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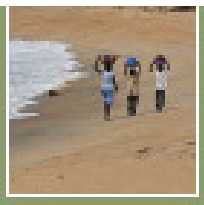
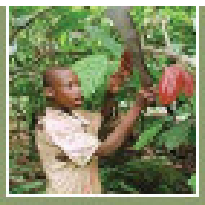
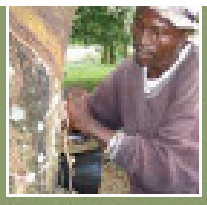

Republic of Liberia
Ministry of Agriculture
Comprehensive Assessment of the Agriculture Sector
Volume 2.2 - Sub-Sector Reports

IFAD

MINISTRY OF AGRICULTURE

COMPREHENSIVE ASSESSMENT OF THE AGRICULTURE SECTOR IN LIBERIA (CAAS-Lib)

Volume 2.2 - Sub-Sector Reports

Liberia 2007

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Liberia 2007

I. LAND AND WATER MANAGEMENT COMPONENT

EXECUTIVE SUMMARY

The Comprehensive Assessment of the Agricultural Sector of Liberia (CAAS-Lib) was launched by the Government of Liberia, with assistance from the Food and Agriculture Organization of the United Nations (FAO), the World Bank and the International Fund for Agricultural Development (IFAD), to provide a vision and policy and programme options for the agricultural sector and for food security, and also to help the sector institutions prepare themselves for the transition to nation-building after nearly 14 years of war and destruction of life and property. The review comes at a time of transition from war to peace and nation building by the recent process of democratic elections and also the Millennium Development Goal (MDG) that calls for halving of the number of poor and hungry people by 2015.

As a sub-sector report contributing to the overall review, the main tasks of this study are to: review information on the resource base and analyse the land and water sector data, bearing in mind the environmental issues; review past and present water development and management projects with regard to water control and soil conservation; analyse options for development of water and soil conservation projects as priority investments; review planned overlapping activities in the sector and formulate implementation strategies.

Located on the west coast of Africa, Liberia (4°18', 8°30' north; 7°30', 11°30' west) occupies a land area of approximately 111 370 km^2 of which 96 160 km^2 (86 percent) is dry land. The rest, 15 210 km^2 and constituting 14 percent of the surface area, is covered by water. It shares borders with Guinea to the north, Côte d'Ivoire to the northeast and east, Sierra Leone to the northwest and the Atlantic Ocean to the south and southwest, with a coastline of about 520 km in length.

The population is estimated at approximately 3.5 million (2004 figure), 52 percent of which is rural, with an estimated total of about 230 000 farming families. It is estimated that Monrovia alone accounts for nearly 40 percent of the population, with most of the returning refugees preferring to settle in Monrovia. At a projected growth rate of 2.3 percent per annum, the population is expected to reach approximately 5 million in 2020. According to the Ministry of Agriculture (MOA; 2006), approximately 40 percent of the total population of Liberia is between the ages of 15 and 35 years.

Liberia's economy, as described by the contribution of the various sectors to the gross domestic product (GDP), can be summarized for the period 1997 to 2005 as: agriculture and forestry (64–77 percent); industry (4–10 percent); services (19–26 percent). The unstable economic environment resulted in the decline of the contribution of industry to the GDP, particularly when most of the revenues from mining were unaccounted for. The war in Liberia has rendered the country one of the poorest in the world, with a reported per capita GDP of approximately US$ 130 in 2003. Eight out of every ten people are said to be living on less than a dollar a day. The Government's strategy for poverty reduction has been first to stabilize the economy and secondly to increase resource allocation to the social sectors.

The climate of Liberia can be summarized as follows: rainfall ranges from about 1 700 mm in the north to > 4 500 mm in the south; temperature 24–28 °C; relative humidity 65–> 80 percent; sunshine duration 2–8 hours/day; evapotranspiration 3.0–4.5 mm/day. The wind

conditions are described as generally mild. The topography comprises mainly flat to rolling coastal plains running into some interior plateaus and then mountains in the northeastern part of the country. The country is made up of four physiographical units: coastal plains (0-100 m), interior hills (100–300 m), interior plateaus (300–600m) and the mountainous areas (> 600m). The country has nine major river systems, all of which are perennial, and run in a northeast to southwest direction into the Atlantic Ocean, draining about 66 percent of the country and taking their sources from neighbouring Sierra Leone, Guinea or Côte d'Ivoire. There are also short coastal water courses, draining about 3 percent of the country. The total renewable water resource is estimated at approximately 232 km^3/year, making Liberia one of the African countries with the highest *per capita* renewable water resources, about 71 000 m^3/year.

The geology of Liberia can be classified into three major rock age provinces: the Liberian age province (2.7 billion years), the Eburnean age province (2 billion years) and the Pan African age province (0.55 billion years). There are three types of soil in Liberia, namely laterites (latosols), sand (regosols) and swamp, covering 75, 21 and 4 percent, respectively, of the land surface.

Nearly 5.4 percent of Liberian land, amounting to about 600 000 ha, is said to be cultivated, and 220 000 ha of this is reported to be under permanent crop or plantation, while the rest is arable. Broadly, the land can be divided into uplands and lowlands or swamps. Swamps can be classified as mangrove, riverine grassland, floodplains or inland valleys. The level of suitability of the swamps for production is not known because they have not been characterized, but there is a general assumption that the swamps are more productive when used for growing rice.

Irrigation potential is estimated at about 600 000 ha, but only approximately 1 000 ha can be described as having a surface irrigation facility. The total water-managed area in 1987, including swamp rice control, was estimated at about 20 100 ha. This includes equipped lowlands (2 000 ha) and non-equipped cultivated swamps (18 000). Therefore, in the real sense of the word, irrigation infrastructure is virtually non-existent, despite the presence of abundant water resources in the country. Areas with good water control and having the possibility of two crops per year are limited. There are also peri-urban irrigation activities around Monrovia, but the method of irrigation is predominantly by hand.

On the issue of water ownership, control and use, there are no statutory regulations. Ownership of water running in a defined channel (e.g. a river) is not properly understood because water is generally assumed to be a free gift. Individual land ownership presupposes a riparian right on the resources that are on or underneath the land.

With regard to the beneficial uses of water, the provision of water supply and sewerage services to the public is the responsibility of the Liberia Water and Sewer Corporation (LWSC). Regulations govern the legality of connections and illegal connections are punishable by law. Also, local authorities are vested with the responsibility to prevent and remedy pollution of fresh water used by the public for drinking and domestic purposes. Unwholesome sources of water supply, whether public or private, are prohibited by law. The law allows for catchment area protection of public water supply schemes and punishes anyone whose activities within such defined boundaries will impact negatively on the water source.

Regarding the control and protection of water works, the design and construction of public water works largely appears to be the responsibility of the Ministry of Public Works (MPW). Arguably, private water supply, hydroelectric works, drainage and sewerage works and those pertaining to field water control are subject to the technical control of the MPW. A permit from the Forestry Development Authority (FDA) is required for the damming of rivers and streams within the boundaries of forest reserves and national parks.

With respect to health-related issues, the discharge of wastewater from any premises into swamps, watercourses or irrigation channels is regarded by the health legislation in force as a statutory nuisance, punishable by law. Groundwater exploitation for any purpose is subject to prior health clearance in the form of a permit from the local health authority.

It must be noted that no clear reference is made to the development and use of agricultural water resources but this is inferred from other legislation affecting water works in general and forestry issues in particular, including matters of forest water resources and catchment protection.

The development, conservation and use of the country's freshwater resources are subject to fragmentation of responsibilities among several branches of the Government and two public utility companies. A draft bill for the establishment of a Water Resources Board (WRB) draws membership from seven ministries, the LWSC and LEC (Liberia Electricity Corporation); two additional members are appointed by the Minister of Water Resources (MWR). The WRB is expected to have the following functions:

- to formulate policies for the conservation, development and best use of the water resources of Liberia;
- to coordinate all public and private projects and programmes concerning the conservation, development and use of water resources;
- to advise the Minister on measures for the implementation of water resources policies and plans and on all matters concerning the conservation, development and use of water resources.

Liberia shares international water resources with her neighbours: St John Basin (Liberia and Guinea), St Paul Basin (Liberia and Guinea), the Cestos Basin (Liberia and Côte d'Ivoire), the Cavalla Basin (Liberia and Côte d'Ivoire), the Moa Basin (Liberia, Sierra Leone and Guinea); and the Mano Basin (Liberia and Sierra Leone). Numerous bilateral treaties have successively governed the delimitation of the frontier of Liberia since 1885 on the Mano River and since 1892 on the Moa River. Some of these treaties have provided for the freedom of navigation and transit fishing and the protection of existing water use rights for the local population.

There are nine major rivers in Liberia with catchment areas varying from 4 000 (Farmington/Du) to 28 000 km^2 (Cavalla). The Mano, Lofa, St Paul, St John, Cestos and Cavalla together drain approximately 65.5 percent of the country. The river flow of the Cavalla at Nyakee in the 1960/61 water year amounted to about 13 km^3/year. The average discharge for St Paul at Mt Coffee for the 1958/66 water years amounted to about 19.2 km^3/year. A water balance study for the Du river catchments upstream of Kakata, with an area of 326 km^2, made over 4 years showed that the mean annual rainfall, runoff and evapotranspiration equalled 2 742 mm, 1 150 mm and 1 592 mm, respectively, with a runoff coefficient of 0.42. A similar study of a 0.7 km^2 area of the steep natural rainforest

catchments of Weakpor creek, based on monitoring for one year, showed annual rainfall, runoff and evapotranspiration of 2 860 mm, 1 320 mm and 1 540 mm, respectively, and the runoff coefficient was 0.46.

The Liberian hydrological year starts in April and ends in the March of the following year. The Liberia Hydrological Service (LHS), part of the Ministry of Water Resources (MWR), is responsible for the collection of hydrometeorological statistics. There were 47 hydrometeorological stations in Liberia before the war and rainfall statistics date back to 1927 at the Ganta station, for example. The stations were operational until 1989. Since 1990, there have been no new records made because of the civil strife. Practically speaking, all the meteorological stations were destroyed during the war except one in western Liberia. There is now, therefore, an urgency to establish and modernize new stations. It must also be noted that the data that were collected previously contain many gaps, and the paucity of data is worth noting. It is simply not possible currently to obtain any meaningful data from existing information, over the full range of meteorological statistics, particularly rainfall, temperature, relative humidity, wind velocity and sunshine duration, for any single station in the country.

Hydropower plants located on the St Paul River and Farmington/Du River have all been destroyed in the war and, because of the cost of building power plants, it will take a considerable time for such ventures to be undertaken to ease the power shortage in Liberia. Nine potential sites have been identified on the rivers Mano, Lofa, St Paul, St John and Cavalla for possible future power plants. This, if achieved, will greatly augment the power supplies of the country. Exploration of hydropower potential on the Lofa River has revealed that several falls and rapids between Lofa and Baha town fulfil the conditions of low-head hydropower plants, for which dams and spillways are not required.

It can be argued from a global perspective that water is not in short supply in Liberia. However, in many local areas this is not true, and a number of swamp thickets have been removed for agricultural purposes. There is evidence to suggest that minor tributaries that used to be perennial have become seasonal due to excessive removal of vegetation cover. Because there are few measured data to suggest that the river flows are reduced, we can only speculate. There is also evidence to suggest that fallow periods could be reduced, especially on upland farms, as a result of population pressure. This land use pattern can threaten water resources and it is imperative that measures are taken at the community level to reverse the trend.

There is a lack of data on groundwater resources in Liberia. There has been some exploitation of groundwater for rural water supplies but hydrogeological data is woefully lacking. Liberia can be divided into three areas according to the occurrence of groundwater, namely the soft rock areas that consist of sedimentary rocks, the fractured/fissured hard rocks and the weathered igneous and metamorphic rocks. The quaternary sediments, which constitute the younger sedimentary rocks, are shallow; they are up to about 30 m deep, 35–40 m thick and are more than 15 000 years old. The extent of the fractured hard rock areas is not known and it is important to perform exploratory investigations to establish the extent of these possible aquifers. The weathered igneous and metamorphic rocks are soft rocks with appreciable porosity and hydraulic permeability; these are over-burdened rocks, not more than 30 m deep and are also not extensive.

Soil survey and classification. Prior to 1987, surveys of a large number of small farms were carried out by the Land and Water Resources Department of the Central Research Institute

(CARI) in Suakoko and the Land Development Division of the Ministry of Agriculture in Monrovia. These surveys were designed to assist in the production of food and cash crops. Medium-scale surveys of large farms were undertaken by different bodies, and provided information on land resources for widely ranging objectives. In addition, large-scale area-oriented surveys of land capability and crop suitability were carried out by integrated agricultural development projects in Lofa, Bong and Nimba counties in northern and northeastern Liberia. In the southeastern part of the country a survey of Grand Gedeh County identified suitable areas for lowland rice and tree crops (cocoa and coffee).

The earliest survey of soils was a national exploratory survey carried out in 1951. It was based on flights over the country and observation along accessible motor routes. A national soil map was produced at a scale of 1:300 000 showing five soil "associations". The description of the soil associations provided some indication of the landforms and the report also provides some idea of the chemical status and an indication of the appropriate use of the land. Although such a survey cannot be used with any reliability for either national or regional planning, it provides the first account of the range of soils to be found in Liberia. In this survey, much of central Liberia is indicated as having very shallow soils (lithosols), but with latosols around the margins. In 1977, the Soil Division of the former Central Agriculture Experiment Station (CARES), with Geiger, established a catalogue of soil series that had been defined up to that time in Liberia. A description is given of each series together with its classification (soil taxonomy) and an indication as to its use. However, the series described were established mainly in Bong County and neighbouring areas, where most soil surveys had been undertaken.

Detailed surveys of the selected swamps and lateral slopes were conducted along trace lines spaced 100 m apart. Mapping was done at a scale of 1:2 000, with separate sheets showing soil types and land suitability for rice and for dry land cropping. Soil texture proved to be the principal factor that determines suitability in swamp areas; soil depth and gravel content were the principal determinants of suitability for dry land crops on the lateral slopes. The soil analysis results indicated that the soils have very low fertility. Infiltration rates and hydraulic conductivity are relatively high in the coarser-textured swamp soils. Five selected swamps totalling 596 ha were surveyed at a detailed level, of which 146 ha were suitable for rice and 128 ha were suitable for dry land cropping. Some 222 ha were found to be unsuitable for cropping.

In this survey two farming systems were identified within the villages, namely an upland farming system and a village farming system, the former is the principal source of the staple subsistence food (rice) and receives priority in terms of labour resources. Surplus labour, if available, is utilized on the village farms, which are oriented towards cash crops, such as tree crops (coffee and cocoa), vegetables and swamp rice. A tentative analysis of the correlation between soil mapping units and other classification systems was performed.

Land Tenure. At independence in 1850, the Government of Liberia vested all land in the state. By the time of the Land Act of 11 January 1850, all Liberians had the right to own land, if feasible, and the process of land acquisition was relatively easy. Under the Anglo-American deed system of land acquisition, Presidential assent was required. Rural land is still under some customary tenure but there is no security in the customary tenure system. According to the Government of Liberia (GOL, 1980), an environment conducive to development must, among other things, include a land tenure system that permits a farmer to feel secure in the use of land, especially where land improvements are involved.

Land in Liberia is divided into lots; 4 lots are equivalent to 1 acre. The cost of acquisition of 1 acre of land in 1850 was US$0.50 but, at present, the same area of land may sell for US$120.

There is no comprehensive policy on the acquisition of land for agricultural purposes, and GoL is silent on the payment of fees. The GOL grants leases to private investors, and land fees are negotiable. The MOA determines fees for agricultural land acquired for private use, although the Ministry of Lands, Mines and Energy (MLME) manages the process of land acquisition.

Land use and forestry. The first comprehensive land use map of Liberia was prepared in 1956 from aerial photographs taken in 1953. At the time, the map showed extensive forest vegetation in the northwest and southeast, with some agricultural areas. In 1981, another land use map was prepared from aerial photographs taken in 1979. This revealed the extensive depletion of forest cover, largely due to farming activities. Apart from the plantations (rubber, cocoa, coffee and oil-palm), which are noted for providing surface cover and minimizing soil erosion, the farming system has largely been one of shifting cultivation, with a fallow period of 9–10 years. Deforestation is said to occur at a rate of 1.5–2 percent per annum.

In 1976, the GOL passed a special Act creating the FDA as the sole institution with authority to manage Liberia's forest estate (Working Group on Liberia's Protected Area Network, 2006). For administrative purposes, Liberia is divided into four forestry regions that are managed by the FDA. These forests are said to be home to about 2 000 species of flowering plant, 150 species of mammal, 620 species of bird, 125 species of reptile and amphibian and over 1 000 described insect species. However, Liberia's forest habitat and biodiversity face increasing threats from slash-and-burn agriculture, mining, logging and the migration of rural settlements.

The FDA now proposes a sustainable forest management policy known as the 3C policy, the *conservation, community and commercial forestry* policy, where community involvement is seen as an important part of the process of management. The aim of commercial forestry is the sustainable production of forest products and the development of viable forest-based industries. Community forest management focuses more on the interests of the people who live in and on the fringes of forest areas. Alternative livelihood issues are to be considered where dependence on forest resources and products such as wildlife is crucial. The aim of forest conservation is to sustain and enhance biodiversity conservation and to maintain the other environmental functions of forests for current and future generations.

On the issue of **land conservation**, prevention and control of soil erosion, which results from human interference with natural conditions, is indirectly provided for by current forestry legislation to the extent that the use of forests is restricted and forest cover is thereby protected. The commercial exploitation of forests at large is restricted with regard to the size of trees that can be felled and additional restriction may be placed on the exercise of timber concessions from the Government. In addition, the GOL may set aside forests for controlled use of natural resources therein.

Wetlands. The wetlands of Liberia that have been designated potential Ramsar sites for conservation include Lake Piso, Marshall Mesurado, Lake Shepherd, Bafu Bay, Cestos-Senkwehn, Gbedin and Kpatawee, as shown in Table 13. It is expected that an inventory and a management plan will be developed for the sustainable management of these wetlands.

These lands are generally considered as wastelands but they are home to important biodiversity and have key economic importance for many Liberians engaged in inland fisheries and swamp rice development.

Land capability studies. These were undertaken as detailed surveys of selected swamps and exploratory semi-detailed surveys of dry land farming areas around selected villages. The semi-detailed surveys extended over the areas affected by cultivation. Maps of vegetation and land use, soils and land capability were compiled at a scale of 1:20 000. Broad patterns of soils were mapped using the "soil family" concept, and land was classified according to a modified version of the United States land capability system Large areas of the land were found to be only marginally suitable for cropping, due to shallow soil depth or excessive gravel content. The maps provide general indications of the features of the village lands and serve as a basis for future integrated development of both irrigated rice and dry land crops.

Agricultural land capability. Land types include tidal swamps, coastal beach plains, flood plains, valley swamps and low and high hills. In the case of the tidal swamps, high tides could destroy crops, requiring substantial investment in drainage if such lands are to be used for agricultural production. The coastal beach plains generally have low fertility and low organic matter content and will require some degree of fertilization when cropped. The flood plains also have the problem of potential flooding that can destroy crops, but proper timing of planting and adequate drainage can improve the situation. The valley swamps, which are potential rice fields, are also poorly drained and have low fertility and organic matter content. Adequate drainage and fertilization can improve their agricultural capability. The low hills are well drained and can be used for upland rice, vegetables and cassava but also have the problem of low fertility and are prone to soil erosion. Fertilization and long fallow periods can improve the agricultural capability of the soil.

Agricultural land and water projects. In the 1970s up to the mid-1980s, a number of large, medium and small agricultural development projects were undertaken in Liberia as part of Government efforts to feed the nation and provide certain raw materials for export. These included a number of water control projects for swamp rice development and oil-palm development.

The large projects included the Lofa County Agricultural Development Project (LCADP), the Bong County Agricultural Development Project (BCADP), the Nimba County Integrated Rural Development Projects I and II (NCIRDP I and II), the South East Rural Development Project (SERUDEP) in Grand Gedeh, Maryland and Sinoe Counties, the Central Montserrado Development Project (MDP) and the Special Rice Projects (SRP) at Zleh Town and Foya. The BF Goodrich Liberia Incorporated Rubber Concession was also undertaken to increase the export of rubber.

The medium to small projects included the SRPs in Philadelphia, Balabokree, Gbedin, Kpein, Kpatawee and Garwula-Tombe. Land areas for the projects ranged from 13 ha for the Kpatawee scheme to 2 272 ha for the Cestos scheme (Table 15). Unfortunately, these projects have deteriorated and the situation has been made worse by destruction of resources during the war and inadequate maintenance of the schemes. There is the need to reclaim these swamps in the short term and to develop additional areas in the long term. Funding for these projects was provided largely by the International Development Agency (IDA), the European Development Fund (EDF) and the African Development Bank (ADB). The Chinese Government also undertook a number of swamp projects.

Since 1994, FAO, along with several other donors, has been assisting Liberia with emergency operations, mainly supplying farmers with agricultural inputs, notably seeds and tools. It was not until February 1997, however, that Liberia expressed interest in participating in the Special Programme for Food Security (SPFS). In May 1997, an FAO exploratory mission visited Liberia to determine the nature and scope of the SPFS, which resulted in the signing of an agreement in February 2000 to implement a pilot phase of Technical Cooperation Programme (TCP) Assistance at six selected sites. The project, which aimed to demonstrate technologies for water management and control for the upland and swampland agro-ecologies, proposed to cover 50 farmers at each site for a total participating farm population of 300 farmers, 40 percent of whom were expected to be female farmers. The project was expected to cover about 600 ha for upland crops and 100 ha for swamp rice.

A number of other local and international NGOs are supporting various aspects of land and water resources projects including forestry development projects. Fauna and Flora International (FFI), the Sustainable Development Institute (SDI), Conservation International (CI) and the Global Environmental Fund (GEF) are supporting forestry projects in Liberia. Two pilot community forestry projects are proposed for implementation, and the World Bank, the FFI and GEF are currently undertaking a community forestry study for Sapo National Park. Some NGOs that are involved in water projects and supported by USAID include the Catholic Relief Service (CRS), World Vision International (WVI), the Mercy Corps, the Liberia Community Infrastructure Project (LCIP), AFRICARE, and the African Development Aid Foundation (FDA). Agencies of the UN, such as FAO, WFP, UNDP, UNICEF, UNHCR, UNEP and UNIFEM, are actively involved in postwar nation-building; some of them are channelling their resources through local NGOs. The United Nations Mission in Liberia (UNMIL), whose mandate is to keep peace in Liberia, is also involved in supporting postwar nation-building.

Agencies of the UN such as FAO have, since 2005, been supporting rehabilitation of old swamp areas in Lofa County, for example, by training ex-combatants in sustainable livelihood activities. A monthly subsistence allowance of US$30 per participant which was provided as an incentive for resettling the ex-combatants did not prove successful because most of the trainees did not go back to swamp rice cultivation. Currently such financial incentives have been discontinued and the assistance generally provided is in the form of inputs for communities, such as seeds, farming tools and training. There is also a system of food-for-work assistance being provided by the WFP but this has also run into various problems.

Agricultural water management. Managing water for agriculture starts with the assessment of the water demands made by the crop and its environment. This is referred to as crop evapotranspiration or crop water requirements. As already stated, there are few data on crop water requirements and there are insufficient data available to enable such computations to be made. The two most important food crops in Liberia that require consideration of water control and management are rice and vegetables. As reported in interviews, farmers would prefer long-duration and high-yielding rice varieties for one main crop in the rainy season to two short-duration, low-yielding varieties. Yields for the second rice crop are generally very low. It has also been concluded that crop maturity and harvest periods should not occur in September because rice consumption by birds is at its peak at this time of year.

