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The U.S. Government's Global Hunger & Food Security Initiative

Liberia: Desk Study of Extension and Advisory Services

Developing Local Extension Capacity (DLEC) Project

June 2017

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Acknowledgements

Written by Vickie Sigman in collaboration with Kristin Davis of IFPRI, this analysis was compiled for the DLEC project under USAID Cooperative Agreement No. AID-OAA-L-16-0002.

This report is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Digital Green and do not necessarily reflect the views of USAID or the United States Government."

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ACRONYMS

ACC	Agriculture Coordinating Committee
AFAAS	African Forum for Agricultural Advisory Services
AFDB	African Development Bank
AFT	(Liberia) Agenda for Transformation
AIS	Agricultural Innovation System
BMZ	Bundesministerium Für Wirtschaftliche Zusammenarbeit
CAADP	Comprehensive Africa Agricultural Development Program
CAC	County Agriculture Officer
CARI	Central Agricultural Research Institute
CDA	Cooperative Development Agency
CDC	Centers for Disease Control
CDP	Cooperative Development Program
CNFA	Cultivating New Frontiers in Agriculture
CRS	Catholic Relief Services
DAI	Development Alternatives, Inc.
DAO	District Agriculture Officer
DLEC	Developing Local Extension Capacity
DPD	Department of Planning and Development
DRDRE	Department of Regional Development, Research and Extension
DTS	Department of Technical Services
EAS	Extension and Advisory Services
F2F	Farmer to Farmer
FAO	Food and Agriculture Organization
FBO	Farmer-based Organizations
FED	Food and Enterprise Development
FFS	Farmer Field School

FUNL	Farmers Union Network of Liberia
FY	Fiscal Year
GAFSP	Global Agriculture and Food Security Program
GDI	Gender Development Index
GFRAS	Global Forum for Rural Advisory Services
GHI	Global Hunger Index
GNI	Gross National Income
GOL	Government of Liberia
GPS	Global Positioning System
HDI	Human Development Index
HIES	Household Income and Expenditure Survey
HR	Human Resources
ICTs	Information and Communication Technologies
IDG	International Development Group
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
IMF	International Monetary Fund
LADA	Liberia Agribusiness Development Activity
LASIP	Liberia Agriculture Sector Investment Plan
LATA	Liberia Agriculture Transformation Agenda
LEAD	Liberia Entrepreneurial & Asset Development
LIFAAS	Liberia Forum for Agricultural Advisory Services
LISGIS	Liberia Institute of Statistics & Geo-Information Services
M&E	Monitoring and Evaluation
MFDP	Ministry of Finance and Development Planning
MGD	Ministry of Gender and Development

MIS	Market Information Systems
MOA	Ministry of Agriculture
NEPAD	New Partnership for Africa's Development
NMCDP	National Millennium Compact Development Project
PRMGE	Poverty Reduction and Economic Management – Gender and Development Group
PSM	Public Sector Modernization
R&D	Research and Development
SAPEC	Smallholder Agriculture Productivity Enhancement and Commercialization
SHOPS II	Smallholder Oil Palm Support II
SIDA	Swedish International Development Cooperation Agency
TAP	Tropical Agricultural Platform
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
VSLA	Village Savings and Loan Association
WAAPP	West Africa Agriculture Productivity Program
WTO	World Trade Organization

INTRODUCTION

Spurred by the 2007-2008 global food crisis and following years of disregard, agricultural extension and advisory services (EAS) are increasingly receiving the attention of the development community. The EAS of today are not the same as EAS of yesteryear and, as such, are progressively viewed as a critical piece in advancing agricultural development and solving the challenging puzzle of reducing hunger and poverty. EAS is one of several agricultural preconditions, including farmer-focused research; accessible markets, inputs, land and profitable technologies; financial services; and a supporting enabling environment, necessary to achieve inclusive economic development and hunger and poverty reduction.

The traditional and linear view of EAS holds that researchers give extensionists agricultural production technology and extensionists then train farmers to use it. EAS have evolved considerably and are herein defined more broadly as: All the different activities that provide the information and services that are needed and demanded by farmers and others along value chains to know about and make informed decisions regarding agricultural practices in order to improve their livelihoods and well-being (Christoplos, 2010; Hird-Younger & Simpson, 2013). Practices include, for example, those related to production, processing, marketing and finance.

The African-led initiative to transform continental agriculture, Comprehensive Africa Agricultural Development Program (CAADP), recognizes that attaining the goal of six percent annual growth in agriculture, agreed upon by those countries party to the program, requires investments in a range of agricultural services including EAS. The recent CAADP Strategy and Roadmap to accelerate African agricultural growth and transformation for shared prosperity and improved livelihood indicates a key action is "to support agricultural research and development (R&D) and advisory services for the development, dissemination and adoption of technologies and innovations" (African Union, 2014, p. 22).

The United States Agency for International Development (USAID), along with other bilateral and multilateral assistance, supports CAADP. In sync with CAADP extension objectives is the recently launched USAID-funded Developing Local Extension Capacity (DLEC) project. DLEC is a global project which targets Feed the Future focus and aligned countries in Africa and those on other continents.

DLEC, a five-year activity, is led by Digital Green. The project is implemented in partnership with the International Food Policy Research Institute (IFPRI), CARE International the Global Forum for Rural Advisory Services (GFRAS) and multiple resource partners. By collaborating with USAID missions, host-country governments, public and private EAS providers, rural civil society organizations, and host-country research institutes, DLEC helps host-country EAS become more effective, accountable, scalable and sustainable.

This report is a component of DLEC's initial diagnostic work and is a desk study of EAS in Liberia. The USAID Country Development Cooperation Strategy for Liberia 2013-2017 has Sustained Market-Driven Economic Growth as one of its Development Objectives (USAID/Liberia, n.d.). Relative to EAS, the approach to achieve this development objective encompasses support for Government of Liberia (GOL) reforms to redefine and reorganize its systems for delivering extension as well as support to enhance both public and private provision of extension

(USAID/Liberia, n.d.). The purpose of this report is to provide information on the status of EAS in Liberia by building on existing literature and to make recommendations for future EAS interventions to strengthen Liberia's EAS system that could contribute to the DLEC learning agenda. Recommendations are intended for consideration by any interested EAS stakeholder.

CONCEPTUAL FRAMEWORK

DLEC uses the best-fit adapted framework (Birner et al., 2009) shown in Figure 1 to guide analyses and to determine EAS areas of focus for on-the-ground activities that are within DLEC's manageable interests. DLEC uses the framework to guide DLEC's learning agenda because it outlines EAS system parameters and identifies the levers of change within it. In each country, the levers of change will differ. The best-fit framework allows users to analyze a country's EAS system, begin conversations with local stakeholders to understand the state of their EAS system and where the critical levers for change might be and analyze and recommend systems change. The framework also enables users to compare across countries.

The framework identifies characteristics of EAS systems on which policy decisions must be made, and the frame conditions to be considered when making decisions. The frame conditions include: the political economy, the business/market and civil society environments, agroecology and the agricultural innovation system. The framework suggests an impact chain approach to analyze the performance and impact of EAS.

Key for DLEC are the EAS characteristics shown in the framework. Referring to Figure 1, the governance structures and policy environment variables (box F) refer to institutional set-up of EAS, or the "rules of the game." The organizational and management capacities and cultures variables (box G) refer to capacity for provision of advisory services, and way in which the services are managed within the respective governance structures. These are essentially the "players" of the game, their abilities, and the way they play.

Advisory methods (box H) are used by EAS field staff in interactions with farmers. Advisory methods can be classified according to various aspects, such as the number of clientele involved (individuals, groups); the types of decisions on which advice is provided (specific to the production of certain crops or livestock; managerial decisions; group activities, etc.); and media used (radio; internet, etc.).

Market engagement (box I) refers to the market elements that EAS can use to better serve farmers, such as aggregation, finance, price discovery and input and output markets. Livelihoods strategies (box J) refers to how EAS develops content to meet the unique needs of clientele and how gender roles impact farming strategies. Community engagement (box K) refers to EAS services based on local social institutions, mechanisms to articulate demand and community psychosocial characteristics.

The frame conditions (boxes A-E) are outside DLEC's manageable interests. The "manageable" outcomes of this framework include the system-level performance areas (box L). The outcomes and ultimate impact at the farm household level (boxes M and N) are outside the core DLEC leader award manageable interests.

Further the building blocks for EAS are also useful in framing recommendations for engagement. They are as follows:

- Customer – farmers and their unique needs
- Content – knowledge being shared
- Methods – how information and knowledge is shared
- Provider – who shares information and knowledge

This report also addresses cross-cutting EAS issues, such as women and youth engagement, climate change resilience, food and nutrition security, and use of information and communication technologies (ICTs).

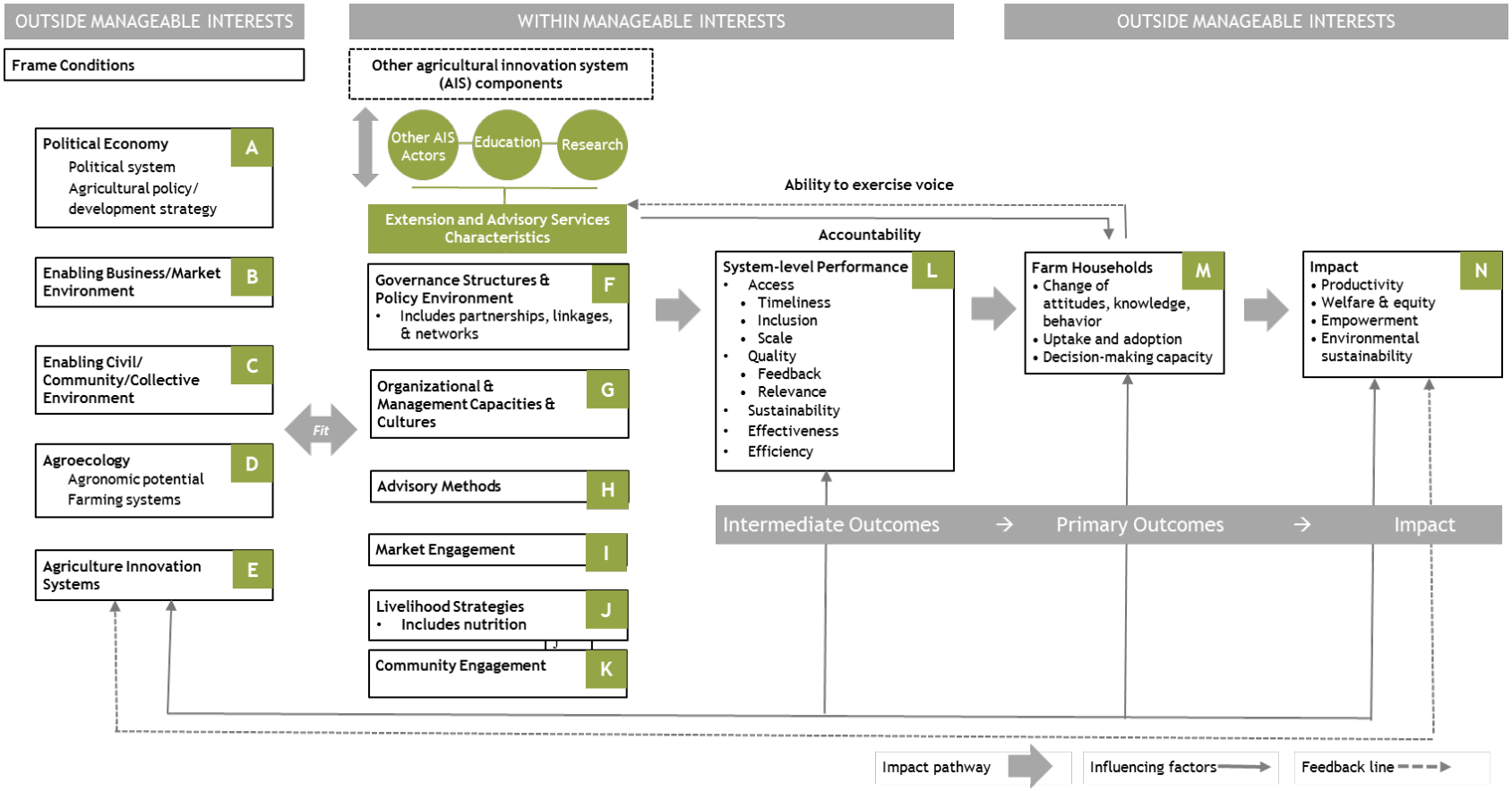

Figure 1. Conceptual Framework for the Study

Source: Adapted from Birner, et al., 2009.

METHODS

This report is based largely on an April 2017 review of existing literature on the EAS system in Liberia. The report builds on the Worldwide Extension Study (Qamar, Swanson, & Bohn, 2013) and other work on EAS in Liberia referenced throughout this report. Additional documents reviewed include annual, monitoring and evaluation and other technical reports; journal articles and other academic documents; and government publications. Documents reviewed were authored by various EAS stakeholders, such as the Liberian and other governments; international and national organizations, agencies, universities, nongovernmental organizations (NGOs) and other civil society actors; and for-profit entities. The author initiated e-mail and/or telephone discussions with several Ministry of Agriculture (MOA) officials, who hold expert knowledge and understanding of Liberia's EAS. She also drew on her two years of experience in Liberia working in agricultural development. Otherwise, this report does not include primary data nor direct observation of EAS in Liberia.

