MoCI, Liberia Marketing Association, private producers ,enterprises, associations, local training firms, GEMS, IBEX |

| Component | Rice Value Chain | Cassava Value Chain | Vegetables Value Chain | Goats Value Chain | Partners/Stakeholders |
|---|---|---|---|---|---|
| | | Review/refine business or enterprise plans for cassava producers/processers | Crop Protection Remedies Act | | |
| **Component 3**<br><br>Build Local Human Capacity | Build human resources needed in rice sector through vocations schools/ community colleges, targeted trainings and TA to build capacity of enterprises and GoL | Work with staff and students at Vocational Agriculture schools, to prepare and give appropriate training in the husbandry, business, marketing and processing of cassava. | Work with staff/students at Vocational Agriculture schools, to prepare and give appropriate training in production, business, marketing / processing vegetables<br>Utilize FED's internship program to place students in farms, demonstration sites, etc.<br>Work with orphanages to teach and promote vegetable production | Assess & provide diagnostic equipment & training to National Animal Disease Diagnostic Laboratory (Fendell) | MoA, MoE, Vocational schools/college interns, Fendell Lab |
| **Crosscutting: Nutrition, Gender, Environment, Communications/KM** | Nutrition: Nutrition Gap Analysis, nutrition messages, targeted activities to increase utilization of diversified food, qualitative studies, and fortification.<br>Gender: Ensure FED Supported Training and Capacity Building Activities are Gender Sensitive and Socially Inclusive, make FBOs more Responsive to the needs of female members, improve female producers' access to finance, supporting FED partner educational institutions efforts to better serve female students<br>Environment: Make any proposed amendment in EMMP, support to Water Quality Monitoring and Irrigation design concepts for FEDs activities in these areas, training for staff and stakeholders in environmental issues and best management, record compliance visits, develop relationship with EPA.<br>Communications/KM: Radio programs publicizing rice demonstration information, impact of good water management. Use Radio, newspapers and other promotional devices to spread news about PUA activities. Nutritional/hygiene campaign via radio, billboards, etc. special studies. | | | | MoA, MoHSW, LAUNCH, FAO, WFP, UNICEF, MYAP, MoGD, radio outlets, media outlets, FBOs, EPA |

## TASK 1.6 INTEGRATING NUTRITION INTO ALL FED ACTIVITIES

Introduction: By the age of two almost half of young children in Liberia are undernourished according to the 2007 Liberia Demographic and Health Survey (LDHS). While the severe acute malnutrition (severe wasting) rate for Liberia is low (2.8 percent of children <-3SD Z-score weight-for-height at 24-36 months of age), chronic malnutrition (moderate stunting) is one of the highest in the West Africa region (49 percent -2SD Z-score height-for-age at 24-26 months) and has been at this high level for many years. FED activities address chronic malnutrition. More than the short stature itself, children's poor growth is the sign that their cognitive development is slowed as well, paving a path of inadequate learning among older children in primary and secondary school, and lower productivity and earned income among adults. Young children also suffer from moderate anemia, another form of undernutrition which contributes to these outcomes. Despite the far-reaching consequences, small children tend to become the norm is communities with up to 50 percent prevalence, and so communities sense no urgency to improve children's situation. Moderate malnutrition tends to manifest most rapidly when children are 6-24 months, a key time in the 1,000 days window from conception to 2 years that provides an opportunity to arrest their undernutrition. After two years of age, children tend to track along the lower trajectory of their growth curve. The girls grow into mothers who are short, often thin, and very often anemic, perpetuating an inter-generational cycle of malnutrition.

The two immediate causes of child undernutrition are 1) poor child feeding, when children are not getting enough of the right foods to promote their growth, and 2) frequent child illness, especially diarrhea, that saps appetite and impairs food absorption into the gut. According to the LDHS, less than 25 percent of children in Liberia are fed according to the minimum acceptable diet, and about one-third are suffering from diarrhea in any 2-week period. To address chronic malnutrition FED will promote awareness about undernourished children and mothers, promote improved child feeding practices, and promote household hygiene to prevent children's diarrhea through two means – nutrition-hygiene messages integrated into FED agriculture training, and a county-specific nutrition campaign with partners.

Strategy/Approach: Children's diets are determined in the context of the household's consumption. Thus, FED's approach to integrating nutrition into its activities and outcomes is to increase both access to and consumption/utilization of a more diversified, and hence more nutritious, diet for the household, with an emphasis on consumption by children and mothers. The target population for the FED nutrition component is those households with undernourished women and children. Of FED's two target populations – the entrepreneurs responding to enhanced market opportunities along the value chains, and the food insecure with land responding to enhanced agricultural production opportunities – we expect malnutrition to be more prominent in the food insecure population, and so this target will be the main one for undernourished women and children.

Dietary diversity is, therefore, a major emphasis in our nutrition efforts, especially among women and young children. The FED strategy to diversifying diets is two-fold: first increasing access to a diverse set of foods through diversifying food production, and second enhancing household consumption/utilization of the diversified set of foods produced. FED will improve the nutritional value of food being produced on household farms, thus increasing a family's access to nutritious food. For example, development of fruit and vegetable value chains will allow rural households to increase their incomes to afford more adequate and nutritious food, as well as produce more nutritious food for direct household consumption. Better household livestock management and fodder production will increase yields of meat, improving access to fatty acids and protein, (nutrient-rich animal source foods are particularly lacking in the diets) and reduce pressure on the environment. Household access to food will also be improved when family members earn income from selling the surplus food they

produce, and use it to buy nutritious foods other than what they produce. Access will be improved in two ways – there will be a greater quantity of food because of higher farm yields and less post-harvest loss, and there will be a higher quality of food since dietary diversity ensures greater intake of vitamins, minerals and other nutrients.

In addition to food access, the FED strategy for dietary diversification will also ensure that project beneficiaries consume/utilize the food produced with the higher nutritional value, and otherwise diversify their diet through FED's nutrition messaging. We will focus particular attention on consumption by mothers and their children, and on the decision making process around a household's food procurement, likely involving fathers, to help ensure the resources needed are present to ensure food consumption and a nutritious diet.

Combined with these efforts will be a set of proven public health interventions featured in the Essential Nutrition Actions (ENA) as well as essential hygiene actions, to address nutritional and micronutrient deficiencies focusing on pregnant women and children under two, improving infant and young child feeding (breastfeeding and complementary feeding), improving intakes of vitamin A, iron and iodine, improving the nutritional status of pregnant and lactating women, and improving hygiene to prevent the diseases that contribute to undernutrition. In year 2, nutrition and food security related activities will be led by a local Nutrition Specialist (new hire), Extension Specialist (LTTA, Gwendolyn Armstrong), with guidance and technical assistance from Kathleen Kurz, FED's Sr. Nutritionist.

FED nutrition activities to accomplish these solutions are described below. First we describe a Nutrition Assessment and Gap Analysis (NAGA) that will delineate current issues, policies and programs that have been accomplished or are on-going and highlight gaps in approach or execution. The NAGA will recommend strategies and activities for improving nutritional status that are relevant to all agencies and actors involved and be specific about contributions well-suited to FED implementation, especially involving dietary diversification. The second and third activity sections describe activities aimed at expanding food consumption, child feeding, household hygiene and dietary diversification; and increasing access to food according to the dietary diversification strategy described above. It should be noted that these two sections will await confirmation or suggestions for revision based on the NAGA.

At the end of this discussion of Task 1.6, a table presents each activity, major constraints, proposed solutions, and expected impact/outputs. Following that, we include a list of expected targets, listed by activity.

### Activity 1.6.1 Nutrition Assessment

Currently, the MoA, with support from FED and others, and in coordination with FAO & WFP are conducting a Comprehensive Food Security and Nutrition Survey (CFSNS), and results will be ready to be shared in early 2013. This updated assessment will be used to revise FED activities. The current nutrition activities are informed by the CFSN Strategy available from 2010 and a Qualitative Report on Infant and Young Children's Feeding (IYCF) conducted in 2010 by MoHSW and UNICEF. This IYCF study highlighted the need for behavior change communication activities focused on IYCF. It is planned to bring on a full time nutrition specialist and local staff by January 2013. In the meantime, field collaboration with other programs will continue and be expanded. Synergies will be developed with other nutrition programs in FED counties such as school feeding, Water Sanitation and Hygiene (WASH), WFP and LAUNCH, complementing their nutrition activities with FED crop diversification activities.

All FED's nutrition programming is based on the existing landscape of nutrition policy, programs, and research in Liberia, particularly in the 6 FTF counties, and supplying resources to fill the gaps. The team has reviewed the existing data on the prevalence of undernutrition among women and young children and its immediate and underlying causes. We will continue to review existing data on nutritional status, health, diet, cropping patterns, income and economic status, and interview key donors, national policymakers, program planners, and clinic staff. This information will contribute to a better understanding of the nutrition landscape of responses to Liberia's undernutrition and help to shape activities. In collaboration with LAUNCH, the county teams will also be conducting group discussions and other participatory research to understand perceptions about maternal and child undernutrition in households and communities, and how FED's activities impact on them. Understanding the perceptions of food insecure households is important because in many settings where child stunting rates approach 50 percent, small child size is accepted as normal and parents are not aware of the long-term benefits and importance of good dietary nutrition among children, particularly from conception to two years of age (the first 1,000 days). Due to gender and age issues in household decision-making that affects mothers' and children's diet, water and sanitation to prevent illness, and health-seeking behavior for the treatment of illness, it is critically important to understand the perceptions of fathers and grandmothers in the gap analysis, not just the mothers of young children. Following discussions with LAUNCH, UNICEF, MoHSW and others, FED will implement activities aimed at increasing dietary diversity.

The main steps in this activity are to:

- Design the nutrition activities in collaboration with USAID programs, MYAPs, MoHSW-Nutrition Division, MoA-Food Security and Nutrition Program, WFP, UNICEF, and others.
- A senior expatriate nutrition/food security/dietary diversity consultant will be submitted for approval to lead the FED nutrition team, along with Liberian staff and Kathleen Kurz, nutritionist at DAI as STTA.
- Meet with all key partners and add county level specifics to workplan nutrition activities.
- Adjust FED's nutrition activities as needed, based on the NAGA findings and recommendations, and informed by the 2012 CFSNS.
- Continue to conduct FED nutrition activities, per the adjustments.

### Activity 1.6.2: Enhancing Child Feeding, Household Dietary Diversity and Hygiene

To motivate behavior change in terms of food utilization, dietary diversification, feeding practices, and health and hygiene habits, the FED project will utilize existing and develop new consumer messages and disseminate them through at least three channels and/or media, e.g., radio, training materials, brochures. Two communication channels are described below -- integrating nutrition messages into agriculture trainings and mounting a nutrition-hygiene campaign in select FED counties. Surveys will be conducted to understand and examine how communities perceive these topics and inform message development. Message dissemination will be undertaken in close collaboration with the MoHSW-Nutrition Division and the MoA-Food Security and Nutrition Program.

### Activity 1.6.2.a Dietary diversity and nutrition-hygiene messages added to agriculture trainings

Targeting our agriculture audience (e.g. agricultural extension officers, agro-input suppliers, master farmers, farmer groups) FED will develop tailored informational nutrition materials and messages to help raise awareness and educate households and enterprises on nutrition, food safety, dietary

diversification, and health and hygiene best practices. Since community agriculture facilitators/master farmers serve as the link between their communities and extension officers, they can provide a strong conduit for sharing nutrition and hygiene information directly with farmers. A concerted effort will be made to recruit female master farmers, but given that decision making over resources at home is usually made by males, it is important for the men to hear the FED/FTF nutrition messages as well.

All FED nutrition messages geared for our agriculture audience will be based on the food-related elements of the ENA program being rolled out by the MoHSW-Nutrition Division. Under FED, nutrition messages will be piloted to the agriculture audiences. At the same time, FED will facilitate discussion between the MoHSW, UNICEF and the MoA to formally adapt ENA messages for agriculture trainings and assist the MoA to disseminate them. We will build on the experience of other programs that may have already integrated their nutrition and agriculture messages together.

In addition, FED's capacity building and training activities will include a module on nutrition information for all participants across the four value chains. Once the messages are integrated, nutrition-hygiene messages will be a part of all of FED's agriculture trainings. For example, consumption of vegetables in farmers' households will be promoted as a way to diversify diets and, hence, increase the nutritional quality of the foods consumed while promoting their sale to increase income. Examples of such vegetables include red chili peppers, onions, cabbage, lettuce, bitterball, tomatoes, and carrots. For the vegetable value chain, FED will encourage diversification and selection of specific vegetables based on their market demand in Monrovia and elsewhere as well their nutrient (vitamins and minerals) content. The choice of crops will be vetted with the MoHSW and the MoA Departments of Extension and of Peri-Urban Agriculture.

A system of self-reporting of levels of home consumption and sale of the high-value vegetables will be set up by the special studies unit to facilitate the monitoring of this aspect of the project.

In Year 2, we will:

- Select those messages among the MoHSW Essential Nutrition Actions materials appropriate for farmers, modify the FED agriculture training material to include them, and compare how other projects have accomplished this
- Present modified training materials to key staff at the MoHSW-Nutrition Division and MoA-Food Security & Nutrition
- Train FED agriculture specialists in nutrition messaging who will then train farmers
- Discuss how to train a larger cadre of MoA agriculturists, extension officers etc., plan and implement FED support as needed
- Implement all FED agriculture trainings with nutrition messages incorporated and monitor progress as per the FED PMP

#### Activity 1.6.2.b. Dietary Diversity and Nutrition-hygiene campaign

Another important and complementary method for communicating the importance of nutrition and hygiene, especially for mothers and children, is to use mass media outlets like community radio and billboards. The messages would be based on the GoL ENA approach. ENA is being rolled out throughout Liberia by the MoHSW-Nutrition Division in collaboration with the MoA-Food Security and Nutrition Program and NGO and UN partners. We will likely support one or more partners to help roll out and strengthen the MoHSW's implementation of ENA in FED counties, especially a nutrition-hygiene campaign element. We will expand the nutrition campaign to other counties in Year 3.

In Year 2, we will:

- Discuss and plan the dietary diversity and nutrition-hygiene campaign with MoHSW-Nutrition Division, including counties
- Identify and plan the implementation of the campaign with a nutrition-hygiene NGO partner
- Plan and conduct a baseline survey on dietary diversity and nutrition-hygiene perceptions and practices
- Partner implements campaign

#### Activity 1.6.2.c Qualitative Research on Perceptions of Nutritional Status and Healthy Diversified Diets

To inform our plans on how communication can promote behavior change FED will conduct qualitative research on if and how the nutrition-hygiene messages are heard and understood, and what opportunities and constraints exist for actual change in behaviors. This research will be designed as a special study, to be conducted mid-year in 3-4 representative settings covering the variety of influences on dietary behavior and other contextual factors that we have described. Results will be used to inform adaptations to the nutrition-hygiene communication activity.

### 1.6.3 Improving Access to Nutritious Food

There are a variety of nutrition activities FED will implement in collaboration with Components 1, 2, and 3 that will improve household access to food, with special emphasis on food that is particularly nutritious, especially animal source foods. This FED nutrition activity will build upon the diversified crop production activity and focus on increasing the utilization of diversified foods produced at the household level, including storage and processing activities and enhancing the nutritional value of cassava through fortification.

#### Activity 1.6.3.a: Processed Complementary Food Products for Children 6-23 months

While best programming methods have been identified by the health sector to prevent child malnutrition, the area of complementary/weaning foods and feeding has lagged behind. More trials are needed as well as involvement of the agriculture sector regarding producing ingredients for these foods. Two constraints to adequate complementary feeding bear special attention. First, mothers often lack time to prepare homemade food for their young children with an adequate variety of ingredients to meet nutritional needs and feed them at least 3-4 times per day. Their food preparation time could be reduced if they had access to processed or instant foods. In addition, mothers often lack the resources to pay for extra food beyond what the family usually consumes and so it is important to find an affordable high-quality processed food that will be accessible to those, whose children could benefit the most, yet are profitable enough for an enterprise to choose to produce it. The nutritive value of the complementary food should be high and include vitamins, minerals, protein and fatty acids. A cereal base with legume flour will be considered as well as adaptations of traditional local weaning foods, including fish powder. The processed foods should meet international food safety standards.

To assess the potential demand for and profitability of food products, a market analysis of the supply and demand factors for complementary food products will be conducted. A market analysis requires about a 4 week time frame to run and the services of two market specialists together with input from local stakeholders. A range of potential producers will be considered, from the commercial food market to cottage industry or local cooperatives, and rural as well as urban locations. The market analysis would include:

- *End market analysis (the consumer demand side)* -- The team will conduct end-market analysis to develop an understanding of demand patterns, consumer preferences, price points, and other factors affecting the producers ability to successfully serve the various target markets (urban as well as rural poor households).
- *Market chain mapping (the producer supply side)* -- The team will develop a market chain map that shows actors, functions, and relationships within the market chain—providing a visual representation of the flow of products from conception to end markets.
- *Analysis of constraints and opportunities* -- The team will organize the data to identify the most serious constraints and most promising opportunities within the market chain and design tailored interventions to remove the constraints and take advantage of opportunities to improve the functioning of the market chain.
- *Roadmap of recommendations* – Finally, information obtained from the market analysis will be translated into a roadmap of specific recommendations, including a list of activities and a timeframe for implementation.

The market analysis of complementary foods will be conducted in Jan-Feb. In March we will prioritize the recommendations and plan activities over the life of the FED project with particular focus on the rest of Year 2. Since many of the recommendations will be implemented by the Enterprise Development team, the Nutritionists will plan activities in conjunction with the Component 2 team. Technical support for product development will likely be continued into Year 3.

### Activity 1.6.3.b: Storage and processing to reduce post-harvest losses

FED will identify and promote improved home storage technologies to better manage food waste and losses and improve food safety, as described under the four value chains: rice, cassava, vegetables and goats. Lack of proper storage and processing options contributes not only to physical losses, but infestations can significantly lower the nutritional value of the product and also compromise food safety leading to illness. Moreover, storage technologies will specifically address women's needs given their central role in food handling and preparation.

The project will support and encourage SMEs to embark on food preservation techniques such as bottling, drying, and parboiling. FED's nutrition specialist will work with the Enterprise Development team leader to identify promising nutribusiness opportunities for (MDF) support.

In addition to reducing post-harvest losses, the storage and processing techniques are also labor-saving (e.g., treadle pumps, power tillers, rice threshers, dryers, and de-stoners), which is particularly important for women. Women may conduct as much as 70 percent of agricultural production activities, as well as do domestic work and take care of children. Storage and processing techniques are described under the value chain sections.

### Activity 1.6.3.c: Investigation of cassava fortification to enhance nutritional value

The fortification of cassava with vitamins and minerals should be explored both as a value addition processing element and as a way of integrating nutrition into the FED cassava promotion intervention. Micronutrient deficiencies are a significant issue in Liberia with almost 60 percent of children under 5 and 40 percent of pregnant women anemic, and 13 percent of children deficient in Vitamin A[4]. Proxy indicators, diet, stunting, and diarrhea rates, suggest that zinc deficiency may also be an issue.

[4] 2011 Liberia Micronutrient Deficiency [DRAFT RESULTS ONLY]

Local processing/milling of cassava flour is planned under the cassava value chain work. Working with processors provides an ideal opportunity to explore the possibility of fortifying cassava flour with micronutrients, especially iron. Small-scale fortification of cereals is a relatively new area, benefitting recently from the development of equipment technology so that small scale millers can mix the fortificant uniformly in the flour. There is little experience globally with fortifying cassava, but all cassava milling is done on a small scale in Liberia, so we will draw on the experience of the small scale cereal fortification efforts. For village-level, small-scale fortification, the technology chosen for fortification should be simple, inexpensive, easy to maintain, and leave little room for human error in the delivery of the fortificant to the vehicle. Additionally, once a technology is identified, further inquiry should ascertain more precisely the additional cost for fortification and the receptivity of the market to fortified cassava products after consumer education and promotion campaigns.