The **swamps** are used extensively for the production of mainly rice in the rainy season and vegetables during the dry season. Other crops such as cassava are planted on mounds. These

are uprooted and stem cuttings transferred and planted on the uplands at the beginning of the rice growing season when the mounds face the danger of submergence. Mounds areconstructed by inversion of soil and burying of stubble/grass, which helps to decompose plant materials and improve soil fertility. A few swamps attempt two rice crops a year and these are mainly the perennial swamps. Drainage is generally poor.

The typical lowland rice production activity involves nursery, brushing and clearing, ploughing, pudding and transplanting, weeding, fertilizer application (if needed) and harvesting. Clearing is not a major activity in the north. Fertilizer application is almost non-existent due to its high cost and poor availability. The typical main drain/canal embankment specification is 75–100 cm crest width, 75–100 cm height and 150–200 cm base width. The field bunds have the following typical specifications: 50–70 cm crest width, 40–60 cm height and 90–150 cm base width. Most of the work carried out by the Land and Water Resources Development Division (LWRDD) of the MOA has been in lowland water management. The water control systems have generally been poorly designed and constructed, and lack of maintenance has caused the systems to deteriorate, sometimes beyond repair.

The typical lowland water control system is tedious and sometimes difficult. The water control activities include digging of canals/drains, clearing of canals/drains, bunding, flooding, drainage, ploughing and puddling, levelling, and repair of canal/drains/bunds.

The **upland** ecosystem for rice is carried out purely under rainfed conditions and the system of cultivation is shifting cultivation. This farming system is putting a lot of pressure on the country's land resources and it is feared that the fallow periods of 9–10 years may reduce if the trend is not halted. Drainage is generally good on the uplands. The typical farming activities involve brushing, felling, burning, clearing, broadcasting and ploughing, weeding and harvesting. The rice is often mixed with maize and cassava, which are all harvested at different times depending on their growing periods.

The upland soils are generally acidic, with low fertility and low water-holding capacity, and are prone to soil erosion. Unfortunately, upland soil and water management is not so much an issue for the farmers. The reason why these farmers do not pay particular attention to field soil and water conservation practices is an important area of research. The farmers, however, complain that in the recent past delays in the onset of the rainy season have led to late planting. This shows that rainfall patterns are changing and poses a new challenge to agricultural water management.

Farmers that crop land on the slopes are faced with different problems of soil water management in a typically rainfed culture. It is generally known that soil water on slopes depletes much more quickly because of faster subsurface flow induced by the generally acute slopes. There is also the risk of soil erosion and nutrient loss on the slopes. On the whole, drainage is generally good on the slopes. Little attention has been paid to the land and water management problems of this group of farmers. It must be noted that there has been little focus on these farmers in the work of the LWRDD.

Another aspect of lowland water management falls under what is known as **recession agriculture**. Practised largely during the dry season, the farmers take advantage of the residual moisture of the soil in the swamps to grow vegetables. Also, **upland irrigation** has not been seriously considered an issue in Liberia probably because of water surpluses in all the agro-ecological zones and the availability of large areas of swamp for rice and vegetable

production. **Urban and peri-urban agriculture** is also practised on a limited scale in Liberia, taking advantage of the ready market in the urban centres for vegetable crops produced through such activities. There is potential for the use of motorized pumps for irrigation from shallow wells in support of urban and peri-urban agricultural activities, especially in and around Monrovia.

Demand for rice land and water. A rice production analysis showed that, on average, coupled with upland rice production, it will require swampland expansion of approximately 10 000 ha/year to achieve the projected food self-sufficiency target. It must be noted that 4 percent of Liberian land, amounting to about 445 500 ha, are designated as swamp and 8 352 750 ha as uplands. Before the war cropped land was recorded as 600 000 ha, of which 220 000 ha was permanent cropland and the rest (380 000 ha) was arable cropland. Assuming a minimum fallow period of 10 years this implies that a total of about 464 000 ha would have to be available for upland rice production, amounting to 5.5 percent of the total upland area of Liberia. By this analysis, it will only be necessary to bring about 37 percent of the swamp under rice production over a period of 10 years to achieve self-sufficiency in rice. On the whole, at the current level of rice production, it will require an expansion of 20,000-25,000 ha of both upland and lowland rice for 10 years for Liberia to achieve self-sufficiency in rice production.

With regard to water resources, assuming 1 500 mm of water is required for the rice crop, and considering surface evaporation, drainage and other losses, a total land area of about 400 000 ha of both upland and swamp rice will require an annual renewable water supply of about 6 billion m^3 or 6 km^3/year. This is only about 2.6 percent of the total annual renewable water resource of 232 km^3/year.

In Liberia, rice research at the international level used to be undertaken by the West Africa Rice Development Association (WARDA) until the late 1980s, when it relocated to Côte d'Ivoire at the beginning of Liberian civil strife. At the local level, rice research is undertaken by the Central Agricultural Research Station (CARI) in Gbarnga and by the universities. Some of these institutions have been conducting research over many years, yet basic data such as water requirements for crops, crop coefficients, crop average rooting depth and growth periods are lacking despite the breeding of new crop varieties. Perhaps the abundance of water resources caused the researchers to put more emphasis on other production aspects of rice while neglecting research into agricultural water management. Even in the MDG development priorities for agriculture, water for agriculture does not appear to be a specific issue but is considered within the promotion of the use of improved farming methods.

Institutional set-up and capacity for land and water resource management. Within the MOA, the LWRDD was created with institutional responsibility in the following areas of agricultural development:

- soil survey and classification
- irrigation and drainage
- land evaluation
- land use planning
- cartography and remote sensing.

By implication, the LWRDD must develop and rationalize water resources and agroclimatological activities in relation to agricultural development and the agro-ecological

areas of the country, develop a national soil conservation and management programme geared towards controlling land degradation, develop a national irrigation and drainage programme geared towards reducing dependence on rainfed agriculture, and rationally develop and use agricultural water to take advantage of agroclimatic conditions in the country.

Before the war, in 1990, LWRDD was headed by a Director and a Deputy Director. There were five sectional heads in charge of the technical divisions of soil survey and classification, irrigation and drainage, land evaluation, land use and planning, and cartography and remote sensing. Staffing and human capital has deteriorated following the war.

The LWRDD, as a directorate within MOA, operates at four levels: the headquarters in Monrovia, County, District and Clan levels. During the war, agriculture was badly hit in the districts and many of the staff of MOA, including those of LWRDD, sought refuge in refugee camps and left their stations in the field. As is the case with many Government departments, LWRDD is grossly under-funded and this greatly hampers its work. There is a need to reorganize and strengthen the work of LWRDD by re-equipping it and building the capacity of its staff through pragmatic staff development programmes. It must be noted that important equipment belonging to LWRDD and valued at several thousands of dollars was also destroyed in the war. Apart from the disincentive of low salaries, the war disrupted the programmes of the department and saw the exit of many qualified staff. An example is a 5-year project on land resource assessment for land use planning, which was initiated in 1987, funded by UNDP and the GOL and executed by the FAO/MOA but was disrupted by the war.

Key Findings. Various issues have emerged from the review and analysis of the agricultural land and water sector, as listed below.

- Liberia does not have a policy document on comprehensive water resource development, although there are small pieces of legislation on land, mining, forestry and water supply that relate to water resources.
- The hydrometeorological and hydrological networks in the country are in a very poor state; some stations have been closed down due to lack of equipment and commitment of observers.
- Even though there are insufficient data to support this claim, current land-use practices are deemed to be having an effect on water resources, as suggested by the seasonality of some tributaries that used to be perennial, and changing rainfall patterns.
- There is the general notion that water resources are limitless. The country must seriously engage itself in a more pragmatic way in planning water resources management in the face of current land use practices. Issues of integrated watershed management and the joint administration of international water bodies must be dealt with. This situation requires immediate attention.
- Forest cover is reducing due to current farming practices, thus posing a threat to soil fertility, biodiversity and the water resources of the nation.
- Institutional capacity for managing agricultural land and water is weak and must be strengthened through capacity building and equipping of the water sector agencies.
- Swamp water management is difficult and makes extra demands on the farmers in terms of time, resources and energy. There is a general preference for upland farming even though rice yields are said to be about half those attainable in the lowlands. There are also problems with poor design, construction and maintenance of water control structures.

- Basic water management data for crops are not available and research in Liberia does not seem to consider this a priority, probably because of the abundance of water resources. The emphasis is more on the control of excess water in the lowlands than management of soil water in the uplands.
- Upland water management and water management on slopes are not considered critical issues in the farming community. The upland soils are generally acidic, with low fertility, low water-holding capacity and are prone to soil erosion, yet soil and water management is not so much an issue for the farmers here. The reason why farmers do not pay particular attention to field soil and water conservation practices on the uplands and the slopes is an important area for research.
- Rain-fed agriculture has seen, in recent years, late onset of the rains, which concerns farmers. Could it be that the rainfall patterns are changing due to general land use practices?
- An aspect of lowland agricultural activity, known as recession agriculture, attempts to use residual soil water for agriculture. Farmers at the periphery of water bodies, advancing and retreating depending on the water regime, take advantage of soil water for crop production. Could options such as this be exploited further?
- Conventional upland irrigation is not considered an issue in Liberia because of water surplus in all the agro-ecological zones in the country and the large area of swampland available for development.
- Shallow well irrigation farming and peri-urban irrigation also take place on a limited scale in Liberia. These activities are probably taken for granted and therefore do not receive any recognition in the plans for achieving food security.

Development potential and constraints. An analysis of the development potential and constraints is based on the following observations:

- there is a high potential risk of an irreversible degradation of land and water resources;
- there is a general lack of recognition of the close interrelationships between livelihood strategies, agriculture and the environment;
- institutional capacity in support of agricultural water development and management is weak and needs strengthening;
- other forms of agricultural water uses have potential uses, such as upland supplementary irrigation, lowland shallow well irrigation, recession agriculture and urban/peri-urban agriculture;
- the poor rural infrastructure, comprising rural roads, markets, irrigation systems, water supply, and health and educational facilities, is basic to quality of life in rural areas and is an important factor in economic development;
- poor accessibility, particularly to potentially rich areas, slows down economic activity in terms of mobility and access to important social services such as markets and health infrastructure;
- Liberia has high economic potential, which, if developed, would provide job opportunities for young people and empower women to generate income for personal family needs. The indications are that the level of deprivation is high especially in the rural areas and has been made even worse by the war, but the fact remains that the rural economic potential is high when appropriate measures are taken.

The way forward. With the main objective of seeing agriculture in Liberia becoming a major source of growth and poverty reduction, any **land and water management** interventions must be aimed at:

- enhancing agricultural production and productivity;
- improving rural infrastructure, especially in the area of accessibility;
- fostering participatory community development, recognizing the role of gender in development.

In view of the above, key project components that can be proposed, with justifications, are as follows:

Component 1: **Land and Water Sector Institutional Capacity Building (2–5 years)**
Component 2: **Land and Water Development for Swamp Rice Production (2–10 years)**
Component 3: **Land and Water Development for Upland Rice Production (2–5 years)**
Component 4: **Urban and Peri-urban Agriculture for Women and Youth Groups (3 years)**
Component 5: **Community Watershed Management (1–5 years)**

Project costs, estimated at US$53.7 million, are summarized in the table below.

N°	**Project component**	**Cost (US$)**
1	Land and Water Sector Institutional Capacity Building	2 500 000
2	Land and Water Development for Swamp Rice Production	22 100 000
3	Land and Water Development for Upland Rice Production	3 000 000
4	Urban and Peri-urban Agriculture for Women and Youth Groups	4 500 000
5	Community Watershed Management	7 500 000
	Total	**39 600 000**

It is expected that by the end of the investment phase of the proposed projects, community and individual farm incomes would substantially increase, mainly through increased net returns from improved agricultural production practices and an increase in the areas brought under rice cultivation in the swamps. Flood recession, small-scale irrigation and peri-urban irrigation for production of vegetables would also result in additional benefits. Also, key Government institutions in the water sector and many communities will benefit either directly or indirectly from the projects through investment in physical infrastructure, equipment, training, technical and/or financial support programmes. The private sector agencies that participate in these projects will not only provide jobs but will also have their capacities strengthened.

1. INTRODUCTION

The Comprehensive Assessment of the Agricultural Sector of Liberia (CAAS-Lib) was launched by the Government of Liberia (GOL) with assistance from the Food and Agriculture Organization of the United Nations (FAO), the World Bank and the International Fund for Agricultural Development (IFAD) to provide a vision and policy and programme options for the agricultural sector and for food security, and also to help the sector institutions prepare themselves for the transition to nation-building after nearly 14 years of war and the destruction of life and property.

The review comes at a time of transition from war to peace and nation-building through the recent process of democratic elections and also the Millennium Development Goal (MDG) that calls for halving of the number of poor and hungry people by 2015. The agriculture sector has been considered a major source from which a number of expectations will be met, notably availability and access to nutritious food, employment, improved income and foreign trade. In the emerging phase of recovery and development in Liberia, the sector will provide a reliable base for resettlement and employment.

In line with the above, this report is intended to provide a technical background to the land and water development and management issues necessary for the review and to propose appropriate projects that can be implemented in the short, medium and long term in line with the objective of seeing agriculture in Liberia become a major source of growth and poverty reduction.

2. TERMS OF REFERENCE

The main tasks involved in this study were to review information on the resource base and analyse the land and water sector data, bearing in mind the environmental issues; review past and present water development and management projects with regard to water control and soil conservation; analyse options for development of water and soil conservation projects as priority investments; review planned overlapping activities in the sector and formulate implementation strategies.

3. BACKGROUND

General

Located on the west coast of Africa, Liberia ($4^{o}18'$, $8^{o}30'$ north; $7^{o}30'$, $11^{o}30'$ west) occupies a land area of approximately 111 370 km^2 of which 96 160 km^2 (86 percent) is dry land. The rest, 15 210 km^2 and constituting 14 percent of the surface area, is covered by water. It shares a common border with Guinea to the north, Côte d'Ivoire to the northeast and east, Sierra Leone to the northwest and the Atlantic Ocean to the south and southwest, with a coastline about 520 km long. The population is estimated at about 3.5 million (2004 figure), 52 percent of which is rural, with an estimated total of 230 000 farming families. It is estimated that Monrovia alone accounts for nearly 40 percent of the population, with most of the returning refugees preferring to settle in Monrovia. At a projected growth rate of 2.3 percent per annum, the population is expected to reach approximately 5 million in 2020. According to the Ministry of Agriculture (MOA, 2006), approximately 40 percent of the total population of Liberia is between the ages of 15 and 35 years. Some of the core of the trained workforce that fled abroad is beginning to return home to rebuild the country.

The resource base

Some aspects of the resource base are described in detail in section 3, but some issues will be introduced here within the physical context of the report as brief background information. The climate of Liberia can be summarized as follows: rainfall ranges from about 1 700 mm in the north to > 4 500 mm in the south, see Map 1; the temperature is 24 28 ^{o}C); relative humidity 65–>80 percent); sunshine duration 2–8 hours/day; evapotranspiration 3.0–4.5 mm/day. The wind conditions are described as generally mild. The topography comprises mainly flat to rolling coastal plains running into some interior plateaus and then mountains in the northeastern part of the country. The country is composed of four physiographical units: coastal plains (0–100 m), interior hills (100–300 m), interior plateaus (300–600m) and the mountainous areas (> 600m). The country has nine major river systems, all of which are perennial, and run in a northeast to southwest direction into the Atlantic Ocean, draining about 66 percent of the country and taking their sources from neighbouring Sierra Leone, Guinea or Côte D'Ivoire. There are also short coastal water courses, draining about 3 percent of the country. The total renewable water resource is estimated at about 232 km^3/year, making Liberia one of the African countries with the highest per capita renewable water resources, approximately 71 000 m^3/year. The water resources are further described in section 3 of this report.

The geology of Liberia can be classified into three major rock age provinces: the Liberian age province (2.7 billion years), the Eburnean age province (2 billion years) and the Pan African age province (0.55 billion years). There are three types of soil in Liberia, namely laterites (latosols), sand (regosols) and swamp, covering 75, 21 and 4 percent, respectively, of the land surface (Table 1). Alluvial deposits constitute about 2 percent of the soils in Liberia. Generally, soils in Liberia are characterized by shallow layers of humus, low organic matter content, high acidity, and are deficient in magnesium and calcium, which serve not only as plant nutrients but also neutralize the acid in the soil. The soils range from weakly developed muds and hydromorphic clays along the coast and in the inland swamps to shallow soils on the Plateau Mountains and lateritic hills and terraces in the north. Liberia is also well endowed with mineral resources, the major ones being iron ore and diamonds.

Table 1. Soils of Liberia

Soil type	Liberian classification[1]	Percentage coverage	Area[1] (ha)	Properties
Lateritic soils or latosols	Kakata, Suakoko and Voinjama Series	75	8 352 750	Reddish brown, leached 10 cm topsoil, 4–6 % OM, acidic, well-drained, productive agricultural soils
Regosols or coastal sandy soils	Claratown, Sinko and Freeport Series	20	2 227 400	Well-drained, 60 % coarse sand, very low water holding capacity, little humus and mineral nutrients, not productive agricultural soils
Alluvial soils or swamp soils	Gbelle, Ballam, Grayzohn and Cuttington Series	5	556 850	Waterlogged, grey hydromorphic soils, poor drainage, thick dark layer of loamy-peaty organic material with relatively high humus content.

Source: GOL (1983), [1]Author's Derivation (2006)

Nearly 5.4 percent of Liberian land, amounting to approximately 600 000 ha, is said to be cultivated; 220 000 ha of this area is said to be under permanent crop or plantation, while the

rest is arable (FAO, 2005). Broadly, the cultivated areas are uplands and lowlands or swamps. Swamps can be classified as mangrove swamps, riverine grassland, floodplains and inland valleys. The level of suitability of the swamps is not known as they have not been characterized. There is, however, the general assumption that the swamps are more productive lands for rice growing.

Irrigation potential is estimated at about 600 000 ha but only about 1 000 ha can be described as a surface irrigation facility. The total water managed area in 1987, including swamp rice control, was estimated at about 20 100 ha (FAO, 2005). This area included equipped lowlands (2 000 ha) and non-equipped cultivated swamps (18 000 ha). Therefore, in the real sense of the word, irrigation infrastructure is virtually non-existent because of the abundant water resources present in the country. Areas with good water control and with the possibility of two crops per year are limited. There are also peri-urban irrigation activities around Monrovia but the method of irrigation used here is predominantly manual.

4. WATER RESOURCES LEGISLATION AND ADMINISTRATION IN LIBERIA

4.1 Water resources legislation

In 1983, The United Nations Department of Technical Cooperation for Development assisted the GOL to perform a systematic review of the Liberian legislation and administration on the development, conservation and use of the country's water resources and developed a draft Water Resources (Control and Utilization) Act for consideration by the GOL. Water issues in Liberian law were referred to with regard to the creation of the Ministry of Lands, Mines and Energy (Peoples Redemption Council Decree [PRCD] 55 of 21 October 1981), the Amended Public Authorities Law (approved 30 January 1973) on the establishment of the Liberia Water and Sewer Corporation, the Amended Public Authorities Law (approved 12 July 1973) on the establishment of the Liberia Electricity Corporation with specific reference to hydropower generation, and the Public Health Law of 19 July 1976 on matters of water-related sanitation (United Nations (UN), 1983).

There are no statutory regulations regarding water ownership, control and use. The ownership of water running in a defined channel (e.g. a river) is not properly understood because water is generally understood to be a freely available resource. Individual land ownership presupposes a riparian right on the resources that are on or underneath the land. Groundwaters, which do not flow in a well defined channel and cannot therefore be assigned to surface water courses, are regarded as the absolute property of the owner of the land above, and can be withdrawn by the owner without liability to adjoining lands. The issue of reasonableness of use or proportionate sharing of withdrawal from a common source currently does not appear to be considered in water rights in Liberia. The grant of a mining concession presupposes the right to take water and use it, and such mining concerns need not secure ownership of land adjacent to water courses in order to draw water for their own purposes.

Regarding the beneficial uses of water, the provision of water supply and sewerage services to the public is the responsibility of the Liberia Water and Sewer Corporation (LWSC). Regulations govern the legality of connections and illegal connections are punishable by law. Also, local authorities are vested with the responsibility to prevent and remedy pollution of freshwater used by the public for drinking and domestic purposes. Unwholesome sources of water supply, whether public or private, are prohibited by law. The law allows for catchment

area protection for public water supply schemes and punishes by law anyone whose activities within such defined boundaries will impact negatively on the water source (UN, 1983).

Regarding the control and protection of water works, the design and construction of public water works appears to be the responsibility of the Ministry of Public Works (MPW). Arguably, private water supplies, hydroelectric works, drainage and sewerage works, and works pertaining to field water control are subject to technical control by the MPW. A permit from the Forestry Development Authority (FDA) is required for the damming of rivers and streams within the boundaries of forest reserves and national parks.

With regard to health-related water issues, the discharge of wastewater from any premises into swamps, watercourses or irrigation channels is regarded by the health legislation in force as statutory nuisance, and is punishable by law. The use of well-water for any purposes is subject to prior health clearance in the form of a permit from the local health authority.

It must be noted that no clear reference is made to the development and use of agricultural water resources but this is inferred from other legislation regarding water works in general and forestry issues in particular, with regard to matters of forest water resources and catchment protection.

4.2 Water resources administration and institutions

The development, conservation and use of the country's freshwater resources are subject to a fragmentation of responsibilities among several branches of the Government and two public utility companies.

The Ministry of Lands, Mines and Energy (MLME) is responsible for the collection and distribution of information on Liberian water resources through its sector agency the Liberian Hydrological Service. The data acquisition cuts across surface and groundwater sources and even brackish water, and this body also has responsibility for water quality monitoring. The Ministry of Health and Social Welfare (MHSW) administers health legislation, with particular reference to water quality preservation, water supply and sanitation. It is this ministry that is responsible for licensing of waste discharges from any origin into any water body, developing quality standards for drinking water obtained from a well and also undertaking urban and suburban water supply projects in some cases. The Ministry of Rural Development has primary responsibility for rural water supply and sanitation programmes, with a specific mandate to develop groundwater resources. This ministry also has oversight responsibility for licensing of ferry operations on inland waterways. The Ministry of Public Works (MPW) is responsible for the technical control of all water-related projects and structures, whether public or private. The Ministry of Planning and Economic Affairs (MPEA) shares with the Liberia Water and Sewer Corporation (LWSC) the primary responsibility for water sector planning. The Ministry of Finance (MOF), through its revenue bureau, licenses river pilots and commercial and sports fishermen for both inland and marine waters. The LWSC is a public utility company in charge of the provision of water supply and sewerage services throughout Liberia. The company has full corporate powers for the implementation of its mandate. The Liberia Electricity Corporation (LEC) is a public company with responsibility for the generation and distribution of electricity throughout Liberia, including hydropower generation; it has full corporate powers for the implementation of its policies. The MOA is engaged in studies and research on irrigation and soil conservation practices (UN, 1983).

A National Water Resources and Sanitation Board has been functioning since 1980, primarily for coordination purposes. This was in line with the United Nations declaration of a Water and Sanitation Decade at the time, which saw many developing countries, including Liberia, sign up to provide safe drinking water for all by the end of the decade. The Board draws membership from all Government departments and agencies and also the private sector; its secretarial functions are discharged by the Liberian Hydrological Service (LHS). A draft bill for the establishment of a Water Resources Board (WRB) draws membership from seven ministries, the LWSC and LEC; two additional members are appointed by the Minister of Water Resources (MWR) and the Board is expected to have the following functions (GOL, 1984):

- to formulate policies for the conservation, development and best use of the water resources of Liberia;
- to coordinate all public and private projects and programmes concerning the conservation, development and use of water resources;
- to advise the Minister on measures for the implementation of water resources policies and plans and on all matters concerning the conservation, development and use of water resources.