RESULTS

Frame Conditions

Three major events over the past three decades profoundly impacted Liberia's development: the civil war, the election of President Johnson-Sirleaf and the Ebola virus disease. The brutal civil wars from 1989 to 2003 virtually destroyed all of Liberia's infrastructure and systems. A reported quarter of a million people were killed with many more suffering (Cutler, 2011). A Peace Agreement was finally signed in 2003 with the promise of a two-year transitional government in preparation for elections in 2005. The first woman president of an African nation, Ellen Johnson Sirleaf, was elected in 2005 and began the difficult process of rebuilding. She ushered in Liberia's first Poverty Reduction Strategy, which recognized agriculture as a major driver advancing the aim of rapid, inclusive, sustainable growth and development (International Monetary Fund [IMF], 2008). From a very low starting point, Liberia's economy began experiencing important improvements. President Sirleaf was re-elected in 2011; the peace held; and strides forward were being made. In March 2014, the tragedy of the Ebola epidemic struck Liberia. In the words of the President, "The outbreak has changed our way of life, challenged our cultural and religious practices, and resulted in the decline of economic and commercial activities and livelihoods." (GOL & Liberia's Development Partners, 2015, p. 3) In January 2016, Liberia was declared Ebola free, having

Figure 2. Map of Liberia

Source: Retrieved from http://www.mapcruzin.com/free-maps-liberia/liberia_sm_2008.gif

experienced over 10,000 total cases and almost 5,000 deaths (Centers for Disease Control [CDC], 2016).

Liberia is a land of rich natural resources, including iron ore, timber, diamonds and gold. The country has the soil, rainfall and climate suitable for very productive agriculture (Fintrac, 2015a). Agriculture plays a key role in the economy, with smallholder agriculture dominating although increasingly there are large-scale commercial farms and concessions.

Table 1 provides data on key development indicators, which influence and are influenced by Liberia's agricultural sector and EAS. Statistical data in Liberia vary depending on source and definition. Where possible, this report uses data from Liberia's Household Income and Expenditure Survey (HIES) 2014 (Liberia Institute of Statistics & Geo-Information Services [LISGIS], 2016a & 2016b), data from other sources reported in the HIES 2014 or data from other Liberian sources.[1]

Table 1. Key Development Indicators

Indicator	Result	Reference
Population	4.1 million	HIES 2014 (LISGIS, 2016a)
Human Development Index (HDI)	.427	United Nations Development Programme (UNDP) Human Development Report, 2016.
Gross national income (GNI) per capita	$700	World Bank Databank (cited in HIES 2014).
Share of people living below poverty line	54.1%	HIES 2014 (LISGIS, 2016a)
Literacy rate	67%	HIES 2014 (LISGIS, 2016a)
Electrification rate	14%	HIES 2014 (LISGIS, 2016a)
Gender Development Index (GDI)	.833	UNDP, 2016.
Child Malnutrition (Under age 5 Stunting)	32.1%	UNDP, 2016.
Population covered by mobile cell network	60%	International Telecommunication Union, (cited in World Bank, 2017a)

- Liberia's population is around 4.1 million. About 60 percent of the population lives in urban areas. The distribution of population is quite skewed. Almost one-third of the total population resides in and around the capital city of Monrovia. The Liberian population is very young with around 50 percent of the population less than 18 years old and 45 percent less than 14 years old (LISGIS, 2016b).
- A composite measure of life expectancy, years of education and Gross National Income (GNI) per capita, Liberia's HDI is 0.427. The index ranges from 0 to 1 where 1 is the maximum. This places Liberia in the low human development category at 177th of a total of 188 countries and territories. Comparatively, HDIs for sub-Saharan Africa and the world are .523 and .717 respectively.

[1] LISGIS typically reports agricultural data in its HIES. However, data collection for the 2014 report was halted early due to the Ebola outbreak and thus insufficient agricultural data to report were obtained.

- The GNI per capita is reported at US $700 with over one-half of the population living below the poverty line. Rural poverty is higher (70 percent) than urban poverty. The poverty rate is highest in the farthest south-eastern area (79 percent) and lowest in and around the capital city (32 percent).
- There are wide differences between rural and urban and male and female literacy rates. Compared to the national literacy rate of 67 percent, urban dwellers (76 percent) are more likely than rural dwellers (50 percent) to be literate and males (81 percent) are more likely than females (55 percent) to be literate.
- A mere 14 percent of Liberians have access to electricity. Only about four percent of the rural population and 22 percent of the urban population have access.
- The GDI is a ratio of female to male HDI values. Liberia's value is .833. Index values can be categorized by group which range from Group 1, where there is high equality in HDI achievements between women and men, to Group 5 where there is low equality in HDI achievements between women and men. Liberia is in the lowest Group 5 and its value is lower than that of sub-Saharan African and the world, at .877 and .938 respectively.
- Liberia's height-for-age measure (32.1 percent) is better than that in other countries in the "low human development" group (37.7 percent) to which Liberia belongs.
- Around 60 percent of Liberia's population is within range of a mobile-cellular signal. Cellular subscriptions per 100 inhabitants have grown to 81 in 2015. Conversely, internet use is minimal with an estimate of around nine percent of the population using internet in 2016 (internet live stats, n.d.).

Several national level policies articulate Liberia's development priorities. Key policies are described in Table 2. Their linkage to the agricultural sector and EAS are identified.

Table 2. Key National Policies

Policy	Description
Policy:	National Food Security & Nutrition Strategy. (MOA, 2008).
Aim:	Ensure availability and accessibility of food.
Status:	The standing policy strategy.
Linkage to agriculture and EAS:	MOA to address food availability. Recognizes the need to strengthen public-sector research and extension to enhance their capacity to contribute to achieving food security.
Policy:	The National Gender Policy. (Ministry of Gender & Development [MGD], 2009).
Aim:	Mainstream gender in national development.

Policy	Description
Status:	The standing policy.
Linkage to agriculture and EAS:	Improve women's access to extension, training, credit, land and farmer groups.
Policy:	National Telecom & ICT Policy 2010-2015. (GOL, n.d.a).
Aim:	Achieve modernization and rapid expansion of telecommunications network and communication systems.
Status:	The standing policy, a new policy is being developed.
Linkage to agriculture and EAS:	Recommends e-agriculture to increase information flow among agricultural stakeholders.
Policy:	Liberia Rising Vision 2030. (GOL, n.d.b).
Aim:	Achieve middle-income country status by 2030.
Status:	Launched 2012; long-term development plan continues.
Linkage to agriculture and EAS:	Strategies embodied in Liberia's Agenda for Transformation (AFT) described below.
Policy:	Liberia's Agenda for Transformation 2012-2017 – Steps Toward Liberia Rising 2030. (GOL, 2013).
Aim:	Secure inclusive wealth creation. For agriculture increase smallholder productivity, increase acreage under irrigation, decrease rice import bill, improve nutrition and engage the private sector.
Status:	Medium-term development strategy continues. Articulates strategies for moving toward Liberia Rising 2030, Liberia's long-term development strategy.
Linkage to agriculture and EAS:	Agriculture linked through Economic Transformation, one of the four pillars structuring the strategy. MOA to provide research and extension services to support smallholders.
Policy:	Economic Stabilization and Recovery Plan. (GOL & Liberia's Development Partners, 2015).

Policy	Description
Aim:	Respond to Ebola epidemic, stabilize economy, renew efforts toward inclusive growth.
Status:	Continuing.
Linkage to agriculture and EAS:	Agriculture is key to one of the Plan's three major interventions Recovery of Output and Growth. Emphasis on developing the export sector, implementing Land Commission reform recommendations, further engaging the private sector; for smallholders specifically, increasing access to credit and promoting diversification.

While not a policy in itself, Liberia's Ease of Doing Business ranking reflects the enabling policy environment. Economies are ranked on their ease of doing business, from 1–190. A high ease of doing business ranking (low numerical value) means the regulatory environment is more conducive to the starting and operation of a local business. Liberia's rank of 174 suggests a difficult business environment (World Bank, 2017b).

Two key policy-related events may affect the ongoing situation in Liberia. First, the United Nations Peacekeeping Mission in Liberia turned over security responsibility to Liberia's security forces in June 2016 after 13 years in Liberia. Second, elections are to be held in October 2017. There are concerns about how these events may impact Liberia going forward.

Land

Land is a conflict issue in Liberia. Conflict over land and natural resource rights were central to the civil wars (USAID, 2010). Liberia has a dual system of land tenure whereby, primarily in urban areas, a western legal system of private ownership is the norm. In rural areas, customary systems are the norm and are based on community or collective ownership and traditional practices. This reflects the historical division between descendants of freed slaves from the United States of America who colonized Liberia in the early 1800s and now represent a largely urban elite (the Americo-Liberians) and the indigenous people of Liberia who continue to reside primarily in rural areas (USAID, 2010).

Agriculture

The agricultural sector, both food crops and cash crops such as rubber, cocoa, coffee, banana and oil palm, continues to be strategic to Liberia's development. The livestock sub-sector, decimated during the wars, is beginning to emerge. Agriculture's share of GDP declined over the ten-year period 2006-2016 from 44 percent to 26 percent (Central Bank of Liberia, 2007, 2016). Other estimates suggest agriculture's greater share of GDP, up to 35 percent in 2016 (CIA, 2017). According to the Food and Agriculture Organization (FAO) statistics, the sector accounts for at least 50 percent of total employment and women account for about 50 percent of the agricultural labor force (2015). These figures may be low as various documents suggest 70 percent of Liberian's earn their living from agriculture (Larbi, 2012; CARI, 2014).

About 28 percent of land in Liberia is considered agricultural land. Of this, only five percent is arable, 21 percent is in permanent pasture, and two percent is planted to permanent crops. Forty-

five percent of all land is in forests and 27 percent is for other uses. Liberia is located in the humid tropics and has two distinct seasons: dry and wet. The dry season generally begins in November and ends in April with the onset of the rainy season from May to October. The rains in Liberia are torrential. The coast receives up to 200 inches (2540 millimeters) annually, while farther into the interior, rains decrease to 80 inches (2032 millimeters) annually.

Low resource, often subsistence-level smallholders make up the majority of Liberia's estimated 404,000 farm families (MOA, 2012a). This number is in contrast with the limited, but growing, number of large commercial crop farms and concessions. Wetland/lowland/swamp or dryland/upland rice is grown throughout Liberia. The smallholder farming system typically consists of rice, cassava, some vegetables and, depending on location, some tree crops (e.g., rubber, cocoa). Smallholder land-holding size varies with estimates of between one and four acres (0.4 and 1.6 hectares) (Namubiru-Mwaura, Knox, & Hughes, 2012). Many large commercial farms and concessions traditionally planted rubber or cocoa with establishment of oil palm plantations beginning in the 1970s. The Firestone rubber plantation has been operating in Liberia since 1926 and is the largest contiguous rubber plantation in the world. An estimated 30,000 people are employed in the rubber sector, with Firestone the largest private-sector employer in Liberia, and an estimated 60,000 smallholders are involved in growing rubber trees (export.gov, 2016). More recently, some of these larger systems are diversifying into rice and fruit production.

Liberia was an early signatory to the CAADP process, signing its Compact in 2009.[2] As part of the Compact, the GOL committed to the target of allocating 10 percent of its budget to the agricultural sector. Figures for GOL budget allocated to agriculture for 2015/16 and 2016/17 indicate a contribution of 0.96 percent and 1.98 percent, respectively (Ministry of Finance and Development Planning [MFDP], 2016a). However, Liberia receives significant donor support and as a percentage of total donor off-budget support[3], the agricultural sector received around 14 percent of donor funds in 2016/17, decreasing to about 10 percent in 2016/2017 (MFDP, 2016a).[4]

Ebola hit the agriculture and other sectors of Liberia's economy hard. For the economy as a whole, real GDP growth rates declined from 8.2 percent in 2012 to 0.7 percent in 2014 to zero in 2015 (GOL, 2013).5 Ebola's impact on food production was severe in 2014, with production recovering somewhat in 2015 (FAO, 2017). Food crop production declined again in 2016. Liberia is a net importer of food with estimates that up to 80 percent of its food (mainly rice) is imported (Senahoun, Gunjal, Mwanundu, Sandstrom, & Giuffrida, 2014 & 2015).

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[2] Signing a CAADP Compact signifies a country's commitment, within the framework of the CAADP process, to identify priorities for and develop a roadmap to implement its strategy for agricultural development.

[3] Off-budget support is support provided by donors for activities and projects in benefit of Liberia. Such funds are not included in the government budget that the President sends to the National Legislature for approval.

[4] FY2016/17 Total government budget – about US $600 million; total donor budget – about US $728 million with nine percent on-budget and 91 percent off-budget. (MFDP (2016a, p. 16).

[5] The significant drop was due mainly to falling global prices of iron ore and rubber, important drivers of economic growth in Liberia.

Rice is a politically and economically sensitive issue in Liberia. The primary staple food for most of Liberia's people, rice consumption rate is estimated to be 293 pounds (133 kilograms) annual per capita, one of the highest rates in Africa (MOA, 2012a). Liberia imports significant quantities of rice to manage the demand, which far exceeds domestic production. In 2008, rice imports had a price tag of US $200 million and the government is keen on increasing production and productivity to ensure food security, putting a rice strategy in place to do so (MOA, 2012a). However, the vigorous debate as to whether Liberian rice growers can compete with imported rice, given government policy to keep the price of rice low, continues with proponents on both sides (Fintrac, 2015b; Wailes, 2015).