We will identify a small scale fortification expert and conduct a technical feasibility assessment of small scale fortification of cassava flour in Liberia. If feasible, we will begin to implement the recommendations from the assessment. In Year 2, we will:

- Conduct a desk review (working with Project Healthy Children) and draft SOW for assessment
- Conduct a technical feasibility assessment of small scale fortification of cassava flour
- Plan next steps accordingly

#### Activity 1.6.3.d: Research on orange-fleshed sweet potatoes and other micronutrient-rich crops

Under Component 3, FED will work with county colleges and other agriculture centers of excellence, to conduct horticulture research. FED nutritionists will work with Component 3 staff so that nutritious vegetables and other nutritious foods are included in the choice of research topics, and that nutritious and diverse crops are grown at orphanages and other sites partnering with FED.

A summary of the nutrition constraints and FED solutions are presented below:

**FIGURE 1.6.A: NUTRITION ACTIVITIES BY CONSTRAINTS, SOLUTIONS, ACTIVITIES**

| Major Nutrition Constraints | FED Solutions | Nutrition Activities Addressing Constraints | Expected Outcome |
|---|---|---|---|
| Inadequate child feeding 6-24 months | Improve child feeding (in context of diversifying household diet) | 2.6.2.a Nutrition-hygiene messages in agricultural trainings<br>2.6.2.b Nutrition-hygiene campaign<br>2.6.2.c Nutrition qualitative studies<br>2.6.3.a Processed, fortified complementary food<br>2.6.3.d Orange fleshed sweet potato research | Child feeding improved |
| Frequent diarrhea among children 6-24 months due to poor household hygiene | Improve household hygiene | 2.6.2.a Nutrition-hygiene messages in agricultural trainings<br>2.6.2.b Nutrition-hygiene campaign<br>2.6.2.c Nutrition qualitative studies | Household hygiene improved |
| Mothers are thin before pregnancy & their weight gain is inadequate during pregnancy, leading to poor health and nutrition outcomes for mother & child | Improve household food consumption, especially women's<br><br>Improve dietary diversity, especially for women | 2.6.2.a Nutritional-hygiene messages in agricultural trainings<br>2.6.2.b Nutrition-hygiene campaign<br>2.6.2.c Nutrition qualitative studies<br>2.6.3.b Food storage & processing<br>2.6.3.c Cassava fortification<br>2.6.3.d Orange fleshed sweet potato research | Household food consumption increased<br>Women's diet diversified |
| Robust system to combat undernutrition | Strengths, weaknesses, opportunities, and threats analysis (SWOT)<br>Assessment of the public nutrition and food security systems. | 2.6.1 Nutrition Assessment and Gap Analysis | Roadmap of recommendations |

## COMPONENT 2: STIMULATE PRIVATE ENTERPRISE

**Introduction**: In early 2012 the Component 2 (C2) team did a number of initial studies and assessments, including the Cassava Sector Value Chain study and the Access to Finance Assessment. Additionally, they piloted some basic business skills training sessions; such as the Enterprise Development Plan and Business Plan Writing. By mid-year, the team was joined by the LT Enterprise Development Specialist and an additional Enterprise Development Officer. This expanded team then identified the business training topics most needed by FED beneficiaries and hired local business service providers to implement training sessions. In addition, the C2 team developed a training assessment tool and started using the tool for rapid assessment of the training needs of the Component 1 beneficiaries. Finally, the team hired and trained four Enterprise Development Assistants to coordinate and implement Component 2 activities in the four primary FED counties. Lessons learned from FY 2012 include:

1. Training curriculum needs to be tailored to the target group (farmer vs. SME) and their development skill level (illiterate vs. semi-literate vs. literate);
2. Additional in-depth studies about the specific market constraints to commercialize the four value chains are needed.
3. Local service providers need guidance and mentorship in applying for USG assistance;
4. The 6 week mentorship program that followed the business plan writing training was a most effective mechanism to ensure full participation and well trained beneficiaries.

In Year 2 C2 will continue to lay the foundation for sustainable investment and economic growth through inclusive development that is market driven. Specifically the team will work to provide additional information about market dynamics in FED's four value chains through market research and profiling of key stakeholders, their functions, locations and relationships in order to better identify opportunities and constraints. This approach will ensure that efficient and integrated upgrading strategies are adapted to the local context and strong linkages between key stakeholders are developed. At the same time, Component 2 will build the business acumen of these stakeholders in order to drive informed investment and supply decisions and improve borrower readiness. While doing so, Component 2will work with GoL and donor partners to upgrade the business enabling environment through communication about relevant policies and regulations impacting on agribusiness along with improving the availability of credit for the agribusiness sector.

Component 2 will work not just with advantaged entrepreneurs at the top of the development scale, but will also empower individuals at the micro and meso levels in order to grant equal access to new opportunities. Component 2 will focus on strategies that encourage economies of scale and scope, improving efficiencies that will make the sectors more competitive. Where possible, Component 2 will utilize existing local resources and transfer expertise through capacity building and mentorship such that all activities are both relevant to the local context and sustainable. Ultimately, Component 2 will need to change attitudes about agriculture as a business and as an employment option, especially amongst youth and women, in order to catalyze growth of this valuable and currently seriously underdeveloped sector in Liberia's economy.

**Constraints:** Liberia's legacy has denied many citizens' access to both basic and advanced education. Because of this lack of training they neither have good jobs, nor can they contribute to the economy. This makes enterprise development challenging and complex. Establishment and growth of agribusiness enterprises in Liberia faces numerous constraints, including the following:

Difficulty accessing working and investment capital: In order to move agribusiness away from subsistence farming toward commercialization, capital investments are required. While both micro credit and commercial loans are available, the current 18-40 percent cost of capital limits financial investment. In addition, current loan products are inconsistent with agriculture production and processing cycles. In many rural areas, even micro credit is not available. Furthermore, most enterprises remain informal and unregistered, which prevents many from accessing financing.

Poor knowledge of and behavior towards saving and credit mechanisms: Due to years of war and a failed economy, Liberians are unaccustomed to saving and very few own collateral such as buildings, vehicles or land. In addition, as a result of the post-war period of humanitarian assistance, they are also unaccustomed to paying for anything, much less repaying loans. This leads to an economically unviable lending environment whereby borrowers are considered too risky and the cost of borrowing is too high.

Borrowers are ill prepared to apply for loans: Due to lack of education and limited or no utilization of financial services, SMEs and even more organized FBOs operate informally – i.e. they are not registered, do not keep monthly financial records, and do not have business plans. These aspects are standard requirements for seeking loans and attracting investors.

Disconnect between producers and sellers along value chains: Producers may have been assisted in increasing productivity and yield, but they lack visibility to buyers. In the meantime, buyers are unable to identify supplies of locally produced goods that meet their quality, quantity, pricing and delivery requirements. As a result, they turn to imported products to more closely meet their needs.

Little local ownership of project funded activities: Organizations and individuals assisted by donor projects often abandon their activities when donor funding ends, rather than continuing to develop productive enterprises. Many organizations were initiated for the primary purpose of capturing donor funding. As a result, a generation of agriculture enterprises has been created to assume free inputs as a foundation of their business model. Understanding of basic business concepts and profitability calculations has to be developed in order to ensure sustainability.

Challenge of transportation and distribution: The shortage and poor condition of existing roads contribute to market inefficiencies; crops perish before reaching markets; would-be buyers and sellers fail to connect; little is known about prices of available products and quantities demanded.

Ineffective FBO's/Associations - economies of scale not captured: Donor initiatives fostered creation of associations and FBOs as a convenient mechanism for dealing with large numbers of smallholder farmers. The FBOs usually have not developed organizationally to provide collective input purchasing and aggregated sales of farm products that would be a better impetus for FBO development.

Limited or no availability of business support service: After 14 years of war that decimated the economy and destroyed the social infrastructure, business acumen among most of the population, particularly agribusiness producers in rural populations, is low. Teachers, trainers and services supporting agribusiness in Liberia are almost non-existent, and agro input dealers, a potential source of agribusiness support, are limited. Micro/Small and Medium Enterprises (MSMEs) cite lack of information on business registration and are not particularly proactive in seeking business information on their own and instead, expect it to be delivered to them.

## TASK 2.1 SME DEVELOPMENT

Fully consistent with the Liberia MSME Policy, FED will employ a strategy of establishing and strengthening commercial linkages between SMEs and larger firms (change agents) as suppliers and distributors along the value chains. FED's approach to SME development follows two major themes:

- Transaction-based assistance for established enterprises to help the sector build a foundation for economic growth.
- Increased access to services that remove some of the constraints to business, constraints that result primarily from market inefficiencies and lack of business acumen.

### 2.1. A -Transaction-based Assistance

Agriculture support in Liberia has focused predominately on increasing the number of producers, the amount of land under cultivation, and yield. Productivity, not profitability has been the focus. Little has been done to rationalize increases in supply to match buyer demand. FED's approach to enterprise development will therefore be market driven – selecting opportunities for commercialization of commodities based on the market demand and producers' and manufacturers' comparative advantage. This means that FED will focus on defining the market and working with stakeholders in the value chain located along the most viable economic corridors – locations with access to and/or proximity to urban populations, inputs, markets, and roads. FED will then work to close the gap between stakeholders along the value chain, working to organize what has to date been a very fragmented market system. FED will train and mentor individuals and producer groups to identify and respond to buyers' demands and establish regular supply relationships. Where producer groups show a strong proclivity to organize, FED will help them with formalization and the development of skills of their leadership and membership in order to make them more effective and ensure they maximize the advantages of working as a group (e.g. access to credit, collective bargaining, forward contracting.) In this way, FED's approach will be both bottom-up (training individuals on how to help themselves) and top-down (leveraging resources, networks, and access to information at the macro level.)

**Cassava Market Study**

There is interest and support for the development and promotion of raw cassava, cassava processed products (e.g. gari, flour, starch), and cassava byproducts (leaves and cuttings) from the National Cassava Sector Coordinating Committee (NCSCC), as well as other donor agencies. This supports a long-term strategy for the sector's development.

The Cassava Market Study will provide a detailed cassava sector market analysis that will inform the Liberian private sector about market opportunities that will guide supply and investment decisions. FED will partner with other donors such as the European Union and WHH to provide information at a national level and will work with expert STTAs and local market research firms to gather the data.

#### Activity 2.2.A.a.i – Market and Sector Studies

In order to utilize a value chain approach that is market driven, FED must better understand the dynamics of the markets for the four value chains – i.e. location of customers, customer preferences, size of demand, purchasing power, elasticity of prices, organization and location of local supply, cost of production for value addition, and competiveness of local industry. Then a full picture of constraints and bottlenecks of the particular value chain can be developed. FED will utilize a combination of existing small scales studies, expert input from STTAs, and will hire local subcontractors such as Subah-Belleh Associates, Prospects Consulting and the Center for Research and Development to conduct these studies. (Oct-Jun FY 2013, Business Enabling Environment Specialist, Special Studies STTAs (120 days), Subah-Belleh Associates, Prospects Consulting, Center for Research and Development, and other local subcontractors to be identified)

#### Activity 2.2.A.a.ii Profile Commercial Buyers

FED will identify and catalogue commercial buyers of products and services in target value chains that are not currently purchasing domestically or that could increase purchases if the supply were available domestically. On the demand side, FED will work with commercial volume buyers such as supermarkets, hotels and restaurants in Monrovia and other major urban centers, as well as institutions

and large corporate and donor operations that have the capacity to drive demand. This demand will be used to guide investments in upgrading throughout the value chain by sourcing locally rather than importing (particularly in the case of vegetables). (Oct-Dec FY2013, Business Enabling Environment Specialist, Subah-Belleh Associates)

### Activity 2.2.A.a.iii – Profile and Select Lead Producers, FBOs, Enterprises

FED will identify, select and profile lead producers working in FED's four value chains– including strong FBOs and associations – that could potentially meet buyers' demand if specific constraints were removed. Working along the value chain, FED will identify other partner enterprises including agro-input dealers, processors, and transportation and logistics companies whose products or services are necessary to support development of the lead producers and who can act as change agents. Profiles will include organizational structure, financial record keeping, trust and cohesiveness of members, equipment, member services for input purchasing and collective selling, geographic information system (GIS) data, and motivation to move beyond subsistence production activities to operate as an enterprise. Information from profiles will be used to determine FED intervention strategies with these stakeholders as well as to link all stakeholders in the value chain. (Oct-Dec FY2013, Business Enabling Environment Specialist, Component 1, Subah-Belleh Associates)

### Activity 2.2.A.a.iv – Create Rural Enterprise Maps

The profiling data that FED is collecting on buyers, sellers, suppliers, processors and producers along the value chain will lead to the creation of rural enterprise maps which will make it more efficient to facilitate linkages in the future. These maps can be of great value to the government and donors in their attempts to identify farmers and groups of rice, cassava and vegetable farmers in target areas. Special efforts will be made to include female farmers and dealers. (Dec FY2013, Business Enabling Environment Specialist, Subah-Belleh Associates, M&E GIS Specialist)

### Activity 2.2.A.b – Linking Value Chain Participants

Given Liberia's extensive market fragmentation, it is entirely possible that a single transaction may require upgrading of several enterprises along the value chain. Market information gathered (described above) will be used to inform type and location of supply of various products. The information collected on buyers and sellers along the value chain (described above) will feed the database described below in the ICT section and will be used by the FED team and its partners to actively link participants utilizing the methods described below: i.e. Trade Fairs, Value Chain Workshops, and Radio Outreach. FED will hire a Market Linkages Officer to specifically work on marketing and market linkage activities. A Value Chain Workshop STTA and Agriculture Marketing STTA will be hired to help train the officer and jump start some marketing initiatives.

### Activity 2.2.A. b.i – Value Chain Workshops

If stakeholders are actively involved in the development and upgrade of a particular value chain, FED interventions will be more appropriate, successful and sustainable over the long-term. Therefore, FED will conduct targeted workshops within each of the four value chains that will bring together lead producers, buyers, processors, input dealers, and transportation and logistics companies identified in the profiling activity to discuss constraints and issues in the value chain and identify solutions and opportunities. By doing so, solutions will be more relevant to the local context and value chain participants will take long-term ownership of development processes.

A follow-on to the initial value chain workshops are pre- and post-harvest planning and networking events for stakeholders of a particular value chain and a particular region to facilitate discussions between buyers and sellers about production amounts, prices, quality, and volumes needed as well as present the latest in best practices such as post-harvest handling and storage and market information services. FED will bring in a Value Chain Workshop STTA to not only develop a workshop suitable for the local context, but train FED staff in how to implement such workshops. (Jan FY2013, Value Chain Workshop STTA (30 days of LOE); Ongoing - Market Linkages Officer, Business Enabling Environment Specialist).

**Go-Buy Chop Women**

An example of localized constraints are the "Go Buy Chop" market women. These market women are extremely well organized and are able to control prices offered to the farmers for their goods, often at unfair returns to the farmers. This prevents farmers from producing at more commercial levels and prevents fresh produce from reaching larger buyers who end up purchasing from international suppliers instead. Many farmers are now calling for the establishment of farmer's markets in order to bypass these marketers altogether. According to the Liberian Marketing Assoc. (LMA), however, these women are only reacting to a surplus in supply, indicating that farmers are not organized and instead bring their products to the market at the same time. A Value Chain Workshop could help flush out the causal factors behind this practice and work with the "Go-Buy-Chop" women and farmers to develop win/win solutions that would help develop marketing channels that meet buyer needs and ensure a fair return for farmers.

### Activity 2.2.A.b.ii – Trade Fairs

Trade fairs can be an extremely useful tool to connect stakeholders in a value chain, introduce new products, services, and technologies, communicate industry trends and opportunities, and provide informal forums for discussion. FED will conduct an annual agricultural trade fair in partnership with the Input Supply Specialist, MoA, MoCI, major value chain associations, and the private sector. (Jul-Sep FY2013, Business Enabling Environment Specialist; Market Linkages Officer, Input Supply Specialist FED partners, local subcontractors to be identified)

### Activity 2.2.A.b.iii – Radio Outreach for Promotion

(Also see Radio Outreach below in ICT/SME) In conjunction with Component 1 and 3 team members, FED will sponsor radio programs in the counties and / or at the national level such as "On the Farm" and "Farmer's Forum". These programs have provided a space where farmers and experts can share experiences and best practices. In addition, input suppliers and other SMEs offering new products, services, and technologies will be encouraged to utilize radio for advertising and marketing with FED assistance. (Ongoing FY2013, Business Enabling Environment Specialist; Market Linkages Officer, ICT Specialist, Component 1 and 3 teams)

### Activity 2.2.A.c – Targeted Technical Support

FED will conduct intensive, targeted assistance with stakeholders along the value chain to build organizational and management systems, establish financial systems, develop systems for collective purchasing of inputs and collective sales of products (for FBOs), build business acumen, and support formal registration. Assistance will be guided by the Enterprise Development Plans or Business Plans, drawing on local advisory and support services as well as support from FED's Component 1 and 3 specialists. The FED team will provide reinforcement and mentorship through implementation hurdles, which can be critical to help owners/managers through SME growing pains. FED will use a top-down and bottom up approach to identify participants for target technical support: expressions of interests, requests for proposals, radio announcements, networking with other donor and government agencies, and working with current FED beneficiaries identified through Component 1 and 3. Beneficiaries will include Lead Producers, FBOs, Cooperatives, Associations, Women's groups, SMEs, market women, and youth groups, all from the private sector.

Targeted Technical Support will take the form of the following interventions:

- Training followed by mentorship in basic business skills, organizational development, business planning, and conflict management (See Activity 2.3.d.ii below)
- Business Plan Competitions
- Cost-sharing for start-ups, investments, pilots, and PPPs
- Expert assistance through STTAs and subcontracting (for example: cold storage, processing/packaging, manufacturing, food quality and safety, etc.)

Currently, FED has hired the following local service providers through an IQC to assist with training and mentorship through March FY 2013:

- Educare
- Rights and Rice Foundation
- AEDE (Agency for Economic Development and Empowerment)
- Pace Management

FED anticipates working with these additional service providers, though this list is not exhaustive:

- BSC Monrovia
- Marketing Innovations
- DEN-L
- LEED (Liberia Entrepreneurial & Economic Development)
- The Marketplace

(Ongoing; Business Enabling Environment Specialist; Component 1 and 3 teams, subcontractors).

In parallel with transaction-based assistance, FED will provide more broad-based support to nascent enterprises and entrepreneurs through a variety of enterprise services described below.

### 2.2. B - Enterprise Services (ES)

For many years, donor projects have followed a standard approach for business support that entails establishing an office staffed by BDS providers. It is difficult to find any successful examples of these BDS centers that have been sustainable, even in countries with business climates that are far more sophisticated than that of Liberia. These BDS centers are typically established with a focus on long-term financial sustainability of the center – often at the expense of sustainability of the enterprises they are meant to support.

In developing the ES, FED will maintain a focus on stimulating and incubating sustainable enterprises while building capacity of local BDS and agriculture service providers. Currently, the business climate in rural Liberia is not sufficiently developed to widely support traditional fee-for-service BDS, though there are a few that exist in Monrovia. In the long-run, as these local entities develop their capacity and deliver services that result in tangible growth for enterprises, their value will be demonstrated and demand for BDS will increase naturally, paving the way for sustainable fee-for-service businesses.

Rather than focusing on a physical center that may be difficult for enterprises to reach in rural areas, FED will focus on delivering services where and when appropriate and connecting resources to diminish market efficiencies. The ES's will be portable, delivering services in a variety of locales,

utilizing a variety of mechanisms, and, to the extent possible, utilizing local service providers. This may include local markets, technical schools, processor facilities, MoA facilities, farmer's fields, and the use of radio programming and ICT.

FED's Enterprise Development Assistants in each county will guide delivery of services to ensure appropriateness for that locale. Specific activities will include:

### Activity 2.2.B.a – Rapid Assessment of Needs

The FED Enterprise Development Team will conduct initial and ongoing assessments of the business service needs of stakeholders in the target value chains and counties. During Year 1, assessment forms were created and tested with farming groups and local enterprises already engaged in FED activities. An additional and substantial portion of assessments of a broader population will take place during the profiling exercise described in 2.3.a.i and 2.3.a.ii above. Ongoing assessments will take place as FED engages with new beneficiaries. (Oct FY2013 – Ongoing; Business Enabling Environment Specialist, ongoing with all Enterprise Development team members)

### Activity 2.2.B.b – Develop Cadre of Business Development Service Providers and Curriculum

During Year 1, FED identified the most obvious and prevalent needs for training to develop business knowledge in rural areas, and concurrently, identified local training curricula and service delivery organizations that can most effectively provide this training. FED will continue to conduct a review of existing curricula and training providers, select curricula that have already been used effectively or can be adapted to local situations, and oversee curricula adaptation for nascent enterprises. Training will be designed for both literate and non-literate levels. Training will be designed for portability to a variety of locations: market places, associations, MoCI and MoA offices, farm stores, community centers, etc. FED will collaborate with other donor agencies such as Advancing Youth and LAUNCH to utilize existing modules that have been tested. (Ongoing 2013 – Business Enabling Environment Specialist, Training Specialist STTA (120 days LOE), and subcontractors listed above).