Liberia shares the following international water resources with its neighbours: the St John Basin (Liberia and Guinea), the St Paul Basin (Liberia and Guinea), the Cestos Basin (Liberia and Côte d'Ivoire), the Cavalla Basin (Liberia and Côte d'Ivoire), the Moa Basin (Liberia, Sierra Leone and Guinea) and the Mano Basin (Liberia and Sierra Leone). Numerous bilateral treaties have successively governed the delimitation of the frontier of Liberia since 1885 on the Mano River and since 1892 on the Moa River. Some of these treaties have provided for freedom of navigation and transit fishing and the protection of existing water use rights for the local population.

It is quite clear that although references have been made to water in connection with landholdings, mining activities, forestry and water supply, there is no clear water resources development policy in Liberia and it is important that any such policy should be sufficiently comprehensive and integrated to ensure the necessary linkages between interrelated sectors. Likewise, the importance of energy, water and sanitation to poverty alleviation and its implications for the building of peace and stability make it all the more necessary to address the energy, water and sanitation situation with utmost urgency and as a framework for policy formulation and implementation. The issue of water for agriculture should be clearly spelt out in any such policy document.

Within the MOA, the Land and Water Resources Development Division (LWRDD) was created with institutional responsibility for the following areas of agricultural development:

- soil survey and classification;
- irrigation and drainage;
- land evaluation;
- land use planning;
- cartography and remote sensing.

By implication, the LWRDD must develop and rationalize the water resources and agroclimatological activities in relation to agricultural development and the agro-ecological

areas of the country, develop a national soil conservation and management programme geared towards controlling land degradation, develop a national irrigation and drainage programme geared towards reducing dependence on rainfed agriculture, and rationally develop and use agricultural water to take advantage of agroclimatic conditions in the country.

Before the war, in 1990, LWRDD was headed by a Director and a Deputy Director. There were five sectional heads in charge of the technical divisions of soil survey and classification, irrigation and drainage, land evaluation, land use and planning, and cartography and remote sensing. Before the war, there were five holders of higher degrees, three holders of first degrees and ten technicians (Table 2a). Currently there are two holders of higher degrees, two holders of first degrees and three technicians (Table 2b).

Table2a. Technical staff of LWRDD before 1990

Technical division	**Number of staff in post before 1990**		
	Higher degree holders	**First degree holders**	**Technicians**
Soil Survey and Classification	2	1	4
Irrigation and Drainage	2	1	
Land Evaluation	1		1
Land Use Planning		1	3
Cartography and Remote Sensing			2
Total	**5**	**3**	**10**

Source: Farnga (2006)

Table2b. Technical staff of LWRDD in 2006

Technical division	**Number of staff in post in 2006**		
	Higher degree holders	**First degree holders**	**Technicians**
Soil Survey and Classification		1	2
Irrigation and Drainage	1		
Land Evaluation	1		1
Land Use Planning		1	
Cartography and Remote Sensing			
Total	**2**	**2**	**3**

Source: Farnga (2006)

The LWRDD, as a directorate in MOA, operates at four levels: the headquarters in Monrovia, and County, District and Clan levels. During the war, agriculture was badly hit in the districts and many of the staff of MOA, including those of LWRDD, sought refuge in refugee camps and left their stations in the field. As is the case with many Government departments, LWRDD is grossly underfunded and this greatly hampers its work. There is the need to reorganize and strengthen the work of LWRDD by re-equipping it and building the capacity of staff through pragmatic staff development programmes. It must be noted that important equipment belonging to LWRDD and valued at several thousands of dollars was also destroyed in the war. Apart from the disincentive of low salaries, the war disrupted the programmes of the department and saw the exit of many qualified staff. For example, a 5-year project on land resource assessment for land use planning, which was initiated in 1987,

funded by the United Nations Development Programme (UNDP) and the GOL and executed by the FAO/MOA was disrupted by the war.

4.3 Agricultural water management

Managing water for agriculture starts with the assessment of the water demands made by the crop and its environment. This is referred to as crop evapotranspiration or crop water requirements. As already stated, there are very few data on crop water requirements, and there is insufficient data available to enable such computations to be made. Secondary data on rice water requirements are shown in Table 3. The two most important food crops with regard to water control and management in Liberia are rice and vegetables. As reported during interviews, farmers would prefer long-duration and high-yielding rice varieties for one main crop in the rainy season to two short-duration, low-yielding varieties. Yields for the second rice crop are generally very low. It has also been concluded that crop maturity and harvest periods should not occur in September because rice consumption by birds is at its peak at this time of the year. This implies that the growing period should be timed such that harvesting falls in late October and beyond.

Table 3. Crop water requirements for selected stations

County	Project	[1]Crop	Transplanting date	Harvesting date	Crop water requirements (mm)
Nimba	Gbedin	Rice	Early March	Early July	448
Grand Gedeh	Zlehtown	Rice	Early January	Late April	449
Cape Mount	Gawula Tombe	Rice	Late February	Early June	431
Bong	Kpatawee	Rice	Early July	Early November	445
Maryland	Philadelphia	Rice	Late March	Late July	440

Source: Derived and modified from Farnga (1988); [1]Rice water requirement does not include water for nursery, land preparation and soil percolation. If these are included, the figures will increase by between 1.5 and 2.5 times.

Irrigation requirements have also been computed. Even for the same crops, the water requirement is generally higher in the drier than in wetter regions. Total rainfall amounts are always higher than the crop water requirements but rainfall distribution can be a problem. Moreover, standard values were assumed for the crop coefficient because there are no such data available for Liberia.

The upland soils are generally acidic, with low fertility and low water holding capacity, and they are prone to soil erosion. Unfortunately, upland soil and water management is not generally an issue considered by farmers. The reason why farmers do not pay particular attention to field soil and water conservation practices is an important research problem. The farmers, however, complain that during the recent past, delay in the onset of the rainy season has led to late planting. This shows that rainfall patterns are changing and poses a new challenge to field water management.

Farmers that crop on the slopes are faced with different problems of soil water management in a typically rainfed culture. It is generally known that soil water on slopes is depleted much more quickly because of faster subsurface flow induced by the generally acute slopes. There is also the risk of soil erosion and nutrient loss on the slopes. Drainage is generally good on the slopes. Little attention has been paid to these groups of farmers with regard to land and

water management. It must be noted that the work of the LWRDD is not generally focused on farmers in these areas.

Another aspect of lowland water management falls under what is known as **recession agriculture**. This is practised largely during the dry season, when the farmers take advantage of the residual moisture of the soil in the swamps to grow vegetables. Also, **upland irrigation** has not been seriously considered to be an issue in Liberia, probably because of the water surplus in all agro-ecological zones and the availability of large areas of swamp for rice and vegetable production. **Urban and peri-urban agriculture** is also practised on a limited scale in Liberia, taking advantage of the ready market in the urban centres for vegetable crops produced through such activities. There is potential for the use of motorized pumps for irrigation from shallow wells to support urban and peri-urban agricultural activities, especially in and around Monrovia.

As an initiative for good governance and to minimize some of its institutional bottlenecks, the GOL is embarking on a decentralization exercise for all Government ministries, including MOA, with increased participation of NGOs and CBOs in agricultural development at the community level.

4.4 Hydrometeorology

The Liberia Hydrological Service (LHS) is responsible for the collection of hydrometeorological statistics. There were 47 hydrometeorological stations in Liberia before the war and rainfall statistics date back to 1927 at the Ganta station, for example. The stations were operational until 1989. Since 1990, there have been no new records made because of the presence of civil strife. Practically speaking, all the meteorological stations were destroyed during the war except one in western Liberia. There is therefore now an urgent need to establish and modernize new stations. It must also be noted that even the data that were previously collected hads many gaps, and the paucity of such data is worth noting. It is simply not possible at present to obtain any meaningful data from existing information over the full range of meteorological statistics, particularly rainfall, temperature, relative humidity, wind velocity and sunshine duration, for any single station in the country. In order to improve the meteorological database, and as part of the LHS modernization plan, 15 new synoptic stations are to be located, one in each county, at all the provisional airstrips in the country.

The paucity of meteorological data in Liberia renders it impossible for any station to have a consistent database covering rainfall, temperature, relative humidity, wind velocity and sunshine duration. In fact many of the stations have no data on any meteorological parameter other than rainfall. There are stations for which the rainfall data cover a period of more than 30–50 years, but these are few and the data frequently show gaps. Table 4 shows rainfall data for Liberia. The average annual rainfall ranges from about 1 687 mm in Suakoko in the north to about 4 614 mm in Robertsport in the south. Overall, 80–95 percent of the rainfall is received between June and October but the number of months in which water surplus occurs varies from –five to eight depending on the location. Reliable rainfall figures computed on the assumption of 20, 50 and 80 percent probability of exceedance for Firestone Harbel are 3 442, 2 950 and 2 723 mm, respectively. Similar figures computed on the assumption of 20, 50 and 80 percent probability of exceedance for Robertsville are 4 189, 3 430 and 3 096 mm, respectively (Table 6). There are very few data on evapotranspiration available, but some scanty information chanced upon for Firestone Harbel for the period June–December 1977 ranged between 95.2 and 120.3 mm/month for the period (Table 7). For the same period,

there was a water surplus of approximately 242 mm/month. Generally, there is a water deficit in the dry months of November to February, when evapotranspiration exceeds rainfall. The reported mean annual potential evapotranspiration amounted to 1 329 mm and 1 318 mm for Firestone Harbel and Robertsfield respectively (United Nations Department of Technical Cooperation, 1987). There is also evidence to suggest that rainfall patterns are changing and perhaps the amount of rainfall is diminishing because of the removal of large areas of vegetation due to the farming practice of shifting cultivation. Even for stations such as Firestone Harbel and Robertsfield, consistent data could only be obtained for the period 1977 to 1982 and they are not complete (Table 5).

Table 4. Rainfall in Liberia

Station	Period	Annual rainfall (mm)
Robertsport	1952–73	4 614
Monrovia	1945–73	4 590
Greenville	1952–73	4 229
Lamco Buchanan	1959–80	3 945
Robertsfield	1949–80	3 740
Goodrich	1956–80	3 388
Bomi Hills	1952–76	3 161
Firestone Harbel	1936–80	3 133
NIOC	1960–80	3 061
LAC	1961–80	2 790
Pinetown	1952–73	2 696
Bong Mines	1962–80	2 543
Firestone Cavalla	1928–80	2 492
Salala Rubber Corp	1961–80	2 475
Voinjama	1953–73	2 426
Sanniquellie	1952–80	2 356
Ganta	1927–73	2 201
Cocopa	1950–80	2 047
Zwedru	1952–73	1 933
Tappita	1952–73	1 931
Suakoko	1952–72	1 687

Source: Liberia Hydrological Service

Table 5. Meteorological data for Firestone Harbel and Robertsfield

Year	Firestone Harbel Latitude: 6°23' north Longitude: 10°25' west					Robertsfield Latitude: 6°14' north Longitude: 10°22' west				
	Rainfall (mm)	Temp (°C)	Relative humidity (%)	Wind velocity (km/day)	Sunshine duration (hours)	Rainfall (mm)	Temp (°C)	Relative humidity (%)	Wind velocity (km/day)	Sunshine duration (hours)
1977	2764	26.2	83	29.4	4.0	2926	25.9	88	131.4	3.7
1978	2856	26.0	84	27.9	3.7	na	25.8	88	135.2	3.6
1979	3161	26.3	83	28.8	4.1	3065	26.0	88	142.2	3.7
1980	3231	26.2	83	29.8	4.0	2426	26.2	88	135.6	3.3
1981	na	26.2	80	27.7	4.3	na	26.2	87	133.0	3.6
1982	na	26.2	81	28.0	4.1	na	25.9	84	114.1	3.9

Source: Liberia Hydrological Service (2006)

Table 6. Rainfall frequency analysis for Firestone Harbel and Robertsfield

Station	Period	Reliable annual rainfall (mm)		
		f = 20 %	f = 50 %	f = 80 %
Firestone Harbel	1941–80	3 442	2 950	2 723
Robertsfield	1961–77	4 189	3 430	3 096

Source: Author's estimates (2006); f = probability of exceedance

Table 7. Water balance for Firestone Harbel (1977)

Month	Rainfall (mm)	Evapotranspiration (mm)	Water surplus/deficit (mm)
June	477.8	108.3	369.5
July	359.9	95.2	264.7
August	732.5	98.9	633.6
September	526.5	86.4	440.1
October	272.5	120.3	152.2
November	41.7	110.7	–69.7
December	9.1	104.5	–95.4

Source: Liberia Hydrological Service; Author's estimates (2006)

4.5 Surface water

The Liberian hydrological year starts in April and ends in March of the following year. Surface water hydrological statistics for Liberia are collected by the LHS of the Ministry of Water Resources (MWR). Before the war there were 45 hydrological stations but by 2003 only one, in western Liberia, was intact. Small amounts of information can be obtained from published texts but the current situation is that the information database has been destroyed. It is therefore imperative that measures are taken to re-equip the water sector institutions to improve the hydrostatistical base. The Liberia Water Company (LWC) also collects some hydrological data but this pertains to their own water supply activities only.

There are six major rivers in Liberia with catchment areas varying from 4 000 (Farmington/Du) to 28 000 km^2 (Cavalla). The Mano, Lofa, St Paul, St John, Cestos and Cavalla together drain about 65.5 percent of the country. The river flow of the Cavalla at Nyakee in the 1960/61 water year amounted to about 13 km^3/year. Average discharge for St Paul at Mt Coffee for the 1958/66 water year amounted to about 19.2 km^3/year (Table 8; Table 9). A water balance study performed over 4 years for the Du river catchment upstream of Kakata, with an area of 326 km^2, reported that the mean annual rainfall, runoff and evapotranspiration equalled 2 742 mm, 1 150 mm and 1 592 mm, respectively, and the runoff coefficient was 0.42. A similar study of an 0.7 km^2 area of the steep catchments of Weakpor creek based on monitoring over one year showed annual rainfall, runoff and evapotranspiration of 2 860 mm, 1 320 mm and 1 540 mm, respectively, with a runoff coefficient of 0.46 for natural rainforest. Another water balance study of a 2.5 km^2 area of the flat catchment of Cassava creek showed annual rainfall, runoff and evapotranspiration of 3 115 mm, 2 090 mm and 1 025 mm, respectively, and the runoff coefficient was 0.67 for farmland (United Nations Department of Technical Cooperation and Development (UNDTCD), 1987). The flow process in Liberia is characterized by high variability because of the effects of the wet and dry seasons. The UNDTCD (1987) reported that for catchment areas smaller than 10 km^2, low flows could be as low as 2–4 litres/m^2/s and high flows could be as high as 2 000–4,000 litres/m^2/s. The important lakes in Liberia are Lake Piso and Lake Shepherd, and have been identified as important wetlands for conservation.

All the Liberian rivers flow in the northeast to southwest direction and into the Atlantic Ocean through the coastal plain region. Earlier estimates suggest that the total renewable water resources of Liberia could amount to approximately 232 km^3/year, amounting to a per capita supply of about 71 000 m^3/year, and making Liberia one of the best endowed countries in Africa in terms of water resources. Total water withdrawal in 2000 was estimated at 106.8 million m^3, of which agriculture took 57 percent and was followed by the domestic sector with 28 percent and industry with 15 percent (FAO, 2005).

Hydropower plants located on the St Paul River and Farmington/Du River have all been destroyed in the war and because it is costly to build a power plant, it is going be a considerable time before such ventures can be undertaken to ease the power supply problems in Liberia. Nine potential sites have been identified on the rivers Mano, Lofa, St Paul, St John and Cavalla for possible future power plants. This, if achieved, will greatly augment the power supplies of the country. Exploration of the hydropower potential of the River Lofa revealed that several falls and rapids between Lofa and Baha town fulfil the conditions for low-head hydropower plants, for which dams and spillways are not required.

Table 8. Major river systems in Liberia

River Basin	Catchment area (km^2)		Main tributaries	Highest elevation (m *asl*)	Hydropower plant	
	Total	Within Liberia			Existing	Proposed
Mano	7 500	6 000	Morro/Mano	750	0	1
Lofa	11 000	9 600	Lawa/Mahe	1 200	0	2
St Paul	20 500	11 500	Via/Tuma	Not known	1	3
Farmington/Du	4 000	4 000		600	1	0
St John	15 500	14 000	Zor Creek/Ya Creek/Mani R	1 000	0	2
Cestos	14 000	11 500	Gwen Cr/Nuon R	1 500	0	0
Cavalla	28 000	11 500	Duobe R	1 500	0	1
Sehnkwehn	4 460	4 460			0	0
Sinoe	3 000	3 000			0	0

Source: Hydrological Service of Liberia. *asl*, above sea level.

It can therefore be argued from a global perspective that water is not in short supply in Liberia. However, that cannot be said from the perspective of local areas where a number of swamp thickets have been removed for agricultural purposes. There is evidence to suggest that minor tributaries that used to be perennial have become seasonal due to excessive removal of vegetation cover. Because there are very few measured data to document whether the river flows are in fact reducing, we can only speculate. There is also evidence to suggest that fallow periods could be reduced, especially on the upland farms, as a result of population pressure. This land-use pattern can threaten water resources and it is imperative that measures are taken at the community level to reverse this trend.

4.6 Groundwater

There are few data on the groundwater resources in Liberia. There has been some exploitation of groundwater for rural water supply but hydrogeological data are woefully lacking. Liberia can be divided into three areas according to the occurrence of groundwater, namely the soft rock areas, which consist of sedimentary rocks, the fractured/fissured hard rocks and the weathered igneous and metamorphic rocks. The sedimentary formations occur mainly in the Pan African age rocks in the Robert Basin along the coast. Unconsolidated

sediments are said to be widespread, especially in Bushrod Island, New Georgia, New Kru Town and Virginia (UNDTCD, 1987). These are fairly extensive aquifers. The quaternary sediments, which constitute the younger sedimentary rocks, are shallow and are up to about 30 m deep, 35–40 m thick and are more than 15 000 years old (UNDTCD, 1987). The extent of the fractured hard rock areas is not known and it is important to perform exploratory investigations to establish the extent of these possible aquifers. The weathered igneous and metamorphic rocks are soft rocks with appreciable porosity and hydraulic permeability; they are over-burdened rocks, not more than 30 m deep and also not extensive.

The hydraulic properties, such as porosity, permeability, transmissivity, storativity and yield, of the possible aquifers in Liberia are not yet known.

Table 9. Discharge of selected rivers in Liberia

River and *location*	**Time of obser vation**	**Mean discharge (m^3/s)**											
		April	**May**	**June**	**July**	**Aug**	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**
Zeliba Cr *Voinjama*	74–76	115	95	175	150	240	300	260	200	150	130	90	80
Mano R *Mano Mines*	59–79	45	100	165	260	460	620	490	275	120	55	35	30
Lofa R *Duogamay*	73–76	10	15	35	45	125	170	110	50	20	10	5	5
Lawa R *Luyema*	73–76	5	5	10	15	30	40	50	20	10	5	5	5
St. Paul R *Walkerbridge*	59–77	65	125	200	285	445	775	550	320	165	85	60	60
St. Paul R *Mt. Coffee*	58–66	150	340	656	850	1 105	1 615	1 220	750	345	165	105	110
Du R *Firestone*	59–61	10	20	30	65	55	80	40	20	15	10	5	10
Farmington R *Owensgrove*	46–50	40	75	140	195	180	340	370	170	80	55	30	70
St. John R *Baila*	59–76	40	60	110	140	130	110	120	150	70	40	30	60
St. John R *Fallo*	59–68 &71	65	215	265	510	905	1 645	1 255	380	190	95	30	50
Cestos R *Sawolo*	63–76	25	35	65	80	90	135	115	70	40	25	20	15
Senkwehn R *Bafu Bay*	60–61	125	155	145	125	115	145	110	140	100	135	95	90
Double R *Zwedru*	75–76	10	15	25	10	10	45	20	5	5	5	5	5
Cavallo R *Nyaake*	60–61	205	205	250	205	475	990	935	860	315	165	110	195

Source: Liberian Hydrological Service

5. LAND RESOURCE ASSESSMENT AND MANAGEMENT IN LIBERIA

5.1 Land resources assessment

Land tenure. This is the subject of a separate review within CAAS-Lib and only a partial view is presented here. At independence in 1850, the Government of Liberia vested all land in the state. By the time of the Land Act of 11 January 1850, all Liberians had a right to own land, if feasible, and the process of land acquisition was relatively easy. Land in Liberia is

divided into lots, where 4 lots is equivalent to 1 acre. The President of the Republic of Liberia signed the land title deeds for the acquisition of land for any purpose. Under the Anglo-American deed system of land acquisition, Presidential assent was required. The cost of acquisition of 1 acre of land in 1850 was US$0.50; currently the same piece of land would sell for US$120. Rural land is still under some customary tenure but there is no security in the customary tenure system. According to the GOL (1980), an environment conducive to development must, among other things, include a land tenure system that permits a farmer to feel secure in the use of land, especially where land improvements are involved. The Government can acquire rural land through the local authorities for projects in the public interest. The administration of land in Liberia is carried out by the Ministry of Lands, Mines and Energy (MLME), which has oversight responsibility for sector agencies such as the National Lands Commission (NLC) and the Surveyors Board (SB) (Julu, personal Communication, 2006). There is no comprehensive policy on the acquisition of land for agricultural purposes and the Government is silent on the payment of fees. The GOL grants leases to private investors and land fees are negotiable. The MOA determines fees for agricultural land acquired for private uses even though the MLME manages the process of land acquisition.

Soil survey and classification. Prior to 1987, surveys of a large number of small farms were carried out by the Land and Water Resources Department of the Central Research Institute (CARI) in Suakoko and the Land Development Division of the MOA in Monrovia. These surveys were designed to assist in the production of food and cash crops. Medium-scale surveys of large farms were undertaken by different bodies, and provided information on land resources for widely ranging objectives. However, large-scale area-oriented surveys of land capability and crop suitability were carried out by integrated agricultural development projects in Lofa, Bong and Nimba counties in north and northeast Liberia. In the southeastern part of the country a survey of Grand Gedeh County identified suitable areas for lowland rice and tree crops (cocoa and coffee). All the extensive surveys were carried out by foreign consultants. Table 10 below highlights major soil or land resource surveys undertaken in Liberia and a summary of these surveys is presented in subsequent paragraphs.

Table 10. Major soil/land resource surveys undertaken in Liberia between 1951 and 1990

Author: year of publication	Type of Survey	Purpose
Reeds, W.E: 1951	Reconnaissance soil survey	Soil associates and landforms
Subramanian, V.S: 1970	Reconnaissance soil survey	Plantation crop development
Fanfant, R: 1970	Reconnaissance soil survey	Lowland rice development
Slusher, D.F: 1970	Soil survey programme	Soil survey programme for Liberia
Fanfant, R: 1972	Reconnaissance soil survey	Lowland rice cultivation
Agra Und Hydrotechnik: 1974	Feasibility of upper LCADP	Plantation & food crop development
Subramanian, V.S: 1975	Reconnaissance soil survey	Lowland rice & tree crop development
SATMACI: 1975/76	Soil and land capability survey	Land suitability for coffee and cocoa
Agra Und Hydrotechnik: 1976	Feasibility of upper NCRDP	Plantation & food crop development
Geiger, I.C: 1977	Soil survey & classification	Soil series description & classification
Soil Division (MOA) & USAID	Soil survey of CARI, Suakoko	Soil series description & classification
Agra Und Hydrotechnik: 1978	Exploratory/reconnaissance	Plantation & food crop development
Van Mourik: 1979	Regional reconnaissance land resource survey	Reconnaissance appraisal for agricultural purposes
Veldkamp, W.J: 1980	Soil series description & classification	Land resource survey for Mano River Union Project areas
Arup Ireland International: 1986	Land capability of Grand Gedeh	Swamp rice and tree crop production
Project LIR/87/010, MOA/FAO: 1987–1990	Land resources assessment for land use planning	To produce a unified soil map of Liberia and standardize the methodology used in Liberia for land resources surveys, soil classification, land evaluation and land use planning

The earliest survey of soils was a national exploratory survey carried out by Reeds (1951). It was based on flights over the country and observation along accessible motor routes. A national soil map was produced at a scale of 1 : 300,000 showing five soil "associations". The description of the soil associations provided some indication of the landforms and the report also provided some idea of chemical status and an indication of appropriate use of the land. Although such a survey cannot be used with any reliability for either national or regional planning it provides the first account of the range of soils to be found in Liberia. In this survey, much of central Liberia is indicated as having very shallow soils (lithosols), but with latosols around the margins.