A bundle of interrelated constraints to improving performance in the agricultural sector negatively impacts along all points of value chains. Among the constraints are:

- low levels of agricultural productivity due to limited use/availability of fertilizers, improved seeds, agricultural machinery and other inputs;
- smallholders' incomplete knowledge of best practices and markets;
- difficulty of obtaining agricultural credit;
- poor infrastructure with inadequate roads severely limiting capacity to move to/from markets and lack of other processing/market/input facilities;
- high post-harvest losses due to unsuitable processing and storage practices and scarce electricity for post-harvest and storage processes; and
- uncertainty of land tenure.

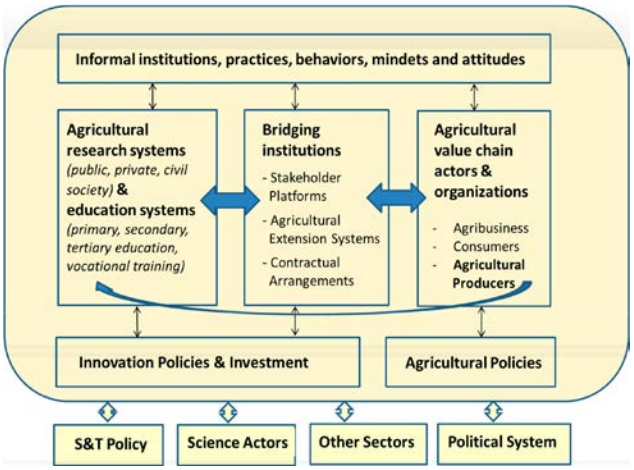
Slash and burn agriculture continues to be practiced extensively. Availability of labor is increasingly becoming an issue. There is a dire lack of agricultural machinery to decrease demand for labor as well as to intensify production. Youth believe there are more opportunities for them in urban areas and migrate to explore opportunities, further shrinking the supply of labor available in rural areas. Less than one percent of land is irrigated (GOL, 2013) reducing the potential for multiple crops per year. Although women have a major role to play in production, processing and marketing, it is widely held that they have lower access to the factors of production, such as land, labor and capital, as well as more limited access to knowledge via extension services to assist them to improve their productivity. This factor may be particularly true for the 31 percent of rural women who are heads of households (LISGIS, Ministry of Health and Social Welfare, National AIDS Control Program, & ICF International, 2014). Underlying these constraints is the generally weak implementation capacity of agricultural-sector public institutions, private-sector organizations and local NGOs. Within the context of these constraints and depending on the resource level of smallholders, profitable improved agricultural technology for smallholders to experiment with and adopt is limited. The positive feature of these constraints is there is ample room for transformational improvements in the agricultural sector.

Nonetheless, constraints currently remain and are reflected in Liberia's Global Hunger Index (GHI) score. The GHI is a composite measure of four indicators (percent of population undernourished, percent of wastage children under five, percent of stunting children under five and percent of children who die before age five). Higher scores reflect greater hunger. Liberia has a high GHI

score, 30.7, as does sub-Saharan Africa at 30.1, indicating that a *serious* level of hunger exists in Liberia and the region (IFPRI, 2017). Liberia has made substantial progress over the years in decreasing the level of hunger from a reported very high score of 49.7 in 1992, which was close to an *extremely alarming* level of hunger (IFPRI, 2017). While it is not only constraints in the agricultural sector that impact GHI, agriculture certainly is a contributing factor.

The Agricultural Innovation System

An Agricultural Innovation System (AIS) "is a network of actors (individuals, organizations and enterprises), together with supporting institutions and policies in the agricultural and related sectors that bring existing or new products, processes, and forms of organization into social and economic use" (Tropical Agriculture Platform [TAP], n.d., p. 1). Formal and informal institutions and policies influence the way actors learn, interact, generate, share and use knowledge (TAP, n.d.). The linkages, interactions, relationships, capacities, influences and learnings among the elements contribute to determining system operation, outcomes and impact (Sigman, 2016). Many of these AIS elements exist in Liberia, some functioning better than others. Elements are further discussed below within the context of EAS characteristics.



Source: Aerni, Nichterlein, Rudgard, & Sonnino (2015); adapted from Spielman and Birner (2008)

Note: S&T = Science and Technology

Figure 3. Conception Framework of an Agriculture Innovation System

An expected outcome of AIS, broadly speaking, is innovation (Klerkx, van Mierlo, & Leeuwis, 2012). One key element of innovation is agricultural technologies. The issue of availability of site and client-specific profitable technology for farmers and others along the value chain to adopt is far more complex than often thought. The assumption is that these technologies do exist and are "on the shelf" for immediate use and impact. However, if so, they frequently are not in a form that can be used by extension, their adoption by smallholder farmers is constrained by many factors resulting in very low application rates and their profitability can be questioned.

This issue is underscored by findings of the Food and Enterprise Development (FED) Impact Survey (International Development Group [IDG], 2017). FED was a US $75 million, five-year Feed the Future value-chain oriented project implemented in Liberia from 2011-2016. A key area of focus, FED intended to increase productivity and profitability in four value chains (i.e., rice, cassava, goat and vegetables) through improved technology and other methods. One of the five evaluation questions investigated in the impact study asked: Have beneficiary farmers applied new practices and technologies to selected value chains? (IDG, 2017, p. 6). The impact survey found:

- For all value chains FED farmers were significantly more likely than non-FED farmers to utilize one or more improved practices/technologies promoted by FED, but that in many cases practices/technologies were used by fewer than half of the FED farmers;

- FED farmers in the four value chains did not show significantly higher yields than comparison farmers; and
- There was no effect on household income or expenditure of FED beneficiary farmers as a result of FED intervention.

The point of these data is to show the immense challenges faced in securing adoption of technologies and in ensuring availability of profitable improved technologies that increase yields and income. These issues are at the heart of the practice of extension. The MOA does not have an inventory of site and client-specific, yield and income-increasing technologies, nor a central repository for learning and other extension materials related to such technologies, representing a major gap in the resources available to EAS providers.

Many different AIS actors contribute to agricultural technology and other types of innovations. The Ministries of Gender and Development, Health, Public Works, and Commerce and Industry along with Liberia's Environmental Protection Agency could be considered part of the AIS. However, this report narrows the focus to AIS actors that more directly could have or have a substantial effect on EAS and vice versa. These actors include education and agricultural research institutions and donors and donor projects. Other Ministry of Agriculture (MOA) departments are also part of the AIS, as discussed later in further detail in this report.

Agricultural Education Institutions

Liberia has a number of community colleges, some of whom offer training in applied agriculture (e.g., Grand Bassa Community College, Lofa Community College, Nimba County Community College and Grand Gedeh County Community College). With support from USAID/Liberia, a two-year National Agriculture Diploma Program curriculum was developed and is being implemented at three of these community colleges – Lofa, Nimba and Grand Bassa and at Booker T. Washington Vocational Education Institute (further discussed in Table 3). Other key institutions offering agriculture and/or EAS education are shown in Table 3.

Table 3. AIS Educational Institutions with Major Focus on Agriculture and/or EAS

Institution	Key Information	Degree
Cuttington University, College of Agriculture and Sustainable Development	Oldest private liberal arts university in sub-Saharan Africa Plant/soil science, animal science, natural resource management Has a school farm for experiential learning Minor in agricultural extension and education Received five-year (beginning in 2011) strengthening program support from USAID	Four-year Bachelor
Cuttington Junior College, Department of Science and Agriculture	Administratively and academically under Cuttington University Preparation for mid-level agricultural technicians including extension agents Includes practicums on school farm	Two-year Associate

Institution	Key Information	Degree
University of Liberia, William R. Tolbert College of Agriculture and Forestry	Leading public institution Agronomy and forestry Offers courses in extension	Four-year Bachelor
William V.S. Tubman University, College of Agriculture and Food Science	Crop, animal, and food sciences along with nutrition Includes agricultural extension and education courses Provides hands-on experience	Four-year Bachelor
Bong County Technical College[6]	Founded in 2012 Considering offering degree in Agricultural Technology	Four-year Bachelor
United Methodist University, College of Agriculture[7]	First inception of students in the University in 2000 College of Agriculture, one of seven colleges Agriculture College occupies 500 acres, most cultivated in palm oil	Two-year Associate, Certificate
Booker T. Washington Vocational Education Institute	Liberia's first agricultural and vocational school Post-secondary public school Preparation for para-professional level agriculturalists	Vocational Certificate/Diploma
Songhai Agro-Enterprise Training Center	Farmer/young farmer training center Preparation to manage small/medium sized farms and agri-businesses	Participation Documentation

Agricultural Research Institutions

The Central Agricultural Research Institute (CARI) is Liberia's semi-autonomous research institute. Almost all infrastructure on the 1,800-acre complex was destroyed in the war. The road to recovery has been slow with a majority of research conducted on rice and cassava and much emphasis given to production of improved rice seed. Inventories of profitable technologies and clear recommendations for farmers by differing resource base have yet to be made available. Linkages between research and extension continue to be weak (McNamara, Swanson, & Simpson, 2011). This is due in part to the historical disconnect between research and extension. However, the academic preparation of new staff and the development of a new strategic plan guiding CARI activity may have laid the foundation for stronger collaboration between research and extension.

The West Africa Agricultural Productivity Program (WAAPP) financed the education of 37 Liberians (32 master's and five Ph.D.'s) who upon their expected return in 2015-2016 are to be

[6] See https://www.facebook.com/pg/BongCountyTechnicalCollege/about/

[7] See http://umu.edu.lr/index.php/academics/programs-of-study/agriculture

posted at the MOA and CARI. This generation of graduates may have received education that ensures they understand the benefits of and can act to facilitate research-extension linkages.

CARI developed a new Strategic Plan 2015-2025 (CARI, 2014). The plan adopts the agriculture research for development paradigm, which takes an AIS approach. The new vision for this plan is: "A commercially-oriented agricultural sector propelled by research, technology transfer, innovations, knowledge and approaches that will contribute to an improved quality of life for all Liberians" (CARI, 2014, p. 33). CARI's core functions are: agricultural research, information and knowledge dissemination, capacity strengthening, and advocacy.

The vision is to be achieved and the functions carried out within an innovation systems framework that recognizes extension (public, private and civil society) as a component of AIS and as a research stakeholder. The plan envisions a role for extension in identifying research issues and in receiving the results of research (CARI, 2014, p. 30). Under its capacity strengthening function, CARI is expected to establish strong relationships with extension agencies in the private and public sectors for transfer of technologies (CARI, 2014, p. 35).

The language of the plan is hopeful, but implementation will be challenging. The AIS framework provides a window of opportunity to strengthen research and extension linkages. However, if this linkage and strengthened relationships are not specified with costed objectives, it seems a concerted effort backed by appropriate incentives will be needed on the part of both research and extension to come to grips with these issues (Sigman, 2016). The gap in the Strategic Plan is that the processes and/or mechanisms for establishing linkages and relationships have yet to be identified. As an initial activity, CARI hosted the First Annual Agricultural Research Review Workshop in March 2017. The Workshop, attended by a range of stakeholders including extensionists, focused on presentation of ongoing results and discussions of future research possibilities.[8] Research, extension and farmers will benefit as similar initiatives are developed and implemented.

Several international research entities, such as Africa Rice and the International Institute of Tropical Agriculture (IITA), carry out research in Liberia. This research is often implemented through projects, some in collaboration with CARI. Africa Rice is involved with the Smallholder Agriculture Productivity Enhancement and Commercialization (SAPEC) project and IITA with the WAAPP project, both activities discussed later in this report. Firestone has a rubber research activity, and the larger oil palm companies, such as Sime Darby and Golden Veroleum, carry out research to improve the oil palm value chain. The interactions among these entities and the MOA's Department of Regional Development, Research and Extension (DRDRE) is limited at this time.

Typically, NGOs are not much involved in research. An exception is the Liberia Entrepreneurial & Asset Development (LEAD), a faith-based NGO involved in micro-finance and business development in the agriculture sector. Borrowers undergo agricultural and business development training as a prerequisite to loan receipt. LEAD identified the need to experiment with new technologies to include in their training programs and to that end began a small research farm in 2011. Research is conducted on a range of issues; of particular interest is conservation farming with

[8] Government stakeholder personal communication, March 2017.

two crops per year. LEAD's operation is not large. However, its efforts serve to develop site-specific adapted technologies, which are then extended to farmers, decreasing farmer risk in adopting new technologies.

Donors and Donor Projects

The major donors in the agricultural sector are the African Development Bank (AFDB), European Union/European Commission, FAO, the German Federal Ministry for Economic Development Cooperation (*Bundesministerium Für Wirtschaftliche Zusammenarbeit* or BMZ), International Fund for Agricultural Development (IFAD), Japan International Cooperation Agency, Swedish International Development Cooperation Agency (SIDA), United Nations, USAID, the World Bank and World Food Programme.

Most agricultural projects involve some aspect of EAS. Yet, currently there are no donor, NGO nor private-sector funded projects or programs to explicitly and systematically strengthen EAS. However, the Liberian Forum for Agricultural Advisory Services, discussed below, periodic activity works toward this end, and there are agricultural projects that include some investment in strengthening EAS.