Modules will include, but are not limited to, the following categories:

- Farming as a business
- Organizational development skills
- Good governance
- Conflict management skills
- Basic business planning or business plan writing
- Small business management
  - Personnel management
  - Customer relationship management
  - Production and Operations
  - Inventory management
  - Financial planning and risk
- Financial management and record keeping
- Marketing, sales, and packaging

- Contract Farming
- Group Buying and Saving
- Value Addition

In addition, the Component 2 team will work with the Gender Specialist to incorporate gender initiatives into training sessions such as gender sensitivity and gender equality in leadership. The Component 2 team will also work with the Environmental Specialist and the Component 1 team to incorporate important environmental management issues such as the use of safety apparatus and responsible use of fertilizers and pesticides into training sessions.

### Activity 2.2.B.c – Business Plan Competition

FED will support Business Plan Competitions at each technical institute. Such competitions are an effective approach to engage youth in enterprise development and to provide a practical application for their studies. Under FED, this activity will offer introductory training to students who will be encouraged to develop a concept paper for a business. Concept papers will be reviewed by a committee of larger enterprises, FED and lending institutions. Short-listed participants will be given intensive training to develop a bankable business plan that could then qualify for additional assistance from the FED MDF or a partner lending institution.

FED will utilize local service providers to conduct Business Plan Competitions with FED Centers of Excellence developed under Component 3 and with youth from other USAID projects such as EHELD and Advancing Youth. Business Plan Competitions will start with BWI, Grand Bassa Community College (GBCC), Nimba CC, UL, and Cuttington University and will then be rolled-out to other youth. (Oct-Dec FY2013 – ongoing, Business Enabling Environment Specialist, Training Specialist STTA (120 days LOE), Component 3 team, subcontractors listed above)

### Activity 2.2.B.d – Increase Enterprise Registration and Local Government Engagement

FED will pilot an innovative model to actively engage local government officials with constituent entrepreneurs to expand the current formalization of enterprise registration and combat corruption and misinformation that hinders enterprise development. FED will work with the MSME of MoCI to develop curricula on enterprise registration that will be a part of basic enterprise development plan and organizational development training. The training will cover the ‘how to’ and benefits of business registration, and inform all participants on acceptable and unacceptable inspections, “fees” and interference by government.

The activity will be supported with radio programming, flyers, and permanent fee signboards for FED and MoCI registration offices. Town hall meetings in each of the counties will provide forums for questions and raise awareness of which inspections and checks by government officials are legal, and what to do in case of illegal inspections. (Oct-Dec; Jul-Sep FY2013– Business Enabling Environment Specialist, MoCI, subcontractors).

### Activity 2.2.B.e – Radio Entrepreneurship Outreach (See ICT section below)

One characteristic of societies that breed entrepreneurs is a constant presence of business information. The prevalence of radio listenership in Liberia combined with challenges of physical movement due to poor roads and few vehicles make radio an excellent vehicle for continuous reinforcement of business concepts such as financial record keeping and understanding buyer needs. Programming may also provide inspiration and confidence by reporting on simple innovations and how local enterprises overcame obstacles similar to those the listener faces.

FED will adapt its modular, bite-size training curricula radio format for regular broadcast. The Dutch NGO, SPARK, is already in development of radio programming to stimulate entrepreneurship, however, the level of sophistication is more appropriately targeted to Monrovia rather than rural areas. FED will develop a curriculum that is adapted to more rural areas. (Jan-Mar-Ongoing, FY2013 Business Enabling Environment Specialist, MoCI, ICT Specialist, Market Linkages Officer, SPARK)

#### Activity 2.2.B.g – Building Local Capacity to Receive US Government Assistance

During Year 1, FED issued Indefinite Quantity Contracts (IQC) for Basic Agri-Business Skills Training for Rural Groups and for SMEs. This was part of an effort to build capacity of local business service providers by outsourcing the training interventions to those institutions that already have developed curricula and experience working in the local context. As part of the proposal process, FED conducted a Bidder's Conference, with great turnout. Ultimately, FED received 25 bids from 11 different organizations. It was apparent from the quality of some of the bids, however, that some organizations could benefit from additional training on the bidding process, especially as it relates to seeking US government funds. In addition, there were not many bids from organizations located in the counties. In Year 2, FED will continue to seek local partners to help implement its program and would like to reach more institutions outside of Monrovia. FED will employ a Contracts STTA to develop a 1 to 3 day training program on the bidding process and working as a USG contractor. The Contracts STTA will train FED staff on how to implement the training program and in conducting effective Bidder's Conferences. The program will be piloted in the four counties with the intent that quarterly or semi-annual training sessions will continue in order to capture emerging institutions. (Q1, FY 2013 Business Enabling Environment Specialist, MDF Manager, Contracts STTA, 30 days LOE)

### *Collaboration and Inclusion*

Enterprise Development (ED) Assistants - During Year 1, the Enterprise Development team identified, hired, and trained four Enterprise Development Assistants that are embedded with the Component 1 and 3 teams in the county offices. The ED Assistants will be the 'eyes and ears' and the main implementation arm of Monrovia-based Enterprise Development team. Co-locating these team members will ensure effective communication, collaboration and integration of ED activities with the field teams. In addition, the assistants will be able to more effectively follow up with FED beneficiaries (SMEs, farmers, and farming groups) at the county level to determine additional coaching and intervention needs. ED Assistants will also be responsible for identifying donor agencies, NGOs, and other fee-for-service providers in the counties that could partner with FED.

Farmers, farming groups, lead producers – Component 2 will work with farmers and farming groups that are identified by the Component 1 team to receive transaction based assistance and to participate in market linkage activities. Training interventions will be coordinated with Component 1 interventions so that there is appropriate sequencing. For example, organizational development and Farming as a Business training should be provided before planting and harvesting additional crops for sale such that farmers understand how to find buyers, market products, and maximize profitability.

SMEs – Component 2 will work with SMEs such as agro-input dealers and machine and tool manufacturers that are already working with the Component 1 team to build business acumen improve borrower readiness, link with other stakeholders in the value chain, and market products. In addition, FED will leverage the MDF to help these businesses expand in to new areas and technologies and access credit. At the same time, Component 2 will link SMEs and lead producers identified from the stakeholder profiles, expressions of interests, and requests for proposals that need expert assistance from agriculture experts to the Component 1 team. Value Chain Workshops, Trade Fairs, and Radio outreach programs will be designed and coordinated in conjunction with Component 1.

Value Chain and Sector Studies – Component 2 will work with Component 1 to design and carry out value chain and market sector studies. The results of these studies will help inform Component 1 of the most profitable and competitive agricultural products to focus on and effective interventions for upgrading the value chains.

Youth – Component 2 will engage youth, youth groups, and interns from Component 3 activities in business plan competitions, business plan training, and other business training such as Farming as a Business. Youth will be encouraged to form their own agriculture groups, associations, cooperatives, or SMEs or to join others in progress in their communities to pair class room training with practical experience. Component 2 will also reach out to other donor agencies who work with youth such as EHELD and Advancing Youth to incorporate their audiences in agribusiness activities.

Literacy and Numeracy – Component 2 will partner with Component 3 to provide literacy training to youth, rural farmers, and women that cannot be reached through other USAID programs such as the Advancing Youth Project, which we are collaborating with to bring their services to FED partners. Literacy and numeracy programs will enhance the participant's ability to engage in more complex business activities, such as planning, contract farming, access to credit, and marketing.

Curriculum – Component 2 will leverage Component 3 expertise to develop a curriculum where needed that is adapted to the local context and to the type of recipient – farmers, youth, and women. Component 2 will also work with other donor agencies that have already created and adapted curriculum, such as Advancing Youth's Level 1 and Level 2 literacy programs and LAUNCH's 'Farming as a Business' modules.

Women – (See section on Gender) FED will not only target women marketers and women's groups as partners in all agriculture and enterprise development activities, but FED's Gender Specialist STTA and Women in Business Officer will work to insure that all training and mentorship activities are gender sensitive and inclusive. This includes training FED staff and implementing partners on how to make sure activities are designed to be inclusive of both genders and sensitive to traditions that would typically exclude women from participating.

Poor – The poorest Liberians generally are those who are in the most rural, hard to reach areas and lack basic literacy and numeracy skills. In order to ensure that FED Enterprise Development is working to promote partners who have a comparative advantage and will be successful increasing production to generate income, FED will focus on small holder farmers and groups who are located near major economic corridors. Farmers and groups along these corridors are still likely to lack basic education, however. FED will utilize a curriculum that does not necessarily require books or literacy – story telling, participatory pedagogy, and group work. Where possible, FED will link these groups to partner programs who can offer alternative education to disadvantaged adults, such as Advancing Youth. FED will also utilize radio programming and town hall meetings to disseminate information to these populations.

**Achieving Scale through Multiple Partners**

FED will partner with lead farmers, FBOs, and SMEs that have the resources, the interest, the power, and the access to broader populations. Four examples are given below.

| | |
|---|---|
| Lead Farmer: Sangai Farm, Bong County | William Tolbert of Sangai Farm owns 900 acres of land and is interested in growing organic vegetables, rice, and cassava and implementing seed testing and multiplication on a commercial scale. His proposed model involves extending best agricultural practices and technology to surrounding small holder farmers as well as using out grower schemes with small farmers utilizing his land. |
| Lead FBO: Dokodan Rice Cooperative, | Dokodan Rice Cooperative has more than 150 member farmers and has been in operation for over 20 years. They currently process parboiled rice that is sold to WFP |

| | |
|---|---|
| Nimba County | and want to utilize credit to expand to an additional 100 members. |
| Lead Processor: Fabrar Rice, Kakata | Fabrar Rice has been processing lowland country rice working with production both from their land and from surrounding small holder farmers. They are keen to begin processing long grain white rice to compete with the vast amounts of imported rice. |
| Lead Agro-input Dealer: T.R. Enterprises, Monrovia | T.R. Enterprises has been producing small scale cassava processing machinery that is sold to donor programs to facilitate food aid to schools. They are interested in utilizing upgraded technology to manufacture improved cassava processing machines for sale to the private sector. |

These are examples of change agents who have access to supply, assets, and even markets and who are willing and able to partner with FED to learn new techniques and take on new challenges to expand production and reach new markets. Year 2 activities will therefore lay the foundation for scaling up in Year 3, first by identifying these key change agents, training and mentoring them in best practices in business and agriculture, testing agribusiness models, and linking them to other stakeholders in the value chain. Once these 'models' have been put in place and are tested, adjusted, and found to be successful, it is expected that they will act as mentors and models for replication to the broader population. The FED project will continue to identify change agents throughout the project, but will also utilize radio programming, trade fairs, and other marketing tools to sell these models to other would-be change agents in the market. FED will also partner with other organizations in Liberia with similar mandates such as the EU, Welthungerhilfe (WHH), Catholic Relief Services, (CRS) and the Committee for American Relief Everywhere (CARE) etc. to transfer best practices, share knowledge about market research, and reach additional beneficiaries..

Additional Resources: Local FT Market Linkages Officer to be mentored by Value Chain STTA, Agriculture STTA and Special Studies STTAs

### TASK 2.2 ACCESS TO FINANCE

Access to finance is one enabling factor in facilitating economic growth. If farmers and businesses have access to financial resources they can buy better quality and greater amounts of seed and other inputs. Financing will permit them to make capital investments in processing equipment or other fixed assets, including vehicles, land, and buildings, which can increase productivity; and they can extend credit to buyers, agreeing to be paid later, which facilitates sales transactions.

In Year 1, the FED team conducted an in depth study to assess the need for and availability of finance for farmers, farmer groups, and agribusinesses in Liberia. There are nine commercial banks at present, and only four or five of these are operating at a profit. There are nine or ten MFIs, and some of the largest of these are dealing with extraordinarily high levels of past due loans. There are also 52 credit unions and more than 50 village savings and loans associations (VSLAs), some of which may be targeting the agricultural sector.

FED has identified several of these banks and institutions that have successful operations and are willing to expand lending into the agriculture sector. These organizations do not have fully developed agricultural loan products, nor do they have experience in lending in the agriculture sector. FED will work with these institutions and with partner organizations such as the Central Bank's Microfinance unit and IBEX to help develop appropriate loan products and build institutional capacity in origination and administration. At the same time, FED will also work with prospective borrowers to improve their ability to apply for loans. By doing so, FED will help improve access to credit for small scale farmers and farming organizations, an underserved market for credit.

While an uncertain, often uncompetitive economy is the reason for some of the loan problems, as a nation there seems to be a culture of non-payment of loans, an attitude that loans were meant to be a hand-out. This is particularly a problem with the MFIs that are transitioning from NGOs. Clients of

these organizations often expect that loans should be forgiven. In many respects this problem reflects the difficulty of transition from post-war, relief-based assistance from donors to conventional institutions that need to operate at a profit to continue to provide services. FED will work with partner organizations to improve borrower readiness, debunk misperceptions, and change attitudes about properly utilizing credit to leverage agri-business opportunities.

FED's finance activities focus on playing a facilitation role and will not compete with the existing banking and finance sector dealing with well-established businesses in agriculture. The three year, USAID-funded IBEX project began operations in May 2012 with a focus on improving Liberia's lending environment in agriculture and renewable energy by providing technical support and capacity building for both existing SMEs with a history of operation and with local banks that utilize the guarantees of the Development Credit Authority. FED, in turn, will be working with businesses that may be investing in new technology or upgrading sections of a value chain that do not have the borrower 'bankability' that is required by banks and the IBEX project (such as a history of financial records and a viable business plan). FED proposes to work on the demand side facilitating access to capital for this kind of investment by building the business acumen of borrowers through graduated support and by then linking them with the appropriate 'next step', the supply side: with IBEX providing additional support to prepare them for applying for a loan and meeting the requirements of lending institutions.

FED will utilize a Financial Services STTA to jump-start many of these activities, who will transfer the implementation of ongoing activities to a full time Finance Services Officer.

The following activities are examples of how FED intends to achieve these goals:

### Activity 2.1.a – Financial Service Policy Review

The Access to Finance assessment conducted in Year 1 touched on some regulation and policy improvements that have been made. For example, the creation of the Commercial Code and establishment of the Commercial Court mean that the threat of foreclosure on assets pledged as collateral for loans is more likely, hence performance on loans is expected to become better. In addition, the new code indicates there are no legal restrictions to leasing. The FED team will continue to monitor these developments and engage in activities to help communicate their existence to the broader public through activities such as Radio Outreach listed below. (Ongoing FY2013 – Business Enabling Environment Specialist & Access to Finance Officer; Jan-Feb, Jul-Aug – FY2013 Policy/Financial Services Specialist, Mary Miller STTA (120 days LOE))

### Activity 2.1.b – Monitor Gaps in Access to Finance

In coordination with the Component 1 and 3 teams, the Enterprise Development team will identify enterprises (lead farmers, model farms, FBOs, entrepreneurs interested in expansion) that require capital to start-up and/or expand and assess the support they require in order to be able to access commercial credit. This information will be used to inform the support provided to financial institutions as well as potential borrowers. (Ongoing FY2013 - Business Enabling Environment Specialist, Access to Finance Officer, Component 1; Financial Services STTA (120 days LOE))

### Activity 2.1.c – Collaboration and Technical Assistance for Prospective Lending Partners

As part of the Year 1 Access to Finance assessment, FED identified the banks and MFIs most likely to be candidates for joint work in finance.[5] In addition, FED has begun to identify alternative sources of

[5] The IBEX project will be working with Ecobank and the International Bank of Liberia that have Development Credit Authority (DCA) guarantee facilities to encourage more lending to SMEs and agribusiness. Both banks reportedly consider agriculture

funding for agribusiness lending, such as social investment and venture capital funds. FED will work with these institutions to further develop agribusiness loan and leasing products, provide technical assistance to improve institutional capacity for agri-lending, expand operations into underserved markets, and to link them to FED beneficiaries who qualify for and are in need of credit.

### Activity 2.1.c.i – Design Agricultural Loan Products and Mechanisms

Existing loan products don't fit growing and harvesting cycles that dictate the cash flow to service the investment. FED will work with financial institutions to develop agribusiness loan products and mechanisms such as offsetting the cost of capital, collateral requirements, and guarantees that will improve access to credit. Financial Service Providers will be introduced to FED trainings and demonstrations to increase their familiarity with the agribusiness sector. (Jan-Jun FY2013, Business Enabling Environment Specialist, Access to Finance Officer, Financial Services STTA (120 days LOE)

**FIGURE 2.1.1 LOCAL FINANCE INSTITUTIONS**

| Name | Type | Description |
|---|---|---|
| Access Bank | Commercial bank | Expanding into agricultural lending; part of a Nigeria-based multibank network; IFC is an investor |
| Afriland Bank | Commercial bank/MFI | MC2 product focused on rural and agricultural finance, is already directly dealing with farmers and agribusinesses; part of a multibank network started in Cameroon |
| BRAC | MFI / NGO | 30 branches in all counties where FED works which has already reached 24,000 micro clients and 1,000 small business clients; NGO that offers agricultural extension services |
| LEAD (Liberia Entrepreneurial and Asset Development) | MFI | Microcredit loans to entrepreneurs, pairing lending services with training in basic business skills; has experimented in agricultural lending for working capital and asset purchases, paring loans with mentoring and extension services; pilots in Bong and Nimba only 6 percent PAR; would like to expand. |
| Root Capital | Nonprofit social investment fund | US based, in West Africa (Ghana and Sierra Leone); working capital and asset financing; Have started loan program to work with local supply chains for domestic consumption of staple food products; want to expand to Liberia; to finance large farming associations/ out-grower schemes, processing. |
| West Africa Venture Capital Fund | Equity fund | Provides equity capital for an investment, which business owners can buy back after five years; help manage and mentor their clients throughout the project to ensure success; in Liberia they have invested in 9 projects, some of which span the logistics and agri-business sectors; IFC is funder |
| Liberian Enterprise Development Finance Company (LEDFC) | For-profit loan company | For-profit loan company with an NBFI license from the central bank, can make loans but not take deposits; wholly owned by CHF; currently provides financing for business plan winners with guarantees by SPARK; funding is a USD 20 million line of credit from the Overseas Private Investment Corporation |

### Activity 2.1.c.ii – Operationalize Lending Program

FED will help define and develop the specific operational requirements for agricultural lending – including standards for organizational structure and capacity, financial systems, and standardization of

lending very risky, although they may be interested in agricultural processing companies. While these initially appeared to be potential partners for FED, realistically they appear to be looking for larger scale clients based in Monrovia, and are not an immediate focus for FED to develop relationships.

documentation. This will include introducing a loan documentation package appropriate for agricultural loans. The package will include appropriate use of financial ratios, business plan format, and application forms. The IBEX project is already actively developing an Agricultural Lending Tool and Loan Checklists. FED will collaborate with IBEX on the development of these products. (Jan-Jun FY2013, Business Enabling Environment Specialist, Access to Finance Officer, Financial Services STTA (120 days LOE)

### Activity 2.1.c.iii - Loan Officer Training

For identified institutions looking to expand into agri-business lending, FED will conduct initial training and will provide on-going support for loan officers to increase their capacity to evaluate loan applications through site visits with agriculture-related enterprises, business plans, and financial ratios. FED will also facilitate training for loan officers on client selection, customer service and monitoring agribusiness loans. FED will collaborate with IBEX on the development of training curriculum. (Jan-Feb; Jul-Aug FY2013, Financial Services STTA (120 days LOE), Ongoing Access to Finance Officer, subcontractors providing training services – see SME Development section)

### Activity 2.1.c.iv – Expand Micro Credit to Underserved Markets

In addition to developing agriculture-friendly loan products and training loan officers, FED will provide additional capital and support to expand to underserved areas. This may include establishing a revolving fund for MFIs as loan pools for agriculture loans. LEAD has an immediate need to expand its agriculture lending products in Bong and Nimba and would like to expand into Lofa and Grand Bassa. (Jan-Feb; Jul-Aug FY2013 with Financial Services STTA (120 days LOE); Ongoing Business Enabling Environment Specialist, Access to Finance Officer)

### Activity 2.1.d – Support for the Development of Leasing Products

Leasing as a finance tool is predicated on the importance of assets in their use rather than in their title. Indeed FED beneficiaries have indicated that renting or leasing farm equipment would be extremely viable and help small holder farmers immediately access better technology to increase production. The advantages of financial leases over loans is that the lessor retains title to the asset, and therefore should be able to foreclose on it more easily than a bank repossessing collateral on a problem loan. Leasing companies also tend to specialize in particular types of equipment, and are more in a position to make a market in the equipment, thereby increasing resale value.