Subramanian (1975) undertook a survey in the Zlehtown area (northeast of Grand Gedeh) to select areas suitable for plantation crops, especially oil-palm, coffee and cocoa. He described the area as being a dissected plateau with steep, eroded land, hillocks and low-lying areas. Much of the upland had concretionary soils with the concretions often being tightly packed. These were considered to be unsuitable for development. Deeper and less gravelly soils were found on the lower slopes – such soils were considered to be suitable for tree crops, although it was thought that cocoa might be sensitive to acidity. The swamps were generally of a sandy nature but were considered to have development potential for rice. Subramanian (1975) pointed out that the soil had been found under forest and that changing land use and forest clearing is likely to have number of effects. Amongst these are the following:

- a reduction in top soil organic matter;
- a risk of hardening of plinthite through increased wetting;
- an increased risk of soil erosion, indicating a need for soil and water conservation;
- an adverse effect on soil structure and infiltration.

SATMACI (1975/76) undertook a soil and land capability survey of eight areas in Liberia to determine their suitability for coffee and cocoa. The areas surveyed were Grand Gedeh, Bong, Lofa, Nimba, Grand Bassa, Sinoe, Cape Mount, Maryland and Montserrado counties. The survey report provides background data on the physical conditions in Liberia and a more detailed account of the soils and land capability in the Grand Gedeh sites (1 772 ha). Two maps, for soils and their crop suitability, at a scale of 1:10 000 were produced.

Soils were classified according to the ORSTOM system. Two soil classes dominated in the survey: ferrallitic soils on the interfluves and hydromorphic soils in the depressions. The suitability of a soil type for coffee and cocoa crops was judged from the physical condition of the soil, in particular texture, gravel/stone content (including concretions), wetness/drainage, and soil depth. Nearly 50 percent of the areas surveyed were classified as moderately suitable, good and/or very good. Neither the map legend nor the tables within the text subdivided the suitability classes according to the limitations that were defined, but reference to the text suggests that high gravel content is the major limitation of these soils. The soils were found to be very low in natural fertility.

In 1976 the MOA commissioned a report for oil-palm and coconut projects in Grand Gedeh and Maryland counties. Three maps at a scale of 1:10,000 were produced, for soil type, morphology and vegetation. Again, the soils were classified according to the ORSTOM system, and were predominantly leached ferrallitic soils that were subdivided on the basis of colour, drainage and gravel content. Stoniness (gravel and concretion), the presence of indurated horizons, and extremes of texture were found to be the main limiting factors.

Fanfant also carried out a series of land resource surveys for lowland rice development in the early 1970s. Geiger (1977) subsequently laid the foundation for a national soil classification system based on soil series. Extensive reconnaissance land resource surveys were carried out in the Mano River Union area between the St Paul River and the border with Sierra Leone (land resources of western Liberia) by Van Mourik (1979), in Nimba County (Agrar and Hydrotechnik, 1978) and in Grand Gedeh County (Arup Ireland International, 1986).

The survey reported by Van Mourik in 1979 was aimed at providing data to assist planners in identifying projects and in regional planning. This was the first major regional reconnaissance land resources survey to have been undertaken in Liberia. In this study, the lands systems approach was used, in which the survey area of some 27 000 km^2 was divided into land systems from interpretation of aerial photographs. These were used as mapping units and formed the basis for field sampling and land suitability mapping.

The constituent land facets of each land system were described in terms of area, landform, soils, and vegetation and land use. An evaluation was then made of the suitability of each facet for various crops including coffee, cocoa, rubber, oil-palm, upland rice and lowland rice. Three maps were presented at the scale of 1 : 500,000 that included vegetation and land use, and land systems. Land suitability was found to be in the range permissible for Oxisols. The authors therefore proposed a new subgroup of Aquoxic Paleudults to accommodate these soils.

In 1977, the Soil Division of the former Central Agriculture Experiment Station (CARES), with Geiger, established a catalogue of soil series defined up to that time in Liberia. A description is given of each series together with its classification (soil taxonomy) and an indication as to its use. However, the series described were established largely in Bong County and neighbouring areas where most soil surveys had been undertaken. Table 11 below suggests a tentative correlation between soil classification systems.

Table 11. Tentative correlations between soil classification systems

Soil unit	Liberian soil series (Soil Division, 1977)	Soil Taxonomy (Soil Survey Staff, 1975)	FAO/UNESCO, 1974
D1	Kollieta	Typic Paleudult Plinthic Paleudult	Orthic Acrisol Planthnic Acrisol
D2	Gbaokele	Plinthic Paleudult Typic Paleudult	Planthnic Acrisol Orthic Acrisol
D3	Gbaokele	Plinthic Paleudult Typic Paleudult	Planthnic Acrisol Orthic Acrisol
D4	Sinyea	Plinthic Paleudult	Planthnic Acrisol
D5	Sinyea	Typic Paleudult	Orthic Acrisol
D6	Sinyea	Plinthic Paleudult	Planthnic Acrisol
D7	Sinyea	Plinthic Paleudult	Planthnic Acrisol
D8	Suakoko	Plinthic Paleudult	Planthnic Acrisol
L1	Kpatawee	Typic Paleudult	Dystric Nitosol
L2	Samukata	Typic Dystropept	Dystric Cambisol
L3	Kitoma	Plinthaquic Paleudult	Planthnic Acrisol
L4	Kitoma	Typic Tropaquult	Gleyic Acrisol
W1	Gbelle	Typic Tropaquult	Gleyic Acrisol
W2	Grayzohn	Typic Tropaquult	Gleyic Acrisol
W3	Ballam	Acric Tropaquult	Gleyic Acrisol
W4	Cuttington	Typic	Dystric Gleysol

Arup Ireland International (1986) undertook a land capability survey of Grand Gedeh County aimed at identifying specific village areas suitable for intensification and improvement of agricultural production. This was followed by more detailed surveys of five selected

areas/sites and the preparation of outline development plans for irrigated rice schemes in swamps, and improvements to a range of tree and food crops in surrounding areas. The survey was also intended as a pilot project to develop appropriate methods for extending surveys to other village areas in the southeast region.

For the reconnaissance survey, regional and land use maps were presented at a scale of 1:250 000, based on field surveys and interpretation of aerial photographs and satellite imagery. The report pointed out that some 70 percent of the area was found to be forest-covered, with 29 percent comprising a mosaic of secondary regrowth and small scale slash-and-burn cultivation. Most of the area was reported to comprise a gently undulating pen plain on relatively uniform and strongly weathered parent material. The report also indicates which differences in soils and land capability proved to be more significant, in terms of agricultural potential at the level of the individual slope sequence rather than at regional level.

Land capability studies. These were undertaken as detailed surveys of selected swamps and exploratory semi-detailed surveys of dry land farming areas around selected villages. The semi-detailed surveys extended over the areas affected by cultivation. Maps of vegetation and land use, soils and land capability were compiled at a scale of 1:20,000. Broad patterns of soils were mapped using the "soil family" concept and land was classified according to a modified version of the United States land capability system. Large areas of the land were found to be only marginally suitable for cropping, due to shallow soil depth or excessive gravel content. The maps provide general indications of the features of the village lands and serve as a basis for future integrated development of both irrigated rice and dry land crops.

Detailed surveys of the selected swamps and lateral slopes were conducted along trace lines spaced 100 m apart. Mapping was done at a 1 : 2 000 scale, with separate sheets showing soils and land suitability for rice and for dry land cropping. Soil texture proved to be the principal factor that determined suitability for agriculture in the swamp areas; soil depth and gravel content were the principal determinants of suitability for dry land crops on the lateral slopes. The results of soil analysis indicate that the soils have very low fertility. Infiltration rates and hydraulic conductivity are relatively high in the coarser-textured swamp soils. Five selected swamps totalling 596 ha were surveyed at a detailed level; of these 146 ha were suitable for rice and 128 ha were suitable for dry land cropping. Some 222 ha were unsuitable for cropping.

In this survey two farming systems were identified within the villages, namely an upland farming system and a village farming system. The former is the principal source of the staple subsistence food (rice) and receives priority in terms of labour resources. Surplus labour, if available, is utilized on the village farms, which are oriented towards cash crops, such as tree crops (coffee and cocoa), vegetables and swamp rice. A tentative correlation between soil mapping units and other classification systems is given in Annex 3 (Dominant Soil Characteristics).

These previous surveys have yielded a considerable amount of information on the land resources of the country. However, as different individuals and organizations carried them out for widely ranging objectives, they differ in the presentation of their findings. The early surveys of Reeds (1951) and Fanfant (1970), which are on too small a scale to be of any practical application and which lack any interpretation of land capability or suitability for particular crops, do not together give a complete picture of the land resources of Liberia. The

need for a coordinated national service for soil surveys was stated as long ago as 1970 by Slusher, but there has been little or no progress subsequently, either in national land resource mapping or in standardizing the survey methodology and data interpretation techniques.

Soils were not mapped, but Van Mourik's report pointed out some of the difficulties of applying the soil taxonomy and FAO/UNESCO classifications (FAO/UNESCO, 1974; Soil Survey Staff, 1975) in the field. It is difficult to recognize diagnostic horizons, because of the exhaustive laboratory and micromorphological analysis that is often required to correctly identify horizons, and because of anomalies in the application of the definitions under Liberian conditions. Thus an approach on the basis of soil "families" was favoured, in which the classification centred on four concepts: i) texture and gravel content of the soil profile (25–100 cm depth), ii) stage of profile development, iii) parent materials and iv) colour.

These features were found to be readily recognized in the field during routine soil surveys and were considered to be directly relevant to assessment of land capability and crop suitability. The families were correlated with subgroups of soil taxonomy and units of the FAO/UNESCO Soil Map of the World.

Land resources assessment for land use planning. The information produced by the various surveys of soil/land resources needed improvement in terms of criteria, standardization of methodology and coordination. As a result, a requirement for a coordinated national land resources survey was recognized as early as 1975. In 1985 the GOL, realizing the need for a nationally coordinated database fundamental to planning and the rational use of its land resources to cater for a rapidly expanding population, made available its counterpart contribution to the project for land resource assessment for land use planning.

The Project, LIR/87/010 "Land Resource Assessment for Land Use Planning", was financed by UNDP and executed by FAO. The project appraisal and formulation mission were carried out in 1985, resulting in a project document proposing a project of five years' duration, with an agreement reached among UNDP, FAO and the GOL in March 1987. The MOA was designated as the Government counterpart agency responsible for project implementation. The Government contributed L$797 600 and the UNDP contribution, as finally revised, was $US2 186 197.

The project became operational on 28 August 1987. However, towards the end of the third year of the project, implementation was interrupted because of political instability in the country. It must be noted that the objectives of this project at that time, compilation of an inventory of soil resources, mapping, computerization, capacity building of staff and development of guidelines for land use, are as relevant now as ever.

Land use and forestry. The first comprehensive land use map of Liberia was prepared in 1956 from aerial photographs taken in 1953. At the time, the map showed extensive forest vegetation in the northwest and southeast with some farmed areas. In 1981, another land use map was prepared from aerial photographs taken in 1979 (GOL, 1983). This revealed the depletion of extensive forest cover, largely due to farming activities. Apart from the plantations (rubber, cocoa, coffee and oil-palm), which are noted for providing surface cover and minimizing soil erosion, the farming system has largely been one of shifting cultivation, with a fallow period of 9–10 years. This farming method involves felling/slashing, burning and planting. For the steep and rolling hills, removal of vegetation cover leads to increased soil erosion. In addition, the communities have found charcoal production very rewarding

financially. Bushmeat, a major source of protein in the diet of Liberians, has put more pressure on forest resources because catching the game sometimes requires the burning of vegetation, thus giving rise to loss of biodiversity and soil fertility.

The forestry sub-sector has been recently reviewed in detail and development proposals made as part of the Liberian Forestry Initiative (GOL, 2004) but a brief review in the context of catchment protection is presented here. In 1976, the GOL passed a special Act creating the Forestry Development Agency (FDA) as the sole institution with authority responsible for managing Liberia's forest estate (Working Group on Liberia's Protected Area Network, 2006). For administrative purposes, Liberia is divided into four forestry regions managed by the FDA. The first forestry region covers Nimba, River Cess, Bong, Margrebi and Grand Basseh counties. The second forestry region covers Grand Gedeh, a portion of Sinoe, Maryland, River Gee and Grand Kru counties. The third covers Cape Mount, Bomi, Gbarpula, Lofa and Montserrado counties. The fourth forestry region covers the rest of Sinoe County. Currently, protected forest covers an area of about 14 200 km^2 (Table 12). These forests are said to be home to about 2 000 species of flowering plant, 150 species of mammal, 620 species of bird, 125 species of reptile and amphibian and over 1 000 described insect species (UNEP, 2004). Liberia's forest habitat and biodiversity face increasing threats from slash-and-burn agriculture, mining, logging, and the migration of rural settlements. According to GOL (2004)[1], forest cover declined from 4.1 million ha in 1992 to about 3.48 million ha in 2001/02 and the MDG target is to reverse deforestation by at least maintaining the current forest cover levels. It is also expected that the land area protected to maintain biodiversity, which stood at 192 000 ha in 2003, will be increased to at least 534 000 ha by 2015. Deforestation is reported to be occurring at the rate of 1.5 to 2 percent per annum.

The FDA now proposes a sustainable forest management policy known as the 3C policy: the *conservation, community and commercial forestry* policy, in which community involvement is seen as an important part of the process of forest management. The aim of commercial forestry is the sustainable production of forest products and the development of viable forest-based industries. Community forest management focuses more on the interests of people who live in and on the fringes of forest areas. Alternative livelihood issues are to be considered where dependence on forest resources and products such as wildlife is crucial. The aim of forest conservation is to sustain and enhance biodiversity conservation and maintain the other environmental functions of forests for current and future generations. The Liberia forest initiative aims to develop a comprehensive land use plan by creating a buffer zone system for farming in order to minimize conflicts with human communities. In fact the Protected Forest Areas Act of 2003 outlines categories for ten protected areas in Liberia, namely buffer zone, communal forest, cultural site, conservation corridor, game reserve, national forest, national park, nature reserve, multiple sustainable use reserve and strict nature reserve (Working Group on Liberia's Protected Area Network, 2006).

With regard to the issue of land conservation**,** prevention and control of soil erosion that results from human interference with natural conditions is indirectly provided for by current forestry legislation to the extent that the use of forests is restricted and forest cover is thereby protected.

Table 12. National forest reserves

Forest Reserve	Area (ha)
Krahn-Basa	513 962
Grebo	260 462
Gola	206 995
Kpelle	174 828
Yoma	2 649
Lorma	71 226
South Lorma	43 506
Gbi	32 930
Gio	66 969
East Nimba	28 966
West Nimba	12 950
Total	**1 415 443**

Source: GOL (2004)[2]

The commercial exploitation of forests is restricted with regard to the size of trees that can be felled and additional restriction may be placed on the exercise of timber concessions from the Government. In addition, the GOL may set aside forests for the controlled use of natural resources therein.

Wetlands. The wetlands of Liberia that have been designated as potential Ramsar sites (IUCN - International Union for the Conservation of Nature) for conservation include Lake Piso, Marshall, Mesurado, Lake Shepherd, Bafu Bay, Cestos-Senkwehn, Gbedin and Kpatawee, as shown in Table 13. These sites are not only home to important biodiversity but also important fishing grounds for many Liberians. It is expected that an inventory and a management plan will be developed for the sustainable management of these wetlands.

Table 13. Wetlands of Liberia named as potential Ramsar sites

Wetland	Type	Area (ha)	Conservation status
Lake Piso	Coastal lacustrine	76 091	Proposed nature reserve
Marshall	Inland riverine	12 168	Proposed nature reserve
Mesurado	Coastal lacustrine	6 760	None
Lake Shepherd	Coastal lacustrine	na	None
Bafu Bay	Coastal lacustrine	na	None
Cestos-Senkwehn	Inland riverine	na	Proposed nature reserve
Gbedin	Inland swamp	8	None
Kpatawee	Inland riverine	na	None

Source: UNEP (2004)

These lands are generally considered as wastelands but they have key economic importance to inland fisheries and swamp rice development.

Agricultural land capability. From previous soil studies, a broad classification of land capability has been developed. Land types include tidal swamps, coastal beach plains, flood plains, valley swamps, and low and high hills (Table 14). In the case of the tidal swamps, high tides could destroy crops, requiring substantial investment in drainage if such lands are to be used for agricultural production. The coastal beach plains generally have low fertility and low organic matter content and will require some degree of fertilization when cropped. The flood plains also have the problem of potential flooding that can destroy crops, but proper timing and adequate drainage can improve the situation. The valley swamps, which are potential rice fields, are also poorly drained and have low fertility and organic matter content. Adequate drainage and fertilization can improve their agricultural capability. The

low hills are well drained and can be used for upland rice, vegetables and cassava but also have the problem of low fertility and are prone to soil erosion. Fertilization and long fallow periods can improve the agricultural capability of the soil.

Table 14. Agricultural land capability

Agro-ecology	Drainage	Crop suitability	Constraints	Improvement measures
Tidal swamps	Poor	Intensive lowland rice	High tide destroys crops	Adequate drainage
Coastal beach plains	Poor to well drained	Unsuitable for most crops except cassava, coconut, oil-palm	Low fertility, low organic matter (OM)	Fertility management
Flood plains	Poor to well drained	Cocoa, oil-palm, upland rice, irrigated rice possible	Potential flooding	Proper timing of cropping activities, adequate drainage
Valley swamps	Poor	Lowland rice	Water-logging, low nutrients, low OM	Adequate drainage, fertility management
Low hills	Well drained; foot slopes poorly drained	Upland rice, vegetables, cassava	Low fertility, erosion	Fertility management, adequate fallow

Source: GOL (1983)

5.2 Review of some agricultural land and water projects

From the 1970s to the mid-1980s, a number of large, medium and small agricultural development projects were undertaken in Liberia as part of Government efforts to feed the nation and provide certain raw materials for export. These included a number of water control projects for swamp rice development and oil-palm development.

The large projects included the Lofa Country Agricultural Development Project (LCADP), the Bong County Agricultural Development Project (BCADP), the Nimba County Integrated Rural Development Projects I and II (NCIRDP I and II), the South East Rural Development Project (SERUDEP) in Grand Gedeh, Maryland and Sinoe counties, the Central Montserrado Development Project (MDP) and the Special Rice Projects (SRP) at Zleh Town and Foya. The BF Goodrich Liberia Incorporated Rubber Concession was also undertaken to increase the export of rubber (GOL, 1983).

The medium to small projects included the Special Rice Projects (SRPs) in Philadelphia, Gbedin, Kpein, Kpatawee and Garwula-Tombe. Land areas for the projects range from 13 ha for the Kpatawee scheme to 2 272 ha for the Cestos scheme (Table 15). Unfortunately, these projects have deteriorated, and the situation has been made worse by the destruction during the war and inadequate maintenance of the schemes. There is the need to reclaim these swamps in the short term and to develop additional areas in the long term. In order to do this, there will be the need to evaluate the performance of these projects. Swamp development costs are said to range between US$350 and US$1 000/ha on average. Funding for these projects was provided largely by the International Development Agency (IDA), the European Development Fund (EDF) and the African Development Bank (ADB). The Chinese Government also undertook a number of swamp projects.

Table 15. Irrigated agricultural development projects in Liberia

County	Scheme	Area (ha)	Crop	Water control method
Nimba	Gbedin	833	Rice	Basin
Grand Gedeh	Zleh Town	233	Rice	Basin
Grand Gedeh	Cestos	2 272	Rice	Basin
Grand Gedeh	Zwedru	50	Rice	Basin
Cape Mount	Gawula Tombe	142	Rice	Basin
Bong	Kpatawee	13	Rice	Basin
Lofa	Foya 1	156	Rice	Basin
Lofa	Foya 2	150	Rice	Basin
Lofa	Foya 4	155	Rice	Basin
Lofa	Foya 5	130	Rice	Basin
Lofa	Foya Tenga	132	Rice	Basin
Lofa	Foya Fagunda	134	Rice	Basin
Maryland	Philadelphia	24	Rice	Basin

Source: Farnga (1988)

Since 1994, FAO together with various other donors has been assisting Liberia with emergency operations, mainly supplying farmers with agricultural inputs such as seeds and tools, but it was not until February 1997 that Liberia expressed interest in participating in the Special Programme for Food Security (SPFS). In May 1997, an FAO exploratory mission visited Liberia to determine the nature and scope of the SPFS, resulting in the signing of an agreement in February 2000 to implement a pilot phase of Technical Cooperation Programme (TCP) Assistance for six selected sites (Table 16). The project, which aimed at demonstrating technologies for water management and control for the upland and swampland agro-ecologies, proposed to cover 50 farmers at each site for a total participating farm population of 300 farmers, 40 percent of whom were expected to be female farmers. The project was expected to cover about 600 ha for upland crops and 100 ha for swamp rice (MOA/FAO, 2000) but implementation was disrupted by the civil strife.

Table 16. SPFS pilot agricultural water projects

N°	County	District	Clan	Site
1	Bomi	Klay Dowein	Tek Gbarvon	Zordee Gbobeh
2	Grand Bassa	Compound No. 2 Compound No. 3	Mobli Zeowein	Kpaweeto Tubmanville
3	Nimba	Sanniquellie-Ma Saclepea-Ma	Sehyi Gbannoi	Sehkinpa Kpein

Source: FAO/MOA (2000)

A number of local and international NGOs are supporting various aspects of land and water resources projects including forestry development projects. Fauna and Flora International (FFI), the Sustainable Development Institute (SDI), Conservation International (CI) and the Global Environmental Fund (GEF) are supporting forestry projects in Liberia. Two pilot community forestry projects are proposed for implementation and the World Bank, the FFI and GEF are currently undertaking a community forestry study for Sapo National Park. Some NGOs that are involved in water projects and supported by USAID include the Catholic Relief Service (CRS), World Vision International (WVI), Mercy Corps, the Liberia Community Infrastructure Project (LCIP), AFRICARE, and the African Development Aid Foundation (FDA). Agencies of the UN, such as FAO, WFP, UNDP, UNICEF, UNHCR, UNEP and UNIFEM, are actively involved in postwar nation-building; some of them are

channelling their resources through local NGOs. The United Nations Mission in Liberia (UNMIL), whose mandate is to keep peace in Liberia, is also involved in supporting postwar nation-building.

The UN agencies, such as FAO, among other objectives, are supporting rehabilitation of old swamp areas by training ex-combatants in sustainable livelihood activities; this has been occurring since 2005 in Lofa County, for example. A monthly subsistence allowance of US$30 per participant, which was provided as an incentive for resettling the ex-combatants, did not prove successful because most of the trainees did not go back to swamp rice cultivation (Koiwuo, personal communication, 2006). Currently, such financial incentives have been discontinued and the assistance generally provided is in the form of inputs for communities such as seeds, farming tools and training. There is also food-for-work assistance being provided by the WFP, but these programmes have also run into various problems.