While there are many NGO and some private investments in EAS, Table 4 reports agricultural projects funded primarily by donors that include some EAS activity.[9]

Table 4. Selected Donor Agricultural Projects with Some EAS Activity

Name, Donor, Amount, Time-Frame, Implementer	Project Description
Liberia Agribusiness Development Activity Feed the Future, US $19.3 million, 2015-2020 CNFA	♦ Strengthen value chains; increase access to and use of agricultural inputs; improve post-harvest processes ♦ Train networks of agro-dealers to embed EAS with their products
Cooperative Development Project Feed the Future, US $4.6 million, 2010-2018 ACDI/VOCA	♦ Multi-country project, last two years (2016-2018) in Liberia ♦ Train agricultural cooperative and association members and extension agents in good management and agricultural practices
Smallholder Oil Palm Support II Feed the Future, US $4.2 million, 2015-2018 ACDI/VOCA	♦ Improve farmer access to processing equipment and to markets ♦ Train and support own cadre of EAS providers to deliver services to farmers
Farmer to Farmer Feed the Future, US $7.9 million, 2013-2018	♦ Multi-country project ♦ Promote food security through volunteer program

[9] Figures in Table 4 and in the list of recently-closed projects are the best available to the author (source for MOA implemented projects: MOA, 2016). Figures may vary somewhat from those in other sources.

Name, Donor, Amount, Time-Frame, Implementer	Project Description
ACDI/VOCA - Winrock	♦ Links US farmers/experts to situations needing their expertise
Smallholder Tree Crop Revitalization Support Project IFAD Loan/GOL, US $24.9 million, 2012-2017 pilot, MOA	♦ Revitalize smallholder coffee and cocoa farms ♦ Improve access to markets through rural roads rehabilitation ♦ Strengthen FBOs ♦ Strengthen MOA and/or private-sector extension
Agriculture Sector Rehabilitation Project II IFAD Loan/Grant, US $17.5 million, 2012-2017, MOA	♦ Rehabilitate agriculture infrastructure ♦ Improve production and productivity ♦ Pilot EAS delivery through FUNL and MOA EAS collaboration
Smallholder Tree Crop Revitalization Support Project World Bank/GOL, US $23.1 million, 2015 – continuing long term, MOA	♦ Rehabilitate smallholder coffee and cocoa farms, oil palm plantation ♦ Promote outgrowers scheme (approach to EAS) ♦ Revitalize rubber farms in partnership with concessionaires[10] ♦ Strengthen MOA technical services, Cooperative Development Agency (CDA) and County Agriculture Offices
Smallholder Agriculture Productivity Enhancement and Commercialization (SAPEC) GAFSP/World Bank, US $54.4, 2013-2017, MOA	♦ Implementation of LASIP, Liberia's investment program ♦ Intensify production ♦ Add value and increase market access ♦ Strengthen institutions and actors including extension

Source: Author

It is worth noting that several key projects that delivered EAS have recently closed. These are listed below.

- AFDB/IFAD/GOL, Agriculture Sector Rehabilitation Project I (US $24.4 million, 2010-2016)
- UNDP and Global Environment Fund, Climate Change Adaptation Agriculture Project (US $8.7 million, 2012-2016)

[10] Concessionaires are the companies that manage concessions (large tracts of land leased to concessionaires by the government).

- USAID Feed the Future Projects: The Food and Enterprise Development program (US $75 million, 2011-2016); the Health, Agriculture and Nutrition Development for Sustainability project (US $34.7 million, 2010-2015); Livelihood Improvement for Farming Enterprises III (US $91 million, 2013-2016); and the Liberian Agricultural Upgrading, Nutrition and Child Health project (US $40 million, 2010-2016)
- World Bank/European Union, Agriculture Infrastructure Development Program (US $54 million, 2007-2015)
- World Bank/Japan/GOL, WAAPP Program (US $14.6 million, 2011-2016). A second phase is in development, likely to commence early 2018.

Extension and Advisory Services System

Liberia's MOA leads the agricultural sector with its mandate to formulate policies and strategies to guide the growth and development of the agriculture sector (MOA, 2016, p.1). [11] The MOA is also to lead Liberia's EAS system, which is highly pluralistic, comprised of public, private and civil-society sector EAS providers. Public-sector extension, established in 1960, completely collapsed during the war years. Following the war, the international community provided extension assistance, largely through NGO and United Nations agencies. Since then, the public-sector MOA Department of Regional Development, Research and Extension has been re-established, NGO assistance continues to be a critical prominent piece in the pluralistic mix, and private-sector actors are slowly becoming part of the EAS landscape.

Governance Structures and Policy Environment

As defined by the UNDP, governance can be seen as the exercise of economic, political and administrative authority to manage a country's affairs at all levels (1997, p. 12). Governance is about the mechanisms, processes and institutions through which citizens and groups make their interests known and exercise their rights. Policy can be defined as a law, regulation, procedure, administrative action, incentive or voluntary practice of governments and other institutions (CDC, n.d.). These concepts are intertwined and are discussed in this report as follows: A review of the current policy documents specifically guiding the agriculture sector and EAS is followed by a discussion of MOA structure and then EAS providers and their financing.

Agriculture and EAS Policy

Earlier in the report general development policies were discussed; this section focuses on agriculture and extension policies. Liberia's EAS policy evolved as part of Liberia's 2010 comprehensive national-level agricultural plan and is in line with current direction for the agricultural sector. As a governing body, the MOA, along with citizen stakeholders, developed the Liberia Agriculture Sector Investment Plan (LASIP) as part of Liberia's CAADP Compact (GOL, 2010). LASIP, a five-year 2010-2015 program, identified Building Extension and Enhancing Technologies as a project within its institution building component.

[11] MOA's responsibilities encompass livestock, fisheries, and crops agriculture and National Budget documents include forestry in the agriculture sector. This report focuses on EAS in crops agriculture.

LASIP was followed by the Liberia Agriculture Transformation Agenda (LATA), the current document guiding development of the agriculture sector. LATA is in accordance with other government policies and strategies earlier mentioned in this report (e.g., AFT, Vision 2030). Although LATA has yet to be formally launched, available documentation indicates a shift toward industrialization through significant support to agro-processing and manufacturing. LATA intends to overhaul the agricultural system focusing on farming as a business: value-chain development, growth corridors, increased use of ICT, more commercial agricultural financing and more involvement of the private sector. The agenda supports strengthening EAS via an institutional development and capacity building component.

Liberia has a national EAS policy, written in 2012 (MOA, 2012b). The National Policy for Agricultural Extension and Advisory Services looks toward transforming EAS in Liberia and provides the legal and enabling framework for a pluralistic, decentralized, demand-driven[12] and market-oriented system. The vision of the policy sees organized groups of Liberian agricultural extension and advisory service clientele across the country demanding and accessing at the right time and the right place, high-quality market-appropriate extension and advisory services from providers of their choice and contributing to the cost of these services (MOA, 2012b, p.4.). The policy identifies complementary roles for public, private and civil-society sector EAS providers.

A visionary document, the National Policy for Agricultural EAS is far-reaching and was developed in a participatory manner with input from a range of actors in Liberia's innovation system. The policy suggests a change in MOA service-delivery orientation toward a more coordinative, facilitative and regulatory monitoring and evaluation (M&E) and resource mobilization role and mechanisms are put forward for coordination of the pluralistic system. The policy also looks toward increasing EAS responsiveness to women and youth and attends to cross-cutting issues, such as nutrition, HIV/AIDS, natural resource management and climate change.

Validated at a 2012 stakeholders' meeting, the policy has yet to be sent for legislative approval. Some question whether this is actually needed. Nonetheless, it reportedly has not been widely distributed. The extent to which the it impacts extension in practice at the field level is difficult to pinpoint as there is no M&E system in place to lend light on this question. Available information suggests somewhat more progress has been made relatively to pluralism and decentralization than to demand-driven and market-oriented aspects of the system. The DRDRE has called for the development of a dissemination strategy and an overall strategic plan to implement the policy. The 2013 Agriculture Sector Public Expenditure Review backs up this call and recommends the policy and its draft project implementation proposal (DRDRE, 2012) be implemented "with determination, consistency and high priority" (World Bank, 2013, p. xii). This step has yet to be accomplished. The policy appears to serve as a point of departure for EAS dialogue and to have raised the awareness of EAS roles, actors and strengths and weaknesses among stakeholders, including donors.

Despite the agricultural strategies and an EAS policy in place to guide EAS in Liberia, in practice the EAS system, its goals and priorities can be project-driven and to that extent influenced by available

[12] The Policy uses the term "demand-driven." The MOA also uses the term "farmer-based."

resources and funders. The private sector differs as goals and priorities tend to reflect underlying incentives of a profit orientation.

The key legal institutional authority for EAS in Liberia is the MOA. The ministry is responsible for the formulation, development and implementation of policies, plans, programs and projects to enhance sustainable agriculture. The MOA sets standards, rules and regulations governing the establishment, licensing and accreditation of individuals, public, private agencies and commercial organizations, in order to safeguard sustainable development of the agriculture sector (MOA, 2014, p. 1).

MOA Structure

The MOA Minister of Agriculture heads four departments, each led by a Deputy Minister, who is assisted by an Assistant Minister. The four departments are Department of Planning and Development, Department of Administration, Department of Technical Services and DRDRE. Reorganization of some departments, including DRDRE, is under discussion. The structure reported below is based on the MOA 2015 Annual Report (MOA, 2016).

The Department of Planning and Development (DPD) is responsible for providing policy advice and facilitating strategic planning. The DPD has several divisions, including the 2008-established Food Security and Nutrition Division that monitors food security and nutrition and coordinates related projects. The division is currently in the process of rejuvenating the Food and Nutrition Security Technical Committee. The committee is made up of various stakeholders from NGOs and others in the development community. DRDRE participates in this committee, which could facilitate the inclusion of nutrition messages in EAS messages and agriculture-related messages in nutrition and food security programming. The outreach capacity of the division is limited, due to the lack of staff at the county level.

The Department of Administration has a Division of Human Resources (HR), which deals with all HR-related activities of the ministry. USAID, as part of a multi-donor trust fund, supports a Public-Sector Modernization (PSM) US $10.7 million project (2015-2020) designed, among other aspects, to modernize the civil service (USAID, 2016b). Although the MOA was not selected to participate in the first round of the PSM project, the project aims to establish performance and accountability standards and incentive structures for civil servants. This step is likely to be carried out at the MOA in due time as part of the human-resource related activities.

The Department of Technical Services (DTS) is responsible for providing technical information and support for all agricultural production across Liberia. The department accumulates, synthesizes and evaluates technical information and packages it for dissemination through the Extension Department (MOA, 2016). Interestingly, the DRDRE is mandated to collaborate with DTS; however, such collaboration is not mentioned in the DTS mandate. The collaboration has yet to be fully developed, which has implications for extension content, further discussed under the section on livelihood engagement.

In addition to technical support for food and tree crops, the Livestock Division is under DTS management, as is the Bureau of National Fisheries. The DTS supervises 15 County Livestock Officers, who provide EAS services. The DTS also supports community animal health workers. Activity in the fisheries sub-sector is increasing and some collaboration relative to EAS services to fisheries via DTS was reported.

The MOA's DRDRE is responsible for oversight of regional development in agricultural production, research in socio-economic programs and extension services within the framework of the demand-driven, farmer-based pluralistic system (MOA, n.d.). The department's core function is the delivery of extension services to farmers. To this end it has the mandate to assemble and disseminate information, knowledge and technologies to farmers in technical, management, marketing and organizational subjects (MOA, n.d.). DRDRE is also involved in distributing inputs to farmers, most specifically in times of stress and hardship. The MOA 2015 annual report states that the DRDRE is to collaborate closely with existing research bodies, earlier discussed in this report.

DRDRE collaborates with various institutions, organizations and projects, both locally and internationally. Many of these are further discussed in this report. Among others, DRDRE is currently discussing EAS strengthening activities with international partners FAO, the University of Illinois and the USAID-funded Integrating Gender and Nutrition within Agricultural Extension Services project.

Major EAS Providers[13]

The general relationship between the MOA and private and civil society EAS providers is one of desirable collaboration rather than of authority. Within the pluralistic system, the MOA is directly involved in service delivery along with others in the private and civil society sectors. The current pluralistic system is similar to that described in the Worldwide Extension Study (Qamar, Swanson, & Bohn, 2013) although there has been progress and some actors and projects have changed as discussed below. The three sectors providing EAS (public, private and civil society) are further detailed below, as is the Liberian Forum for Agricultural Advisory Services (LIFAAS) which potentially has a role in harmonizing and linking the various providers

Public-Sector EAS Provider: DRDRE

Administratively Liberia is divided into 15 counties, with around 130 administrative districts. DRDRE is decentralized to the county level with the objective of further decentralizing services to the district level. The current decentralized team consists of a County Agriculture Coordinator (CAC) and District Agricultural Officers (DAO) at the district level. Reorganization of the structure of the decentralized teams is currently under discussion with the possibility of a structure based on 91 operational agricultural (rather than administrative) districts being proposed.[14]

Each county currently has a CAC responsible for the supervision of EAS across the county. Each county also has a County Livestock Officer, assigned to a different division, but there are no subject-matter specialists assigned to DRDRE. Prior to the war there were extension agents in every district and at the clan (township) level. Coverage is now far less with estimated extension officer to farmer ratios of anywhere from 1:1,000 to 1:5,000 (Moore, 2014). While there are different ways of interpreting the data, MOA (2015) and MFDP (2016b) reports both show DRDRE service delivery

[13] DLEC also conducted a key stakeholder mapping exercise that identifies key EAS providers in Malawi.