Financial leasing has not been pursued for some time in Liberia, and according to the Executive Director of the Bankers Association, the banks don't really understand it. IFC and the National Investment Commission (NIC) held a National Leasing Forum in June 2012 to attract international and regional leasing companies that could bring investment and funding for leases. IFC may also be a source of lines of credit for leasing through the West Africa Venture Capital Fund.

FED will facilitate the development of leasing products. (Jan-Feb; Jul-Aug 2013 Financial Services STTA (120 days LOE); Access to Finance Officer, NIC, IFC, West Africa Venture Capital Fund)

### Activity 2.1.e – Village Savings and Loan

VSLAs are not considered a substantial source of finance for agriculture, but are important for income-smoothing and as a safety net for their members, as they offer an organized savings program. FED will partner with other organizations such as CARE and Educare to provide training in the set-up and operation of VSLAs for FED beneficiaries. (Jan-Feb; Jul-Aug 2013 with Financial Services STTA (120 days LOE); Ongoing - Business Enabling Environment Specialist; Access to Finance Officer, Educare, CARE)

### Activity 2.1.f – Outreach Activities to Promote Access to Credit

FED will conduct awareness seminars on accessing financial services through local NGOs, MoA, MoCI, Central Bank's Microfinance unit, and BDS providers. Where possible, FED will collaborate with IBEX on these seminars. In addition, FED will conduct radio outreach programs aimed at changing attitudes and behaviors about loans and building capacity about new loan and leasing products. (Jul-Sep FY 2013, Business Enabling Environment Specialist, Access to Finance Officer, MoA, MoCI, IBEX, Central Bank)

### Activity 2.1.g – Improve Borrower Readiness

FED will improve enterprises' readiness to apply for and manage credit by facilitating assistance with business planning, business systems and buyer linkages. This will include creating Enterprise Development Plans[6] and bankable Business Plans with FED beneficiaries and ensuring financial systems are in place. This support will also be linked into the broader Enterprise Services (see 2.3B below) aimed at establishing financial systems, creating buyer linkages, articulating business plans and building overall management capacity. As a result, borrowers' business projections will be based on concrete offers and sufficient profitability. (Ongoing with Business Enabling Environment Specialist, Access to Finance Officer, subcontractors providing training services – see SME Development section).

### Activity 2.1.h – Value Chain and Sector Studies to Inform Investment

(Also at Activity 2.2.A.a.i in SME Development section above, – Value Chain and Sector Studies) Little is known about the market dynamics of the four value chains FED supports. Some small scale studies and high level value chain analyses have been conducted; however, comprehensive in-depth detailed information on the markets and constraints is needed. This level of detail is necessary in order to provide borrowers, banks, other lending institutions, and potential investors with focused studies that better inform investment decisions. FED will hire expert STTAs and local subcontractors such as Subah-Belleh Associates, Prospects Consulting and the Center for Research and Development to conduct these studies. (Oct-Jun FY 2013, Business Enabling Environment Specialist, Special Studies STTAs (120 days), Subah-Belleh Associates, Prospects Consulting, Center for Research and Development, and other local subcontractors to be identified).

[6] An Enterprise Development Plan is developed in partnership with a business and it has clearly defined targets and reciprocal obligations over time. It is a simplified version of a much more in depth business plan and is aimed to help beneficiaries with little business acumen, such as farming groups.

## FIGURE 2.1.2: STIMULATING PRIVATE ENTERPRISE IN LIBERIA FY 2013

| Major Constraints | FED Proposed Solution | Activities Addressing | Expected Impact/Output |
|---|---|---|---|
| **Task 2.1 SME Development** | | | |
| Disconnect between producers and sellers along value chains; Challenge of transportation and distribution | • Identify and profile market demand for FED's four value chains<br>• Identify and profile major stakeholders from supplier to buyer along the value chain<br>• Link all stakeholders along value chain and promote networking and marketing activities<br>• Promote better access to market information | • Activity 2.3.A.a.i – Value Chain and Sector Studies<br>• Activity 2.3.A.a.ii Profile Commercial Buyers<br>• Activity 2.3.A.a.iii – Profile and Select Lead Producers, FBOs, Enterprises<br>• Activity 2.3.A.a.iv – Create Rural Enterprise Maps<br>• Activity 2.3.A.b – Linking Value Chain Participants<br>• Activity 2.3.A. b.i – Value Chain Workshops<br>• Activity 2.3.A.b.ii – Trade Fairs<br>• Activity 2.3.A.b.iii – Radio Outreach for Promotion<br>• See ICT section for M. Info. Services | • Private sector will be informed of market opportunities in order to drive supply and investment decisions<br>• Stakeholders will be linked to other stakeholders through various forums to take advantage of market opportunities and plan proactively<br>• Stakeholders will identify better ways to organize in order to meet supply and demand<br>• Stakeholders will have access to real time market information |
| Little local ownership of project funded activities | • Increase capacity of farmers and FBOs to understand farming as a business<br>• Increase capacity of private sector to commercialize activities, moving away from 'NGO' model<br>• Engage youth in basic business planning concepts and practice building small businesses<br>• Increase awareness of new and more streamlined procedures for forming a business or organized group | • Activity 2.3.B.a – Rapid Assessment of Needs<br>• Activity 2.3.A.c – Targeted Technical Support<br>• Activity 2.3.B.c – Business Plan Competition<br>• Activity 2.3.B.d – Increase Enterprise Registration and Local Government Engagement<br>• Activity 2.3.B.e – Radio Entrepreneurship Outreach | • Farmers and FBOs will understand the importance of planning, understand profitability, and learn to respond to market demand for products – leading to more sustainable business models<br>• SMEs will operate as profit centers, responding to market demand and more efficiently organizing supply channels<br>• Youth will be encouraged to think and behave like entrepreneurs<br>• Barriers to formalization will be removed with improved access to information about streamlined and standard procedures, land more trust between GoL and the private |

| Major Constraints | FED Proposed Solution | Activities Addressing | Expected Impact/Output |
|---|---|---|---|
| | | | sector |
| Ineffective FBO's/Associations - economies of scale not captured | • Work with FBOs and Associations to strengthen their ability to operate as a cohesive group<br>• Build capacity of well organized groups to maximize the advantages of working as a group (e.g. access to credit, collective bargaining, forward contracting.) | • Activity 2.3.B.a – Rapid Assessment of Needs<br>• Activity 2.3.A.c – Targeted Technical Support<br>• Activity 2.3.B.d – Increase Enterprise Registration and Local Government Engagement | • FBO's and Associations will be more effective, functioning as profit centers and improving ability to serve small holder farmers<br>• FBO's will be prepared to effectively engage with buyers and processors, leading to organized and higher quality production<br>• FBO's will be prepared to effectively engage with lenders leading to access to credit to improve use of technology and increased and higher quality production<br>• Barriers to formalization will be removed with improved access to information about streamlined and standard procedures, leading to improvement in trust between GoL and the private sector |
| Limited or no availability of business support service | • Utilize existing local business service providers for all training and mentorship of beneficiaries, upgrading their services through new curriculum and practices<br>• Work with MoCI on business registration process and communicating standard procedures to the broader public<br>• Improve local service provider's knowledge about USG assistance | • Activity 2.3.B.b – Develop Cadre of Business Development Service Providers and Curriculum<br>• Activity 2.3.B.d – Increase Enterprise Registration and Local Government Engagement<br>• Activity 2.3.B.g – Building Local Capacity to Receive USG Assistance | • Business service providers will be prepared to respond to the specialized needs of a broader public, include small rural groups<br>• Private sector will see the benefits of utilizing business service providers– establishing the foundation for sustainable fee-for-service models<br>• Local service providers and NGOs will be prepared to provide development services directly to the USG. |
| **Task 2.2 Access to Finance** | | | |
| Difficulty accessing working and investment capital for agriculture | • Improve access to finance by identifying what types of credit products are needed by borrowers and preparing lending institutions for providing these products<br>• Aid lending institutions to expand to rural areas not previously reached | • Activity 2.2.a – Financial Service Policy Review<br>• Activity 2.2.b – Monitor Gaps in Access to Finance<br>• Activity 2.2.c.i – Design Agricultural Loan Products and Mechanisms | • Specific needs of the borrowers will be identified to inform type of lending products needed<br>• -Agriculture lending products will be developed (loans and leases) suited to the local context<br>• -Capacity of lending institutions to originate |

| Major Constraints | FED Proposed Solution | Activities Addressing | Expected Impact/Output |
|---|---|---|---|
| | • Act as a liaison between lending institution and donor agencies working in the financial sector and the private sector | • Activity 2.2.c.ii – Operationalize Lending Program<br>• Activity 2.2.c.iii - Loan Officer Training<br>• Activity 2.2.c.iv – Expand Micro Credit to Underserved Markets<br>• Activity 2.2.d – Support for the Development of Leasing Products<br>• Activity 2.2.e – Village S&L | and administer agriculture lending products will be developed<br>• -Expand reach of lending institutions to rural locations where credit does not currently exist<br>• -Beneficiaries' knowledge and behavior towards utilizing saving and credit mechanisms will be improved<br>• Access to credit will be increased by linking borrowers to lending institutions |
| Poor knowledge and behavior towards saving and credit mechanisms such that borrowers are considered risky and cost of borrowing is high | • Improve knowledge and behavior through outreach, mentorship and participatory methods | • Activity 2.2.c.iv – Expand Micro Credit to Underserved Markets<br>• Activity 2.2.e – Village S&L<br>• -Activity 2.2.f – Outreach Activities to Promote Access to Credit | • Beneficiaries' knowledge and behavior towards utilizing saving and credit mechanisms will be improved<br>• As behavior improves, more lending institutions will be able to afford to extend credit to these borrowers at more affordable rates |
| Borrowers are ill prepared to apply for loans, which prevents them from accessing credit | • Improve business skills and practices of borrowers-capacity building and mentorship<br>• Provide information about the value chains and markets to inform supply/ investments | • Activity 2.2.g – Improve Borrower Readiness<br>• Activity 2.2.h – Value Chain and Sector Studies to inform Investment | • Borrowers will be able to prepare business plans and financial records necessary for loan packages<br>• SMEs informed of current market opportunities business plans presented strengthened, improving access to credit |

Component 2 Year 2 Indicators and Targets – Tasks 1 and 2 Complete List

Ind. #1.2.1: Up to 400 private enterprises, producer orgs, women's groups, trade and business associations and community-based-organizations (CBOs) receiving USG assistance

Ind. # 1.2.2: Up to 1,000 private enterprises, producer orgs, women's groups, trade and business associations and community-based-organizations (CBOs) that applied new technologies or management practices as a result of USG assistance

Ind. #2A: Up to TBD in value of incremental sales

Ind. #2B: Up to $500,000 in value of new private sector investment

Ind. #2C: Up to 580 jobs attributed to FTF implementation

Ind. #2D: Up to 25 public-private partnerships formed as a result of FTF assistance

Ind. #2.2.1: Up to 100 enterprises accessing business development services through USG assistance

Ind. #3.2.1: Up to 400 individuals that have received training on management or leadership

## TASK 2.3 USE OF ICTS IN STIMULATING LIBERIAN AGRI-BUSINESS

The use of ICTs in global agriculture has become widespread. Yet, within the Liberian agriculture sector, ICT remains limited because of challenges in technology adoption, cost, and human resources. Lessons learned over the past decade have shown the importance of deeply understanding the local context before implementing technology.

FED's ICT strategy builds on emerging opportunities and needs within Liberia. Liberia has identified ICT as a key component in future agricultural activity. The national e-agriculture strategy identifies the following goals:

5. Computerization of all records related to agricultural management;
6. The creation of an on-line agricultural information system to provide strategic information on agro-technologies and techniques, weather forecasting, pricing and marketing information;
7. Working with private sector entities to find cost-effective means of meeting the communication needs of the sector;
8. Developing and maintaining a nation-wide geographical information system (GIS) to monitor agricultural land use and manage natural resources at national and district levels;
9. Encouraging farmers and agriculturalist to conduct transactions utilizing ICTs, which would in turn make it easier and more transparent to track sales, profits, and other key indicators in the sector;
10. Linking rural agricultural producers to markets;
11. Monitoring the sustainable utilization of natural resources in agriculture production

Primary lessons learned from year 1 include:

- Heavy content development and management structures need to be developed in Liberia before ICT initiatives can be successfully deployed.

### ICT Strategy: Year 2 and Beyond

ICT is not seen as a final product, but will rather be integrated into all FED components to amplify the reach and impact of Year 2 activities. Adequate project management and personnel support are needed to accompany the introduction of any technology. During Year 2, FED's strategy will focus on developing content and management for ICT initiatives; when appropriate we will first pilot tools within FED's system to develop these systems and focus on scale up in Year 3. ICT will be considered more heavily over the lifetime of the project as FED builds the capacity of partners.

### Capacity Building

ICT activities will focus on knowledge creation within FED staff and partners. Specifically:

- Radio and Media STTAs will be paired with the FED Communications staff.
- ICT STTAs will be paired with the M&E, enterprise development, and MoA or other partners.

In Liberia, a number of technology opportunities exist that can be leveraged to support FED goals.

Mobile Phones: Mobile phones can act as a vehicle for farmers, extension agents, and businesses to access or report agricultural information. This can include market prices, pest control strategies, fertilizer application instructions, transport vehicles, buyers looking for goods and sellers advertising

products. Those involved in agriculture already use their phones to access information, but it can be a challenge without a trusted source. To address this information gap, organizations around the world have implemented agriculture service programs via mobile phones and radio. These services have included market information, soil monitoring, call-in recordings on pest management, and short messaging service (SMS) weather and disease alerts. Literacy, cost, marketing, management, and sustainability are challenges that many projects face.

### Activity 2.3 a. FED Agricultural Communications System

FED will implement a mobile agricultural communications system throughout FED county offices to improve the speed and efficiency of M&E, data collection, and extension (Q1, ICT STTA). Key areas of focus include using mobiles to share pictures of crop diseases and pests and to monitor rainfall. Expansion activities (Q2, ICT STTA) may include content on market information, agribusiness, and videos of improved agricultural practices. We expect that this pilot will help drive the development of additional agricultural content and produce a range of failures and successes that can be applied to creating a larger-scale system with partners in Years 2 and 3.

**Market Information Systems: The tendency for tunnel vision when implementing ICT**

Market information is often the starting point for organizations interested in using ICT to extend the reach of agricultural information. Market information can be delivered viaShort Message Service ( SMS), Interactive Voice Response (IVR), data networks, websites,Unstructured Supplementatry Service Data ( USSD ) menus, radio, or through closed systems such as extension officers. A range of technology products are available to support the delivery of this information (i.e. Esoko, Souktel, FarmerConnect, FrontlineSMS).

In Liberia, market information has been delivered via SMS at a small-scale. These projects have faced significant challenges in management and sustainability. Despite this, interest in Market Information Systems (MIS) is growing in Liberia. It will be important for FED and partners to look beyond technology to consider the management realities of such systems and also consider what information will have the greatest impact in advancing agriculture sector. The answer may certainly be ‘market prices’, but it also may be transportation and aggregated purchasing of inputs.

### Activity 2.3 b. MoA (and/or partner) Agricultural Communications System

Based on lessons learned from FED’s Agricultural Communications pilot, FED will work to design a larger-scale communications system targeted at actors in the agricultural sector (Q4, ICT STTA, and MIS STTA). This will be maintained outside of FED by either the MoA or MOCI and could include market information system activities. Year 3 will focus on implementing this system and delivering content.

### Activity 2.3 c. Knowledge Generation and Support on Market Information Systems

FED will host a roundtable on market information systems with donors, MoA, MoCI, and key stakeholders (Q2, ICT STTA, Communications & Enterprise Development). Based on the outcomes of the roundtable, FED will assess opportunities to support the development of an MIS, develop an ownership and partnership plan, and allocate STTA as necessary (Q1, MIS STTA).During year 2, FED will continue to monitor CARE's efforts in establishing a sustainable market information system and will participate in a multi-donor workshop on MIS.

### Activity 2.3 d. MoA Extension Service Assessment and Implementation

FED will perform a technology and information needs assessment of the MoA extension service (Q1 ICT STTA). In conjunction with MoA staff, we will prepare an action plan for implementing a data

collection system and ICT tools where appropriate. Potential outputs include ICT pilots, database development, and computer training.

### Activity 2.3 e. ICT Consulting to Facilitate Access to Finance

FED is working with microfinance institutions on expanding into underserved markets in agricultural lending. This will include developing agricultural loan products, training officers, and upgrading IT infrastructure to transmit payment information from remote areas (Q3, ICT Specialist or a local IT company depending on organizational needs).

Mobile Payments

Mobile money was launched in Liberia by Lonestar/MTN in November 2011. Lonestar has an active marketing and enrollment campaign and a growing agent network, providing real opportunities for farmers and agro businesses to use mobile money to reduce risk and overcome payment challenges. Across Liberia, awareness of how mobile money can be used in agriculture remains limited.

### Activity 2.3 f. Mobile Money Workshop

FED will host a mobile money workshop to familiarize staff with Lonestar's mobile money product and provide examples of how mobile money has been used in agriculture (Q1, Lonestar & ICT STTA).

### Activity 2.3 g. Mobile Money Roundtables

FED will host one roundtable on mobile money in agriculture (Q2, ICT STTA & Lonestar representative) and another on mobile money for access to finance (Q4, ICT STTA & Enterprise Development).

### Activity 2.3 h. Agricultural Business Resource Database

In Q1 FED will profile agriculture value chain stakeholders. FED will look to roll this into a wider information system that could be maintained by the MoA, MoCI, or other. Value chain workshops (Q2, Enterprise Development Team) will be used as a forum for discussing sustainability.

### Activity 2.3 i. ICT Opportunities for Voucher System

Challenges and opportunities from the voucher pilot in Component 1 will be assessed with particular attention to 1) voucher validation, 2) information management, and 3) fraud. EVouchers may be implemented for future campaigns.

### Activity 2.3 j. Low-cost Video Workshop

When used effectively, video can be an excellent mechanism for communicating messages about improved farming practices. The purpose of this workshop (Q1, FED ICT & Communications staff) is to develop the capacity of Liberian media organizations in creating video with locally relevant agricultural content. This workshop will introduce MoA to the use of video in extension.

Radio continues to be the most commonly accessible communications medium to reach farmers in Liberia. The prevalence of radio listenership in Liberia combined with challenges of physical movement makes radio an excellent channel for disseminating agricultural information.

### Activity 2.3 k: Radio Partnership

FED will work with a local media partner (Q1-4, Communications & MDF, Q1-2 Communications STTA) to create content and programming where farmers can share experiences, ask questions, and

receive information on agriculture. Panelists will include the MoA, FED experts, agro-input suppliers, banks, farming associations and cooperatives.

### Activity 2.3 l: Collaborate with the MoA Communications Department

FED will continue to collaborate with the MoA communications department on joint media efforts for shared events and programs to reach a wider audience, engage additional media partners, and increase public awareness of agricultural information and events (Q1-Q4, Communications Team).

### Activity 2.3 m: Communications and Agriculture Media Workshops

FED will hold workshops at the county level to facilitate stronger relationships and information sharing between input suppliers, agri-businesses, and media organizations (Q2, Communications STTA).

### Activity 2.3 n: Radio Station Business Development

FED will work with radio stations to promote for-profit business models that encourage information sharing about agricultural practices and agribusiness (Q2, Media Business STTA).