The International Committee of the Red Cross (ICRC), which claimed to be offering assistance to about 40 000 community groups, provided seeds and tools. The Food Support for Local Initiatives (FSLI) group also provided seeds, tools and food-for-work in assistance to the communities. The German Technical Cooperation Agency (GTZ) also provided assistance in the multiplication of tuber crops, plantain and vegetables. The Pentecostal Ministries Union (PMU) is also assisting the communities in vegetable production. The United Methodist Committee on Relief (UMCOR) also provides assistance in swamp rice development and seed multiplication. The Sustainable Agricultural Services Union (SASU), in collaboration with FAO, implemented training for communities in crop, livestock and fisheries production. The NGO CONCERN is implementing FAO support for 1 500 beneficiaries in swamp and upland rice production. The local NGO ADA provides assistance to farmers in the form of farming inputs and food-for-work in Foya, Gbedin and Kpatawee, for example, but did not appear to be well accepted by the beneficiary farmers. The water control headworks at these three sites are damaged and need to be repaired urgently. The FAO and WFP, as part of the agricultural sub-sector assistance, are also assisting ex-workers of the Central Agricultural Research Institute (CARI) in the form of seeds, tools and food-for-work to undertake rice seed multiplication on the abandoned research fields that cover 6.5 ha of swamps and 4.2 ha of upland. Some of the ex-workers will be re-engaged when CARI resumes full operation as the country's main research institute. Rice varieties such as New Rice for Africa (NERICA) are being multiplied at CARI with the assistance of WARDA.

At Zuluyee (Sanniquellie District) and Mowulahun (Kolahun District), for example, traditional swamps are being developed by a group of farmers, even though the land areas involved are small in proportion to the number of participating farmers. However, the demonstration of self-help spirit is notable and commendable.

The United Methodist Church Agricultural Project (UMCAP) and USAID are supporting the rehabilitation of an improved swamp rice farm covering 2 ha to produce some food for the inmates of a leprosarium in Ganta. Supported by the LCIP/USAID as part of the Demobilization, Disarmament, Rehabilitation and Reintegration (DDRR) programme, 480 ex-combatants and farmers were also assisted by the local NGO CATALYST, which provided seeds, tools and technical assistance. In an 8-month programme, CATALYST implemented 27.6 ha of swamp rice development in six villages in Bong County, which they described as successful. The assisted communities have continued the work even without further outside assistance.

Also between 1996 and 1998, 20 ha of swamp rice development was implemented by the local NGO Zao Development Council Incorporated (ZADC) for five communities in Nimba County, with financial assistance from CRS and FAO. As usual, the assistance came in the form of planting material, tools and technical assistance in capacity building. BANBATT 10 of UNMIL also assisted the Kpein community, under what was known as the Nimbanian Bangladeshi Friendship Agricultural Project (NIBAFAP), in the rehabilitation of a 4.5 ha upland rice project in Nimba county. Earlier assistance provided by FAO under the SPFS in the construction of water control headwork for the development of additional swamps at Kpein did not turn out to be successful but the farmers, on their own initiative, are engaged in swamp rice development activities. Vegetable crops such as peppers, eggplant and bitter ball are also produced at Kpein, where irrigation is done by hand. Also at Saclepea, the Nimba County Rural Development Project (NCRDP) and Community Union for Productivity (CUP) have initiated swamp rice projects. Lessons learned from all these experiences are discussed later.

6. EMERGING ISUES IN THE LAND AND WATER SECTOR

Various issues have emerged from the land and water sector review and analysis.

- Liberia has no comprehensive policy document relating to water resources development but there are small portions of the legislation on land, mining, forestry and water supply that relate to water resources.
- The hydrometeorological and hydrological networks in the country are in a very poor state; some stations have been closed down due to lack of equipment and commitment of observers.
- Although there are insufficient data to support this claim, current land-use practices are deemed to be having an effect on water resources, as suggested by the seasonality of some tributaries that used to be perennial, and the changing rainfall patterns.
- There is the general assumption that water resources are limitless. The country must seriously engage itself in a more pragmatic way in planning its water resources in the face of current land use practices. Issues of integrated watershed management and the joint administration of international water bodies must be dealt with. This situation requires immediate attention.
- Forest cover is reducing due to current farming practices, thus posing a threat to soil fertility, biodiversity and the water resources of the nation.
- Institutional capacity for managing agricultural land and water is weak and must be strengthened through capacity building and the equipping of the water sector agencies.
- Swamp water management is difficult and makes extra demands on farmers in terms of time, resources and energy. There is a general preference for upland farming even though rice yields are reported to be about half those attainable in the lowlands. There are also problems with poor design, construction and maintenance of water control structures.
- Basic water management data for crops are not available and research in Liberia does not seem to consider this a priority, probably because of the abundance of water resources. The emphasis seems to be on the control of excess water in the lowlands rather than management of soil water in the uplands.
- Upland water management and water management on slopes are not considered to be critical issues in the farming community. The upland soils are generally acidic, with low fertility and low water-holding capacity, and are prone to soil erosion yet soil and water management is not generally considered by the farmers. It is necessary to investigate why

farmers do not pay particular attention to field soil and water conservation practices on the uplands and the slopes.

- Rainfed agriculture has seen, in recent years, late onset of the rains, which is of concern to the farmers. Could it be that the rainfall patterns are changing due to general land use practices?
- A system of lowland agricultural activity known as recession agriculture attempts to use residual soil water for agriculture. Farmers at the periphery of water bodies, advancing and retreating depending on the water regime, take advantage of soil water for crop production. Could options such as this be exploited further?
- Conventional upland irrigation is not considered to be an issue in Liberia because there are water surpluses in all the agro-ecological zones in the country and large areas of swamps available for development.
- Small, shallow well irrigation farming and peri-urban irrigation also take place on a limited scale in Liberia. These activities are probably taken for granted and therefore do not receive any recognition in the plans for achieving food security.

7. DEMAND FOR RICE LAND AND WATER

In this section an estimate of the land area and water resources needed to achieve self-sufficiency in production of the staple food crop is presented (Table 17). The projected population (P) was computed using 2004 as the baseline year, assuming an annual growth rate of 2.3 percent for the period 2006–2015 (10 years). Assuming the per capita consumption of rice to be 124 kg, the domestic rice required (DRRq) for the entire population over the ten year period was computed. Assuming that rice imports will progressively decrease over the same period, a progressively declining rice import factor (RIF) was applied to determine the total rice imported (TRI). This includes commercial imports and food aid. The total domestic rice produced (TDRP) over the period was computed by subtracting the TDRP from DRRq. It was further assumed that there are three different production systems: upland rice (UpR), traditional swamp rice (TSR) and improved swamp rice (ISR), contributing 50, 30 and 20 percent respectively to the domestic rice produced. The factors were applied to compute the UpR, TSR and ISR. The land areas required to grow the UpR, TSR and ISR were computed by assuming average rice yields of 1.2, 1.5 and 2.0 MT/ha respectively. The results indicate that a total swamp land (TSL) area of approximately 167 000 ha and an upland area (UpRL) of 232 000 ha will be required by 2015, if a consistent rice policy is implemented over the period, making a total of nearly 400 000 ha of both types of land. If double cropping is done each year in the swamps, the swampland area could be halved to achieve the same result.

On average, coupled with upland rice production, it will require swampland expansion of about 10 000 ha/year to achieve the food self-sufficiency target projected. It must be noted that 4 percent of Liberian land, amounting to about 445 500 ha, are said to be swamp and 8 352 750 ha are uplands. Before the war cropped land was reported to measure 600 000 ha, of which 220 000 ha was permanent cropland and the rest (380 000 ha) was arable cropland. Assuming a minimum fallow period of 10 years this implies that a total of approximately 464 000 ha would need to be available for upland rice production, amounting to 5.5 percent of the total upland area of Liberia. By this analysis, it will require only about 37 percent of the swamp area to be brought under rice production over a period of 10 years to achieve self-sufficiency in rice. On the whole, at current rice production levels, it will require an

expansion of 20 000–25 000 ha of both upland and lowland rice for 10 years for Liberia to achieve self-sufficiency in rice production.

Table 17. Rice production analysis

Year	P (million)	DRRq (MT)	RIF	TRI (MT)	TDRP (MT)	UpR (MT)	TSR (MT)	ISR (MT)	UpRL (ha)	TSRL (ha)	ISRL (ha)	TSL (ha)
2006	3.663	454 194	0.45	204 387	249 806	124 903	74 942	49 961	104 086	49 961	24 981	74 942
2007	3.747	464 640	0.40	185 856	278 784	139 392	83 635	55 757	116 160	55 757	27 878	83 635
2008	3.833	475 327	0.35	166 364	308 962	154 481	92 689	61 792	128 734	61 792	30 896	92 689
2009	3.921	486 259	0.30	145 878	340 381	170 191	102 114	68 076	141 826	68 076	34 038	102 114
2010	4.012	497 443	0.25	124 361	373 082	186 541	111 925	74 616	155 451	74 616	37 308	111 925
2011	4.104	508 884	0.20	101 777	407 108	203 554	122 132	81 422	169 628	81 422	40 711	122 132
2012	4.198	520 589	0.15	78 088	442 500	221 250	132 750	88 500	184 375	88 500	44 250	132 750
2013	4.295	532 562	0.10	53 256	479 306	239 653	143 792	95 861	199 711	95 861	47 931	143 792
2014	4.394	544 811	0.05	27 241	517 571	258 785	155 271	103 514	215 654	103 514	51 757	155 271
2015	4.495	557 342	0.00	0	557 342	278 671	167 203	111 468	**232 226**	111 468	55 734	**167 203**

Source: Author's estimates (2006)

With regard to water resources the situation is as follows: assuming 1 500 mm of water requirements for the crop, considering surface evaporation, drainage and other losses, a total land area of about 400 000 ha of both upland and swamp rice will require an annual renewable water supply of about 6 billion m^3 or 6 km^3/year. This is only approximately 2.6 percent of the total annual renewable water resource of 232 km^3/year.

8. LAND AND WATER DEVELOPMENT CONSTRAINTS AND POTENTIAL

An analysis of the development potentials and constraints is based on the following observations.

- There is a high potential risk of an irreversible degradation of land and water resources. The abundance of natural resources in Liberia cannot be overemphasized. With regard to water resources, it is true that Liberia is one of the few West African nations which are endowed with adequate supplies. Whereas there are few scientific data to describe the extent of the water resource, physical observation alone attests to the fact that this resource is substantial. As stated earlier, it is estimated that the country possesses about 232 km^3 of renewable water resource per annum. The statistics also show that deforestation is at the rate of 2–5 percent per annum. There is concrete scientific evidence to suggest that when forest cover diminishes, water resources also dwindle, thereby increasing the risk of perennial streams becoming seasonal. The country must as a matter of urgency move away from the notion that water resources are limitless and must seriously engage itself in a more pragmatic way in planning the management of water resources in the face of current land use practices. This situation requires immediate attention.

- There is a general lack of recognition of the close interrelationships between livelihood strategies, agriculture and the environment. The population of Liberia is intimately integrated into the landscape of river systems, lakes and mangrove swamps. The rural people earn their livelihood through the cultivation of food crops, fishing, extensive husbandry of livestock, collecting fuel wood, producing vegetables, growing tree crops such as cocoa and coffee and through other non-agricultural activities. Under the right conditions, these people should invest in the long-term health and productivity of their

land, water, tree and livestock resources. The most important conditions influencing these investments are profitability, power and certainty. Quite often bottlenecks exist with regard to uncertainties over the rights to land. Land users need to be sure that investments in the land will yield good future returns and they must be certain that they will be able to reap what they sow (ICRAF, 2001). This calls for an integrated approach to basin management to be able to derive livelihoods from the larger environment on a sustainable basis. Improved resource management in all basins requires input from many agencies and sectors, along with more collective action by local community groups. There is the need to empower legitimate local authorities and community groups to develop and enforce regulations on resource use and to exert control over catchment areas. Community regulation of resource use is very important for maintaining the integrity of the resource base and for stimulating private investment in resource management (Agodzo, 2003).

- Institutional capacity in support of agricultural water development and management is weak, largely due to the destruction that occurred during the war and underfunding of the sector. A highly centralized institution, LWRDD lacks key equipment and personnel to provide the needed services at the community level. The concentration of resources in Monrovia, as with all Government departments, also makes it difficult for district and community level work to be carried out. Government is in the process of reforming the agricultural sector by decentralizing services to the grassroots level. When governments try to do too much via the civil service, they end up not doing anything well. Current global trends involve private sector participation in service delivery, thus leaving the civil service to concentrate on providing the enabling environment and control for entrepreneurship development. It should be possible for the private sector to participate in some aspects of the land and water management work, by providing such services as training for staff and farmers.

- Basic water management data for crops are not available and research in Liberia does not seem to consider this to be a priority, probably because of the abundance of water resources. The emphasis appears to be on the control of excess water in the lowlands rather than management of soil water in the uplands. Upland water management and water management on slopes are not considered to be critical issues in the farming community. The upland soils are generally acidic, with low fertility, low water-holding capacity and are prone to soil erosion, yet soil and water management is not thought to be an issue for these farmers. Rain-fed agriculture has seen, in recent years, late onset of the rains, which is of concern to farmers. Could it be that the rainfall patterns are changing due to general land use practices? No link has as yet been scientifically established between the changing rainfall patterns and general land use practices. The reasons why farmers do not pay particular attention to field soil and water conservation practices on the uplands and the slopes require investigation.

- Swamp rice water control is very difficult. Labour for swamp water control is generally expensive. Labour gangs operate in certain areas, where farm work is rotated among gang members. There is an arranged form of payment in kind for labour. However, there can be labour shortages at the peak of the farming season and the cost of hiring labour can be high. Studies showed, for example, that in neighbouring Sierra Leone, 70–80 percent of farmers abandoned swamp farms for the uplands when the Government made investments in developing swamps using conventional water control systems (Kandeh, 2003). There are still problems with swamp rice production because of difficulties in water control and

the extra demand it makes on time, energy and resources of the farmers. However, there is also evidence that rice yields in swamps can be up to twice those obtained on the lowlands. Opportunities exist to improve water control in the lowlands and to continue to train farmers in techniques of water control.

- The potential exists for development of other forms of agricultural water use, such as upland supplementary irrigation, lowland shallow well irrigation, recession agriculture and urban/peri-urban agriculture. There are hardly any statistics on the extent of these activities and how much they are contributing to the food sector of the economy. The cost implications of upland supplementary irrigation will definitely be higher (about US$5 000–8 000/ha), but there is also evidence that the returns are equally high when properly managed. It is understood that peri-urban farmers would rather grow vegetables to generate income to buy the rice they eat than grow rice themselves. For urban/peri-urban agricultural activities, simple pumping technologies with capacities of 1.0 m^3/hour, and capable of irrigating 100 m^2/hour of land area at an assumed irrigation depth of 10 mm, could be promoted. It is believed that the potential exists for simple forms of agricultural water use to achieve food security in Liberia. Those advocating water control interventions currently promoted by GOL to achieve food security must also consider these interventions.

- The rural infrastructure is generally poor. Rural infrastructure, comprising rural roads, markets, irrigation systems, water supply, and health and educational facilities, is basic to the quality of life in rural areas and is an important factor in economic development. Although the statistical reporting systems are weak, there is evidence to suggest that the key rural infrastructure necessary to accelerate economic growth is generally below the levels that will promote adequate levels of economic activity. Many dwellings were destroyed and/or abandoned during the war. Only 4 percent of rural households are reported to have access to safe drinking water. Only about 4.5 percent of villages in some districts have access to functional markets. The road network is estimated to be 70 km per 1000 km^2, making it one of the worst in sub-Saharan Africa. The level of destruction of life and property during the 14 years of war has made the situation worse, so that even finding the money for postwar reconstruction is becoming a problem. This suggests that the level of deprivation is high, especially in rural areas.

- Poor accessibility, particularly to potentially rich areas, slows down economic activity in terms of mobility and access to important social services such as markets and health infrastructure. Rural roads are considered a fundamental factor for the development of agriculture. Scientific evidence suggests that production levels increase, input costs reduce and even farm wages increase when road accessibility is good. The road infrastructure, worsened by the civil war, is generally poor and most roads become flooded during the rainy season because of poor drainage. In fact, there were long years of neglect of the feeder roads even before the war, thus making accessibility to markets and other social services difficult in the rural areas. PARKBATT (Pakistani Battalion) and BANBAT (Bangladeshi Battalion) engineers from the United Nations Mission in Liberia (UNMIL) have been involved in the rehabilitation of some major road links in the country. One other problem of poor accessibility is that residents of potentially rich agricultural areas near to the borders of neighbouring countries may engage illegally in smuggling in order to dispose of their commodities at good prices, partly because of lack of access to the important internal markets. It is therefore vital that potentially rich

agricultural areas be linked up to the key market centres in order to boost trade within the country.

- Liberia has high economic potential, which, if developed, would provide job opportunities for young people and empower women to generate income for personal family needs. Whereas diamonds have become the symbol of wealth in Liberia, it is becoming increasingly clear that the country needs to face up to the reality of the times and invest more in agriculture not only to provide jobs in the agribusiness chain but also to improve the food security situation in the country. The indications are that the level of deprivation is high, especially in rural areas, and has been made even worse by the war, but the fact remains that the rural economic potential is high when appropriate measures are taken.

9. POTENTIAL LAND AND WATER INVESTMENT ACTIVITIES

With the main objective of seeing agriculture in Liberia become a major source of growth and poverty reduction, any **land and water management** interventions must be aimed at:

- enhancing agricultural production and productivity;
- improving rural infrastructure, especially in the area of accessibility;
- fostering participatory community development, recognizing the different roles of the two genders in development.

In view of the above, key project components that can be proposed, with justifications, are given below.

9.1 Proposed projects

Component 1: **Land and Water Sector Institutional Capacity Building (2–5 years).** Made worse by war, such important institutions as the Land and Water Resources Development Division (LWRDD), the Liberia Hydrological Survey (LHS), the Water and Sanitation Department (WSD) and the Liberia Water Company (LWC) in the business of water resources development and swamp rice development in Liberia urgently need to be strengthened and to support agricultural and other sectoral developments in the country. Useful data have all been destroyed during the war.

The project should support the following activities:

1. land use assessment of Liberia (**5 years**);
2. detailed study of the water sector (**2 years**);
3. development of a comprehensive national water policy (**2 years**);
4. establishment of a water resources commission (**2 years**);
5. improvement in the meteorological and hydrological networks (**5 years**);
6. staff training in the management of the hydrological and meteorological network and capacity building of the staff of the water sector (**5 years**).

The Liberia Hydrological Surveys (LHS), for example, is the sole agent responsible for generating meteorological, surface hydrological and geohydrological data. Out of the 47 meteorological stations that existed before the war, only one is currently intact. Of the

45 hydrological stations that existed before the war, only one is intact. The future requires that the water sector institutions are assisted to provide the necessary data for development planning. A proposed Water Resources Commission (WRC), as present in many countries, would require start-up funding but must generate income from royalties paid by water users to meet part of its recurrent expenditure.

During the implementation of the project, LWRDD is expected to be the lead institution that facilitates and manages the project. In collaboration with other sector institutions, LWRDD and the LHS will procure and install key meteorological and hydrological equipment and also improve such networks. Capacity building for the various categories of staff in the water sector institutions is to be undertaken by private consultants. At least 20 key staff selected from all the water sector institutions are to be trained in local and foreign institutions. Mechanisms for the joint management of international water bodies must be put in place. There must also be strong support for tertiary education and research in water resources engineering.

Component 2: **Land and Water Development for Swamp Rice Production (2–10 years).** Land under swamp rice was lost during the war. In the short term, this land area needs to be brought back into production by rehabilitation of these swamps to bring them up to the pre-war figures, as a short-term measure to meet the country's cereal requirements. There are already ongoing swamp rice reclamation projects scattered over Liberia, either as community-initiated postwar activities or as initiatives for resettling ex-combatants. There is the need to bring more of the improved swamps into sustained production and also to provide support for traditional swamp rice production efforts in order to help achieve the objective of food security. This project will also support the expansion of community involvement in the restoration of priority swamps at a rate of about 10 000 ha/annum over a period of 5 years; the initiation of farmer field schools in land and water management in swamp rice production; and will equip farmers to sustain production.

The project activities should include the following:

1. assessment of the potential of swamps and inland valleys and their characterization for agricultural development (**2 years**);
2. support for improved swamp rice production (**10 years**);
3. support for traditional lowland rice production (**10 years**);
4. capacity building in the construction and management of water control structures (**10 years**);
5. research trials in swamp rice production (**10 years**).

Support for improved swamp rice production will include reclamation of old improved swamps lost during the war and the development of new improved swamps. Support for traditional lowland rice production will include the reclamation of old traditional swamps lost during the war and the development of new traditional swamps. These could take the form of technical, credit and input support for the participating farmers.

The LWRDD shall be the agency responsible for the implementation of the project in collaboration with NGOs and faith-based organizations (FBOs).

Component 3: **Land and Water Development for Upland Rice Production (2–5 years).** Conventional rice cropping in Liberia occurs on the uplands. Although the exact area out of the estimated 380 000 ha of arable land that is involved is not known, it is estimated that this

activity occupies a large proportion of the arable lands of Liberia. Although it has been scientifically proven that the swamps are more productive per unit area than the uplands, it is equally true that there is less work involved in upland rice cultivation. Moreover, it allows for more crop diversification through intercropping with other staples. Therefore, upland rice production will remain a major production activity for a long time despite the relatively low yields. The farming system in Liberia is one of shifting cultivation on predominantly rolling to steep slopes; unprotected slopes lend themselves to soil erosion, thus leading to rapid soil degradation. The soils are generally acidic due to the high rainfall. The need to conserve soil and maintain soil fertility on such slopes thus becomes paramount in this type of farming system.

It is assumed here that most of the intervention required will be in the form of input support and farmer training/field schools in soil and water conservation strategies. A conservative figure for a pilot area of 100 ha is proposed initially and will be expanded gradually in the long term.

The project will focus on identifying suitable technical options for intensification, and increased efficiency of upland rice development and management, allowing for intercropping as well as for soil conservation.

The project activities should include:

1. providing support services in terms of credit, farm tools, seeds and agrochemicals to approximately 500 female farmers and 300 young farmers in 50 groups, potentially those involved in subsistence production activities (**2 years**);
2. capacity building in soil and water conservation strategies on uplands (**5 years**);
3. expansion of new upland farms at 10 000 ha/annum (**10 years**);
4. research trials on upland rice intercropped with other staples (**5 years**).

It is expected that the project will be managed by the LWRDD in collaboration with NGOs and CBOs.

*Component 4***: Urban and Peri-urban Agriculture for Women and Youth Groups (3 years)**. Urban and peri-urban agricultural activities are increasing in Liberia because of the high demand for produce by the rapidly increasing urban population. It is believed that Monrovia alone now accounts for nearly 40 percent of the Liberian population because most refugees returning home do not move to their county of origin but rather choose to settle in Monrovia. The proximity to input and output markets and the relatively better market infrastructure compared with rural-based agriculture gives this type of agriculture an advantage. Amongst the genuine and promising developments in Liberia is the emergence of civil society groups and several theme-focused youth groups. Youth groups seeking to undertake ventures in agriculture need to be encouraged and mechanisms should be put in place to facilitate their engagement in replicable productive enterprises. Furthermore, there is a wide range of small-scale service and business activities in the agrifood chain that could profitably be picked up by organized youth groups.

This project will focus on the following activities:

1. assessing the potential and benefits of urban and peri-urban agriculture (**0.5 year**);

2. providing support services in terms of credit, farm tools, seeds and agrochemicals to approximately 1000 female farmers and 600 young farmers in 50 groups, potentially those involved in market-oriented production, input supply and post-harvest activities (**3 years**);
3. capacity building in urban/peri-urban production and post-harvest activities (**3 years**);
4. construction and equipping of shallow wells with motorized pumps for irrigation of urban/peri-urban farms (**3 years**).

The project is to be managed by MOA with strong linkages maintained with women's and youth groups as well as with appropriate NGOs and CBOs. The activities of the project could be incorporated into similar projects that are already in train.

Component 5: **Community Watershed Management (1–5 years).** The presence of an agrarian economy suggests that economic activity is land-based. There is evidence to suggest that some small tributaries of the main rivers that used to be perennial have become seasonal because of the removal of swamp thickets for agricultural production. The general assumption in Liberia is that water is limitless. Buttressed by the fact that the country does not have a water policy to regulate, use and protect its water bodies, the situation calls for re-examination of the general land-use practices in relation to water resources. As stated earlier, there is a need to empower legitimate local authorities and community groups to develop and enforce regulations on resource use and to exert control over catchments. Community regulation of resource use is very important for maintaining the integrity of the resource base and for stimulating private investment in resource management. The best option will be a community-based approach to conservation of river basin resources, at the same time allowing the development of livelihoods on a sustainable basis.