[14] An agricultural operational district would be staffed by a DAO, a district agricultural technician and a livestock officer.

reached 41,615 farmers in 2015 with technical backstopping, visitation and/or training, although these figures can be questioned (Peterson, 2016).[15] Of these, over one-half were reportedly female farmers, confirming MOA intentions to promote gender-sensitive practices and culture within its staff and the wider agricultural community (MOA, 2016).

Nonetheless, such a high extension officer to farmer ratio is a fundamental constraint to achieving DRDRE's core function. The MOA and DRDRE approach to addressing coverage is that of pluralism, both by design and as a practical matter. In addition to its civil servant staff, the MOA coordinates a number of non-civil servant field agents hired, and whose salaries are paid for, by NGO and donor-funded projects. NGOs play a vital role in expanding extension's reach, with the private sector also contributing, as further detailed below.

The objective to increase coverage, which underlies pluralism, has a better chance of being realized when the services extended are well-coordinated. The MOA attempted to accomplish this by convening the Agricultural Coordinating Committee (ACC), a group designed to bring the various agriculture and EAS stakeholders together to coordinate activity in the sector, share information, decrease duplication of services and otherwise strengthen EAS delivery. The ACC is housed under the Ministry's Department of Planning and Development, Division of Sector Coordination. The group operates primarily at the national level with a majority of attendees representing NGOs. Various technical working groups (cassava, rice etc.) have formed under the ACC, with the cassava group reportedly the most active in bringing various stakeholders together to address constraints in the cassava value chain.[16] While the Committee is meant to meet monthly, recent reports indicate the Committee as a whole has not met for several months and earlier information is that meetings are sporadic[17] (Moore, 2014). With varied results, some counties have convened county-level ACCs to include farmers. Notably, CACs seldom have sufficient budgets to host these meetings and, if NGOs do not come forward to host, meetings simply are not held.

The imperative of coordination is central and, if successfully addressed, could contribute to reaching more farmers with better services. DRDRE/MOA is in position to lead the coordination effort if they were empowered through appropriate training (coordination requires particular knowledge, skills and attitudes) and resources to do so. The National Policy for Agricultural EAS, discussed earlier, puts forward an EAS-specific coordination platform at three levels: national, county and district. Membership would be open to all stakeholders at all levels, emphasizing farmer participation, particularly at the district level. The platforms would be managed through a National Extension Platform under the ACC, a technical working group to be duplicated in the counties. Details of the platforms were to be articulated in the strategic plan for policy implementation, which has yet to be developed.

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[15] Part of the confusion is the MOA (2015) document also reports 82,353 farmers were provided EAS services.

[16] Government stakeholder personal communication, May 2017.

[17] Government stakeholder personal communication, April 2017.

Private-Sector EAS Providers

For the purposes of this paper, private-sector providers are defined as for-profit businesses typically controlled by individuals and companies rather than by the government or non-profit entities. Private-sector providers include individual farmers, farmer-based organizations (FBOs) such as farmer groups and cooperatives,[18] profit-oriented farmer-to-farmer extension service providers, processors, traders, agro-input supply dealers and distributors, and other agricultural for-profit companies.

A type of private-sector EAS provider is an individual who has expertise in a given subject matter, works directly with farmers and receives a fee from farmers for services delivered. These providers are apt to work with the more commercialized producers (Swanson & Rajalahti, 2010) such as large-scale rubber or cocoa farmers. This type of EAS has yet to gain traction in Liberia's smallholder sector. For smallholders, the complex debate continues as to whether smallholders will or can afford to pay for EAS, or for what type of EAS. Eicher's associated question "can poor farmers buy their way out of poverty" continues to resonate (2002, p. 34).

Other types of private-sector extension services are slowly growing in Liberia, more rapidly over the past five years, from an almost complete dearth of services after the war. FBOs including cooperatives, commercial large-scale farmers and concessionaires operating outgrower or other contract-farming schemes, along with the more traditional agri-businesses, such as input suppliers are the major actors in private-sector EAS.

As FBOs mature, they often are able to provide extension services to their members. Examples of FBOs providing member services, either directly or via assistance from donor-funded projects or local NGOs, include the Farmers' Union Network of Liberia (FUNL), the United Farmers Association, the Swine Producer Association of Liberia, the Beekeepers Association, the National Fish Farmers Union and the National Rubber Planters Association.

Liberia has numerous farmer cooperatives including the familiar Kokoya, Voinjama and Foya Cooperatives located across the country (Asare, 2012). Liberia's Cooperative Development Agency (CDA) overseas the creation of cooperatives. A government agency, CDA's mission is to support activities of all registered cooperatives, including providing advisory and research services to its members (MFDP, 2016b). The agency's effectiveness in providing services to its members is currently limited. A 2015 study of agri-business in Liberia indicates the CDA is moribund, in need of reform and reaches fewer than 10,000 farmers, but that strengthening the agency could benefit large numbers of farmers (Fintrac, 2015a) if the cooperatives developed strong EAS systems internally. Further discussed below is a USAID-funded activity currently addressing this with CDA and the Liberian National Federation of Cooperative Societies.

Outgrower schemes represent an extension business model for commercial farms including plantations. The schemes guarantee a market and provide pre-harvest financed inputs (through loans, usually in-kind) and extension advice to small-scale farmers, who produce for commercial

[18] Cooperatives are included herein as private sector actors. Although they may be managed by government, they are meant to provide goods and/or services for their members so that members make a profit from their activities.

farms. Small-scale farmers supply the product and repay the loans that they took out for inputs at the time of sale. Commercial farmers thus have a steady supply of product for further processing and/or onward sale. Smallholders have inputs available at planting and a guaranteed market. Arjay Farms, Inc., a woman-owned company, adapts an outgrower model for the production and sale of rice seed. Wienco Liberia Ltd., through a loan and donor support, uses this model to improve small farmer cocoa production,[19] and Firestone led such efforts in the rubber sector.

Some input suppliers embed services in the products they sell. Such suppliers are often initially supported by donor-funded projects, which encourage the incorporation of EAS. An example is the GROW project, a five-year SIDA-funded "Making Markets Work for the Poor" activity, implemented by Mercy Corps and Adam Smith International. GROW works through established agro-input dealers providing capacity development so dealers have the ability to sell inputs and provide extension advice and training directly to farmers (GROW Staff, personal communication, April 10, 2017). However, a 2012 report finds that 90 percent of all agro-input suppliers are based in Monrovia and their primary clients are donor agencies/projects and government (Asare, 2012). This detail would tend to preclude rural farmers from accessing either their products or extension advice. USAID/Liberia plans to address this constraint through the Liberia Agribusiness Development Activity (LADA) discussed below. For reference, a list of input suppliers is included in Annex 1.

Civil-Society-Sector EAS Providers

The major civil-society EAS providers are international and local NGOs and other non-profit organizations, who apply various strategies to deliver EAS. Faith-based NGOs play a very important role in Liberia. NGOs are typically dependent on donor funding, which brings the sustainability of their individual projects into question. Nonetheless, various NGOs and non-profits, such as ACDI/VOCA, CARE, Catholic Relief Services (CRS), International Rescue Committee, Winrock and the faith-based Partners Worldwide, have operated in Liberia for many years.

Recently-completed in 2016, Feed the Future's five-year, US $75 million FED project was implemented by a mix of EAS providers. Implementers included private-sector, for-profit contractors (Development Alternatives, Inc. (DAI)), international NGOs (Winrock) and local NGOs with a great deal of experience (Samaritan's Purse). The project was carried out in the six counties, making up USAID/Liberia's Zone of Influence. In pursuit of food security, FED was designed to, among other objectives, improve extension services. FED's approach included hiring its own extension officers as well as training lead farmers, MOA extension officers and NGO extensionists to provide EAS to farmers involved in the FED project.

USAID/Liberia's current agricultural development and food security project is the 2015-2020, US $19.3 million, Feed the Future LADA project, awarded to Cultivating New Frontiers in Agriculture (CNFA), an international non-profit organization. LADA intends to, among others things, expand access to and use of agricultural inputs (CNFA, 2017). This goal will be accomplished in part through strengthening networks of agro-dealers, who will embed extension services with their products. Although LADA does not have a specific mandate to strengthen MOA extension, the expectation is that collaboration will be high and strengthening efforts will be made. This action is in

[19] This is a five-year, five-million-dollar project in response to the Ebola crisis. The project provides cocoa smallholder farmer financial and other services (GAFSP, n.d.).

line with the FED Project Impact Study recommendation pertaining to the strengthening of local support institutions which states: "Future projects like FED should coordinate more closely with local government officials and keep them better informed, even if they are not directly involved in project implementation" (2017, p. 11).

ACDI/VOCA, an international NGO, leads several projects in Liberia:

- The Cooperative Development Program (CDP) is a USAID-funded, multi-country, US $4.6 million program. The program will run through 2018 and provides training to cooperatives, farming associations and extension agents in good organizational management and good agricultural practices.
- The USAID-funded, US $4.2 million Smallholder Oil Palm Support II (SHOPS II) project is led by ACDI/VOCA in collaboration with Winrock. Running through 2018, SHOPS II focuses on increasing palm growers' income through improving farmer access to oil palm processing equipment, such as "Freedom Mills," and by improving processing and marketing of oil palm products. SHOPS II has its own cadre of extension agents that engage with farmers to achieve project goals.

ACDI/VOCA also leads the Farmer to Farmer (F2F), five-year project, which links volunteer farmers from the United States with technical expertise to Liberian farmers or other stakeholders (such as processors) in the agricultural sector that would benefit from such expertise to promote food security (USAID, 2016a). In essence, the F2F program is an extension outreach activity. In 2011, a F2F volunteer assisted women's groups to improve their vegetable production. A 2014 F2F activity improved cowpea post-harvest handling and storage for a woman-managed cooperative (FTF, 2015). Currently, an F2F volunteer is assisting DRDRE to develop short, informative EAS videos in English and selected local languages to be used as teaching tools with EAS field staff and farmers.

Coordinating the activities of the array of civil society actors represents a challenge. The ACC is meant to coordinate EAS efforts more generally. The New African Research and Development Agency, a consortium of Liberian NGOs working in various sectors, also is concerned with NGO coordination. There are examples of high-level coordination and collaboration between MOA and NGOs as well as examples where NGOs "do their own thing." If asked, NGOs will typically advise they are keen to coordinate and collaborate with the MOA. However, in practice this often does not occur, for various reasons, among them the challenge of working with MOA extension, due to MOA resource constraints and a lack of incentives to do so. Further, there are sensitivities between NGO and MOA extensionists. NGO extension staff salaries are typically considerably higher than those of MOA salaries. NGO extension staff are provided adequate transport and allowances, including communication allowances to carry out their work, and they have access to funds to support their extension programs (McNamara, Swanson & Simpson, 2011), while for MOA staff these items are more limited. Nonetheless, although NGOs are able to hire away the more competent MOA extensionists and provide them higher levels of resources, both NGO and MOA extensionists are expected to perform equally well.

Around 60 NGOs were providing EAS in 2011 in Liberia (McNamara, Swanson & Simpson, 2011). The report provides details of several of these larger NGOs (2011). Those not mentioned earlier in

this section are listed here and the reader is referred to the report for specific details: Africare-Liberia, Building Resources Across Communities (BRAC), Concern Worldwide, Danish Relief Council, German Agro Action/Welthungerhilfe and Human Development Foundation. Further, Annex 2 provides a list of additional NGOs and technical agencies, whose operation in agriculture and in some form of EAS is confirmed.

LIFAAS

LIFAAS, a forum rather than a project per se, is linked to the CAADP process and is part of Liberia's AIS. Established in 2014, LIFAAS is the country-level body of the continental African Forum for Agricultural Advisory Services (AFAAS), which in turn is part of GFRAS. These entities reach across the globe and collectively look toward improving, supporting and coordinating the development of EAS. The LIFAAS mission is to harmonize, standardize and add value to EAS initiatives in Liberia through sharing of information and increasing professional interactions (AFAAS, 2015). A component of its work is to advocate for and inform formulation of policies that are supportive of EAS. AFAAS supported LIFAAS largely through World Bank Multi-Donor Trust Funds (AFAAS, 2015).

EAS Financing

Documentation of public-sector EAS repeatedly points to a lack of resources for DRDRE to carry out extension activities (AFAAS, 2015; McNamara, Swanson & Simpson, 2011; Moore, 2014; Peterson, 2016). Funds are limited for the essentials needed to develop and deliver extension programs, such as transport (mobility is minimized by inadequate funding for maintenance coupled with rough road conditions[20]); communication tools, including ICT and office equipment, educational materials for use with farmers and other extension clients; M&E systems; and in-service training opportunities. The DRDRE is by most measures under-resourced, compromising its capacity to carry out its responsibilities, functions and mandate.

For fiscal year 2016/2017, the MOA budget from GOL was about US $8.4 million; of this about US $0.5 million (six percent) was allocated to DRDRE (MFDP, 2016, p. 367). However, the MOA fiscal year (FY) 2016/17 total budget, including both GOL and donor funds was $31.3 million (MFDP, 2016, p. x). Information on the allocation to DRDRE of the total budget was not available for this report. However, since there was no specific donor project to strengthen DRDRE and given DRDRE reports of resource constraints, it likely was minimal.