## FIGURE 2.3: ROLE OF ICT'S IN STIMULATING PRIVATE ENTERPRISE IN LIBERIA FY 2013

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| Availability of Agricultural Information<br>• Limited content available on agricultural practices/inputs.<br>• Where information exists, it is rarely adopted to local contexts, including agro-technologies and techniques, soil profiles, weather forecasting, pricing, and more. | FED will stimulate the creation of localized content on agricultural practices by:<br>• Training media houses on producing low-cost agricultural videos.<br>• Working with a radio partner to develop scripts, expert panels, dramas, and jingles to communicate agricultural information. | • Activity 2.3 j. Low-cost Video Workshop<br>• Activity 2.3 k: Radio Partnership<br>• Activity 2.3 c. Knowledge Generation and Support on Market Information Systems | • Improved availability of localized agricultural information. |
| Access to Agricultural Information<br>• Information on improved agricultural practices and inputs, when available, is not well distributed across the population or adapted to the user (i.e. considering literacy and language skills). | FED will promote greater distribution of agricultural information by:<br>• Implementing a mobile agricultural communications system throughout FED counties to improve access to agricultural information (e.g. pests and diseases).<br>• Implementing a larger-scale communications system targeted at actors in the agricultural sector. Content on market information, pest control etc.<br>• Distributing information, such as profiles of value chain businesses, through the MoA, MoC, or others.<br>• Forming radio partnerships to broadcast interactive radio dialogue on agriculture across Liberia.<br>• Collaborating with the MoA communications department to reach a wider audience. | • Activity 2.3 c. Knowledge Generation and Support on Market Information Systems<br>• Activity 2.3 a. FED Agricultural Communications System<br>• Activity 2.3 b. MoA (and/or partner) Agricultural Communications System<br>• Activity 2.3 h. Agricultural Business Resource Database<br>• Activity 2.3 k: Radio Partnership<br>• Activity 2.3 l: Collaborate with the MoA Communications Department | • Improved distribution of localized agricultural information throughout Liberia.<br>• Improved utilization of localized agricultural information by farmers.<br>• Improved exposure of agribusiness and new technologies. |
| Payment & Finance Barriers<br>• Roads, transportation networks, theft, limited knowledge of price and fee structures, and corruption slow or prevent payments.<br>• Rural and agricultural markets are underserved by financial institutions. Capital is scarce.<br>• Knowledge of the prices of inputs and products is limited, | FED will address payment and finance barriers in agriculture value chains by:<br>• Providing forums for partners to develop knowledge on market information systems.<br>• Working with microfinance institutions to upgrade their IT infrastructure so that they can expand into rural markets.<br>• Expanding knowledge of mobile money and how it can be used to promote access to finance.<br>• Assessing how ICT can promote voucher distribution. | • Activity 2.3 c. Knowledge Generation and Support on Market Information Systems<br>• Activity 2.3 e. ICT Consulting to Facilitate Access to Finance<br>• Activity 2.3 f. Mobile Money Workshop<br>• Activity 2.3 g. Mobile Money Roundtables<br>• Activity 2.3 i. ICT Opportunities for | • Improved knowledge of payment and financial barriers.<br>• Improved access to finance for actors in agriculture.<br>• Improved connection between actors in the value chain. |

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| | | Voucher System | |
| Radio Station Profitability<br>• Radio stations do not have appropriate for-profit business models to promote knowledge of agribusiness dealers and agricultural information. | • Improve links between media and agribusiness dealers.<br>• Provide business development services. | • Activity 2.3 m: Communications and Agriculture Media Workshops<br>• Activity 2.3 n: Radio Station Business Development | • Improved radio station profitability.<br>• Improved relationship between media and agribusiness.<br>• Increased featuring of agribusiness on the radio (ads, panels, etc.) |
| Limited efficiency and availability of agricultural extension services.<br>• Data collection and information sharing within the MoA extension system is limited. | • FED will perform a technology and information needs assessment of the MoA extension service and prepare an action plan for implementing a data collection system. | • Activity 2.3 d. MoA Extension Service Assessment and Implementation | • Improved extension service |

## TASK 2.4 ENABLING THE POLICY ENVIRONMENT FOR PRIVATE SECTOR GROWTH

As Liberia redevelops its agricultural economy, government policy decisions and the implementation of those decisions are critically important. Government policy decisions always involve a compromise between competing goals, but hopefully strike a balance between the interests of the nation as a whole and those of the private sector, including farmers, to achieve growth, prosperity, and equity. The FED project is supporting the GoL efforts both to design and to implement the right policies needed to allow the agricultural sector to meet its full potential.

Policy reform and implementation will require balancing multiple competing interests. FED sees its role here as providing input to inform the policy formulation and the policy implementation process, sourcing data from all the various stakeholders, from the village to the Ministerial level allowing the GoL to make informed decisions. Over the next four years, we will focus on a small number of topics, supporting regulatory reform and better policies and incentives to support agriculture growth.

Policies impacting agricultural productivity and food security: The Liberia Agriculture Sector Investment Program (LASIP) identified a number of challenges, and opportunities for improvement. Six priority policies in that document are i) Land Policy to define access, use and tenure security. ii) Food Pricing Policy in relation to domestic rice production, iii) Agricultural Incentives Policy to encourage private sector investment, iv) Policy on the role of the Government in agricultural growth and development, v) a Social protection through agriculture policy, and vi) a National Seed Policy.

LASIP specified that the approach to agricultural policy and food security "will be a public private partnership (PPP) in which activities along agricultural value chains, from production to domestic and export marketing, will be spearheaded by the private sector while the public sector concentrates on promoting the small farmer sector and other critical aspects of value chains with enabling policies and regulations and the delivery of essential services."

The COP will coordinate FED's policy efforts with the help of the team and selected short-term consultants, ensuring that policy change is integral to the value chain activities and is informed by field realities via consultations carried out at the local level at village forums and the ACCs. All policy work will be done in consultation with USAID. FED will continue to coordinate with USAID funded regional programs on inputs, trade and other capacity building projects that adhere to ECOWAS policies and protocols.

Examples of policy issues which may have an impact on FED work:

12. Promoting Women's Participation: While there do not seem to be explicit obstacles to women's participation in the agricultural economy and many women participate as heads of farm households and as entrepreneurs, FED will work with the MoA and the MoGD to review, design and implement policies to further facilitate women's contribution to agricultural and economic growth and prosperity.

13. Land tenure issues: Insecurity of land tenure may constrain investment in improvements in, for example, fertility, irrigation infrastructure, storage or animal pens. The boundaries among communal lands, concessions, private parcels, and government land are not always clear. The usufruct system of tribal land may not be functioning efficiently, and in certain locations, such as Suakoko, much of the land has been deeded to institutions or to others (Montserrado) so access to land may be limiting production. FED will analyze the impact of tenure on beneficiaries' investment decisions and access, and the possibilities for new tenure arrangements, such as share cropping in order to inform its interventions.

14. Plant Protection and Pesticide Regulation: The MoA and FED will work to review and improve the regulations for the import and safe use of appropriate agricultural chemicals (pesticides, herbicides, fertilizers) and launch a training program in collaboration with NGO's engaged in agriculture to ensure that regulations are respected by the private sector and applied by officials at the county and district levels. This support will include reforming as needed the regulations and enforcing rules governing seeds, Crop Protection Products (CPP), and fertilizer with the objectives of encouraging private sector driven input markets, by working towards effective government regulations of truth in labeling, (with EPA) to ensure safe use of agro-chemicals.

15. Food policy: Liberia permits the import of staple foods quite freely. A large portion of the country's foreign exchange goes to cover these costs. One of FED's priorities is to review the extent to which Liberia should seek to replace rice imports with home-grown rice. Imported rice is now generally cheaper than Liberian rice. What policy decision would impact investment in lowland irrigation or in large rice concessions and availability of Liberian rice?

16. Regulations and regulatory behavior: Once a policy decision has been made and finalized, to what extent should the GoL implement it by strengthening its own regulatory capacity through training, and testing equipment. Or should the private sector self-regulate under the GoL by enforcing such rules such as truth in labeling describing the contents of crop protection inputs.

17. Prioritizing infrastructure investments: The Poverty Reduction Strategy names 'revitalizing the economy' as the second most important priority for infrastructure investments. At present, there seems to be no channel for enterprises in the agricultural sector to influence investments to allow better access to markets and input supplies. Most concessions (e.g. Firestone and LAC, maintain their own roads and all enterprises along their roads benefit. But many secondary farm-to-market roads leave much to be desired. Linking infrastructure priorities to economic potential could be of great service to Liberia's agricultural economic development.

18. Taxation policy: At different points in the value chain for the FED commodities, participants may pay customs duties, VAT, income taxes, or illicit enrichment activities (IEAs). Licit taxation can also constrain or encourage Liberian entrepreneurs at all points in the FED value chains. The GoL needs revenues and taxation is a legitimate function of government, but entrepreneurs, especially those launching new and risky businesses, may need relief as they establish.

Four illustrative examples of potential policy interventions follow; all require GoL leadership.

### Activity 2.4.1: Promoting women's access to land and secure land tenure rights.

Women farmers manage many of Liberia's family farms, providing the principal source of labor for both family and commercial farming enterprises. Whether women farmers produce crops for market and for home consumption, research shows that they are more likely to make sure their output includes vegetables and other crops consumed at home, that enhance children's nutritional status.

Women typically gain access to land through marriage (as do men; single men are rarely granted land in their own names). The land rights of married women are thought to be generally secure, and widows typically remain on their family land after the death of their husbands. However, divorced women may be forced to return to their families of origin, and face diminished land rights and social and economic status. There is growing evidence of the women farmers acting to secure land outside of these family arrangements. Some women, farming vegetables for market and for household consumption in the PUAs, are negotiating short and long-term arrangements as tenants or as owners. Dietary diversity and income are tied into access to peri-urban land for vegetables.

FED is committed to better understanding the opportunities and obstacles women farmers face in becoming commercial producers and securing stronger land tenure rights. A start was made in this effort with the consultancy in May 2012 of Dr. Steven Lawry, DAI manager for land tenure and property rights programs. Dr. Lawry will return to Liberia in early 2013 to design this study, which will be undertaken by FED's M&E team with an appropriate Liberian organization or individuals.

### Activity 2.4.2: Local tenure arrangements and community organizations.

Tenure security in customary systems is embedded in a web of social relationships and local authority structures that control the allocation, exchange and inheritance of land. In order to construct effective agricultural interventions, it is essential to have a clear understanding of local tenure arrangements and community organization. Using interviews, focus groups, mapping and observation, Dr. Sandra Joireman will work with the FED team to design a detailed case study and social inventory of an agricultural community in Nimba and its customary land rights. Land issues have been a source of conflict in Nimba County, particularly with the return of displaced people after the war. Her work will help bring clarity to some of the issues surrounding land access, community organization and authority structures, and build on previous DAI activities. In addition, Dr. Joireman's work will complement and be integrated with work by the Community Facilitator, Gwen Armstrong, who is working on the technical aspects of women and agriculture and the Farming Systems Economist, David Mansfield, who will study community farming systems in Nimba.

The findings of this study on local tenure arrangements and community organization in Nimba County and the previous one on land acquisition strategies employed by peri-urban farmers will be shared with the Liberian Land Commission and with senior staff in the MoA. The interventions and strategies that aid women in securing land or increasing their access to land will be the topic of a FED workshop organized in collaboration with the Land Commission, the MoA, and other projects engaged more directly in tenure, such as the Land Policy Institutional Support Project, the Land Conflict Resolution Project, PROSPER, GEMS, and the Mitigating Land Disputes Program. Like all the other policy issues in this section, we are deliberately addressing various aspects of the way policies impact the program; commercialization versus food security here.

### Activity 2.4.3: Improving the Policies around Seed and Crop Protection Chemicals.

Constructive policy engagement with the government will ensure improvements in the importation of inputs such as seed and agrochemicals. The following issues exist;

- There are no clear guidelines on the importation of plant materials (vegetative and seed).
- There does not appear to be a national register of approved crop cultivars.
- There is no national pest list for Liberian horticultural crops or rice and cassava.
- There is no local formal Sanitary and Phytosanitary (SPS) support mechanism.
- Liberia has no list of registered agrochemicals for crop use. Proposed/actual rules are the general Food and Agriculture Organization (FAO) guidelines on pesticide registration.

As requiring formal registration of crop protection products (CPP) is likely to lead to a withdrawal of most agrochemicals due to the small size of the Liberian market, which does not justify the costs of registration, truth in labeling is a better alternative. FED will work with USDA and FAO through the MoA on these policy issues.

Drawing on previous analyses of the agro-input situation in other West African countries, in particular the standardized input policies developed with ECOWAS under the Marketing Inputs Regionally (MIR) project, in collaboration with the regional fertilizer program, FED will work with MoA, MoCI

and FED staff to reform policies, regulations and enforcement of seed, CPP and fertilizer rules with the objectives of private sector driven input markets, effective government regulations of truth in labeling, (with EPA) importation and safe use of CPP, etc. One goal is to lower fertilizer and other input prices. (STTA Policy Advisor)

**Activity 2.4.4: Rice Policy.** FED will provide policy advocacy support to assist in the improved commercialization of the local rice value chain. The focus will be on private sector market structure development. STTA Dr. Eric Wailes will return to assist in the development of policy interventions for the rice value chain. He will define training plans and targeted technical assistance to achieve specific policy objectives. Specific policies that could be addressed include: 1) A unified approach to subsidies and support to the sector; 2) implementing the national seed policy to establish the rice certified seed program; 3) a commercialization policy to assist in the development of input support networks (seeds, fertilizers, pest management) and post-harvest rice drying, storage and milling; and 4) finance, research and extension policies ensuring best practices are available to change agents.

As requested and as needed, appropriate FED staff and specialist STTA will work to improve the implementation of the current policies, and the understanding by value chain participants of these and other policy issues. STTA, Max Goldensohn will support these tasks along with specialist STTA, Steven Lawry (tenure), Kwaku Ayegmang (livestock) and Doe Adovor (extension). This work will be conducted in collaboration with GEMS, USDA, MoCI staff, EPA, the Deputy Ministers of Planning and Extension in MoA, FED partners such as input suppliers and the national cassava coordination committee and FED.

## COMPONENT 3: BUILDING LOCAL HUMAN CAPACITY

Introduction: Many Liberian citizens are currently not equipped with the appropriate skills to address their country's development challenges. There is a real shortage of individuals with the training and experience to build the private sector businesses, effective government institutions, and civil society organizations that are needed to contribute to Liberia's development. The FED Program aims to catalyze sustainable changes that, in conjunction with their partners in the MoA, MoEd, and the universities and vocational institutions, will provide Liberia and Liberians with the appropriate skills to engage in revitalizing agribusiness in Liberia and improving food security. Our capacity-building methodology includes a "training of trainers" approach to all FED-supported STTAs.

In FY 2013, the FED Program will work intensively with four of the five vocational educational institutions at the post-secondary level[7]. Interventions include:

- Curriculum Development: The MoED is developing a suitable vocational agricultural business curriculum for job-force readiness and articulation with advanced degree entrance requirements; FED is supporting that effort in collaboration with the World Bank and SIDA;
- Information Resources: Providing internet access for up-to-date agricultural and business-related data, providing instructors and libraries with textbooks related to new curricula. Media training materials to teach practical vocational skills made by and for Liberians will be developed, utilized and archived. Staff will be trained in producing these materials.
- Establishing Working Farms and Laboratories. FED will provide practical agricultural experience by working with the colleges to make resources available to develop suitable learning spaces on college farms and improving the science laboratories.

[7] The College in Bong is under construction. We will work with the Dean in FY 2013 as appropriate.

- Youth Leadership: Leadership development through creating and nurturing college student-led, faculty-advised and subject-specific vocational education organizations.
- Internship Program. The FED Internship program will continue to develop its programs and focus on job readiness skills and practical experience. This will connect college education with community stakeholders and other related workforce opportunities;
- Upgrading Vocational Educators: FED will intervene with college instructor and administrator capacity building through ongoing trainings, as well as short term opportunities at other vocational education institutions in Africa, Asia and the USA.
- Agricultural Awareness. FED will provide an overall awareness in the counties and towns where agricultural activities are established. Gender equity, nutrition and environmental protection will be included in the promotion of agricultural business enterprises. Interventions will use mass media and target secondary schools.

All scopes of work of FED include a specific capacity-building component. Direct interventions in capacity building at the five vocational agricultural institutes continue to be carried out.

## TASK 3.1 CREATING CENTERS OF EXCELLENCE

Although Component 3 activities have been underway since January 2012, delays in the recruitment of the Vocational Training and Non-Formal Education Specialist (VTNFES) meant Component 3 has been the last to reach full implementation. FED will continue to take a step by step approach, basing expansion on positive achievements. To achieve this, the team will need Liberian input and buy-in at all levels: the central government Ministries (Education, Youth and Sport, and Agriculture), County and District officials, the private sector including farms, and farmers' associations of all kinds. This input also includes businesses of all sizes which contribute along the four FED value chains. .FED wishes to have all of its work led by Liberians, particularly the work aimed at improving the academic and management performance of the Liberian vocational education colleges, on which the VTNFES will concentrate his efforts. To achieve this, an aggressive recruitment of a variety of Liberian specialists is underway to form an expert's list that can be called on to help.

### 3.1.1 General Component 3 Activities for Year Two (2012 – 2013)

*Curriculum Development:* Selected vocational staff at target institutions will be encouraged and be assisted to plan lessons, develop learning materials and design courses effectively, allowing them to monitor student progress and spot problems early. Component 3 staff will assist with alternative learning structures, better lecturing techniques, problem solving in the field and the classroom, cooperative learning, discussion, independent practice, coaching, mentoring, and internships, among other things.

*Information Resources:* FED will service the five targeted institutions with adequate library resources and satellite internet service, thus, allowing instructors and administrators access to state-of-the-art instructional and education resource materials available at educational resource centers throughout the world. Training will be ongoing to encourage regular updating of best practices by mining information on the internet. All relevant vocational and practical trainings will be video-taped by trained Liberian staff and conducted by Liberians to produce materials suitable for illiterate and semi-literate nationals.

*Vocational Instructor Capacity Building:* Lead teachers in the agriculture or business departments in each of the three educational institutions will be identified and challenged to conduct activities of best practices in vocational education. One incentive to do so will be a scholarship opportunity to attend a

vocational teacher training institution outside of Liberia. The relevant host institution will be identified during this year and one teacher from each of three institutions will be offered a scholarship to visit and learn best vocational education practices. Upon returning to Liberia she/he will be required to offer training to her/his colleagues in vocational education.

*Practical Farm Development:* Educational institutions will be assisted to update and provide high quality practical activities for students. Each institution will be assisted to develop and use a farm area for student learning. Instructors will be encouraged to utilize these "land laboratory" resources to make learning more practical and interesting. Component 1 staff will provide workshop training for community college instructors and students. A portion of the Land Laboratory will be allocated for each of the four value chains for demonstrations. A lead agriculture college instructor will be provided with training and basic equipment to demonstrate best practices as promoted by FED staff and visiting STTAs. The newly formed student leadership organizations will be encouraged to form a business plan and establish business ventures, such as a goat project or a processing center within their institution or in cooperation with a nearby lead farmer.

*Student Leadership Development:* Each educational institution will be requested and assisted to form a student-led vocational organization. The goal of the student-led organization is to encourage students to learn skills as well as to assist their learning process. These SkillsUSA® and FFA®-type activities, leadership training, service learning projects, career readiness, goal setting, will equip them to deal with complexity, stretch them in facing the world of work, help them to develop analytical skills and grow professionally. It will foster their ability to problem-solve and deal with change. It will install FED's attitude towards failure: "someone who never fails has never tried."

*Stake Holder Involvement:* Educational Institutions will be encouraged to have a department-relevant advisory committee where regular meetings will take place between vocational instructors and the stakeholders in the community. Initially the FED Component 3 staff will model the working with stakeholders and educational tuition staff. The Agriculture departments will then take control of the stakeholder meetings, thus, forming a regular *advisory committee* for the ongoing partnering with the local community agribusiness leaders. This will be linked into FED's other community forums.

The FED team will plan and work closely with those GoL Agriculture and Education Ministries and other organizations. These entities are critical in the development of programs to meet our objectives under Component 3 which are needed to build the local technical and managerial human resources to sustain and expand objectives achieved under Components 1 and 2.