The project will focus on the following activities:

1. assessing past and current land use practices at the community level (**1 year**);
2. assessing the extent of degradation in the various river basins using geographical information systems (GIS) and other appropriate tools (**1 year**);
3. detailed hydrological studies of all river basins, including the development of hydrological maps for all river basins in Liberia (**2 years**);
4. development of detailed land use maps (**2 years**);
5. development of detailed soil and soil suitability maps for agricultural planning (**2 years**);
6. undertaking community needs assessment in environmental conservation programmes (1 year);
7. design and implementation of community-based watershed management projects (**5 years**).

It must be noted that the International Center for Research in Agroforestry (ICRAF), which is based in Nairobi, has over the years been involved in successful community resource conservation activities, from which examples can be adopted for implementation in Liberia.

Although the project should assume a national character, pilot schemes can be started in the three most vulnerable districts in three small watersheds ($\leq$ 100 km^2). While the LWRDD of the MOA will play the role of facilitator in implementation of the project, the private sector should be contracted to undertake the tasks listed above under the supervision of the appropriate government agencies. A project heading in this direction should be inter-sectoral, involving the LHS, the Forestry Development Agency (FDA) and the Wetlands Division.

9.2 Project costs

Project costs (Annex 1), estimated at US$39.6 million are summarized in Table 18.

Table18. Cost summary for water management and irrigation sector

N°	**Project component**	**Cost (US$)**
1	Land and Water Sector Institutional Capacity Building	2 500 000
2	Land and Water Development for Swamp Rice Production	22 100 000
3	Land and Water Development for Upland Rice Production	3 000 000
4	Urban and Peri-urban Agriculture for Women and Youth Groups	4 500 000
5	Community Watershed Management	7 500 000
	Total	**39 600 000**

9.3 Project benefits

It is expected that by the end of the investment phase of the proposed projects, community and individual farm incomes would substantially increase, mainly through increased net returns from improved agricultural production practices and incremental areas brought under rice cultivation in the swamps. Flood recession, small-scale irrigation and peri-urban irrigation for production of vegetables would result in additional benefits. Also, key GOL institutions in the land and water sector and many communities will benefit either directly or indirectly from the project investment in physical infrastructure, equipment, training, and technical and/or financial support programmes. The private sector agencies that participate in these projects will not only provide jobs but will also have their capacities strengthened. Specific benefits are shown in Table 19.

Table 19. Project expected benefits

N°	**Project component**	**Expected benefits**
1	Land and Water Sector Institutional Capacity Building	• Skill improvement for key staff in the public sector • Operational efficiency improvement in the land and water sector • Modernization of equipment and hydrostatistics management • Mapping of the resources of Liberia for operational planning
2	Land and Water Development for Swamp Rice Production	• Increasing productive land area to pre-war levels • Strengthening private sector participation in design and construction of water control structures • Improvement in the water management skills of farmers • Provision of jobs
3	Land and Water Development for Upland Rice Production	• Intensification of upland rice production • Skills improvement for farmers in upland rice production • Increasing income of farmers • Provision of jobs
4	Urban and Peri-urban Agriculture for Women and Youth Groups	• Intensification of dry season vegetable production • Skills improvement for farmers in upland and peri-urban irrigation • Increasing income of farmers and empowering women • Provision of jobs
5	Community Watershed Management	• Increased environmental consciousness • Strengthening private sector participation in design of watershed management interventions • Development of detailed resource maps for planning • Sustainable use of land and water resources in line with community livelihood activities • Provision of jobs

9.4 Project management

Specific roles are recommended for the implementation of the projects as detailed in Table 20. The principle used in assigning roles is that, while LWRDD (representing central Government) creates the enabling environment for business and ensures smooth running of the projects, the actual work should be the responsibility of the private sector and community-based organizations (CBOs).

Table 20. Organization and management of water management and irrigation projects

N°	**Project component**	**Institutional responsibility**	**Expected role**
1	Land and Water Sector Institutional Capacity Building	LWRDD/LHS	Project facilitation/management; procurement and installation of equipment
		Private consultants/local and foreign institutions	Capacity building
2	Land and Water Development for Swamp Rice Production	LWRDD	Project facilitation/management
		Private consultants	Feasibility study and scheme design
		Private contractors	Scheme construction
		Farmer-based organizations	Beneficiary participation in all stages of implementation
3	Land and Water Development for Upland Rice Production	LWRDD	Project facilitation/management
		Private consultants	Geophysical study and well design
		Private contractors	Well construction; pump and accessories procurement
		Farmer-based organizations	Beneficiary participation in all stages of implementation
4	Urban and Peri-urban agriculture with Women and Youth Groups	LWRDD	Project facilitation/management
		Private consultants	Feasibility study, scheme design, farmer training
		Private contractors	Scheme construction
		Farmer-based organizations	Beneficiary participation in all stages of implementation
5	Community Watershed Management	LWRDD	Project facilitation/management
		Private consultants	Feasibility study; project design; application of GIS tools in preparation of various resource maps; LWRDD extension staff training in watershed management techniques
		Community-based organizations	Beneficiary participation in all stages of implementation

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ANNEX 1

CAAS-Lib – Investment proposal

Name of project	**Land and Water Sector Institutional Capacity Building (2–5 years)**
Institutional responsibility	Liberia Hydrological Surveys (LHS) and Land and Water Resources Development Division (LWRDD)
Aim(s) of project	To build the capacity for the land and water sector institutions for strategic planning and management of land and water resources to support agricultural and other sectoral development.
Description of the project	Made worse by war, such important institutions as the Land and Water Resources Development Division (LWRDD), Liberia Hydrological Surveys (LHS), Water and Sanitation Department (WSD) and the Liberia Water Company (LWC) in the business of water resources development and swamp rice development in Liberia urgently need to be strengthened and to support agricultural and other sectoral developments in the country. Useful data have all been destroyed during the war. The project will support the following activities: • land use assessment of Liberia • detailed study of the water sector • development of a comprehensive national water policy • establishment of water resources commission • improvement in the meteorological and hydrological networks • staff training in the management of the hydrological and meteorological network and capacity building of the staff of the land and water sector.
Expected result(s)	• skills improvement for key staff in the public sector • operational efficiency improvement in the water sector • modernization of equipment and hydrostatistics management • key Government institutions in the water sector will either directly or indirectly benefit from the project investment in physical infrastructure, equipment, training, technical and/or financial support programmes • mapping the resources of Liberia for operational planning.
Impact on food security, poverty reduction & economic development	This project will directly impact on natural resources planning and management, which will indirectly lead to the efficient use of such resources to improve agricultural production, food security and consequently the general economic growth.
Implementation procedures	Hydrological studies, forecasting and mapping; procurement and installation of hydrostatistical equipment and monitoring; local and foreign training for selected staff of the water sector institutions, establishment of the Water Resources Commission, detailed mapping of the land resources of Liberia.
Period of execution	July 2007–July 2012
Estimated cost	US$2 500 000

Name of project	**Land and Water Development for Swamp Rice Production (2–10 years)**
Institutional responsibility	Land and Water Resources Development Division (LWRDD)
Aim(s) of project	To increase rice production through the reclamation of swamps lost during the war and expansion of new ones with the aim of improving household food security, nutrition and income.
Description of the project	Land under swamp rice was lost during the war. In the short term, this land area needs to be brought back into production by rehabilitation of these swamps to bring them up to the pre-war figures as a short-term measure to meet the country's cereal requirements. There are already ongoing swamp rice reclamation projects scattered throughout Liberia, either as community-initiated postwar activities or as initiatives for resettling ex-combatants. There is a need to bring back more of the improved swamps into sustained production and also to provide support for traditional swamp rice production efforts in order to help achieve the objectives of food security. This project will also support the expansion of community involvement in the restoration of priority swamps; the initiation of farmer field schools in land and water management in swamp rice production; and equipping farmers to sustain production. The project activities shall include the following: • assessment of the potential of swamps and inland valleys and their characterization for agricultural development; • expansion of community involvement and participation in restoration of priority swamps by initiating small farmer field schools in land and water management in swamp rice production and equipping farmers to sustain production; • expansion of new swamp areas for improved water control at 5 000 ha/annum; • expansion of new swamp areas for traditional water control at 5 000 ha/annum; • capacity building in the construction and management of water control structures • research trials in swamp rice production. Support for improved swamp rice production will include reclamation of old improved swamps lost during the war and the development of new improved swamps. Support for traditional lowland rice production will include the reclamation of old traditional swamps lost during the war and the development of new traditional swamps. This could take the form of technical, credit and input support for the participating farmers.
Expected result(s)	• skills improvement for farmers in the construction and management of water control structures for swamp rice production; • expansion of traditional and improved swamp rice production; • development and improvement of improved rice varieties for the swamplands.
Impact on food security, poverty reduction & economic development	This will positively impact on household food security and nutrition and improve household income and consequently the agrarian and the national economy.
Implementation procedures	Evaluation of pre-war swamp development activities; identification of old swamps for reclamation; identification of new swamps for development; capacity building for LWRDD staff and farmers in swamp rice cultivation; credit and input support for organized farmer groups.
Period of execution	July 2007–July 2017
Estimated cost	US$22 100 000

Name of Project	**Land and Water Development for Upland Rice Production (2–5 years)**
Institutional responsibility	Land and Water Resources Development Division (LWRDD)
Aim(s) of project	To increase rice yields on the uplands through sound field management practices with the aim of conserving soils and maintaining soil fertility on slopes and to identify suitable technical options for intensification and increased efficiency of upland rice development and management, allowing for intercropping as well as for soil conservation.
Description of the project	Conventional rice cropping in Liberia occurs on the uplands. Even though it is scientifically proven that the swamps are more productive per unit area than the uplands, it is equally true that there is less work involved in upland rice cultivation. Moreover, it allows for more crop diversification through intercropping with other staples. Therefore, upland rice production will remain a major production activity for a long time despite the relatively low yields. The farming system in Liberia is one of shifting cultivation on predominantly rolling to steep slopes; unprotected slopes lend themselves to soil erosion, thus leading to rapid soil degradation. The soils are generally acidic due to the high rainfall. The need to conserve soil and maintain soil fertility on such slopes thus becomes paramount in this type of farming system. It is assumed here that most of the intervention required will be in the form of input support and farmer training/field schools in soil and water conservation strategies. A conservative figure for a pilot area of 100 ha is proposed initially and will be expanded gradually in the long term. The project will focus on identifying suitable technical options for intensification and increased efficiency of upland rice development and management, allowing for intercropping, as well as for soil conservation. The project activities will include: • providing support services in terms of credit, farm tools, seeds and agrochemicals to approximately 500 female farmers and 300 young farmers in 50 groups potentially involved in subsistence production activities; • capacity building in soil and water conservation strategies on uplands for LWRDD staff ; • expansion of new upland farms at 10 000 ha/annum; • research trials in upland rice intercropped with other staples.
Expected result(s)	• skills for soil erosion control and water conservation on upland slopes will be acquired by LWRDD staff and farmers; • capacity building of farmers in field water management techniques for intercropped upland rice.
Impact on food security, poverty reduction & economic development	This will also positively impact on household food security and nutrition and improve household income and consequently the agrarian and national economy.
Implementation procedures	Site selection for on-farm trials; farmer field schools in intercropped upland rice development and management; capacity building for soil and water conservation techniques on upland slopes.
Period of execution	July 2007–July 2012
Estimated cost	US$3 000 000

Name of project	**Urban and Peri-urban Agriculture for Women and Youth Groups (3 years):**
Institutional responsibility	Land and Water Resources Development Division (LWRDD)
Aim(s) of project	To build the capacity for urban and peri-urban agriculture for women and youth groups with the aim of providing jobs and incomes and meeting the urban market demand for fresh vegetables.
Description of the project	Urban and peri-urban agricultural activities are increasing in Liberia because of the high demand for the produce by the rapidly increasing urban population. It is believed that Monrovia alone now accounts for nearly 40 percent of the Liberian population because most refugees returning home do not move to their county of origin but chose to settle in Monrovia. The proximity to input and output markets and the relatively better market infrastructure compared with rural-based agriculture gives this type of agriculture an advantage. Among the genuine and promising developments in Liberia is the emergence of civil society groups and several theme-focused youth groups. Youth and women's groups seeking to undertake ventures in agriculture need to be encouraged and mechanisms should be put in place to facilitate their engagement in replicable productive enterprises. Furthermore, there is a wide range of small-scale service and business activities in the agrifood chain that could profitably be picked up by organized youth groups. This project will focus on the following activities: • assessing the potentials and benefits of urban and peri-urban agriculture; • capacity building in urban/peri-urban production and post-harvest activities for LWRDD staff, women and young people; • providing support services in terms of credit, farm tools, seeds and agrochemicals to approximately 1 000 female farmers and 600 young farmers in 50 groups potentially involved in market-oriented production, input supply and post-harvest activities; • constructing and equipping shallow wells with motorized pumps for irrigation of urban/peri-urban farms.
Expected result(s)	• meeting urban market demands for fresh vegetables at competitive prices; • job creation for youth and women's groups in the urban and peri-urban areas; • skills acquired in shallow well construction and irrigation of vegetable crops.
Impact on food security, poverty reduction & economic development	This will directly impact on natural resources planning and management, which will indirectly lead to the efficient use of such resources to improve agricultural production, food security and consequently general economic growth.
Implementation procedures	Feasibility studies, identification and registration of youth and women's groups that engage in agriculture; training, credit and input support for youth and women's groups in urban and peri-urban irrigated agriculture.
Period of execution	July 2007 – July 2012
Estimated cost	US$4 500 000

Name of project	**Community Watershed Management (1–5 years)**
Institutional responsibility	Liberia Hydrological Surveys (LHS) and Land and Water Resources Development Division (LWRDD)
Aim(s) of project	To build the capacity for the land and water sector institutions for the strategic planning and management of the land and water resources to support agricultural and other sectoral developments.
Description of the project	The agrarian economy suggests that economic activity is land-based. There is evidence to suggest that some small tributaries of the main rivers that used to be perennial have become seasonal because of the removal of swamp thickets for agricultural activity. The general notion in Liberia is that water is limitless. Buttressed by the fact that the country does not have a water policy to regulate, use and protect its water bodies, the situation calls for re-examination of general land-use practices in relation to water resources. There is a need to empower legitimate local authorities and community groups to develop and enforce regulations on resource use and to exert control over catchments. Community regulation of resource use is very important for maintaining the integrity of the resource base and for stimulating private investment in resource management. The best option will be a community-based approach to conservation of river basin resources, at the same time deriving livelihoods on a sustainable basis. The project will focus on the following activities: • assessing past and current land use practices at the community levels; • assessing the extent of degradation in the various river basins using GIS and other appropriate tools; • detailed hydrological studies of all river basins, including the development of hydrological maps for all river basins in Liberia; • development of detailed land use maps; • development of detailed soil and soil suitability maps for agricultural planning; • undertaking community needs assessment in environmental conservation programmes; • designing and implementing community-based watershed management projects. It must be noted that the International Center for Research in Agroforestry (ICRAF), based in Nairobi, has over the years been involved in successful community resource conservation activities, from which examples can be adopted for implementation in Liberia. Although the project should assume a national character, pilot schemes can be started in the three most vulnerable districts in three small watersheds ($\leq$100 km^2).
Expected result(s)	• Increased environmental consciousness. • Strengthening public–private sector participation in the design of watershed management interventions. • Development of detailed resource maps for planning. • Sustainable use of land and water resources in line with community livelihood activities.
Impact on food security, poverty reduction & economic development	This will also directly impact on natural resources planning and management, which will indirectly lead to the efficient use of such resources to improve agricultural production, food security and consequently general economic growth.
Implementation procedures	Field studies of land and water resources; land and water resources mapping using GIS and remote sensing techniques; identification of small catchments for pilot community watershed management projects; capacity building of CBOs in community watershed management.
Period of execution	July 2007–July 2012
Estimated cost	US$7 500 000

ANNEX 2

Crop water requirements for rice

Table B1. Net irrigation requirement for Gbedin Rice Project

Month	Decade	ETcrop mm/day	Perc. mm/day	L.Prep mm/day	Eff.Rain mm/dec	IRReq Mm/day	Tot.IRReq mm/dec
Mar	1	0.51	2.2	5.6	11.5	9.47	94.7
Mar	2	2.39	4.4	5.6	27.6	9.70	97.0
Mar	3	3.82	5.0	0.0	31.8	5.64	56.4
Apr	1	4.55	5.0	0.0	32.5	6.30	63.0
Apr	2	4.52	5.0	0.0	33.2	6.20	62.0
Apr	3	4.49	5.0	0.0	35.6	5.93	59.3
May	1	4.46	5.0	0.0	37.9	5.67	56.7
May	2	4.44	5.0	0.0	40.3	5.41	54.1
May	3	4.18	5.0	0.0	43.7	4.81	48.1
Jun	1	3.92	5.0	0.0	47.1	4.21	42.1
Jun	2	3.66	5.0	0.0	50.6	3.61	36.1
Jun	3	3.42	5.0	0.0	51.0	3.32	33.2
Jul	1	3.01	2.5	0.0	25.7	2.92	14.7
Total		**448.0**	**535.0**		**445.4**		**537.6**

Source: Farnga (1988)

Table B2. Net irrigation requirement for Zlehtown Rice Project

Month	Decade	ETcrop mm/day	Perc. mm/day	L.Prep mm/day	Eff.Rain mm/dec	IRReq Mm/day	Tot.IRReq mm/dec
Jan	1	0.12	1.3	6.0	4.6	7.90	94.7
Jan	2	o.74	2.9	6.0	2.8	9.36	93.6
Jan	3	2.59	4.3	0.0	8.0	6.11	61.1
Feb	1	4.43	5.0	0.0	13.8	8.06	80.6
Feb	2	4.66	5.0	7.5	18.3	15.33	153.3
Feb	3	4.65	5.0	8.3	22.2	15.76	157.6
Mar	1	4.68	5.0	8.3	26.1	15.40	154.0
Mar	2	4.71	5.0	0.0	30.1	6.70	67.0
Mar	3	4.76	5.0	0.0	33.1	6.45	64.5
Apr	1	4.77	5.0	0.0	36.1	6.16	61.6
Apr	2	4.75	5.0	0.0	39.2	5.84	58.4
Apr	3	4.86	5.0	0.0	35.6	6.30	56.7
Total		**449.0**	**492.0**		**261.0**		**858**

Source: Farnga (1988)

Table B3. Net irrigation requirement for Gawula Tombe Rice Project

Month	Decade	ETcrop mm/day	Perc. mm/day	L.Prep mm/day	Eff.Rain mm/dec	IRReq Mm/day	Tot.IRReq mm/dec
Feb	3	0.38	2.0	6.0	4.8	7.90	79.7
Mar	1	1.96	4.3	6.0	12.6	10.96	109.6
Mar	2	3.57	5.0	0.0	17.6	6.81	68.1
Mar	3	4.53	5.0	0.0	22.6	7.27	72.7
Apr	1	4.64	5.0	0.0	27.5	6.89	68.9
Apr	2	4.80	5.0	0.0	32.5	6.55	65.5
Apr	3	4.80	5.0	0.0	39.4	5.86	58.6
May	1	4.79	5.0	0.0	46.3	5.17	51.7
May	2	4.74	5.0	0.0	53.2	4.42	44.2
May	3	4.50	5.0	0.0	58.2	3.68	36.8
Jun	1	4.40	5.0	0.0	63.3	3.08	30.8
Total		**431.0**	**513.0**		**378.0**		**686**

Source: Farnga (1988)

Table B4. Net irrigation requirement for Kpatawee Rice Project

Month	Decade	ETcrop mm/day	Perc. mm/day	L.Prep mm/day	Eff.Rain mm/dec	IRReq Mm/day	Tot.IRReq mm/dec
Jul	1	1.49	1.9	7.5	16.5	12.48	149.8
Jul	2	3.09	3.9	7.5	28.6	11.69	116.9
Jul	3	3.81	4.9	0.0	35.9	5.07	50.7
Aug	1	3.89	5.0	0.0	37.1	5.18	51.8
Aug	2	3.76	5.0	0.0	37.6	5.00	50.0
Aug	3	3.89	5.0	0.0	42.2	4.66	46.6
Sep	1	4.00	5.0	0.0	48.9	4.11	41.1
Sep	2	4.12	5.0	0.0	54.5	3.67	36.7
Sep	3	4.18	5.0	0.0	49.2	4.26	42.6
Oct	1	4.27	5.0	0.0	43.2	4.94	49.4
Oct	2	4.36	5.0	0.0	37.6	5.60	56.0
Oct	3	4.18	5.0	0.0	35.9	3.09	30.9
Nov	1	3.88	2.5	0.0	25.0	3.88	27.2
Total		**445.0**	**508.0**		**459.0**		**450.0**

Source: Farnga (1988)

ANNEX 3

Dominant soil characteristics

Soil group and map symbol	Topographic location	Colour	Texture	Depth to limiting layer (cm)	Structure	Mottles	Drainage	Flooding	Geology
D1	Upland – gentle slopes and plateau location	Dark greyish brown over yellowish brown over strong brown to yellowish red	LS (or SL) over SCL over SC/C	100+	Granular and crumb over moderate SAB	Occasionally few orange	Good	None	Gneiss and granites
D2	Upland – slope sites	Dark yellowish brown over yellowish brown to strong brown	LS/SL over gravelly-(iii) SCL or SC	50 to 100	Granular and crumb over weak to moderate SAB	Occasionally few orange	Good	None	Gneiss and granites
D3	Upland – slope sites	Ditto	LS/SL over gravelly-(iii) SCL or SC	25 to 50	Granular over weak SAB	Rarely, few to common, fine, faint to distinct orange mottles	Good	None	Gneiss and granites
D4	Upland – often steeper slopes sites	Ditto	Gravelly LS or SL over gravelly SCL	< 25	Granular over loose SAB	None	Good	None	Gneiss and granites
D5	Upland – gentle slopes and plateaus	Dark greyish brown over brown to pale brown and yellowish brown	LS over SL (sometimes slightly gravelly below 60 cm)	100+	Granular and crumb over weak SAB	Occasionally few greyish or yellowish below 60 cm	Good	None	Gneiss and granites
D6	Upland – slopes of undulating terrain	Dark brown over yellowish brown	LS over slightly to moderately gravelly SL or SCL (often weathering bedrock within 1 m)	100+	Granular and crumb over weak SAB	Usually common red mottles below 60 cm	Good	None	Gneiss and granites

Soil group and map symbol	Topographic location	Colour	Texture	Depth to limiting layer (cm)	Structure	Mottles	Drainage	Flooding	Geology
D7	Upland – slope of undulating terrain	Dark brown over yellowish brown to strong brown	LS over slightly to moderately gravelly SCL or SL (often weathering bedrock within 1 m)	100+	Granular and crumb over weak SAB	Usually common red mottles below 60 cm	Good	None	Gneiss and granites
D8	Upland – slope of undulating terrain	Dark brown over yellowish brown to strong brown	LS over SL (sometimes slightly gravelly below 60 cm within weathering bedrock w)	100+	Granular and crumb over weak SAB	Usually common red mottles below 60 cm	Good	None	Gneiss and granites
L1	Lowland – gentle slope sites	Dark greyish brown over yellowish brown to strong brown	LS/SL over SCL or SC	100+	Granular and crumb over moderate SAB	Few to many, fine and medium, faint to distinct orange below 80 cm	Moderately well or well drained	Low risk of short term flooding during wet season	Colluvium
L2	Lowland – level sites	Dark yellowish brown over light yellowish brown to yellow	Fine S to SL throughout	100+	Single grain or granular throughout	None	Well to excessively well drained	Very low risk of flooding	Course alluvium
L3	Lowland	Dark brown over pale or olive brown over gray/greenish gray	LS/ SL over SCL/ZCL or finer or SC	100+	Granular or crumb over weak to moderate SAB	Common to many, distinct, medium pale brown and grey	Moderate to poor	Liable to flood in wet season	Colluvium
L4	Swamp triangle sites – flat to gently sloping	Dark greyish brown over grey	LS over S to course SL	100+	Weak granular and single grain	Few, faint, and distinct, fine yellow	Moderate to poor	Liable to flood in wet season	Colluvium -Alluvium
W1	Swamp	Dark brown over grey, light grey or greenish grey	Fine-dominantly C, CL, ZC. And fine SC in top meter	100+	Crumb over SAB	Few to many, faint to prominent, medium and course , yellow brown to orange	Poor to very poor	Regularly or permanently flooded in wet season	Colluvium -Alluvium