Civil-society EAS providers are funded by donors and/or NGOs and are typically better resourced than DRDRE EAS providers. The private sector is financially supported via charges for services rendered (although donors do fund agricultural small business enterprise activities to build Liberia's private sector). Data are not available on resource levels for these two sectors.

[20] For example, the DRDRE fleet of vehicles, including some motorcycles, is reportedly currently grounded due to lack of funds to repair broken-down vehicles.

Financing for public-sector EAS is a perennial and difficult challenge, which has yet to be resolved. There may be areas where available funds could be used more efficiently. However, identifying specific areas of weakness and developing funded plans for improvement in itself requires funding. Fee-for-service from Liberia's smallholders is unlikely, particularly for EAS, which is considered a public good. Private or NGO-sector contracting of public-sector extension providers could occur, but has not. Options, which are theoretically reasonable, are to increase funding, reduce staff numbers, or limit responsibilities, functions and mandate, but, to date, these options have not proven realistic.

Organizational and Management Capacity and Cultures

As earlier mentioned, the MOA envisions an EAS system that is pluralistic, decentralized, demand-driven and market-oriented. Along with many other African ministries of agriculture, the MOA's overarching focus is on production agriculture. This focus is changing. The MOA-led LATA directive moves the MOA toward being a business enabler for strong private-sector participation and shifts it from being an implementer. The emphasis is on improving exports and adding value to exports through agro-processing and manufacturing. LATA highlights value-chain development for products, such as cocoa and rubber; rice and cassava; fisheries, poultry and small ruminants; and horticulture. Based on LATA, the MOA is discussing outsourcing some EAS services for some value chains and accelerating decentralization of DRDRE. DRDRE will remain as the EAS lead in the country and increase emphasis on EAS program planning, development and M&E, either jointly with partners or alone as appropriate.

DRDRE has CACs in each of the 15 counties, and about 60 percent of the 91 district-level DAO posts are filled, an increase over earlier years.[21] Around 13 percent of DRDRE civil-servant staff are female (MOA, 2016). The standard educational requirement for a CAC is a master's degree or a bachelor's degree with seven years of experience; and for a DAO, the requirement is a bachelor's degree with three years of experience. Specific data on compliance with the standards are not available. However, staff generally meet requirements. Many received their training years ago at one of the agriculture education institutions mentioned above. To build staff capacity, particularly that of younger staff as many current staff are on the verge of retirement, the MOA has over the past several years supported a higher-education degree for numerous staff in domestic, regional and international institutions of higher education.

Opportunities within DRDRE for in-service training do exist. In-service most frequently occurs on an ad hoc basis, when individual projects provide training to farmers. DRDRE extensionists are invited either to participate in the training or, in some cases, help deliver training. Generally, there is more training in technical aspects of extension work (e.g., production, processing) than in functional (or soft skill) aspects of extension work (e.g., adult learning, extension program development). DRDRE does not have a systematic capacity development program for its staff. The current capacity of staff is considered insufficient given the range of competencies CACs and DAOs need to demonstrate in a pluralistic system.

[21] Government stakeholder personal communication, April 2017.

Limited extension capacity is confirmed in a recent survey of the training needs of DRDRE extensionists and extension staff of MOA's SAPEC project (Oladele, 2016). The survey was conducted with 75 extension agents across 12 of Liberia's 15 counties. Respondents were asked to rate the level of importance of 125[22] competencies on a Likert scale (*not important, important, very important*) and then rate their level of competence relative to the competency on a Likert scale (*not competent, competent, very competent*). The survey was informed by the "New Extensionist," a fresh way of thinking about energizing EAS, which articulates roles, strategies and capacities needed to strengthen EAS in a rapidly-changing world (Davis & Sulaiman, 2014). A summary analysis of the survey data shows the following:

- The large majority (around 70 percent) of respondents gave either an *important* or *very important* response to the individual competencies. *Not important* responses ranged from seven percent to 27 percent of responses for individual competencies. These results indicate respondents in general considered all competencies *important*.
- For 86 of the competencies studied, over one-half of those responding to the competency reported they were *not competent* in that area. This result suggests there is a widespread need for capacity development in numerous subject areas.
- Only four competencies received both a high percentage of *very important* responses (over 70 percent) and a high percentage of *not competent* responses (over 70 percent). These results were in value-addition and value-chain development; livestock production and disease control; operation and maintenance of agricultural machines; and irrigation techniques. Livestock extension is not the responsibility of DRDRE staff, which sheds some light on the livestock finding. Further, there is little mechanized and limited irrigated agriculture in Liberia. The ratings of the last two competencies likely reflect the work focus of many of the respondents. They are extension workers involved in lowland/swamp rice development where machinery for land preparation can be used and irrigation applied. The finding regarding value-addition and value-chain development is particularly important due to MOA's focus on these areas earlier noted. Clearly, this is an area for training to increase extensionists' capacity to successfully engage with actors along value chains.

Table 5 shows responses to selected competencies related to technical skills and to the EAS policy aim of creating a pluralistic, demand-driven, market-led EAS system (MOA, 2012b). In very broad strokes, data in Table 5 suggest:

- Respondents' technical skills are stronger than their functional skills and technical skills overall are considered more important than functional skills.
- Skills to promote pluralism appear to be limited. While respondents apparently have a strong basis on which to build demand-driven EAS, suggested by their capacity to be sensitive to the feelings and wishes of farmers, they lack the skills to do so. The DRDRE

[22] For purposes of this analysis, eight of the original 133 competencies were removed from this analysis because they were competencies outside the purview of general extension in Liberia, such as techniques for GMO foods production, scientific writing and reporting, joint research contracts, etc.

does not have an in-place system through which farmer demand can be articulated and farmer-informed programming developed. These are areas which DRDRE is aware of and hopes to address.

- Capacity to engage in market-led development appears particularly weak. Developing understanding of and skills in market-led extension will be critical to reaching the aims laid out in current agriculture and EAS policy documents.
- Noteworthy and positive are responses relative to monitoring and gender. These aspects of EAS work are considered *very important* and the majority of respondents indicate they have skills in these areas. Commonly-held beliefs are that EAS monitoring is limited, as is their outreach to women farmers. Respondents may believe these are areas of importance and have skill in these areas, but these skills are not applied. Gender and monitoring are two areas fundamental to EAS success that merit clarification through further research.

In summary, survey results support the frequent call for increased training for EAS staff. They also point to the notion that change in EAS providers will require not only capacity development, but some modification in the EAS culture as in what is considered important and valuable.

Table 5. Extension agents' response to level of importance and level of competence of selected competencies

Competency	% Frequency Responses (N 75)	
	Very Important	*Not Competent*
Technical Skills		
♦ Adequate technical knowledge in the subject area	72%	41%
♦ Rodents and pest control	76%	53%
♦ Storage and post-harvest	76%	63%
Skills to Promote Pluralism		
♦ Networking and partnership development	64%	67%
Skills to Stimulate Demand-driven EAS		
♦ Facilitation	61%	61%
♦ Involving farmers in program planning	71%	57%
♦ Sensitive to the feelings and wishes of farmers	65%	33%
Skills to Promote Market-led EAS		
♦ Market-led extension	65%	69%
♦ Brokering	52%	71%
Other Relevant Skills		
♦ Working with rural women and using gender-sensitive extension approaches	76%	45%
♦ Keeping records of monitoring/other activities	72%	40%
♦ Use of new ICT	67%	75%

Source: Based on Oladele (2016).

DRDRE would like to establish and institutionalize an annual extension staff competencies assessment, coupled with in-service training. Such plans are under discussion between the DRDRE

and the University of Illinois. In addition, there is some forward thinking that DRDRE could carry out competency assessments of NGO and private-sector EAS providers, which would be in line with the move toward creating an enabling environment for other than public-sector EAS actors.

DRDRE has a staff performance assessment and appraisal system that is being carried out as part of the GOL Civil Services reform process that USAID currently supports. Along with the MOA Human Resources Division and Civil Service Agency, assessment and appraisal of both headquarter and field extension staff has been carried out reportedly since 2014.[23] Details were not available for this report.

The Department of Planning and Development of the MOA has a Division of M&E responsible for providing guidance in setting indicators and tracking performance. The MOA recognizes the importance of M&E. However, the division is staffed by one person and the demand, based on policy and project documents, for M&E far outstrips the capacity of the MOA. This lack of capacity affects DRDRE as there is very limited M&E of EAS activities. The primary DRDRE monitoring method is monthly reports from the field. DRDRE headquarters staff visit the field periodically, both the agricultural offices and farmers, to monitor activities. The FED project worked with DRDRE, primarily at the county level, to put in place an M&E system, providing training and equipment to support the effort (DAI 2013; 2014). There is no evidence to suggest these efforts created sustainable systems within DRDRE. The recognized need to put in place a rigorous sustainable M&E system continues. Doing so would provide mechanisms for better feedback and input from the field as well as provide data needed for planning and reporting.

Non-public providers are often considered to have greater capacity to deliver EAS than public EAS, though this is not necessarily the case. What is the case is that non-public projects are typically better resourced than public EAS and able to hire and sustain (during the life of the project) well-trained staff due to their capacity to pay higher salaries than public EAS. Non-public providers are able to provide other incentives to their staff, such as training, communication equipment and transportation, whereas this is limited in the public sector. Non-public EAS staff are able to move around in the field and reach famers more readily than public EAS staff, and, in an area covered by a particular project, there are more extension workers working for the NGO or donor projects than are working for the public sector. There are few Liberian private-sector EAS providers against which to assess capacity. Given they operate on a for-profit basis, their capacity to deliver should be relatively high, otherwise their services will not be requested, nor sustained. DRDRE extensionists continue to be key to Liberia's EAS.

Capacity development targeted at the organizational level would benefit DRDRE as its reorganization unfolds. Such efforts could update and build on an earlier institutional analysis of DRDRE carried out in 2008, which proposed an organizational structure based on four functions: regional development, agricultural extension, farmers' organization and applied research (ARD, 2008).

[23] Government stakeholder personal communication, April 2017.

EAS Methods

Various types of EAS methods are used by DRDRE, NGOs and the private sector to deliver EAS. Within the extension sub-sector as a whole, DRDRE does not encourage one method over another. Questions of standards and quality of methods are left unanswered as DRDRE is not in position to effectively monitor its own activities, much less those of other sectors. This system drawback needs to be addressed.

A majority of methods used by DRDRE staff are group-based. The intention is to move away from prescriptive extension messages toward a more learner-centered participatory approach. The latter requires different skills than the former, and training for many of DRDRE extensionists is needed to realize this intention. For example, a 2017 needs assessment study of extension agents found that over one-half of responding agents recorded they were *not competent* in approaches to adult education (Oladele, 2016).

In rural Liberia, information typically moves through verbal face-to-face communications, although mobile phone communications are rapidly increasing. Due to high illiteracy rates and lack of infrastructure, rural people generally do not read print media, nor watch television as much as they listen to the radio (Parkinson, 2013). This fact affects the type of EAS methods used and results in people-to-people methods being the most popular. ICT-based methods and using ICT to facilitate more traditional methods are increasingly being adopted in EAS.

There is little difference in the methods used based on characteristics of the subject matter to be delivered or characteristics of receivers. There are some all-women groups, but this is not widespread. Groups generally are mixed male-female groups. There are some differences in extension methods used based on who initiates or funds the method. For example, project-driven extension, such as that delivered by the FED project, introduced and used the more innovative (and generally more costly) methods. FED trained community radio journalists in the development of agricultural programming and supported stations with equipment, produced various videos on the value chains FED promoted and trained local NGO extension aides on the use of hand-held global positioning system (GPS) devices to measure land sizes (DAI, 2014).

Individual methods, for example face-to-face visits between the various actors (i.e., extension agents, farmers and agro-dealers) continue to be used. Print materials, written and pictorial, backstop trainers involved in training farmers. The DRDRE lacks the capacity to develop pictorial or other learning materials. Other projects and organizations do contribute these materials on an ad hoc basis, but there is no dedicated unit in the MOA capable of producing extension teaching/learning materials for literate or illiterate audiences. Nor is there a unit to assemble and reproduce existing material. Further DTF responsibility to evaluate and package technical information for delivery by extension is constrained by limited capacity.

Examples of other EAS methods practiced in Liberia are highlighted below.

Mass media and ICT

- The MOA periodically has an agricultural radio program to which DRDRE contributes.
- The F2F and the now completed USAID-funded Modernizing Extension and Advisory Services project helped DRDRE develop educational videos in local languages to be

used as teaching tools. Some training around the use of these videos was delivered to extension agents. Nevertheless, further capacity development is needed to fully exploit the potential of educational video and other educational ICT methods.

- DRDRE is working on developing a web-based database of EAS providers. DRDRE recognizes the importance of ICT-facilitated extension methods and programming, but lacks the infrastructure, funding and capacity to act on this recognition. Telling examples are the MOA internet connection is slow and the connection frequently lost. Further, reports indicate not all county extension staff are computer literate (Peterson, 2016).
- Firestone uses text messaging to send rubber outgrowers information.
- The MOA, in partnership with Cellulant Mobile and the AFDB, have an on-line e-registration system for farmers to improve basic data collection and to link with the MOA's eWallet system that will serve, similar to a voucher system, to facilitate delivering/paying for agricultural inputs[24] (Peterson, 2016).