The Component 3 team, complemented by STTAs, engaged Private-Sector Partners, (e.g. Firestone, Chevron, Ancelor Mittal etc.) and relevant GoL specialists will develop outreach programs to ensure that training is tailored and aimed at specific employment opportunities. We will continue working with other complementary projects such as EHELD to organize an Internship Council to coordinate the terms for businesses and farms to accept and train interns: stipends, periods of engagement, and other conditions. Our aim is to equip as broad a segment as possible of Liberian youth to obtain useful and remunerative employment in the agricultural sector and to launch profitable business ventures of any scale throughout the country. We have hired an internship coordinator and will be adding the best of this season's crop of interns to her staff to expand the program.

### 3.1.2 Specific Component 3 Activities, October 2012 to September 2013:

These activities will include:

- A formative appraisal of the ongoing internship program, including office establishment at the colleges, finding new internship sites and more diverse partners based on needs;

- Formative assessments will be conducted based on curricula needs for practical learning activities at BWI and three other community colleges, Nimba, Lofa and Grand Bassa County Community Colleges. For each institution a memorandum of understanding (MOU) will be developed where FED will provide basic learning-farm needs, including specific tools, equipment, and machinery. Each institution will leverage their resources for providing adequate hands-on farm learning experiences.
- Conduct a summative appraisal of the existing library facilities at all five institutions to determine the needs to furnish, equip and to update the reference literature, furniture and equipment. Students at BWI and the community colleges will be exposed to modern methods of accessing data from the internet. This activity will commence during the first quarter and continue through the second.
- Textbooks, videos, e-resource materials and other educational resources and library facility needs will be acquired for the library holdings that relate to new curricula in each of the educational institutions FED is engaged in. Each subject of the ECOWAS National Education Diploma Curriculum will receive a minimum of three relevant textbooks, one for the Instructor and two for student access in the college library.
- FED will work cooperatively with the MoE to organize and conduct a teaching symposium for Post-Secondary Vocational Institutional Instructors.
- Component 3 will develop and conduct targeted training to meet teacher and administrator needs identified at BWI and the four community colleges.
- Initiate and train interested instructors and student leaders in student-run leadership organization and service-learning projects, which will be linked closely with FED Component 1 and 2 activities.
- In the latter half of Year Two, expansion of these interventions to address the needs of the two other county vocational education centers, Lofa and Bong County Community Colleges.
- Component 3 will look at each cooperating educational institution for the purpose of selecting an instructor or support staff person to send out of the country for training in a relevant need for the institution.
- FED Component 3 will work with the MoED's Bureau of Science Vocation, and Special Education office to better coordinate the implementation of the ECOWAS TVET curriculum in the Community Colleges and at BWI. A MOU will be entered upon and FED will supply the ICT equipment needed as well as hosting a coordination meeting to finalize the program.
- Component 3will work with each vocational education college to develop a relevant student learning farm (Land Laboratory). Instructors will be trained in how to effectively utilize this laboratory for suitable job readiness training.

Component 3 will work with each vocational education college to enhance and provide critical needs for the Agricultural Science (soils, animal and plant) Laboratory. Instructors will be trained in how to effectively utilize this laboratory for suitable job readiness training.

## FIGURE 3.1: ROLE OF COMPONENT 3 IN BUILDING CAPACITY IN LIBERIA FY 2013

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| **Activity 3.1.1: Vocational Instructor Capacity Development** | | | |
| Vocational Educational Institution Instructors are not trained as Vocational Teachers i.e. they are unfamiliar with course material development and how to teach making education 50 percent theory and 50 percent practical orientated. | • Provide workshops in designing syllabus, course material and resource information gathering.<br>• Demonstrate how to conduct nonformal practical oriented activities.<br>• Send Instructor to University outside Liberia for Vocational Education Certification. | • Hire local Vocational Education Teacher Educator to provide workshops during semester breaks, e.g. January and July 2013.<br>• Hire and train Vocational Education Officers in and for each county to work alongside the vocational Education Instructor during the semester.<br>• Provide scholarship for a highly active, engaged Instructor from each County College and BWI | • Instructors will learn and be engaged in Syllabus creation and Course Material development.<br>• Local Vocational Education Officers will themselves be trained in best practices of vocational education and will in turn monitor and supervise the county colleges with issues and concerns forwarding them to the VTTS and VTNFES for immediate attention.<br>• A certified vocational educator will be available at each county college and BWI. |
| **Activity 3.1.2: Improved access and use of information** | | | |
| Lack of Information Resources | - Provide Internet and relevant resources, plus Knowledge Management and Library training<br>- Provide Textbooks relevant to the new ECOWAS Curriculum<br>Create locally made video media training materials suitable to the needs and conditions of the Liberian counties and business and production potential as introduced by FED and partnering institutions. | - Install Satellite-based internet at each educational Institution. Conduct workshops for lead teachers in each Institution in Internet Information Resource Gathering.<br>- Provide current and relevant textbooks for each course in the curriculum. Three per Institution (one for the instructor and two for the Library.<br>Bring in STTA to train vocational and other staff in video development.<br>Provide video camera and other equipment for high quality media production training videos. | - Instructors equipped and able to find relevant information for their courses and capable of updating their course material and class presentations.<br>- Instructor enabled to use a hard copy of a textbook for class lecture, practical activities. Students will be able to research using textbooks relevant to their course work.<br>Each educational institution as well as each MoA county office will have access to video training materials. |
| **Activity 3.1.3: Internship Program** | | | |
| Internship Program not available in College Administration | - Provide resources (Staff and Office Equipment) to start an office of Career Services | - Initiate and equip an office with ICT and relevant Career Services training. Place the Vocational Education Officer at the Institution for duration of FED.<br>Engage the local community and stakeholders to cooperate with Internship | - Internship and Career services become an integral component of the VocAg and VoCom & Ind Programs and students are assisted to have a suitable Internship experience and job placement assistance. |

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| | | program. | |
| Activity 3.1.4: Practical agriculture experience | | | |
| - Inadequate Land and Agricultural Facilities to implement the Curriculum. | - Encourage partnerships with private and NGO Stakeholder involvement.<br>Establish MoUs whereby FED will provide specific needs and the Institution will engage and leverage their existing capacity. | - Identify land availability on the existing campuses. Assess needs and advise department how to adequately implement specific practical elements of the curriculum.<br>MoU to provide specific resources to develop the land laboratories | - Instructors enabled to make the curriculum a 50 percent-50 percent theory and practical learning environment. |
| Activity 3.1.5: Student Leadership | | | |
| Problems to Initiate and Develop Student Leadership Organization | - The initiation of the Student-Run Leadership Organization will have a specialist to stop-gap issues raised in order to start the college-based organizations | - The VTNFES and a STTA specialist in Vocational Student Leadership Organization will conduct workshops introducing and setting up the organizations. | - College instructor advising together with Leadership training will ensure successful launching of the organizations. |

### 3.1.3 Partnering Institutions

Component 3 began work first with the BWI in Kakata where vocational education in agriculture has a long standing presence. This institution has a secondary vocational program in various vocations from auto mechanics, business, and information technology to agriculture. BWI has a post-secondary, vocational-specific two year program, called the Accelerated Program. This is an adult-based job readiness certificate program. BWI has made the decision to become a vocational college. The FED program, through its Local Human Capacity Building component will focus on working with BWI to become a vocational college Center of Excellence (CoE).

Nimba County Community College (NCCC) at the Nimba County Seat, Sanniquellie is the second institution for direct intervention by FED Component 3. This college is in its second year of offering vocational agriculture and has an extensive and impressive community volunteer farm and program of activities. FED will cooperatively intervene to enhance the capacity of the instructors and learning environment. This unique educational center will also include adult literacy, information and computer technology training and a focus will be to make NCCC a gender equity model for other institution to follow.

Grand Bassa Community College (GBCC) in Buchanan is the third focus of FED Component 3. This institution is in its second year of operation, but has only begun vocational agriculture this year with 45 students enrolled and two college instructors. It is housed in the local high school awaiting the completion of the new campus in early 2013. GBCC has requested FED help to make it a center of excellence for the county and port city of Buchanan.

Lofa Community College (LCC) is located in Voinjama. This institution has opened its doors to vocational agriculture education for the first time in September 2012. FED will work with LCC in a limited way this year providing information resources (Internet and library resources) as well as instructor training and curriculum development assistance. More direct intervention will take place in Year Three and upon building on success with the first three institutions.

Bong Community College in Gbarnga is the fifth institution that FED will focus on. This institution has not yet opened. The campus is currently under construction. It will open its doors in September 2013. However, the college president has requested assistance from FED to make Bong Community College a CoE by establishing a Technical Community College with a four-year bachelor degree program in vocational subjects including agriculture and entrepreneurship.

### 3.1.4 Memorandums of Understanding (MoU) Required

- Critical agreements (e.g. MoUs) need to be negotiated with specific partners. These include: financial, facilities, and other assistances to Nimba County Community College and Grand Bassa County Community College with regard to providing Internet, Library and Land/Science Laboratory establishment needs.
- An agreement with the community colleges to allow trained teachers to use a certain number of hours to conduct training each week outside their institutes.
- An agreement that the community colleges are willing to integrate revised curricula into the classes of the teachers trained by FED.
- An agreement with the colleges stating that their technical teachers and students who have been trained to use the improved/revised curricula will be allowed to conduct training for their institutions and enterprises with which FED will be working.

- An agreement with all participating institutions that students can run a student-led leadership organization that focuses on Service-Learning for working with FED or any other community-based organization for a specified number of hours/week.
- Each county college will provide office space, staff and an agreement to host a students' career services department. This office will be equipped and staff trained to implement a suitable pre-graduation Internship program. Vocational and career preparations (CV, interview etc.) services will be provided as well as a community-based adult literacy and other community-requested entrepreneurship and agricultural education programs.

Memorandums of Understanding will be determined for the longevity of the five-year FED program. Such MoUs will stipulate the role and responsibilities of the partnering institution and FED. These Memorandums of Understanding will be collaboratively negotiated such that both parties will have equal representation and collectively agreed upon responsibilities in a reasonable time.

## 3.2 STTA SUPPORT

In addition to in-country collaborators from FED, GoL, the Vocational Centers, and other sources, Component 3 will be supported by STTAs. A minimum of assistance for Year Two include:

- *Internship Development (ID) Specialist*. Dr. Reid Bates, (LSU Professor of Human Resource, Leadership and Organization Development), will develop an internship program for all higher Education institutions and CoEs. This STTA will come twice in FY2013. The first visit will be to conduct an assessment and facilitate National staff to enhance the learning opportunities of the Internship Program. A second visit will be to design an extensive training program to consolidate the Internship program and to attract additional resources that will ensure a sustainable program long after FED closes its doors. County college Career Services offices will be established.
- *Vocational Student Leadership (VSL) Specialist.* Dr. Bradley Leger (LSU Professor of Agricultural Education) will design youth development programs that encourage future farmers and agribusiness people to become active members of the value chain. Dr. Leger will come once during FY2013 for a four week visit in April. He will conduct a day-long training session in vocational education for the vocational teachers in the three targeted institutions, BWI, NCC, GBCC.
- *Vocational Education (VE) Specialist.* Howard Williams, (DAI Vocational Education Advisor) will help assess the learning and training needs in the three targeted Institutions, BWI, NCC and GBCC. He will partner with the newly hired VTE specialist. Mr. Williams will also research suitable sites for sending Vocational Educators (one per institution) to a suitable certificate program in Vocational Education in Africa or Asia. His visit is planned for two weeks in November 2012.
- *Vocational Teacher Education (VTE) Specialist.* Dr. James Bunch, (LSU Assistant Professor Agricultural Education) will follow up on Mr. Williams's assessment. Conducting workshops and working individually with vocational instructors and administrators on topics related to instructional development and delivery in performance-based environments. Dr. Bunch's visits will be for two-weeks, once during the January-March semester and another during the June-August vacation.
- *Agriculture Teacher Education (ATE) Specialist.* Dr. Craig Edwards, (Oklahoma State University Professor of Agricultural Education) will determine the opportunities for Vocational Education with respect to the Land Laboratory and Science Laboratories in all five educational institution partners. Further, Dr. Edwards will determine the readiness of the institutions to establish a student leadership organization establishment. A third aspect of his assessment will be on the best way to

provide agricultural awareness in the non-vocational secondary schools where FED Components 1 and 2 have direct interventions. Dr. Edwards's visit will be for three-weeks in November 2012.

- *Curriculum Development Specialist (CDS): Mathematics*. Sarah Eaton (MSc Math Education) will help develop the practical mathematics component of the curricula, choosing the best approaches to making mathematics suitable to the needs of graduates that need basic math skills to be successful. These included fractions, decimals, estimation, metric-English conversions, measurement, calculating feed rations, and basic agribusiness math using information technology such as calculators and computer programs. Ms. Eaton's will visit for three weeks, to conduct a rapid assessment of curricula need, a development of the math curriculum and a workshop for the lead teachers of all relevant vocational education departments.
- *Video and Media Materials Training Specialist (VMMTS).* Michael Cooney (Workforce Communications and Media Editor) will conduct workshops in three of the educational institutions to train vocational educators and MoA Extension staff in producing locally relevant, Liberian language and staffed training materials using video cameras. These multimedia presentations will be used when training is conducted and one main location per county is equipped with presentation media. Multimedia materials produced locally will be archived at the educational institutions.

FED will bring on STTA's to do a recruitment campaign to encourage high school students and the adult community to consider a career in agricultural production or a value chai enterprise and enroll in one of the Vocational CoEs. This would require development of recruitment/informational materials aimed at youth, parents, educational professionals, agricultural professionals and community leaders. Information will be shared through public dissemination of printed materials and live presentations at schools and other appropriate public arenas.

## TASK 3.3 NON FORMAL EDUCATION ACTIVITIES

### 3.3.1 Community Based Projects

Component 3 staff will work closely with and provide assistance to Components 1 and 2 and the County offices as they identify human resource development needs in the community that reflect the FED target - building human capacity. This will offer agro-business related Adult Literacy and Information and Computer Technology (ICT) education as one reward and incentive for volunteer farmers who participate with Community farms in the targeted Community Colleges.

### 3.3.2 Adult Literacy

As an incentive to encourage community involvement in the educational institutions, Component 3 staff will work with other USAID programs such as Advancing Youth, as well as providing opportunities for engaging adult volunteers to provide relevant adult literacy classes in local languages. Volunteers will be provided with opportunities to attend night classes in basic education as well as entrepreneurship and information technology training. Instructors will be recruited among the college staff or local national organizations that specialize in Adult literacy programming. Component 1 and 2 national staff will participate by providing special topics and workshops.

### 3.3.3 Video Technical Training Materials

All trainings conducted by FED and partnering organizations will be video-taped by trained Liberian staff during the course of the FED program. These training materials will be archived and available for ongoing and future trainings. Such computer-based materials will be available at each of the county educational institutions and the MoA county offices. Vocational educational staff as well as

MoA extension staff will be trained in making media training materials as well as their effective use for training students, farmers and other intentional learners.

### 3.3.4 Agricultural Awareness prior to college

Component 3 will also require its National staff and STTAs to focus on recruitment efforts to encourage students to consider a career in agricultural production and, thus, enroll in one of the Vocational CoEs. This would include development of **recruitment/informational materials and competitions** aimed at youth, parents, educational professionals, agricultural professionals and community leaders. Gender equity, nutrition, and environmental awareness will be a feature of the information/awareness campaigns. Information would be presented through public dissemination of printed materials and live presentations at schools and other appropriate public arenas. This work will coordinate closely with the outreach programs of the MoA and FED.

In targeted communities, Component 3 staff will make visits to local **secondary schools**. In these visits a **presentation** will be offered to the student body of the importance of agriculture with regard to employment opportunities, entrepreneurship, environmental protection, nutrition, and gender equity awareness. The Vocational Technical and Non Formal Education Specialist (VTNFES) or Vocational Technical Education Specialist (VTES) via the County Vocational Education Officers (VEOs) will visit the targeted school(s) and enlist willing secondary school principals. The VTNFES will then request the Component 1 and 2 program implementers to provide a value chain specialist or officer to prepare a presentation of the agricultural work being conducted in the area.

FED is currently engaged in an agriculture and art training in the high schools in the target counties. It ends with an art competition which, in collaboration with FAO, will result in an exhibition and prizes given on the World Food Day celebrations in November by the MoA.

### 3.3.5 Private Sector Entrepreneur Outreach.

Component 3 activities will engage local entrepreneurs in regular training at their respective local institutions. As the instructors and students of the various educational institutions learn and practice relevant and appropriate technology, forums will be encouraged. It is envisioned that the educational institutions will take on a community educational responsibility to disseminate appropriate technology and relevant information to entrepreneurs.

## CROSSCUTTING ACTIVITIES (“COMPONENT 4”)

### TASK 4.1 KNOWLEDGE MANAGEMENT

Over the last year, using a value chain approach, from market demand through the chain to producers, the FED team has been meeting and interviewing people, visiting enterprises and markets, working with government staff and other donor projects engaged in the sector, running field trials, and holding workshops. The intent is to be a learning organization, so we are building on those experiences and the first year workplan, on which drafting only started after two weeks of workshops and discussions with a wide variety of key informants. This year the team met at the county level and discussed with the County Agriculture Coordinator (CAC) for two days the lessons learned and the way forward. Then a workplan was drafted and staff presented the main points at a validation workshop in Monrovia., The diverse group in attendance included USAID and participants from all along the four value chains and across the three components. At the workshop, the proposed approaches were discussed in both small and large group settings. The participants included ministry staff, farmers, entrepreneurs, vocational education specialists, and resource specialists. This process provided a number of insights and suggestions, which have been incorporated. In FY2013 these collaborative

processes, which are already part of FED's approach, will be deliberately built on and expanded to reach more partners, stakeholders, and experts and receive national, county and community level inputs.

Given the dearth of updated agriculture data in Liberia, FED will make knowledge management—which encapsulates obtaining data, cataloging/storing it, and then widely disseminating it to relevant stakeholders, a priority for year two. FED will be hiring a Liberian Knowledge Management (KM)/Special Studies Specialist to oversee the KM/Special Studies Unit. This new unit will coordinate closely with FED's Component leads, technical STTA, and the M&E team to ensure that all of the valuable information that is being collected is not just stored on a shelf, but is being distributed widely to FED stakeholders (Ministries, donors, USAID, private sector, FBOs, etc.) and used to inform programmatic decisions. In Q1, FED will have a dynamic KM database in place and FED-funded reports will be disseminated widely. The KM/Special Studies Specialist will participate in various coordination meetings around the FED value chains to glean what information sectors need on how FED can assist and to see what information FED already has collected that can be shared. All of the reports and special studies that FED will undertake in year two will continue to be used for programmatic decision making (Margaret Orwig, STTA, FED staff).

A number of production training sites will serve to pilot, test and demonstrate improved practices and technologies. Farmer field days will be organized at these major sites, increasing the number of farmers who will benefit directly from the FED agriculture activities by a factor of approximately two. In the target districts, either directly, through local NGO's or in partnership with other projects such as WFP and IFAD, a limited number of complex demonstrations will be designed and intensively managed by the FED staff. In and around these centralized learning/practice/teaching hubs, a larger number of simpler, but related demonstrations will be managed by local NGO's. Proximity to the hubs will allow easier access and the more rapid diffusion of ideas and technology to and from farmers in the vicinity of the secondary sites. Information flows will be directed by village level facilitators and a media publicity campaign aimed at youth and women

The KM unit will continue to collect information on the main markets for the four commodities, to categorize the different types of actors in the four value chains, with their horizontal and vertical relationships, the interconnected vertical markets for inputs etc., which support them, and the overall policy environment. FED will also collect information on prices and seasonal prices fluctuations make an estimate of the trade flows and the size of the various markets, and an estimate of urban purchasing power, and how people spend their money. A household consumption survey would not only provide valuable nutrition data, but also provide a wealth of information on how extra food is consumed, as well as people's marginal propensities to consume (i.e. as they get an additional dollar to spend, where and how will they spend it), which are critical to understanding the various growth opportunities within the value chain. For example, 80 percent of the ECOWAS market for rice comes from outside the region. For Liberia alone, this is a 100-200 million dollar a year import cost. Liberia also has the lowest price for rice in the region and the highest prices for inputs. What is the effective demand for country rice, where are the markets (who is buying), size of the markets (how much they are buying), products in the markets (what people want to buy), purchasing power of the consumers, segmentation of the markets where the consumers are located, and the structure of producers (how many, where, what volumes are they producing), what the average rice farm looks like in a particular district, what its labor use is, where they are located, or how they actually get their rice to market, and all the costs associated. Price elasticity's and consumer preferences will also be considered.