Soil group and map symbol	**Topographic location**	**Colour**	**Texture**	**Depth to limiting layer (cm)**	**Structure**	**Mottles**	**Drainage**	**Flooding**	**Geology**
W2	Swamp	Dark (greyish) brown over grey or greenish grey	Fine to medium dominantly ZCL, CL/SC fine SCL in top meter	100+	Crumb over SAB	Few to common distinct, medium, yellow brown, yellow and orange	Poor to very poor	Regularly or permanently flooded in wet season	Colluvium -Alluvium
W3	Swamp	Dark brown over grey to light grey or greenish grey	Medium to course: dominantly course SC, SCL and SL in top meter	100+	Crumb over SAB	Few to common, faint to distinct, medium orange and yellow	Poor to very poor	Regularly or permanently flooded in wet season	Colluvium -Alluvium
W4	Swamp	Dark brown over grey to light grey, dark grey (when organic staining occurs) or white	Course: dominantly course LS and S with associated course quartzite stones in top meter	100+	Granular over single grain	Occasionally, few, distinct, fine to medium grey or light brown at depth	Poor to very poor	Regularly or permanently flooded in wet season	Colluvium -Alluvium

NOTES:
SAB=Sub-angular blocky
SL = Sandy loam
SC = Sandy clay
CL= Clay loam
ZC= Silty clay
LS = Loamy sand
SCL= Sandy clay loam
S= Sand
ZCL= Silty clay loam
C= Clay

ANNEX 4

CAAS-Lib Land and Water Sector Field Study

Field trip itinerary

Personnel	**Driver and vehicle**	**Itinerary (8-16 August 2006)**
Land and Water Management Group S.K. Agodzo P.K. Farnga	Oliver Cooper UN 486	Monrovia–Cape Mount–Monrovia Monrovia–Bong–Lofa–Monrovia Monrovia–Nimba–Monrovia
Personnel	**Driver and vehicle**	**Itinerary (7-16 September 2006)**
Southeastern Field Trip P.K. Farnga	UN Shuttle Flight John UN 61	Springgs–Zwedru–Spriggs Zwedru–Zlehtown–Zwedru; Zwedru–Behtown–Zwedru; Zwedru–Ziatown-Zwedru; Zwedru–Fishtown–Zwedro

List of persons contacted

Personnel	**Designation**	**Location/address**
Mr Julu Johnson	Assistant Minister	Bureau of Lands and Survey, Ministry of Lands, Mines and Energy (MLME), Monrovia
Mr George Saa	Director	Agriculture Section, Ministry of Planning & Economic Affairs (MPEA)
Mr Saye H. Gwaikolo	Director	Liberia Hydrological Survey, (LHS), MLME, Monrovia
Mr Jeffery W .Wallace	Assistant Director	Liberia Hydrological Survey, (LHS), MLME, Monrovia
Mr Anthony D. Kpadeh	Hydrometeorologist	Liberia Hydrological Survey, (LHS), MLME,- Monrovia
Mr Carton Miller	Director	Liberia Geological Survey, (LGS), MLME, Monrovia
Mr Chea Garley	Technical Coordinator	Department of Technical Services, Ministry of Agriculture (MOA), Monrovia
Mr Edward Fatoma	Deputy Director	Livestock Division, MOA, Monrovia
Mr Nathaniel Ketter	Statistician	Department of Planning and Evaluation, MOA, Monrovia
Mr Alexander Pearl	Director	Conservation International (CI), Monrovia
Mr Nathaniel B. Walker	Programme Coordinator	Conservation International (CI), Monrovia
Mr Ralph A. Woods	Head	Wetland/Ramsar focal point, Environmental Protection Agency (EPA), Monrovia
Mr George Yango	Acting Minister	Ministry of Rural Development (MRD), Monrovia
Mr Theo Freeman	Technical Manager	Forest Conservation, Forestry Development Authority (FDA), Monrovia
Mr Moses Biah	Head	Wildlife Management and training, FDA, Monrovia
Tarnue Koiwu	National Consultant	FAO TCP, Voinjama, Lofa County
Mr Francis Woiwor	County Agriculture Officer	Department of Extension and Research, MOA, Voinjama
Mr Henry Saa	District Agriculture Officer	Department of Extension and Research, MOA, Voinjama
Mr Benjamin Gobeh	Contact person	Africa Development Aid (ADA), Kolahun, Lofa County

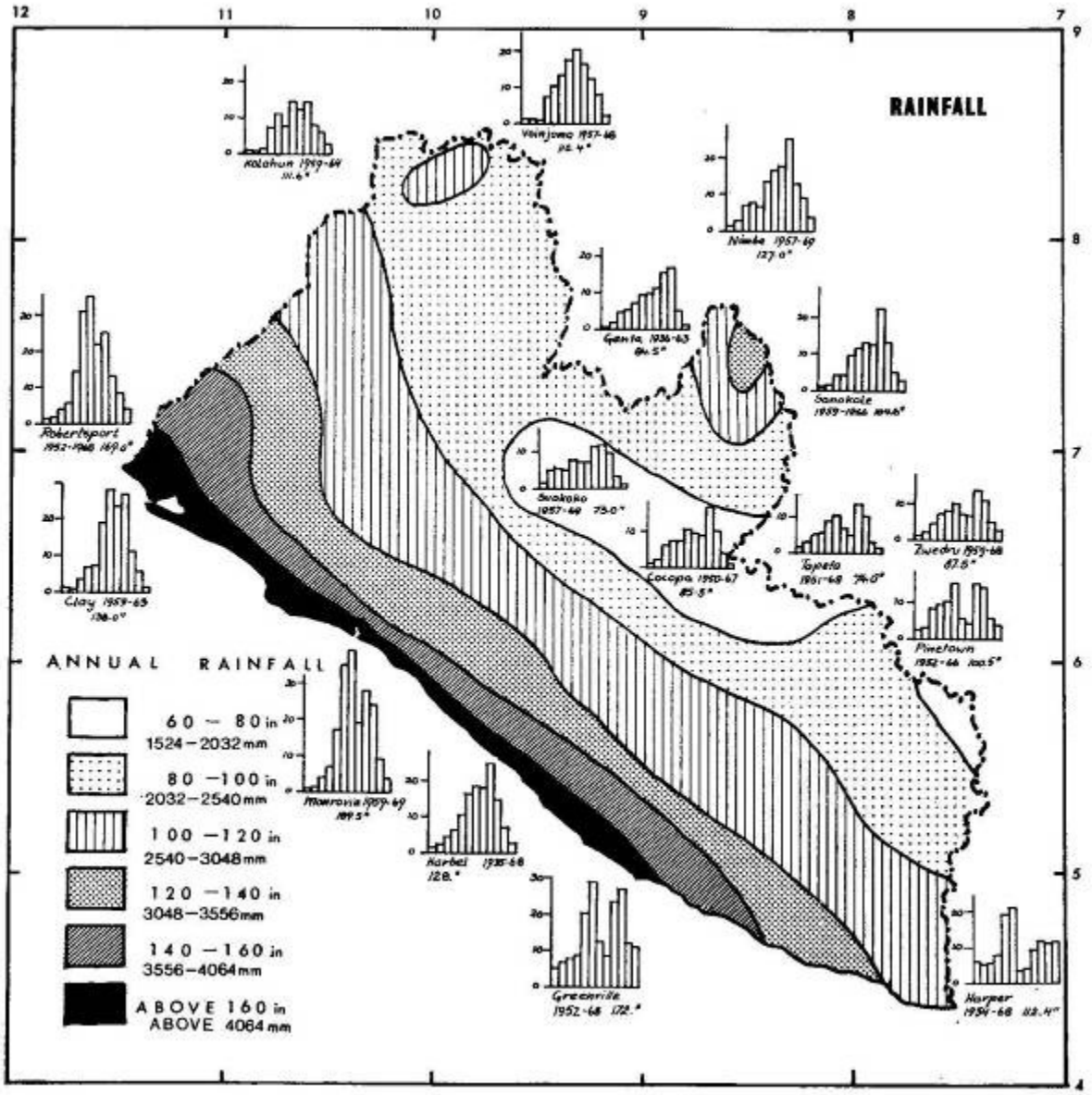
Personnel	**Designation**	**Location/address**
Ms Jenneh Kpehe	Farmer	Africa Development Aid (ADA), Kolahun, Lofa County
Ms Weedor Kollie	Farmer	Africa Development Aid (ADA), Kolahun, Lofa County
Mr Fonba Toure	Supervisor	Africa Development Aid (ADA), Kolahun, Lofa County
Mr Musa F. Kamara	Acting Development Superintendent	Ministry of Internal Affairs (MIA), Voinjama, Lofa County
Mr Varnie Kanneh	Project Coordinator	Concern Agriculture Section, Zorzor, Lofa County
Mr John D. Wennah	Field Assistant	Department of Extension and Research, MOA-Kpatawee Rice Project, Bong County
Mr Gertie Sulonteh	County Coordinator	Department of Extension and Research, MOA, Bong County
Issac Flower	National Consultant	FAO TCP, CARI, Bong County
Daniel Gbegbe	Supervisor	FAO, TCP, CARI, Bong County
Alfred Vah	County Agriculture Officer	Department of Extension and Research, Nimba County
Ms Known Mattor	Farmer	Gbedin Rice Project, Nimba County
Ms Yah Suah	Farmer	Gbedin Rice Project, Nimba County
Mr David Menaced	Agriculture Technician	Ganta Rehabilitation Agriculture Project, United Methodist Church Swamp, Ganta, Nimba County
Mr J. Gonkanue Gueslah	Project Management	Catalyst Project, Nimba County
Mr Josiah Gasser	Administrative Manager	Zawu Development Council (ZADC), Ganta, Nimba County
Mr Offerece N. Kpolowolo	Project Management	Kpein Agriculture Project, Kpein, Nimba County
Mr Richard Gaye	Agriculture Technician	Kpein Agriculture Project, Kpein, Nimba County
Ms Josephine Kawee	Chairperson	Kpein Agriculture Project, Kpein, Nimba County
Mr F. Stewart Sherman	Senior GIS Officer	Liberia Geological Survey, (LGS), MLME-Monrovia
Mr Samuel Peters	National Consultant	FAO TCP, Zwedru, Grand Gedeh County
Mr Augustine Freeman	County Agriculture Officer	Department of Extension and Research, Zwedru, Grand Gedeh County
Mr Alfred Q. Dennis Sr	Technical Advisor to Superintendent	Ministry of Internal Affairs (MIA), Zwedru, Grand Gedeh County
Mr Jonah C. Sampson	Executive Director	Multi-Agrisystem Promoters (MAP), Zwedru, Grand Gedeh County
Glody William Saydeh	Project Management	Multi-Agrisystem Promoters (MAP), Zwedru, Grand Gedeh County
Mr Kerkpatrick Kahn	Administrative Assistant	Liberia Agriculture System (LAS), Zwedru, Grand Gedeh County
Ms Cecelia Pratt	Project Manager	Gilgal Construction Firm Sub-Office, Zwedru, Grand Gedeh County
Mr Amara Konneh	Chairman	Memba Farmer Cooperative Society, Zleh Town, Grand Gedeh County
Mr Jeffrey George	Secretary	Memba Farmer Cooperative Society, Zleh Town, Grand Gedeh County
Ms Christina Williams	Member	Memba Farmer Cooperative Society, Zleh Town, Grand Gedeh County
Mr Steffen Schulz	Chief Agriculture Officer	German Agro Action(GAA), Zwedru, Grand Gedeh, County

Personnel	**Designation**	**Location/address**
Mr Isaac Stevenson	Deputy Chief Agriculture Officer	German Agro Action(GAA), Zwedru, Grand Gedeh, County
Ms Hannah Solo	Agriculture Officer	German Agro Action(GAA), Zwedru, Grand Gedeh, County
Mr Forkpa Padeye	Agriculture Officer	German Agro Action(GAA), Zwedru, Grand Gedeh, County
Mr Osman Kenneh	Chairman	Work and See Farmer Cooperative Society, Zwedru, Grand Gedeh County
Mr Anthony George	Fishery Technician	CBO Aquatic Rehabilitation Project, Zwedru, Grand Gedeh County
Mr Alex B. Sanpee	Executive Director	Land Agency for National Development (LAND)
Mr Harris Kanniah	Executive Director	CBO, Amounnou Farmer Cooperative Society, Beh Town Grand Gedeh County
Ms Esther Wisseh	Field Officer	Humanitarian Coordinating Office, Zwedru, Grand Gedeh County
Mr Teemart Williams	Agriculture Officer	German Agro Action(GAA), Fish Town, River Gee, County
Mr Boakai Kandakai	WATSAN Officer	CARITAS, Fish Town, River Gee, County

ANNEX 5

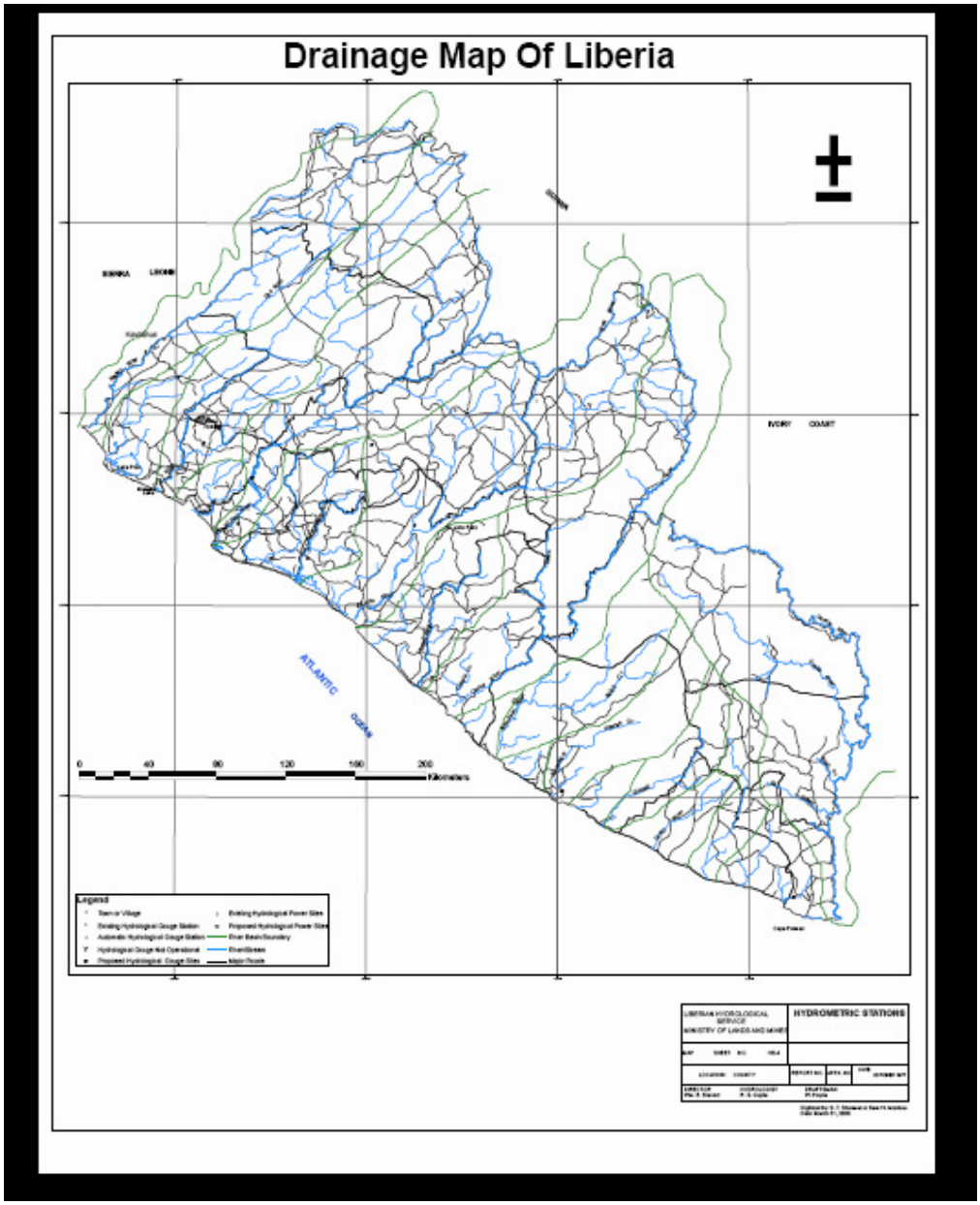
Maps of Liberia

Map 1: Rainfall map of Liberia



Map 1: Rainfall map of Liberia showing distribution of precipitation

Map 2: Drainage map of Liberia



II. LAND TENURE

By

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Liberia 2007

II. LAND TENURE

1. INTRODUCTION – METHODOLOGY AND SCOPE

This report is the result of a review of existing literature, together with a week of interviews in Monrovia comprising individual and group interviews on issues of land tenure. The literature reviewed is listed in the section '*References and Related Documents'*.

This report will not review the fundamentals of African land tenure in general, or give a description of the general features of postwar land tenure, or general land tenure in Liberia. These have been described elsewhere for African land tenure (Bruce and Migot-Adholla, 1994; Bruce *et al*., 1994; Platteau, 1996; Platteau, 2000; Quan, 2000; Toulmin and Quan, 2000), postwar land tenure (Roth *et al*., 1994; Marquardt *et al*., 2002a; 2002b; Unruh, 1995; 1996; 1997; 2001; 2003; 2004; 2005), and Liberia (IGC, 2004; Richards *et al*., 2004; Richards n.d.; Sawyer, 2005). Instead this report will focus on: 1) a description of the primary and secondary problems and issues, and 2) suggestions for a way forward.

2. PRIMARY LAND ISSUES

The problems and issues described herein are some of the primary concerns in postconflict land tenure for Liberia, and will probably affect the land policy and reform work. They are described in their problematic character below, and potential approaches to them are addressed in the following section on *'The Way Forward.'*

2.1 Landholding types, tenure security, investments, and technology adoption

For the smallholder sector there are five broad types of landholding, with different levels of tenure security: 1) deed holders (or holders of other documents) with a comparatively high degree of tenure security; 2) customary occupation without a deed resulting in relative security within the customary domain; 3) rental or leasing of land with lower security; 4) 'strangers' or 'borrowers' of land who are not from a local area and who do not rent, but are allowed very temporary and insecure access to land, and must supply a token amount of the crop produced to the owner to acknowledge that the land is owned by another – in essence acknowledging that the land is being loaned; and 5) squatters, who although they can be evicted at any time they are discovered by the owner, are also the most aggressive about attempting claim through tree crop planting and forms of adverse possession. While there is a comparative difference in tenure security between the types of holding, all suffer from poor tenure security and issues emerge when the different types interact. The subsections below describe the primary problems with each type of holding.

2.2 Deed/document holdings

While a deed holder is one of the most secure arrangements for a small or large landholder, when renting or loaning land out, the actual insecurity of this form of holding is such that there are strong prohibitions against making permanent improvements on the land by the tenant, for fear that the presence of economically useful trees and other improvements may be used as a form of permanent claim to the land. The lack of a registry of land means that no systematic records system exists whereby one can determine the true owner of land, those to

whom all or part has been sold, boundary locations, inheritance, the role and validity of historical deeds, and the presence of fraud. This puts the legitimate deed holder in a vulnerable position. Thus the fear of counterclaims (based on investments made by tenants or documents held by others) is based on commonplace experience. The lack of a national land registry results in two problems. 1) The growth over time of enormous confusion over what has been sold, subdivided, inherited, etc., and to whom. The result is an inability to be certain of the owner, area purchased, or existing counterclaims. 2) The creation of a situation whereby opportunists are able purposefully to make multiple sales of the same land, with few or no repercussions. In one sense this is a variation of the 'culture of impunity' that exists after a war.

Other problems include confusion over the different types of deeds, problems with adjudication, including enforcement of decisions, the theft of deeds during the war (particularly from the National Archives), destruction and loss of deeds, misrepresentation involving deeds, and the high degree of ambiguity, low capacity and high confusion in the land and property institutions. This has resulted in the value of a deed as a piece of evidence (argument for a claim) being decreased relative to other forms of evidence for a claim. While a deed can be a good piece of evidence, because there are so many problems regarding land deeds it is not nearly as good as it could be, and thus does not provide adequate tenure security in the current institutional environment. A particular issue that combines with the decreased value of a deed as evidence for a land claim is the interaction between deeds and tree crop planting as forms of claim - beyond that noted above. While the connection between planting economically viable trees and land claim is not included in formal law as a way to acquire land, it is nonetheless a very strong notion in the customary sector, including customary farmers with deeds. Even a deed holder will not allow a tenant or borrower of land to plant trees for fear that it may be used as an attempt to claim land. This is an important interaction between formal law (deeds) and customary norms (tree crop equals land claim) that needs attention, because it acts as a significant constraint on both tenure security and technology adoption. Deed holders themselves, however, can and do plant economic trees, both to pursue economic returns, and to further strengthen claims to land. However, as noted below, there are still constraints to tree planting (and making other investments) among deed holders.

In addition to the possession of deeds, the fieldwork performed in Bong County revealed a variety of other documents in circulation in rural areas that are used as proof of claim to landholdings. They are apparently quite securely locally, although of questionable legal standing. There have been cases where local forms of deeds have been issued at the district level by various government and customary offices. These are used as forms of claim, and together with robust tree crop planting by smallholders involved in this type of holding appear to be fairly secure within local communities. This is a category of occupancy where the formal practices (documentation of holding) interfaces with poor customary understanding of what constitute legal documents in land matters. Tenants and land 'borrowers' on this type of holding are expressly forbidden from permanent improvements such as tree planting, revealing a limit to the security involved in this form of holding – similar to deed holdings.

An additional problem with deeds and documents is the issue of ill-defined boundaries. The surveys that have taken place in the course of issuing deeds have in many cases been carried out in an incomplete and haphazard manner. In such cases, one boundary, for example along a road, is surveyed, and then the instruction by the surveyor to the deed applicant is to "take 300 acres away from the road" with the subsequent boundaries at both the far end of the 300 acres and along the sides of the demarcation left unsurveyed. This leaves it up to the deed applicant to

estimate where the boundaries of the allocation are. The result is a large number of boundary disputes.

The interaction between concessions, fee simple deeds, aboriginal deeds and family and tribal land, and the inability of the formal and customary tenure systems to effectively interact (particularly regarding adjudication) has led to significant confusion, animosity and opportunism. This is an issue that intersects with longstanding problems between Americo-Liberians and indigenous Liberians – in some cases aggravating this divide. The overall effect is decreased tenure security, which then acts as a constraint on agriculture investments and therefore production.

2.3 Customary holdings

The customary tenure sector has played a large and positive role in the reintegration and resettlement of dislocates after the war, and from the limited fieldwork performed it does not appear that there are pervasive, explosive problems with land allocation. There are however several issues of significant concern. Important among these are the profound lack of confidence among smallholders regarding forms of customary courts and their ability to adjudicate land issues fairly. This has led to an increase in 'trial by ordeal' for many issues including land conflicts. Trail by ordeal in Liberia involves (among several approaches) use of poisonous plant materials applied to an individual in various ways with the result indicating innocence or guilt. In addition, the prohibition against renters or 'borrowers' of land applying improvements to the land, and specific prohibitions against tree crop planting, are explicit. To a degree, this can act as a disincentive to allow 'strangers' onto customary land for rental or loaning in the first place. The result is that land goes uncultivated, strangers are without land, and food security is not what it could be.