Group methods

- Farmer groups are the common organizational mechanisms through which most EAS is delivered. Groups are organized for various reasons, for example, for production and marketing of specific commodities or to facilitate member savings and loan.
- Lead farmers provide support in some farmer groups. A lead farmer is a group member who receives special training and subsequently voluntarily transfers it to their group. Lead farmers are, reportedly, employed by donor-funded projects (DAI, 2014), a practice which could create challenges for non-paying projects/activities. NGOs train and work with lead farmers frequently, DRDRE less so. The final FED Impact Survey found limitations to the lead farmer method, including lead farmers reporting their initial training was insufficient to allow them to transfer knowledge to others and group members, reporting knowledge was not shared with them (IDG, 2017).
- Farmer field schools (FFS) is a method widely used by NGOs. Several of the tree crops projects effectively used FFS. The original FFS methodology was very rigorous. There are suggestions that the FFS methodology was diluted, with most any group receiving training considered a FFS.
- Field demonstrations, both method and result, are widely-used by NGOs and DRDRE has demonstration plots at county-level offices. Farmer field days are also fairly standard practice, and farmer exchange visits are said to be popular with farmers.
- Workshops are held frequently. As a favored method, workshop participants would benefit from inclusion of appropriate hands-on learning activities or other practical applications of the workshop subject-matter.
- Cuttington University periodically organized agriculture fairs to showcase farmer and agribusiness products.

[24] Government stakeholder personal communication, April 2017.

Market Engagement

Market engagement in the context of EAS is concerned with farmers' access to credit, market-related advice, market linkages, quality inputs, group development and output markets. Key overarching constraints to market engagement in Liberia are the poor road conditions and limited access to credit (National Millennium Compact Development Project [NMCDP] & GOL, 2013). The large majority of farm-to-market roads in Liberia are virtually impassable in the rainy season. In the dry season, roads are better, although feeder roads do not reach all agriculture production areas. Those that do are not in good shape, making travel difficult and time-consuming. These constraints, to farmers readily accessing markets outside their village and to buyers from reaching the farm gate or other areas of aggregation, result in high transaction costs, which act as a disincentive to production. Carrying loads on the head to distant markets is not an attractive alternative and farmers know it will be difficult to sell their surplus product.

The GOL and various donors are well-aware of this situation. MOA prioritized the inclusion of farm-to-market roads, as well as other agriculture infrastructure development, in infrastructure rehabilitation projects, some of which are collaboratively implemented by the MOA and the Ministry of Public Works. Investments were and are being made to improve both urban and rural roads. For example, SIDA's rehabilitation of farm-to-market roads project, which ended in 2015, concentrated on and improved feeder roads. Two large World Bank projects are currently operating: the US $53.2 million, (2009-2017) Urban and Rural Infrastructure Rehabilitation Project, which improves road access in Monrovia and targeted rural areas (World Bank, 2017c) and the Liberia Road Asset Management Project, a US $249.4 million (2011-2022) project that improves Liberia's major highway from Monrovia upcountry to the Guinea border (World Bank, 2017d). The 20-year, Millennium Challenge Corporation, a US $257 million Liberia Compact that began in 2015, focuses on road maintenance and sector capacity development as well as on increasing access to electricity. Although progress is definitely being made, there are many roads that require improvement, and many rural farm-to-market roads continue to be in bad shape.

Another major constraint to market engagement is the limited availability of agricultural credit, which often leaves farmers, particularly women, unable to purchase agricultural inputs, such as equipment, fertilizer and improved seed. This constraint is related to the low yields Liberia's farmers experience. Even though reluctance to lend to the agriculture sector continues, the agriculture lending landscape is changing.[25] Non-bank financial institutions, such as micro-finance institutions, play an increasingly important role and are the main source of loans for the majority of Liberians (Oeking, Oshima & Chawani, 2016). These institutions include village savings and loan associations (VSLAs), which consist of a small group of 25-30 people, very frequently women, who save together and lend to each other from those savings. The MOA and the Central Bank collaborated to provide agribusiness finance through the Agriculture Stimulus Initiative (MOA, 2015). Typically serving large businesses, the Central Bank began lending to AfriLand Bank, which lends to the smallholder sector,

[25] In the financial sector, there are: Nine commercial banks, one development finance company, one microfinance deposit-taking institution, 20 insurance companies, 20 microfinance institutions, nine licensed rural community financial institutions, 400 credit unions and 1,450 village savings and loans associations (Oeking, Oshima, & Chawani, 2016).

and the Central Bank set up a facility to extend credit to non-banking institutions, such as VSLAs (Fintrac, 2015a).

EAS providers have a potential role in improving access to credit via the non-bank financial institutions. Facilitating linkages between EAS clients and micro-finance institutions is an important EAS role. Financial literacy is another area of contribution as is supporting the organization and development of VSLAs. The skills of EAS providers in these areas will likely need to be developed prior to engaging with farmers.

Other issues which impact market engagement are product aggregation, product quality, market information, and post-harvest and processing. These issues and the role EAS providers play or could play in addressing them are discussed below.

Product Aggregation

Part of the rationale for the development of cluster groups of farmers or apex farmer group organizations, such as unions or cooperatives is to aggregate members' product so as to be in a stronger position vis-à-vis the market. On the supply side, EAS providers can assist in group development and management and planning for transparency in all transactions. On the demand side, EAS providers can facilitate and coordinate the linkages between sellers and buyers.

Production Quality

At the global level, Liberia became a member of the World Trade Organization (WTO) in 2016. Liberia's Sanitary and Phytosanitary Regulations are aligned with WTO's Sanitary and Phytosanitary Standards (MOA, 2016). At the local level, commodity and food crop standards have yet to be articulated. EAS has a role to play in ensuring farmers understand the quality requirements of buyers. This role is carried out usually within a value chain context by various EAS providers.

Market Information

The Liberia Market Price Monitor is a national effort to analyze the price of food and essential commodities. Housed in the MOA Food Security & Nutrition Unit, the price bulletin typically tracks rice and cassava prices. Other commodities and factors affecting food prices are also periodically tracked. For the field level, there is little information available on the status of market information systems (MIS). The FED project disseminated market price and producer information over the radio (DAI, 2014). The LADA project, discussed above, intends to develop digital and other MIS in support of its goal to increase farmer incomes. MIS may be an area that would benefit from further EAS attention.

Post-Harvest and Processing

According to FAO, there is no Liberia-specific information on post-harvest losses and losses of 15 percent and 25 percent of production of rice and cassava respectively are estimated based on regional and developing country rates (Senahoun et al., 2014). General discussion among stakeholders suggests losses are much higher. The loss in the vegetable value chain is also likely high, given the short shelf-life of most vegetables. Various projects are attempting to decrease post-harvest losses and improve processing, including the MOA-implemented projects earlier discussed. A recent New Partnership for Africa's Development (NEPAD) Policy Brief directed toward governments of West Africa indicates cooperation and communication between research and extension is needed to tackle post-harvest losses (Sowe, Conteh, Koroma, Pereira & Sanyang, n.d.).

Further, the brief suggests to governments that the development of a five-year strategic plan focusing on research and extension in the value chain would be worth considering (Sowe et al., n.d.).

Livelihood Strategies

Public, private and civil society-sector EAS works with diverse groups of clients across value chains ranging from input suppliers to smallholders to large-scale commercial farmers and from producers to processers and buyers. The content of EAS should be targeted to meet the circumstances and livelihood needs of these various groups. The following provides an overview of how the three EAS sectors in Liberia develop content and programs for their primary audiences.

Content Development

There are numerous sources for the content of extension learning materials and programs in Liberia. EAS providers deliver content based on their goals, their resource base, their philosophy of development and other factors. Some DRDRE staff suggest extension messaging, or the content of extension activities, is problematic (Peterson, 2016) because messages are not "harmonized," that is, messages may vary depending on who is delivering them. Different messages tend to confuse the farmers receiving them. In a pluralistic system, part of the monitoring role of the DRDRE would be to assess the quality of field messages and programs. DRDRE is not in position to do this for reasons earlier discussed. Nonetheless, the extent to which this is a problem for farmers and other extension clients warrants further attention.

Two dimensions of extension content are the technical content and the crafting (or packaging) of that content for use by those who are to benefit from the content. The issue of availability of site and client specific profitable agricultural technology for farmers and others along the value chain to adopt foundational to extension content and programming was earlier discussed. Discussion of other aspects of content and programming follow.

DRDRE is mandated to assemble and disseminate information, knowledge and technologies to farmers in technical, management, marketing and organizational subjects (MOA, n.d.) and to work closely with DTS in this endeavor. The Ministry's DTS is responsible for the provision of technical information and support for all agricultural production across Liberia. The division accumulates, synthesizes and evaluates technical information and packages it for dissemination through the Extension Department (MOA, 2016). These mandates seem to be somewhat duplicative, but, in any case, the capacity to develop extension content is limited. International entities, such as those in U.S. university systems and the CGIAR consortium system (e.g., IITA), are resources for extension content, but more work is needed to strengthen these linkages. If the evidence-based technical content is available, there are no subject-matter specialists, nor other experts, in DRDRE to translate this into extension content. Projects, such as FED, developed content and provided materials to DRDRE, which begs the question of MOA capacity to do so and represents a major challenge.

The associations and cooperatives that provide EAS to their members usually are involved in training for specific products. The content of training is typically derived from the expertise of extension agents or other specialists they hire, from members and from written documentation available to them. Where associations or cooperatives are supported through projects, project staff are involved in content development. MOA extension agents are also sources of information depending on the subject matter. Agro-dealers, who embed EAS in their products, often do so as

part of the activities of projects in which they are involved and which provide them various types of support. Input to the development of content delivered by agro-dealers is also based on product manufacturer information and expertise of project staff.

NGOs, as the main EAS providers in this sector, access information for content development from various sources. The smaller NGOs often search for material and expertise from other NGOs, their staff and innovative farmers. In addition to these information sources, the larger NGOs are able to access content from technical resources, such as subject-matter specialists and national and international centers of expertise, including research centers.

Content Areas

The areas in which EAS requires proficiency in order to support rural livelihoods are becoming increasingly complex and include gender, nutrition and climate change. These livelihood-influencing factors are discussed below.

To summarize earlier mentioned key gender-related issues that impact EAS: women's literacy rate is lower than males, the very large majority of DRDRE staff are male, and women have lower access to the factors of production (i.e., land, labor and capital) as well as more limited access to knowledge via extension services to assist them to improve their productivity. Juxtaposed with this are DRDRE reports that over one-half of farmers reached by DRDRE in 2015 were women and while requiring further investigation to confirm, a survey of DRDRE and MOA project extension staff suggests they recognize the importance of working with rural women and believe they are *competent* in doing so.

Liberia enjoys policy-level support for gender mainstreaming (MGD, 2009) and many projects consider gender in their programming activities (DAI, 2013; DAI, 2014). Against a background of progress, much remains to be accomplished to ensure agricultural development and extension activities build on and strengthen women's contributions to Liberia's development. Although figures vary, women are reported to produce over half of the output in food crops while their access to cash crops, particularly tree crops, is limited (Poverty Reduction and Economic Management – Gender and Development Group, [PRMGE], 2010.)

Across the whole value chain, what women do, what resources they have access to and what they have control over are important factors to consider in designing and implementing interventions that aim to strengthen their involvement in value chains and ultimately increase their incomes. Data on these factors are not available by value chain and represent a weakness, which needs to be remedied.

Increasing ICT-based EAS could contribute to increasing EAS coverage. For women in particular, increasing their access to and use of ICT offers a pathway to improve women's access to EAS. A preliminary step is to investigate both the supply of digital EAS services and the effective demand for mobile EAS services in Liberia. On the supply side, some initial work has been done on video development and provision of market information. On the demand side, gendered differences in ICT utilization need to be considered and the situation in Liberia documented. For example, women are less likely than men, and rural women are less likely than urban women, to own a mobile phone. Women often borrow a phone when needed rather than purchase, and the cost and fear of being unable to use a phone constrains women from purchasing them (GSMA, 2014).

The MOA Food Security and Nutrition Unit coordinates nutrition-related activities. DRDRE is a logical choice for the development of nutrition-sensitive agricultural EAS programming, which, among others, incorporates nutrition messages related to dietary diversification.

Liberia is vulnerable to climate changes, which can affect agricultural production and livelihoods, thus having impacts on food security. These changes include warmer temperatures, increases in annual rainfall, and increases in the frequency of heavy rainfall (USAID, 2012). EAS could contribute to mitigating climate change impacts by, among others, promoting integrated crop and livestock farming, crop diversification and water resources management.

The MOA has a capacity development plan for Climate Change Management in Agriculture developed through the recently ended Climate Change Adaptation Agriculture Project discussed earlier (MOA, 2013). This project intended to train DRDRE staff at the county and district levels in the two pilot project counties in which it was implemented and to eventually extend training to other DRDRE staff. The project developed various materials for use by extension and others. Data are not available on numbers of trainings and materials delivered, but training materials could likely be obtained by following up with UNDP, a collaborator on the project. As well, project documents indicate modules for short courses on climate change and adaptation in agriculture were developed for University of Liberia and Cuttington University (UNDP, 2012). These modules would be important in developing extension content related to climate change.

Community Engagement

Liberia's pluralistic extension system is meant to be demand-driven. Farmer demands need to be known and understood before targeted content and program responses can be developed. Currently, farmers do not have a sector-wide mechanism through which they can "demand" services. The National Policy for Agricultural EAS lays out a framework for articulating farmer demand through a series of platforms at the district, county and national level (MOA, 2012b). However, neither this system, nor an alternative has been put in place.