## TASK 4.2 SPECIAL STUDIES, BASELINE STUDIES, IMPACT SURVEYS, M & E

There is a clear need across the board in Liberia for better data to inform decision making, at all levels. While the MoA has a certain responsibility for data collection and FED itself will be collecting a range of data to track its progress, it is not the best use of the MoA or FED's time to collect all the data that is needed. It is important to build the skills and capacity of local firms to collect agricultural data. Through the Market Development Fund (MDF), FED is awarding performance-based subcontracts to Liberian entities to conduct a range of surveys/studies. The FED MDF is also being used to equip the county offices of the MoA, as well as Liberian companies and NGOs, with the skills and tools they need to collect and analyze data that are critical to their activities in increasing productivity, enterprise development, value chain upgrading, and decision making.

Following a data needs assessment in October, MoA county officers will be trained in the use of the computer equipment they have received, along with other innovative IT technologies. Both NGO partners and the MoA staff will continue to join FED staff and farmers in a wide range of trainings, such as compost making, soil testing, fertilizer recommendations, making crop yield assessments, development and use of extension tool kits (materials/leaflets/photos), etc. The experience of the first project year is that the FED M&E team is fully occupied with regular data collection, analysis, and reporting activities with only limited time to engage in special studies. Among other things, this means delays in implementation and limited transfer of technical knowledge visa-vie trainings by the technical STTA.

In October 2012, FED will develop a special studies team that will engage in a range of data collection and analysis activities, with support from M&E, the technical STTA's, and other FED staff. Increased collaboration with the FAO around data needs and sharing is also planned.

**Activity 4.2a. Improving data collection systems.** To achieve this objective FED will:

i. Work to strengthen the capacity of existing data collection entities in Liberia with particular focus on the FED counties, including the ability to design and administer gender-disaggregated surveys. Conduct a data needs assessment for MoCI officials at the county level to help them articulate data needs, analyze data and equip the county offices. (Led by M&E Specialist and supported by M&E team).

ii. Assess the MoA M&E system, and prepare a detailed action plan in conjunction with MoA staff, to build capacity in survey design and administration, effective baseline surveying, on-going data collection and specific studies. Approved by MoA. (Quarter 1 FY 2013, M&E team)

ii. Engage existing MoA and MoCI county staff in FED value chain analyses and M&E design/administration in their respective counties to create on-the-job learning opportunities for the Ministries' county staff. Ensure that MoA and MoCI staff are engaged in FED M&E data collection/analysis on a quarterly basis, and that they take on an increasingly active role over the life of FED in directing the data collection and providing formal data analyses. (FED team, M&E).

iii. Explore sustainable IT options for MoA and MoCI county offices to link their data with Monrovia. Review and cost the options and discuss with MoA. Select and procure equipment and train staff in use of IT solutions. (Information & Communication Technology (ICT) STTA)

iv. Collaborate with vocational center staff to establish curricula in each CoE that will mentor public and private sector partners on techniques for gender-sensitive design, administration of surveys, statistics, and data analyses. (LT Curriculum Development STTA and ICT STTA)

v. Work with the MoA, the MoCI, NGOs, and Liberian ICT service providers to use ICT-based applications that streamline survey administration and data tabulation, and reduce data collection errors. (ICT STTA, IT STTA and M&E team)

vi. Coordinate with the WFP, WHO, and UNICEF and continue collaborating with and assisting in building the capacity of the MoA and MoHSW to administer the biannual food security and nutrition survey. (FED nutrition staff, COP)

### Activity 4.2b. Baseline Surveys, Impact Surveys and Special Studies

The FTF baseline survey will be done in FY 2013 by external consultants overseen by the USAID Mission. In FY12, FED completed a baseline survey of the households in the target areas. In the 1st Quarter of FY 2013, a crop cutting survey will be done to provide information on existing and improved yields and gross margins. Additional surveys will be done through local Purchase Orders to estimate the diffusion effects of the demonstration, to calculate the number of farmers or groups using improved technologies, market surveys of the current value of farm sales of the four FED commodities, and enterprise profiling to determine who is already engaged in activities along the FED value chains in the six counties.

According to USAID Evaluation Policy (January 2011), implementing partners do not have to conduct impact evaluations of their own project. USAID's operating units' contract with third-party evaluators to conduct impact evaluations of their innovative medium-sized and larger projects. Considering the size and importance of FED, it is hoped that FED can work with the Mission in early FY13 to help outline a project impact evaluation for which data can be collected in a timely manner.

Periodically, throughout the life of the project and in collaboration with our partners, special studies will be designed and undertaken to gather information for decision making and to determine the impact of various activities within the project. These studies will be managed by the KM Unit staff with coordination from the long-term specialists, such as the input supply expert or the Agribusiness Specialist, and specialized short-term expertise, both expatriate and Liberian. These studies (examples of which are given below) will employ various qualitative and quantitative methods in order to build a knowledge base as well as illuminate the changes that are occurring as a result of FED's work. These studies will allow FED partners (public and private) and Program Managers to make better informed decisions about future activities. The information from these studies will be shared widely. (Ongoing activity, M&E unit, STTA, David Mansfield, STTA Margaret Orwig, other STTA, local partners, public and private). Examples of studies include:

i. Work with the MoA to select, adapt, and implement the Modernizing Extension and Advisory Services (MEAS) report recommendations and the SEAS plan. Key is the development of Extension Technical Tool Kits for use by MoA or FED extension agents. (FED VC teams, STTA Doe Adover, MEAS)

ii. To measure productivity, FED is using GPS Units to measure farm sizes and will do crop cuts to map farm yields and production. Training is being provided to FED project staff and the county level MoA technicians who will be involved with crop harvesting. (M&E team and GIS Specialist)

iii. One important issue is the profitability of both paddy rice and rice seed production in Liberia. If farmers are to adopt new practices or serve as suppliers of pre-certified seed, then the gross margins resulting from any change in their current practices have to be determined and any profitable changes in varieties, techniques, and management need to be demonstrated and communicated to rice growers. There is a real deficit of data in this area. FED will collaborate with the MoA and our private sector partners on simple studies on this issue and others such as: the impacts of iron toxicity, weed management in lowland rice, appropriate fertilizer use, multi-location variety trials, the adaptation and

consumer acceptance of the new varieties, labor saving machinery use, the potential for more sustainable upland rice production etc. (FED VC team, EHELD and STTA).

iv. FED will look at the returns on investment (ROI) for fertilizer in Liberia to revitalize and commercialize agriculture in Liberia, an increase in soil nutrient status is essential for economic gains. The optimum methods, timing, and rates of application need determining, but ROI will vary significantly depending on the input price. The short-duration rice varieties are a huge potential advantage for farmers, but they won't have much acceptance or impact in Liberia without fertilizer. FED and its partner IFDC, through its newly won regional fertilizer program, will conduct a practical study on the best routes for fertilizer importation and distribution, discussing policies with the MoA and MoCI and with importers, as well as players with the liquidity to become larger.

v. Application of nitrogen (N) fertilizer and improved crop management practices are the main drivers to increased rice yields elsewhere in Africa. Fertilizer use efficiency in most farmers' fields amounts to only 25-40 percent of applied N, and these low rates are caused mainly by high volatilization losses of top-dressed broadcast applied urea fertilizer, poor timing of fertilizer applications, and overall poor crop and water management. Since nitrogen fertilizer, even in countries with cheaper fertilizer, represents 15-30 percent of total variable production costs, these losses correspond to huge monetary losses for many smallholder farmers in lowland and irrigated rice schemes in West Africa. Currently there is little or no information on the use efficiency, limiting nutrient factors, and the returns to nitrogen fertilizer use on Liberian lowland swamp soils, with traditional or improved varieties, under farmers' conditions and current farming systems in Liberia. FED will look for ways to rapidly address these information gaps. Working closely with other partners, FED will share any best practices widely. (STTA, Edward Rhodes, working with the KM Unit on a variety of specialized studies in FY 2013)

vi. Soil, crop, and fertilizer analyses will need to continue in 2013, to assess the economic and financial viability of fertilizer and to determine economic application rates. Because of the importance of fertilizer use to improving productivity with improved varieties, fertilizer vouchers could have an initial subsidy of 50 percent (this is larger than usual, but would only serve to bring the current fertilizer price in line with Nigeria). Any successful voucher scheme can be scaled-up in subsequent years on an annual declining subsidy basis. The input supply and enterprise development LTTA's will develop scopes of work to help identify and bring to Liberia the appropriate expertise, for these studies and the policy studies. (IFDC STTA, FED LTTA)

The data we propose to collect with our partners will be linked closely to refining FED activities and used to calculate the profitability, plus the labor, cash and time requirements of existing farming systems versus any proposed new systems, such as new practices in lowland rice. Gross margins per unit of land, labor, capital etc. will be determined and this information will then be presented to growers as part of their decision to adopt new opportunities. (LTTA, STTA).

Other potential economic feasibility, soil/fertilizer and agronomic studies are listed below. All such studies will include consideration of the impact of interventions on food availability and nutrition (access and utilization). To present technologies new to Liberia, FED will do demonstrations, based on work carried out elsewhere in West Africa. FED studies are not meant as academic exercises for publication, but rather as paths to applicable interventions.

- Deep placement of Urea in lowland rice (See activity 1.2, pilots, demos and testing)
- Multi-location variety demonstration trials of rice, cassava and vegetables (1.3,1.4,1.5)
- Appropriateness of technology such as tillers, small rice mills, cassava grinders.

- Socio-economic study on impact of switch from upland to lowland rice on households (1.3)
- Sustainability and environmental impact of upland rice within farming system(1.3)
- Nutritional Assessment and Gap Analysis (1.7)
- Testing increased portability of equipment, using motorbikes.

In addition to activities currently proposed for extension support and curriculum development, the input supply component will work with the vocational agriculture specialist to involve students and teachers from VoAG centers in field based research and trials. These will include research on fertilizer recommendations in Liberia, in collaboration with the soil test results from Boima Engineering, the private soil test facility established with FED support. Other possibilities, such as international exchange visits and/or internships for teachers, professors and students and researchers from CARI with research elsewhere in the region, can be explored as well to expand Liberia's knowledge base.

The KM Unit will use the FED teams' technical staff to ensure the extension approaches, application of training modules, working materials, and appropriate tools are effectively summarized, presented and applied. We will develop cost effective and appropriate methods and M&E tools for FED's outreach and extension activities measuring impact and diffusion.

### Activity 4.2c. Ongoing Monitoring and Evaluation.

The FED M&E program will be led by an LTTA M&E Specialist. Unfortunately, there have been delays in identifying a suitable candidate, but pending USAID approval; we anticipate having this position filled in Q1. FED's M&E Specialist will be responsible for the central collection and reporting of data on the progress and performance of project activities. He will be supported in the central office in Monrovia by two M&E Officers and an M&E/ GIS Assistant. While FED currently has one M&E Coordinator based in each of the four priority county offices, we have come to the realization that given the unanticipated delays in collecting and transmitting data (poor roads, IT connectivity, etc.), additional field-level M&E personnel are required. In Q1, FED will be recruiting and hiring (2) additional staff per county office. A Data Entry Clerk (female hire preferred) and a Data Monitor will be hired to help support the M&E Coordinator and ensure that there's increased information and capture and swift data transmission back to Monrovia.

Although FED has had difficulties in staffing this unit (identifying both qualified expatriate and local staff), the baseline, M&E system establishment (both in Monrovia and the county offices), revisions to the PMP, and main assessments have all been completed. Moving into the second year of the program, the M&E team's will incorporate all of the recommendations from the Data Quality Assessment (DQA) conducted in the summer of 2012 and will focus on strengthening the systems to continue meet USAID, FTF, and MoA's reporting needs. FED will cooperate to the extent possible to address FTF targets, but we are only contractually committed to meet the targets specified in the FED contract. More intensive/targeted training for FED M&E staff and partners (MoA) will be a priority (training will include use of ICT in data collection, GIS, survey techniques, database management, etc.). A focused effort on strengthening our M&E system and continuing to build the capacity of our staff and partners will ensure FED continues to produce good quality data and reporting. As needed, FED's M&E team will also help with data collection/analysis efforts for Special Studies. (M&E Specialist, STTA Margaret Orwig). FED's indicator table with year 2 targets can be found in Annex V.

## TASK 4.3 GENDER RELATED PRIORITIES FOR YEAR 2

Introduction: Promoting women's meaningful participation in agriculture demands action on several levels. On the programmatic level: women must be able to participate in, and benefit from, project activities. At the design phase, project activities must be designed to address key gender-based constraints that female producers confront; and all project activities should promote gender equality and transform traditional gender norms. FED's LOP (Life of Program) gender strategy is designed to accomplish this. FED's activities are also designed to ensure that the benefits of FED programming extend to both male and female producers, dealers, consumers, and household members.

Approach: Consistent with FED's approach to gender integration, all year two activities are designed to be implemented as part of existing project activities or to complement them. Local hired staff, (Gender Specialist) will lead these programs, supported by other relevant FED technical staff and Liberian training institutions, and FED's Gender STTA, Rebecca Sewall. Some mentoring, (review of curricula, and the creation of tools) will be conducted virtually by the Gender STTA. Training of Trainers (TOTs) will be performed during STTA trips to the field. All activities will utilize and build the capacity of FED staff, Liberian institutions, and the MoA.

FED's year two activities will scale-up some initiatives started (making FBOs work for women), ensure key delivery and outreach elements of other programs engage women in FY 2013 (e.g. ensuring that all FED capacity building activities are gender sensitive and socially inclusive), and help lay the ground work for future work (work with input suppliers and study of go-buy-chop women). They will be conducted through the existing activities described earlier in this workplan.

FED's gender-related activities in year two:

### Activity 4.3.1. Ensuring Gender Sensitive and Socially Inclusive Training

All FED-sponsored trainings, demonstrations, extension assistance, and other capacity building activities need to engage and successfully transfer skills to women. FED's Gender Specialist supported by the Gender STTA, together with FED's technical team, will build the capacity of FED trainers/facilitators, extension agents and Liberian training institutions (such as AEDE, Educare, Rights and Rice Foundation, Pace Management) to design and deliver training and capacity building activities that reflect best practices in gender and promote women's empowerment.

A TOT on socially inclusive training delivery methodologies will train: FED staff, FED contracted Liberian training institutions (such as AEDE, Educare, Rights and Rice Foundation, Pace Management), and interested MoA and MoGD staff. The FED staff will then conduct gender training with the technical leads and country managers. Step down training then will be conducted by designated FED staff and FED partner capacity building institutions for: FED extension agents, BDS providers, FED partner Loan Officers, FED partner academic institutions, and FED Enterprise Development Service Delivery Providers, which will also build the capacity of staff and local training institutions

The Gender STTA will work with the M&E team to develop tools to evaluate and monitor the training outcomes of FED sponsored activities. A questionnaire to assess participant knowledge will be administered by facilitators/demonstrators before and after the training. FED Gender specialists will also assess the participation of women in FED trainings by adapting and using the Women's Participation Rating Tool in FED-sponsored capacity building and knowledge transfer events.

### Activity 4.3.2. Training for FBO leaders

FBOs can play an important role in helping female producers overcome many of the gender-based constraints that inhibit their agricultural productivity and limit their returns to labor. However, if

FBOs are going to play a meaningfully role in integrating women into agricultural production, they must be more responsive to the needs and interests of their female membership.

Following-up on year one work, to promote women's participation in FBOs, FED's Enterprise Development staff will roll out their training module to help FBOs start to consider gender.

The Gender Specialist will work with the Women in Business Officer and Enterprise Development Officer, as well as Liberian training institutions to conduct trainings and technical assistance to promote gender sensitive FBOs, supporting partner FBOs, such as the Dokodan and Intofawar Farmer Cooperatives, to increase the access to benefits for female producers.

FED also seeks to ensure that women are represented in the highest levels of FBO leadership. Component 2's value chain workshop activities (2.2 H) will include a series of women's leadership workshops for members of producer groups who are in, or considering standing for, leadership positions within their FBOs. The Gender STTA will review existing leadership curricula and, in conjunction with the FED BEE Specialist identify Liberian training institutions to conduct trainings. The Gender STTA will develop the curriculum and conduct a TOT with interested staff from FED, the MoA, and MoGD as well as with the identified Liberian training institutions.

### Activity 4.3.3. Improving Female Producers' Access to Finance

Expanding women's access to credit is an essential step towards improving women's access to inputs, and is, therefore, one key to improving their agricultural productivity. Gender-related activities in year two will focus on ensuring Component 2 activities, aimed towards expanding access to finance, are gender-sensitive and positively promote women's access to and success in utilizing financial services.

FED's Financial Services STTA (Mary Miller) in Component 2 will ensure that loan products and lending programs reflect best practices and lessons learned (see the Presidential Initiative to End Hunger in Africa, IEHA) in creating gender- sensitive loan products and lending practices. To make financial services more accessible and gender- friendly, the Gender STTA will identify/adapt/develop a training module on working with female borrowers to be used as part of the Loan Officers Training activity conducted through a Liberian training institution contracted through the MDF.

Capacity building will be integrated into existing Component 2 trainings conducted by institutions such as AEDE, Educare, Rights and Rice Foundation, Pace Management. Female borrowers could benefit from additional support such as asking for a loan (role playing, etc.), preparing the necessary documents, understanding what to expect in the borrowing experience, and any fact sheet materials explaining different loan products. A local women's BDS provider could provide designated services to individual female FED partner managers. Larger, private sector banks may provide staff to volunteer their time to mentor potential female borrowers as part of their social responsibility.

### Activity 4.3.4 Supporting FED Partner Educational Institutions to Better Serve Female Students

Working with the Agriculture and Extension Education Specialist, Dennis Eaton, FED's Gender STTA will provide technical assistance to partner educational institutions (BWI, GBCC,, Nimba CC, Lofa CC) to recruit and retain more female students and faculty; ensure that faculty are trained in gender-sensitive teaching methods; ensure like outcomes of education for female students, that curricula reflect best practices in gender; promote leadership among female students, ensure that female students get like jobs and internship opportunities as male students; and alumni organizations provide services for females.

FED's partner academic institutions will receive gender-sensitive capacity building training from those local institutions FED trains in gender-sensitive training delivery and methodology (see above). In this way, FED will be creating a demand for the services of local training institutions. For this activity, FED will seek to engage the private sector and particularly private sector actors in agro-business, by matching successful women in agro-business with female students in the educational institutions. (The Gender Specialist will be paired with the Vocational Educational Specialist, and work through local NGO's such as AEDE, Educare, Rights and Rice Foundation, Pace Management).

## FIGURE 4.1: GENDER MAINSTREAMING IN LIBERIA FY 2013

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| **Crosscutting Activities** | | | |
| Traditional gender norms inhibit women's ability to attend, meaningfully participate in and benefit from FED knowledge transfer and capacity building activities.<br><br>Traditional gender norms inhibit women's ability to operationalize knowledge transferred through training and capacity building activities. | Build the capacity of FED staff and FED supported capacity building institutions to deliver state of the art gender-sensitive and inclusive trainings, demonstrations and other capacity building and knowledge transfer activities. | Develop inclusive training and delivery curriculum, conduct TOT, and step-down trainings for selected FED staff and Liberian capacity building institutions.<br><br>Provide technical assistance to FED staff and Liberian capacity building institutions.<br><br>Develop tools to evaluate and monitor FED knowledge transfer activities. | Women participate in and benefit from FED knowledge transfer and capacity building activities to the same extent as men.<br><br>The capacity of Liberian training institutions to provide cutting edge inclusive training is improved. |
| **Component 1 Activities** | | | |
| FBOs do little to advance the interests of female members.<br><br>FBOs leadership is not responsive to the needs of female members.<br><br>Gender based constraints often limit the ability of women in leadership positions in FBOs to effectively advance women's interests.<br><br>Women tend to be under represented in leadership positions in FBOs. | Enhance the capacity of FBO leadership to be more responsive to the needs of female members.<br><br>Enhance the leadership capacity of women in FBO leadership positions and women who aspire to be in FBO leadership. | Training and technical assistance to FBO leaders to promote responsiveness to women and gender considerations.<br><br>Develop curricula, conduct TOT and roll out training to promote leadership skills of women in FBOs.<br><br>Design and roll out mentorship and networking for female leaders of FBOs. | FBOs are more responsive to the needs of female members.<br><br>The benefits of participation in FBOs are improved for women.<br><br>More women join FBOs.<br>Female leadership within FBOs is more effective.<br><br>The proportion and number of women serving in leadership positions of FBOs is increased. |
| **Component 2 Activities** | | | |
| Go-Buy-Chop women are known to exploit female producers | Minimize the potential for Go-Buy-Chop women to exploit female producers | Analyzing the Role of the "Go-Buy-Chop" Women<br>See 3.1 Enterprise Development | Research that will inform the design of activities to improve the bargaining position of female producers vis-à-vis Go- Buy-Chop women |

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| The lack of female extension agents limits the access of female producers to information and technology. | Mobilize women to serve as extension agents. | Study on ways to increase the proportion of female agricultural agents.<br><br>Design and operationalize an extension agent tracking system for the MoA. | The number and proportion of female extension agents is increased.<br><br>Female producers have improved access to knowledge and technologies. |
| Women's ownership of and access to land is curtailed due to discriminatory policies and the inability of women to assert their rights. | Promote policy changes that advance women's land ownership and access to land.<br><br>Improve women's awareness of their rights and create an enabling environment for them to advance their rights to land. | Study on women's access to and ownership of land and design awareness and advocacy activities.<br><br>See 4.1 Land tenure | Groups working on land policy reform advance a core set of principles that promote women's rights to land.<br><br>Effective rights education and advocacy activities are designed. |
| Women's access to finance is inhibited by:<br><br>Loan products that do not to take the gender-based constraints into consideration.<br><br>Women's lack of knowledge about loan products and confidence and preparedness to access them.<br><br>Lending institutions and loan officers that intimidate women or are inconvenient for them to use. | Design female friendly loan products.<br><br>Enhance lending institutions capacity to better serve female clients.<br><br>Promote awareness and improve the capacity of women to access loans. | Design women-friendly loan products.<br><br>Curriculum design, TOT and training for Loan Officers.<br><br>Technical assistance to lending institutions.<br><br>Capacity building and coaching to promote female borrowers' preparedness.<br><br>See 3.2 Finance | Gender-friendly loan products are available to women.<br><br>Lending institutions and loan officers are better able to meet the specific needs of female clients.<br><br>Improved awareness of loan products among women.<br><br>The number of women seeking loans is increased. |
| **Component 3 Activities** | | | |
| Educational institutions do not optimize opportunities to create female-friendly learning environments and support female students. | Improve the capacity of educational institutions to implement gender-sensitive policies and procedures and better meet the needs of female students. | Gender assessment and targeted technical assistance to FED partner educational institutions. | Improved learning and professional outcomes for female students. |
| **Component 4 Activities** | | | |

| Major Constraints | FED Proposed Solution | Activities Addressing Constraint | Expected Impact/Output |
|---|---|---|---|
| Inconsistent knowledge of how to apply best practices in gender to FED programming among FED staff.<br><br>Lack of systems in place to capture and disseminate knowledge of FED gender-related lessons learned. | Build the capacity of FED staff to implement gender-sensitive activities and contribute to the body of lessons learned from women in agriculture | Tools and operational procedures and technical assistance.<br><br>Gender training for county managers and FED staff.<br><br>Documenting and disseminating FED's lessons learned. | FED's ability to extend programmatic benefits to women is enhanced.<br><br>FED's capacity to address gender-based constraints that inhibit women's meaningful participation in agriculture enhanced. |

# SECTION THREE: PROGRAM MANAGEMENT

## A. COMPONENT MANAGEMENT

Role of DAI and its partners

**DAI:** Responsible for overall management, performance monitoring, quality assurance oversight, and leadership and direction of all three components. Coordinates security, operations, finance, subcontractors, procurement, and knowledge management; providing home office support and technical oversight. Primary liaison with USAID, USG agencies, the GoL, and team partners. Provides Chief of Party, Jonathan Greenham, Deputy Chief of Party/Enterprise Development Specialist, Agnes Luz, Business Enabling Environment Specialist Melanie Bittle, DCOP Finance/Operations, Arthur Dela Cruz, (M&E Specialist TBD), and Technical Program Coordinator, Boima Bafaie. Annex II FED Org Chart, details all of the current FED positions. STTA as needed in agriculture and value chain development, enterprise development, policy, finance, knowledge management and ICT as detailed in Annex III.

**Winrock International:** Provides an Agribusiness Specialist, responsible for strategic vision and overall management of Component 1 (Inputs, Extension) and Liberian LTTA to implement the peri-urban garden activities. Provides short-term technical assistance (STTA) as needed in agricultural processing and enterprise development; value chain support in horticulture, cassava, and rice. Works with COEs to develop extension materials and methodology and train trainers; train and develop local equipment suppliers, and farmer-based organizations and link them to credit and other service providers.

**International Fertilizer Development Center:** Provides Input Specialist Jean Nyemba to manage Input Supply activities and Liberian LTTA for county office technicians supporting dealers. Works to develop Liberia relevant materials, and train and develop agro-input dealers and associations and link them to credit and other service providers. Provides STTA as needed in increasing farmer access to inputs and technical support for pilots of UDP and ISFM.

**Louisiana State University Agricultural Center:** Provides LTTA Curriculum Development Specialist for Capacity Development at the Vocational Agriculture Institutes. Provides STTA as needed and required in capacity building and across the four value chains.

**The Cadmus Group**: Provide STTA for all required environmental impact reviews, environmental compliance, and training; provide development of supplemental IEEs/IEE amendments.

**CEDPA/Plan International:** Provide Gender STTA.

While Samaritan's Purse was an initial subcontractor under the FED program, they will not continue to be partners in year 2. DAI is completing the paperwork required to remove Samaritan's Purse (termination for convenience). After a year of trying to finalize a subcontract and start programmatic work, we agreed that they simply did not have the time, the knowledge of USAID contracts, or the human resources to carry out the agreed upon SOW under FED.

## B. ROLE OF MONROVIA AND COUNTY OFFICES

Though FED is a field based project, the Monrovia office plays an important role in providing financial and administrative support to FED's county offices. In addition, it serves as the hub for field activities and technical coordination between the GoL, enterprises, and other donors. Technical staff that are based in Monrovia spend a significant amount of time outside of the office visiting and monitoring field programs, up to 3-4 days each week, occasionally longer.

Over the last year, to support the Monrovia-based team's field activities, FED has established five county offices to support field programs. FED has offices in Monrovia (Montserrado County), Kakata (Margibi County), Suakoko (Bong County), Voinjama (Lofa County), Buchanan (Grand Bassa) Compound # 3, and Ganta (Nimba County). These regional and sub-offices house logistics support and office space for FED program field and traveling staff. Many are co-located with FED county partners, such as the MoA County Agricultural staff in Ganta, Compound 3 and Voinjama or at BWI. With FED's county offices fully operational in year two, an increased number of field-level programs will be implemented, relationships solidified with FED stakeholders, community input solicited further and momentum gained.

### ROLES AND RESPONSIBILITIES OF FED STAFF

One of the lessons learned from year one is that FED needs additional expatriate technical assistance to help support, integrate, and better coordinate all component activities. After an extensive recruitment effort, FED identified Agnes Luz, a seasoned development practioner with outstanding technical and managerial qualifications to fill a newly created DCOP/Technical position (filling the Key Personnel Enterprise Development slot). FED hopes to have her join the team before 2013. Ms. Luz will oversee all programmatic activities under Components 1 through 3 and help to integrate, troubleshoot, and build synergies amongst component leads and FED's key partners. She will also oversee all MDF activities. Under this new structure, the Component Leads and MDF team will report to Ms. Luz and she will in turn report to the FED COP.

The Technical Program Coordinator (TPC), Boima Bafaie, is based in the Monrovia office with frequent travel to the field. The TPC, under the direct supervision of the COP, is responsible for planning, directing and overseeing all field related activities, all field staff, and ensuring that contract deliverables are achieved. He coordinates the various technical field related activities to support all of FED's efforts, coordinates with other programs in the county, and directs the overall field program management. The TPC also takes responsibility for ensuring that the data required for M&E is collected and reported to the central M&E office in Monrovia.

The four priority counties, Lofa, Nimba, Bong, and Grand Bassa have a County Manager, who provides the day-to-day supervision of the field based staff in the county. The staff in each county office includes an administrative/logistics assistants, extension staff, enterprise development assistants, and M&E staff. The type and number of the other field-based staff depend on the specific nature and scale of the activities in that county. The County Manager in each of the County Offices reports to the TPC for all field related activities.

FED will also be seeking USAID approval to hire Gwendolyn Armstrong, an Community Specialist that will focus on finding ways to include more women and youth in FED's activities (mobilized in Q1).

## C. COORDINATION

Coordination at all levels is central to the successful implementation of the FED program. FED will continue to coordinate all Monrovia and field-based programs with relevant Ministry counterparts.

This is essential to ensuring that the relevant Ministries are on board with FED's programs, are involved in their implementation (CACs, extension staff, university faculty, etc.), there is knowledge transfer, and Ministry staff have the capacity and resources needed to continue programs once FED disbands. Some Ministry-level activities that FED will collaborate on include drafting a National Livestock Policy, developing an extension tool kit for MoA Extension Officers, conducting an IT needs assessment of MoA to see what technologies could help extension agents, and working with the MoHSW to develop and disseminate a widespread nutrition campaign.

In year two, FED will continue to coordinate with other donors/programs including FAO (through FFS), LAUNCH (around nutrition), LMEP (data collection and special studies), Farmer to Farmer to tap into their TA network, and with SIDA to leverage their investments in infrastructure (roads). In addition, FED will continue to attend monthly MoA meetings (both national and county-level), including the various County Agriculture Coordination Groups, National Agriculture Coordination Committee, National Cassava Coordination Committee, National Rice Sector Working Group, and Peri-Urban Agriculture Working Group meetings. Participation at these meetings will ensure that FED is tapped into and in tune with all opportunities to build synergies. FED will continue to work with CARI (for improved rice varieties and cassava cuttings) and IITA (for research multiplication for improved planting material for cassava). Coordination is critical to avoid duplicating efforts, undermining gains made, and ensuring that FED leverages resources to the maximum extent possible.

## D. COMMUNICATIONS

The goal of the FED communications department is to increase the visibility of the core program accomplishments, and promote the story of FED activities and projects both internally, and to external facing audiences. Working in collaboration with local partners, including the MoA communication department, local Liberian radio stations, and other parties, FED continues to expand its media outreach. Additionally, the communications team is focusing on strengthening and improving internal, cross-sector communication via specific communication products, trainings, and tools. This includes working across all three components to coordinate media, radio, and communication efforts.

A FED project website will no longer be pursued given new USAID rules and regulations; therefore, FED is focused on pursuing social media outlets. Toward this aim, FED will utilize the DAI global outreach network via Facebook, Twitter, and Flickr and the USAID-Liberia website and Facebook into communication product distribution, utilizing all multi-media pieces, press releases, photos, success stories, and other FED project information. Social media will become a powerful tool in engaging specific audiences into the personal narratives and accomplishments of the project going forward. FED has designed and will promote a regular newsletter distributed internally, and to the MoA, local partners, and USAID on a quarterly basis. It covers FED personnel, field stories, visiting groups, and large initiatives and projects by long and short term FED staff.

Working across all three FED components and value chains, the communications team will actively engage in radio and television advertisements, forums, and programs to promote the FED message, and solicit interest and information across all Liberian counties, targeting selected farmers, farmer organizations or associations, private-enterprise actors, and other relevant government agencies and ministries. This includes incorporating the Liberia Media for Democratic Initiatives (LMDI) as an active partner in raising public awareness and education on the intent and benefits that Liberian farmers and the general public stand to gain from FED project goals and initiatives via radio program broadcasts.

## E. CAPACITY BUILDING

FED is committed to building Liberian capacity at all levels. We are working with the MoA and other partners to identify and support additional, relevant opportunities to build capacity and improve their staffs' skills. Such opportunities could include regional study tours, internal trainings, exchanges with international universities, etc. One opportunity FED is currently exploring is sending MoA and partner staff to a six month intensive *rice transfer of innovation* training in India. There is another potential training opportunity for *women in agriculture* for FY13, which FED will also work to identify relevant project stakeholders to attend. FED will continue to build the capacity of Liberian farmers through demonstrations and trainings and enterprises through intensive business skills training, gender mainstreaming training, and targeted mentoring.

Internally, the FED program plans to expand its staff capacity building program. Working with FED's Training Specialist, FED is developing a comprehensive training menu that staff can reference when trying to identify appropriate training programs to improve their skills. Potential trainings programs could include: project management and planning, reporting, USAID contract compliance, basic Microsoft Word skills, training on CAADP and LASIP, value chain analysis, agribusiness skills, etc. In addition, The FED Training Specialist will be organizing a monthly lunchtime speaker series—topics will include areas of interest identified by the staff (i.e., how to gain access to finance, mobile money, using technology to further projects (GPS, ICT), gender awareness, etc.). Training for the FED demonstrations will be conducted collectively.

## F. MANAGEMENT OF THE MARKET DEVELOPMENT FUND-MDF

To achieve the major changes needed in the Liberian agriculture sector, FED developed a Market Development Fund (MDF), a subcontracting mechanism with a timeline, fixed priced deliverables, and responsibilities on both sides to fund FED interventions. The MDF is a subcontract mechanism; it is not disbursing grants or loans and is not a conventional source of business or organizational financing. Through the MDF, FED aims to leverage capital investments of individuals, groups, or firms in innovation, inputs, training, equipment, and infrastructure. The MDF helps partners obtain finance from other sources. The MDF generates competition through contractual partnerships, on a cost-sharing basis with reciprocal obligations.

The Market Development Fund is FED's instrument to support risk taking by entrepreneurs while combatting the 'give/get-things-free' approach to agricultural development. The MDF is supporting value chain participants, including farmers, transporters, processors, packagers, marketers and all associated industries, small and large, in both the private and the public sector, to overcome critical constraints to generating increased income by taking full advantage of existing and emerging market opportunities. The MDF is designed to be a flexible tool to help FED achieve its objectives and intermediate results.

The MDF is not designed to disburse grants or loans and is not a conventional source of either business or organizational financing. FED leverages individuals', groups', or firms' capital investments in inputs, training, equipment, small infrastructure. The MDF can also help support obtaining finance from normal lenders – banks or MFIs. The MDF is set up to generate competition to establish contractual partnerships, on a cost-sharing basis with reciprocal obligations. The Liberian Government's policy is to cease the provision of highly subsidized or free services to donor program and GoL beneficiaries. All FED program elements, including the MDF will respect this policy enthusiastically and will discourage those, who continue to sabotage the agricultural sector with free goods and guaranteed, non-competitive markets.

**MDF ELIGIBILITY:** The MDF will continue to make awards on a competitive basis, following the issuing of RFPs or IQCs for specific investments or for all those with commercial ideas to propose within the confines of the agricultural economy. FED makes cost-sharing awards to applicants who propose innovative approaches to accelerating the realization of growth opportunities within the four targeted value chains.

**MDF MANAGEMENT:** The Fund is now fully operational; the MDF Manual was completed and the Technical and Administrative Management Information System (TAMIS) MDF system was established in the spring of 2012. Local MDF staff including a MDF Specialist (1) and MDF Coordinators (2) were hired in the summer of 2012 and have each been assigned to a specific component. County staff have also been trained in the MDF procurement cycle and we anticipate a growing number of MDF concepts and awards being generated from the county teams. All MDF staff are now fully trained to oversee the MDF process—from concept—to award. In early 2013, FED anticipates DCOP/Technical, Agnes Luz's arrival; she will help to oversee all program components and also will ensure that the MDF is operating smoothly and meeting the programmatic needs of all components.

Adjustments to the MDF process have been made and a new "concept" stage has been introduced to help address questions/concerns before the "concept" is entered into the MDF TAMIS as an activity. An MDF committee (consisting of FED staff members from finance/operations, technical team, senior management, and MDF) is formed regularly to review concepts. Following a vote, the committee will either choose to move the concept forward, reject it, or ask for it to be reviewed again once questions and concerns are addressed. We are confident that this additional step will help to streamline the approval process and result in an increased number of MDF awards in year two.

It is envisioned that when FED ends in 2016 it will go unnoticed as the human and economic investments will remain in country through GoL, farmers, private sector, and other partners that FED has supported throughout the program. Our job over the next four years is to equitably train, invest in, and empower Liberians in the agriculture sector to be change agents so in four years FED is an afterthought. Practically speaking, FED will ensure that all MDF activities end at least three months before the project closes down per our MDF Manual and USAID rules and regulations. MoUs and any other contractual agreements between the stakeholders and FED will cease before FED's closedown.

### ESTIMATED EXPENDITURES FOR MDF

| MDF Budget | Est. Yr. 1 | Yr. 2 | Yr. 3 | Yr. 4 | Yr. 5 |
|---|---|---|---|---|---|
| Awards | $400,000 | $5,700,000 | $6,800,000 | $4,500,000 | $1,000,000 |

## G. OVERVIEW OF THE FED ENVIRONMENTAL MONITORING SYSTEM

FED has implemented a comprehensive environmental compliance framework that conforms to Liberian and U.S. government requirements for environmental management of project activities. This includes preparation of the USAID-approved project Initial Environmental Examination (IEE), which is reviewed on a regular basis—and amended as needed—to ensure consistency with FED workplans and field-level interventions. FED has also developed and is following an Environmental Mitigation and Monitoring Plan (EMMP) that limits the potential adverse impacts of project activities as discussed and assessed in the IEE. As part of EMMP implementation, FED regularly prepares and reviews multiple environmental compliance controls and safeguards, including a Water Quality Assurance Plan (WQAP), and stand-alone technical analyses of rice value chain activities and the

introduction of Modern Transitional Technologies. FED will continue implementing the EMMP and will ensure its consistency with the project IEE and all environmental compliance requirements.

In addition to preparing documentation in accordance with USAID Environmental Procedures, FED has made significant investment in operationalizing the environmental compliance requirements enumerated in the project IEE and EMMP. Given the range of activity types and the project's geographic scope, a full-time Monrovia-based Environmental Officer position was created to oversee implementation of the EMMP and to ensure continued alignment of on-the-ground efforts with the governing IEE. The Environmental Officer works closely with FED County Managers to clarify environmental compliance requirements and makes regularly scheduled field visits to monitor implementation of the EMMP. This field monitoring allows FED to adapt or revise the EMMP to best suit project realities, and to address any gaps in effective mitigation of environmental impacts. Through this position FED is able to ensure that management level decisions and field implementation conform to FED internal and USAID processes. The Environmental Officer integrates environmental monitoring within the project M&E function.

A key operational resource for overseeing implementation of IEE conditions and EMMP requirements is the Technical and Administrative Management Information System (TAMIS), FED's internal project management application. TAMIS integrates environmental management criteria as part of the activity proposal, review, and approval process, and all activities linked to EMMP requirements are reviewed by the Environmental Officer. In addition to establishing environmental mitigation as a critical path issue for activity review and approval, this process automatically creates a record that facilitates downstream monitoring—FED managers understand precisely where and how an EMMP-linked activity will be implemented, and are assured that EMMP-based mitigation and monitoring requirements are communicated to the requesting manager. While TAMIS is a powerful resource in the office, field monitoring is central to FED's long-term environmental management strategy. The development of customized checklists, monitoring forms, and other resources will continue as FED activities gain additional traction in the target Counties, and specific monitoring needs emerge. FED's organization structure and investment in personnel and management tools support an adaptive approach that meets stakeholder criteria.

The USAID-approved project PERSUAP guides all pesticide-related efforts, and establishes clear standards for safe pesticide use at all stages. FED will continue training and capacity building in pesticide safety in Year 2, and will ensure that a separate EMMP pertaining to the use of specific products is implemented. These environmental compliance efforts will be supported by the project's full-time, Monrovia-based Environmental Officer. The FED Environmental Officer is also responsible for overseeing the project EMMP and for facilitating environmental monitoring and reporting.