Currently, DRDRE extensionists informally survey farmers to identify their problems and use this input for the development of annual work plans. In the past, even though work plans were developed, funding constraints precluded plan implementation, which in turn disincentivized and disappointed many extensionists, farmers and others who had participated in their development.

Some NGOs conduct wide-ranging, participatory, farmer needs assessments and build projects around farmers' articulated needs. This approach is quintessential to developing demand-driven extension content and programming. But, this approach is not systematic, nor typically shared with other EAS actors. For other NGOs, the focus of their work is determined by their donor. In such cases, NGOs usually engage with farmers to identify the areas related to the livelihood focus that need to be strengthened, building activities around those areas. Or, less favorably, they do not consult farmers and develop content and program based on what they think is needed.

The Peace Agreements of 2003 set the stage for reconciliation and Liberia's movement forward. Nonetheless, the excesses of the civil wars endure with many Liberians, exacerbated by the Ebola virus. The need to rebuild trust among and between neighbors and communities remains. Two traditional institutions may contribute to this rebuilding process. Susu is the widespread traditional savings and loan mechanism upon which current VSLA have been built. Susu continues to operate

at the village level, either as a stand-alone group or one modified and termed VSLA. The kuu system is a small group of farmers, who organize themselves to help each other with their farm work. This system is practiced primarily in northwest and central Liberia. The FED project reports delivering EAS to kuu groups and successfully establishing related demonstration farms on kuu leader farms (DAI, 2014).

RECOMMENDATIONS

The following recommendations are based on this report and are in line with DRDRE plans for strengthening EAS.[26] Recommendations are intended for any national, regional and/or international EAS stakeholder interested in strengthening Liberia's EAS system including government, donors, the private and civil society sectors and others. Recommendations are put forward considering both the strengths and limitations of Liberia's EAS.

To identify which stakeholder among those in the AIS are best-fit to carry the recommendations forward (best-fit includes willingness, capability, resources and commitment) will require discussion and dialogue among stakeholders. To facilitate this discussion and dialogue, the report offers suggestions for organizations or institutions that could possibly take leadership roles in acting on recommendations.

The strengths of Liberia's EAS system, which present a foundation on which to build EAS investments, include:

- DRDRE is ardently committed to improving EAS for the benefit of its clients;
- the national agriculture policy recognizes the importance of EAS;
- the policy framework for a pluralistic, demand-driven, market-led EAS system exists;
- pluralism was and is embraced;
- private-sector EAS is emerging;
- potential opportunities for public-private partnerships between MOA, concessionaires and, in particular, large-scale tree crop farms are present;
- slow, but steady, progress toward public-sector EAS decentralization is being made;
- ample opportunity for ICT-based EAS exists; and
- EAS endeavors to apply gender-sensitive approaches.

First, as a priority, channel EAS investments from government, donors and other funders into developing and maintaining sustainable systems in the DRDRE. Second, strengthen Liberia's EAS system as a pluralistic whole. While this report identifies various activities that improve EAS, there is no comprehensive effort to explicitly strengthen Liberia's EAS system as a whole. This second

[26] Government stakeholder personal communication, April 2017.

overarching recommendation cuts across the various characteristics of EAS per the best-fit framework, and suggests remedying EAS system weakness by designing, implementing and evaluating a holistic EAS strengthening project that is comprised of distinct components that can be individually (or collectively addressed) by various EAS and AIS stakeholders. The objective is to clearly articulate a roadmap of priority activities to improve EAS as an entire system while dividing the whole into smaller-sized activities or projects, which can be taken on by different stakeholders in the AIS, based on their interests, strengths and budgets. Stakeholders include government, donors, private-sector actors, civil society NGOs, projects and any others in the AIS interested in supporting EAS. A minimal management structure is recommended whereby an EAS taskforce led by DRDRE is convened under MOA's existing Agriculture Coordinating Committee to provide general coordination of funded activities. This recommendation requires some investment in the development and maintenance of an EAS taskforce. A comprehensive project designed, funded and implemented by an EAS stakeholder or consortium of stakeholders is the ideal. However, given reported resource constraints and the history of EAS funding in Liberia, compartmentalizing EAS needs into component parts for funding offers an alternative. Compartmentalization is based on the premise that the whole will be more than the sum of its parts. Designing a comprehensive strengthening effort is the first step. The following recommendations stand alone or may be used to inform this first step.[27]

Governance Structures and Policy Environment

1. Convene a small group of influential EAS stakeholders to identify why the National Policy for Agricultural EAS was not submitted to the legislature for approval nor widely distributed, to formulate a plan to address constraints that may be identified, and to facilitate the dissemination of the policy, most specifically at county and district-levels. (DRDRE/ACC with LIFAAS technical and resource support)
2. Survey ACC members to determine what prevents the committee from becoming sustainable and collaboratively develop a plan to reinvigorate and strengthen the committee, so it is responsive to its members and able to carry out its functions. (ACC with LIFAAS technical and resource support)
3. Convene an EAS Task Force under the ACC to ensure EAS representation and to advocate for EAS nationally. (ACC with LIFAAS technical and resource support)
4. Develop and resource the national, county and district mechanisms to (a) coordinate the pluralistic EAS system and (b) stimulate and capture farmer demand to design demand-driven EAS programs, as articulated in the National Policy for Agricultural EAS, or design and resource alternative mechanisms. (Donors, existing projects, regional and/or international stakeholders)
5. Build on the available window of opportunity opened through CARI's new strategic plan and collaboratively develop a roadmap to identify responsibilities and build positive active working relationships among DRDRE, CARI, other research institutions and educational institutions

[27] Several recommendations in this section are similar to those previously put forward in McNamara, Swanson and Simpson (2011).

involved in research. (DRDRE along with CARI, Cuttington University, University of Liberia, and DRDRE international partners, such as University of Illinois and FAO)

6. Considering the primacy of smallholders as EAS clients, explore potential public-private partnerships between DRDRE and large-scale commercial farm operations and concessionaires to formulate EAS activities of benefit to all parties. (Donors, MOA, DRDRE, LADA, SHOPS II, Firestone, Golden Veroleum, Sime Darby)

Organizational and Management Capacities and Cultures

7. Fund operational expenses of DRDRE, particularly for transport and communications, to enable staff to carry out their responsibilities. Outsource DRDRE fleet management and maintenance and track transport problems encountered to provide input into MOA budgeting processes. (Government, donors, ongoing projects)
8. Improve the quality of existing DRDRE staff through developing and implementing a targeted systematic in-service training program informed by findings of the existing training needs study (Oladele, 2016). Focus training on three high-priority areas: Value-chain development, including post-harvest practices and processing; participatory extension program development, implementation and monitoring; and market-led extension. Design and implement induction training for new staff. (DRDRE supported technically by national, for example NGOS operating in Liberia, international partners and donors)
9. Review the responsibilities and duties of DRDRE and DTS to identify and address overlapping areas of responsibility and facilitate positive engagement between the two departments. (International partners and donors along with DRDRE and DTS)
10. Collaboratively with EAS stakeholders, review DRDRE M&E activities to identify the priority data needs of DRDRE and areas where DRDRE data needs and stakeholder data needs intersect. Request assistance from stakeholders, targeting donor-funded projects in particular, to find means for DRDRE to sustainably capture and report priority and intersecting data. (Donors, LISGIS, ongoing projects)
11. Support DRDRE in its effort to reorganize the department, building on earlier analytical institutional development work. (Government, donors, international partners)

EAS Methods

12. Inventory and document site and client-specific profitable agricultural technologies and their supporting recommendations, so EAS providers can access such evidence-based information for use in their EAS activities. (CARI and DRDRE, ongoing projects, IITA, Africa Rice, international partners, donors)
13. Establish an Extension Communications Unit within DRDRE to act as a repository for technology inventory materials and other extension materials from pluralistic EAS providers. Build capacity of unit staff to design and develop extension education materials for use by those in the pluralistic system and to articulate standards for extension materials. (MOA, international partners, donors)

14. Increase the use of ICT-enabled and gender-sensitive extension methods among the pluralistic EAS providers, in particular building on existing video material and strengthening MOA agricultural radio programming. (MOA, DRDRE, ongoing projects, national and international partners)

Market Engagement

15. Prioritize the inclusion of financial literacy for farmers to improve their chances of accessing credit and explicitly link farmers to sources of credit. (Donors, ongoing projects (e.g., LADA), national and international partners)
16. Develop a performance-based incentive system to reward DRDRE staff who assist farmers to aggregate and sell high-quality products. (DRDRE, donors, ongoing projects)
17. Investigate the cost/benefit of developing a national market information system or of alternative systems for specific commodities. (DRDRE, donors, ongoing projects)
18. Respond to NEPAD's call to involve both research and extension in decreasing post-harvest losses in the vegetable value chain in the development and delivery of a corresponding pilot project. (DRDRE, CARI, Cuttington University, University of Liberia, donors)

Livelihoods

19. Fill the gender data gap in key value chains (e.g., rice, cassava, vegetables, goats) by conducting gender analysis of the chains, making results available to EAS providers. (Donors, LADA and other major ongoing projects, international partners focused on gender)
20. Examine the extent and impact of differing content of livelihood messages and determine the cost/benefit of harmonizing messages. (ACC, DRDRE, ongoing projects, donors)
21. Build on existing collaboration with the Food Security and Nutrition Unit to develop nutrition-sensitive agriculture messages and incorporate messages in EAS activities. (DRDRE, ongoing projects, international partners)
22. Develop a protocol for assessing constraints and facilitators to adoption of technology to be pilot-tested and refined collaboratively by DRDRE and others in the EAS or AIS system. (DRDRE, CARI, Cuttington University, University of Liberia, international partners, donors)

Community Engagement

23. Carry out participatory community-level monitoring of strengths and weaknesses of the mechanisms to capture farmer-demand recommended above. (DRDRE with donors and ongoing projects)
24. Twin the development and organization of farmer groups with the development and strengthening of VSLAs. (DRDRE, ongoing projects)

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ANNEX 1. AGRO-INPUT SUPPLIERS, SCALE OF OPERATION, AND ADDRESS

Excluding Weinco and Arjay entities earlier discussed in this report, details of the EAS approach of agro-input suppliers listed below are not available.

Table 6. Agro-Input Suppliers

Name	Scale of Operation	Address
Agricultural Material Business Center	Retailer	Ganta Parking, Gbarnga
Aloysius Sumo Business Center	Retailer	Central market, Gbarnga
Arjay Farms Inc.	Seed producer	Kingsville, Montserrado
Falama, Inc.*	Processing & Packaging	Sinkor, Monrovia
Farbrar Liberia, Inc.*	Rice Processer	Kakata, Margibi
Green Farms	Importer/wholesaler	Corner of Broad & Johnson St., Monrovia
Greenfield Liberia Inc.	Importer/wholesaler	Capitol Bye-Pass, Monrovia
Gro Green	Importer/wholesaler	Capital Bye-Pass, Monrovia
Miagro	Importer/wholesaler	Elwa Junction, Adjacent Isaac Davies High School Paynesville, Monrovia
Price Trading Inc.*	Wholesaler – Animal Vaccines and Medicines	Jallah's Town Road, Monrovia
Project New Outlook*	Retailer	Bernard Farm, Montserrado
T.R. Enterprise*	Retailer - Small/medium scale food processing equipment	West Benson Street, Monrovia
VADEMCO*	Seed/Nursery Supplier	Somalia Drive, Monrovia
Wienco	Importer/wholesaler	P. O. Box 1998, 1000 Monrovia 10, Liberia

Source: Modified from Asare (2012).

*Additions to original source list.

ANNEX 2. ADDITIONAL NGOS AND TECHNICAL AGENCIES OPERATING IN AGRICULTURE/EAS

Table 7. Additional NGOs and Technical Agencies

NGO or Technical Agency	RELATED FOCUS/ACTIVITY
4-H Liberia	Youth program in agriculture and other subjects
Africa Development Corp.	Lowland rice development
Agency for Economic Development and Empowerment	Innovation platforms for rice production
AgriCorps	Exchange program whereby US professional agriculture volunteers provide agriculture education to groups in Liberia
Agricultural Missions Inc.	Via the West Africa Initiative of Liberia, production of snails and bees, planting of indigenous trees for livelihood improvement
Community of Hope Agriculture Project	Agriculture/livelihoods focus; train farmers on System of Rice Intensification
Community Youth Network Program	School gardens
Concern Worldwide	Farmer field schools, nutrition and livelihoods
Finn Church Aid	Livelihood improvement: egg production for rural and national markets; peri-urban vegetable production training
Rights & Rice Foundation	Economic empowerment, financial management training
Sustainable Livelihoods Promoter Program	Installs hand pumps
ZOA	Training in agricultural production
ZOE	Food security through teaching agriculture to children/youth

Source: Modified based on 2015 Liberia Humanitarian Agency Contact List (retrieved from dlca.logcluster.org/display/DLCA/4.2.2+Liberia+Humanitarian+Agency+Contact+List) and MOA n.d. Contact Details for Extension People in Liberia ("LIFAAS") (retrieved from http://www.moa.gov.lr/doc/CONTACT%20DETAILS%20FOR%20EXTENSION%20PEOPLE%20IN%20LIBERIA.pdf.)