Apparently many of the transactions and problems in the community and tribal areas stem from differences between those who have deeds and those who do not. Maryland County is a particular problem in this regard. One of the processes that lead to this is the granting of land in a 'fee simple' construct when a new road is built and the adjoining land becomes valuable. Those (particularly locals) who have the means can purchase such lands and then determine which communities or individuals already occupying the land can stay or must depart. In addition, the new owner can set conditions by which the community occupants can stay, including labour, rent, etc. Those who depart then move further away from the road and on to land already claimed customarily.

2.4 Rental and leased holdings

For tenants, their comparative insecurity restricts them to annual crops only, with tree crops or other forms of permanent improvements specifically prohibited. Land is often rented only for one cropping season in order to ensure that permanent claims will not be pursued. Rental price varies and is often tied to a percentage of the crop yield. Often, however, rental and leasing of land occurs between neighbours and relatives who know each other well and are able to operationalize forms of informal trust. Even so, those renting or leasing land have reported that if the crop is too successful the agreement may be broken so that the owner can retake the land including the standing crop. This is a disincentive to making even temporary investments in land. Contract rental/leasing arrangements among people who are not familiar with each other are rare. This is most likely due to the low capacity of the legal structure to enforce contracts, and the low level of trust in the legal structure of customary smallholders. In general the

occurrence of renting or leasing land is variable, with communities reporting a range of different situations. The range extends from where rental/leasing is possible but does not often occur, to places where it never occurs, to arrangements frequently being broken and conflicts erupting over rental and leasing engagements. In general leasing is regarded as a good idea, with the exception of where tree crops are involved, even it if does not often occur. There is little knowledge of contracts and how they work.

2.5 Borrowed holdings

Borrowing of holdings can involve people who know each other (lender and borrower) as well as strangers to the lender who essentially are "begging" land. In this case planting trees is strongly prohibited, and a token amount of the crop yield is provided to the owner, in order to acknowledge that the borrower is not the owner of the land and will not claim land. This is a significantly insecure form of tenancy and the smallest infraction can see the borrower evicted. A very good crop can also see the borrower evicted so that the owner is able to take full advantage of the yield. This acts as a disincentive to invest in land in terms of fertilizer etc.

2.6 Squatted holdings

Squatted holdings constitute a large problem in both rural and urban areas. In some cases squatters can be seen as the most aggressive in pursuing forms of land claim involving tree planting or other improvements, and in adverse possession. The latter can be pursued after 20 years of occupation with no attempt by the property owner to evict. There is some discussion within the legal sector in Monrovia as to whether the 14-year civil war period should or should not be counted toward the 20-year period for adverse possession claims. A formal legal decision is needed in the near-term on this issue, as many claims using the 14-year war period are likely to be made soon. Eviction of squatters risks social unrest if carried out on a large scale, is very visible, or if it involves ex-combatants. Tenure security is so low for squatters that in many cases they have little to lose, and so can attempt to claim land in the hope that any resulting dispute will at least result in some form of compensation. Such low tenure security can also result in rural squatted holdings being subject to extraction activities such as illegal timber and rubber harvesting.

2.7 Technology adoption and investments in land for smallholders

The prospects for technology adoption, such as tree crops, and investments such as soil conservation, terraces, or other long-term strategies differ with the different occupancy types noted above. Deed holders face two difficulties in this regard – the issue of multiple transactions over time (including fraud), and boundaries. For the former, the current surge in land and property dispute cases in all forms of courts, not just probate court (between 75 and 90 percent of all court cases in Monrovia are related to land and property), that relate to various problems with deeds means that deed holders who are involved in a dispute, or think that others might in any way have a counterclaim, may be unwilling or less willing to adopt long-term technologies such as tree planting or investments associated with longer-term strategies. For customary landholders the poor management of the relationship between formal and customary law, and the resulting historical taking of land for concessions, discrimination in adjudication, and internal customary problems, make some customary communities reluctant to pursue such investments. Also a problem is that such investments are visible, and if successful in increasing yields, they attract the attention of opportunists able to use the instruments of the state to claim such land. Other long-established, less war-disrupted customary communities, however are

more secure and do not experience such problems to the degree that disrupted, recovering and returnee-stressed communities do. For rented/leased and borrowed holdings the strong prohibition against investments in agricultural land is a primary constraint to improvements in yields. Particularly acute with this group is the desire not to appear too successful as a farmer, for fear that the land will be taken back (along with the standing crop) by the owner, prior to the agreed upon time. As a result there is reluctance actively to pursue strategies that involve technology adoption or investments that would attract attention due to their success.

3. SECONDARY LAND ISSUES

Land issues contributed to the cause and maintenance of the war. During the course of information gathering for this report, it was noted repeatedly the central role that land issues had in the cause and maintenance of the conflict in Liberia, and the high importance of the issue currently. There is a strong depth of feeling regarding land problems that fed into the war, with high levels of resentment being caused by specific land issues, particularly in Nimba and Lofa counties. Many combatants ended up in the war due to no small degree to discrimination of various kinds in their home communities, including over land access. This particularly affected rural youth, who felt ill-treated with regard to land and marriage prospects by the customary sector. Richards *et al*. (2004) include a summary of these discrimination problems.

Several of those spoken to with direct access to the President indicated that she is highly concerned about the issue of land tenure in the country and believes it to be of primary importance, and has passed on her sense of urgency regarding land and property rights reform. Several respondents noted the potential for the lands issue to be a flashpoint, and that the way land issues are dealt with in the peace process has been problematic. Some of those spoken to indicated that a number of issues central to the war have translated into land issues after the war. Others noted that because the different factions held large areas of the country for long periods, the GOL is only now learning about what went on regarding land access, land and politics, claims, etc. Other ministerial officials spoken to indicated that land issues were among the biggest challenges facing the current Government.

A good number of respondents indicated that the war has changed much in Liberia, including social relations with regard to land. Much in customary life has changed, and this will probably be reflected in changed approaches to land and property rights.

4. CONCESSIONS

Concessions for access and exploitation of natural resources lead to a complex of problems. Foremost among them is the considerable confusion about what rights are included or excluded with regard to concession holders. There is widespread understanding that a concession, while issued for the purpose of exploiting timber, rubber, minerals, or agriculture, is in reality a very broad issuance of rights to claim and exploit land resources in whatever way suits the concession holder, although this may have little to do with the business proposal that was used to obtain the concession. In addition, there are significant problems with the actual areas granted as concessions, with the total area granted as concessions in some counties adding up to more than the area of the county itself. There seems to be little connection between the area granted or held and the area to be developed or exploited. Frequently the concession areas granted were much larger than the area actually developed for rubber, agriculture, etc. The mismatch between the area granted to a

concession holder and the area then developed may be quite large, amounting to hundreds of thousands of acres claimed (to the exclusion of others) but not used.

In certain sectors there is some confusion over who has had the authority to grant concessions, particularly because there has been a problem historically in consulting local communities, which creates a good deal of anger and animosity.

4.1 Rubber concessions

Much of the easily accessible land (the 'rubber belt') is under rubber concessions. One of the more serious problems in the rubber plantations is the ongoing presence of ex-combatants (in some cases still armed) in the plantations. Some of these groups are tapping rubber trees and selling the latex, while other groups are hired by plantation owners to protect the plantation and exclude occupants, and still other groups appear to report to former militia commanders for a variety of reasons. At the same time those concession holders who are returning want their rubber farms back so they can engage in effective production again. As a result security is a large problem on rubber plantations. Resolving the presence of ex-combatants on rubber plantations will be delicate. Currently the price of rubber is high, and so encourages extra-legal tapping and makes the regularization of the rubber holdings more difficult.

The Firestone concession was granted in 1926 and a further seven concessions were established in the 1950s. These cover quite large areas (the larger ones comprise hundreds of thousands of acres per concession). A primary problem with these concessions is that usually only a fraction of the total concession was ever developed for rubber. For example in one case a concession was granted for 650 000 acres, but only 5 000 acres was developed; nevertheless the claim for the full 650 000 acres is maintained. Given that US$12 000 is needed per acre for rubber development in Liberia, the investment needed to develop even 100 000 acres is much more than can reasonably be expected to be invested in the country in the near to medium term or perhaps in the long term. Thus the sizes of the concessions allocated for the purpose of developing rubber are, in a significant number of cases, mismatched with the money needed to realize the investment, and as a result much of the land has, and continues to be idle, or at least undeveloped for rubber. Such land is essentially not accessible for other investment, nor can it play a significant role in local or national food security. Currently the issue of rubber concession claims versus local community land claims is extremely problematic. Thus the need for a thorough review of all rubber concessions for technical and legal flaws was noted by several of those spoken to, and it was also a key recommendation of the Rubber Task Force. A key issue in the rubber industry is the size of these concessions versus the desire by smallholder agricultural communities to access land for food security and cash crop production. The issue is made still more problematic because some of the concession holders are of the Liberian political elite.

Some interest was expressed in facilitating greater rubber outgrower arrangements with smallholders. Various constructs were noted, from the needed proximity to buyers of latex and commercial plantations, to forms of community and social forestry, which have appeared to be successful elsewhere. Community and social forestry is an area of particular interest to some donors, such as USAID.

4.2 Timber concessions

The natural forest on all land in the country, including on private land, belongs to GOL and can be allocated under concession arrangements. The exception is forest on private lands that have been reforested by the owner. Thus in Liberia the owner of the land and the owner of the trees are distinct.

Timber concessions have received significant attention due to the international sanctions on Liberian timber imposed by the UN Security Council. Recent efforts to have the sanctions lifted, and international assistance in this regard, have led to a great deal of legal and enforcement effort regarding the issue of timber concessions in Liberia. This has included review of existing timber concessions and changes in how timber concessions are granted. The NTGL established the Forest Concession Review Committee, which recommended the cancellation of all concessions. The Ellen presidency accepted the recommendations and cancelled the concessions through Executive Order #1 in February 2006; this Order also established the Forest Reform Monitoring Committee. These efforts have resulted in the National Forestry Reform Law of 2006, and Forestry Development Authority (FDA) Draft Regulations and Contracts. The FDA is the lead agency for these activities. Currently ten FDA regulations have been drafted and are being publicly vetted. These FDA regulations are important to fulfilling the UN Security Council conditions for lifting all timber sanctions against Liberia. One aspect of these regulations provides for establishing a "chain of custody" regarding timber with regard to location, the specific concession, etc., such that legality and taxes can be determined.

Under the new law forestry concessions can be granted in three ways: 1) a forestry management contract, which is bound by a maximum limit of 400 000 ha and a contract for a maximum of 25 years; 2) a timber sales contract, which is limited to 5 000 ha for three to five years; 3) a forest product use permit, which focuses on non-timber forest products (charcoal, honey, etc.). Competitive bidding for concessions is now promoted as a way to connect the price for concessions to the market.

Significant changes have occurred with regard to the relationship between forestry concessions and local communities. As part of the new forestry law, a new concession cannot be granted without obtaining permission from the local community. Also, a new forestry concession must enter into a "social agreement" with local communities. Additionally, land rental fees are subject to a benefit-sharing arrangement in which the concessionaire pays 30 percent of the land rental to the local communities, and another 30 percent to the county (and the remainder to the MOF).

4.3 Other concessions

Oil-palm and mineral concessions are also problematic and there were recommendations by some respondents that that these too should be reviewed as the forestry concessions were.

5. COMMUNITY AND TRIBAL LANDS ISSUES

5.1 General

Several issues regarding community and tribal lands have become problematic as a result of the war (and land relations prior to the war) and currently constitute a set of important issues

in need of attention. It was noted on a number of occasions that rural people need to have more of a voice on land (and other) questions. The Ministry of Agriculture (MOA) laments that the Tribal Reserve Law has not been respected, complicating the MOA's ability to manage agricultural efforts in the tribal areas. Tribal land is often claimed by outsiders, with the resulting disenfranchisement causing significant problems. Also creating considerable animosity is the arrangement whereby GOL claims to own all the land in the interior of the country, and also has issued concessions without consulting local communities. Adding to this animosity is the lingering perspective that only if one moves from the rural areas to the city and becomes "civilized" (baptized, married according to statutory law) can one own land privately. The Ministry of Internal Affairs (MIA; the primary institution for dealing with community and tribal lands, and including local government) notes that the perception of the community and tribal lands is that the issue is quite confused – although there is some indication that at the village or community level local arrangements operate in greater clarity.

Administrative units in the rural areas that deal with the communities can vary. While the county is the primary subnational unit, clans and chiefdoms are both administrative units with a kin aspect. There are also the units of city, and town. There is considerable disarray and confusion regarding the borders of all these units, as they have been changed repeatedly over time, often with little reconciliation with neighbouring boundaries. The UNDP is currently engaged in attempting to collate the legal documentation involved in such redistricting activities.

5.2 The Mandingo issue

Postwar Liberia has seen tribalism emphasized, particularly with regard to the Mandingo group. The aggravation of tribalism due to the war stems in part from the reliance on close kin for survival, as other networks of social reciprocity collapsed. This is a common postwar feature in Africa (Unruh 1995; 2004; 2006). The Mandingo land tenure issue is a particular problem that needs focused attention. While the history of the issue has been described elsewhere (e.g. Richards *et al.,* 2004), the essence of the problem seems to reside in whether the Mandingos are considered citizens of Liberia or not, and thereby whether they are able legitimately to claim and occupy land. While the Mandingos have been in Liberia for generations, neighbouring ethnic groups insist that they are not legitimate Liberians and should return to Guinea. One aspect of the issue is the conflicts emerging between adverse possession claims by Mandingos and traditional claims by neighbouring ethnic groups. Part of the problem is that the Mandingos sided with Samuel Doe during his reign because he recognized them explicitly as Liberians (Richards *et al*., 2004).

5.3 The aggravation of the Muslim–Christian divide

There is some indication that the war and the current land situation have aggravated a Muslim–Christian divide in some parts of the country. Research is needed in order to ascertain the role that institutions, grievances, and entitlement connected with religion (and tribe, and other groups) have in resolving or creating divisiveness with regard to the land situation.

5.4 Women's issues

Women's issues come to the fore with regard to the land question primarily in terms of land access and inheritance, with these two issues being intertwined. In this regard women tend to

have fewer rights regarding land under customary law than under statutory law. In 2003 a group of female lawyers in Monrovia, the Association of Female Lawyers of Liberia (AFLL), worked to help pass a new law "An Act to Govern the Devolution of Estates and Establish Rights of Inheritance for Spouses of Both Statutory and Customary Marriages" (MOFA, 2003). Thus at present inheritance of land by women is the same under statutory and customary law. Subsequent to passage of the law AFLL created a simplified version and delivered it and other information regarding the law in rural workshops and to rural women's groups, and also distributed audiocassettes containing further messages about the new law in the form of songs and drama to local radio stations. The impact of the new law and the dissemination of the work of AFLL on customary law regarding women, inheritance and land appear to be variable, but will in any case require time and sustained effort for effective implementation. The new inheritance law has received resistance from some rural men (and parliamentarians) who would like to keep the previous inheritance arrangements intact; however others have accepted the new arrangement. In this regard AFLL has noted that Muslim areas are more open to the new inheritance law than other areas. A number of respondents noted that a great deal has changed for women in society due to the war, and having a female president is an important factor.

5.5 Refugees and IDPs

Land tenure appears to be a concern for some refugees and internally-displaced persons (IDPs) with regard to community and tribal land. This can connect with an ethnic dimension with regard to who is or should be attached to which lands. There can in some locations also be a divide between those who stayed and those who fled with regard to land use, reclaim, and eviction. One respondent noted that land access problems are one reason why many remaining refugees and IDPs have not yet returned to their areas of origin. This remaining group, its size, location, current occupation, and precise reasons for access to land may become an issue warranting attention if particular problems emerge. Sierra Leone has experienced significant problems in this regard (IGC, 2004; Unruh, 2005).

The Liberian Refugee Repatriation and Resettlement Commission (LRRRC) has had a role in moving IDPs and refugees (who resided in camps and were registered) back to areas of origin. Reportedly there were considerable efforts at working with local community leadership to facilitate reintegration via land access for returnees. This reportedly included land and property committees at the community level constituted by the LRRRC and comprised of local elders.

6. ONGOING ISSUES NEEDING FURTHER CLARIFICATION

Perhaps the primary land tenure problem in the country as a whole is the massive confusion that exists over a range of administration, boundary, claim and ownership issues. The link between such confusion and wide ranging tenure insecurity is explicit (Bruce *et al*., 1994). Some of the more important issues pertaining to this confusion over land tenure are noted here.

- There is still some disagreement among certain ministries with regard to which ministry will take on what components of land and property administration and operation. While it is clear that the Governance Reform Commission (GRC) will be responsible for the policy aspects, the cadastres and geographic information systems, administration on different topics and at different levels, survey, concession authorization for different uses,

and the financial aspects of land and property still need to be sorted out among interested ministries.

- Subsequent to the conflict there exists a great deal of ambiguity regarding the physical location of relevant laws, regulations, records, registries, statistics and other relevant documents. While a great many of these have been destroyed or irretrievably scattered, others exist in private residences or as part of small personal archives of those who worked or work in the various government, university and private offices. While the personal acquisition and possession of such documents has provided an invaluable service to the country during the war, in that it has prevented such documents from being permanently lost, currently there is considerable difficulty in locating and gaining access to such documents. In part this is because individuals in possession of such documents are understandably extremely reluctant to part with them, even for the purpose of photocopying.
- There is confusion regarding the overall status and application of polices and laws regarding land and property. Those that exist are often unclear, lack effective implementing regulations, and are often very dated and so do not adequately serve the present Liberian reality. A good deal of the law received from the United Kingdom via the United States can be unsuited to the present Liberian reality. Thus there is ambiguity regarding which laws have been applied in which cases and how, particularly with regard to the granting of concessions and resolution of disputes. The physical absence of these laws complicates this problem.
- There is considerable confusion regarding what constitutes legitimate evidence for land and property claims. This has led to a good deal of speculation, and the use of historical documents of varying degrees of relevancy.
- As noted above there is a good deal of ambiguity about what rights are and are not included in a concession. Particularly important in this regard is the right to exclude others (local communities).
- The court system constitutes a problematic and legally pluralistic arrangement for solving land and property disputes. A variety of procedures are used, depending on the actors, the context, and the issue at hand.
- Fraudulent and ambiguous land transfers have created a great deal of ambiguity regarding who has rights to what lands, and how defensible these might be. Some of the cases in this category are explosive. Confusion over long-term and multiple transfers is a particularly difficult tangle, as is the existence of incomplete documentation.
- The general lack of clarity in land rights is increased by the existence of the dual tenure systems in the country (statutory and customary). While such duality is not in itself a problem – as co-existence occurs in other countries– in Liberia there is no clear understanding about what rights go with which system. Also, there is no legal or institutional mechanism whereby disputes and other issues between systems can be resolved. As a result the level of legal ambiguity is quite high and problematic.
- There is no land use plan/policy that stipulates what can go on where in the country. This leads to improvisation, and such improvised decisions will need to be taken into account when a land use plan is drawn up. A broader problem is that a great deal of land tenure decisions need to be made as a matter of every day life, and the need for such decisions does not wait for laws, policies or plans to be drawn up.
- There is confusion regarding different types of ownership, with the types needing greater definition – including the issue of who owns the land in rural areas, the Government or the people, and who within the population owns which lands and properties under what

forms of claim. In an institutional context this is a problem because even the buildings for rural government offices need to be rebuilt, but it is unknown who owns the land.

- Effective boundary demarcation is a problem, both for counties (and subunits) and concessions. In a number of cases how much land exists in the various counties and concessions is unknown. In others, incorrect numbers are used to calculate such areas. One cause of this problem is that a great deal of redistricting has occurred in rural areas during the various previous regimes, particularly during the conflict, for political reasons. Such changes were not adequately recorded as they occurred, including with regard to shared boundaries. Complicating this is that during the 1990s about half of the country (as noted above) was under the control of factions and GOL is only now coming to understand what has occurred there regarding the political and administrative change in units. The overall situation is that subnational boundaries are in severe disarray.
- Despite the new inheritance law, there continues to be a great deal of confusion around issues of inheritance – between siblings, between children and between families.
- The rights regarding claims, use, and administration of community land are not fully defined. There are also no working definitions of city, town, clan and chiefdom with regard to the land and property rules that apply to these units.

7. THE WAY FORWARD

The way forward for Liberia in a land tenure context requires attention on several fronts. This section articulates some of these in an aggregate way. Subsequent to a description of a few large issues having to do with the general approach, a list of more specific recommendations follows.

7.1 "Approach" issues

Untangle all issues, or management of types of problems?

Given the severely confused nature of certain aspects of the tenure situation, it is not realistic to pursue an approach in all cases or to seek to untangle what has gone on in order to find resolution – in other words, to seek to unravel the history of transactions. While some cases involving acute (particularly security) problems, and high-profile cases would need particular attention with regard to what went on when, where and with whom, in many cases and on many topics this is not likely to be possible, particularly in a timely manner. Rather, specific policy and legal constructs should be applied to "clean up" certain issues. However, this must be done carefully so as to take into account what has already occurred, as individuals, communities and groups have made decisions about land tenure – with these decisions often being quite binding. If such informal decisions (made outside of law, policy or national plan) are not taken into account, then new legislation will not have traction for the population and there will be a purposeful disconnection from such laws and policies (Unruh, 2003; 2005; 2006). While there are specific technical ways to clean up particular issues, these are best suggested to the Governance Reform Commission for their consideration, and the World Bank can support this process.

7.2 The "category" approach

Related to the above issue is an approach that seeks to reduce the volume of outstanding cases involving disputes, claims problems, evidentiary issues, border problems and restitution; as well as the time and money involved in dealing with them. As opposed to only pursuing resolution of such cases when courts or special tribunals are up and running and

seen as fair, legitimate and effective (an approach suited to well functioning societies), the category approach seeks to delineate categories of problems, or types of similar cases, and then provide a legal approach to dealing with the category. This has the advantage of quickly reducing the overload on courts, as well as the time, money and effort needed to go through each and every case. Liberia has just accomplished a form of this approach in deciding to cancel and review all forestry concessions as a category. Such categories can be as narrow and as numerous as deemed necessary to capture the important differences between sets of problems, and to deal with certain problems in a short time frame. While not all tenure problems can be dealt with in this manner, it does, again, have the effect of reducing the volume of cases (Unruh, 2002).

Laws and policies that attend to postwar issues are different from those that serve a well functioning society. Land and property laws and approaches that best serve a stable society over the long term, and that facilitate capital formation and capital movement with regard to land and property (e.g. de Soto, 2000), are often unable to clean up a postwar land tenure environment effectively and in a timely manner so that approaches that assume stability can operate. While the derivation and implementation of such (stable) laws and policies is of course a necessary objective, there must also be legal approaches able to deal with the host of complicated issues regarding land tenure after a war. These need to come on-line prior to the derivation of policies and laws that are more suited to well functioning societies: banks, a private sector, cadastres, underlying policies, managed discrimination, and fair, legitimate and effective courts, as well as the capacity to operate all these. Issues of retribution, profound inequality in land and property legal pluralism that favours some sectors of society over others in land matters or that add confusion, the presence of non-reintegrated ex-combatants and others, a legal system that is non-inclusive due to rigid and narrow evidence rules, along with other postwar issues, need attention much sooner than the implementation of 'stability assuming' approaches can provide (Unruh, 1995; 2002; 2003; 2005).

One example of a way to attend to postwar problems in land policy reform is to ascertain through research what the most acute land tenure issues are, and then attend to them specifically in law. In other words, ascertain specifically what land rights, or aspects of rights, are problematic, and then deliver that right or a specific form of security regarding such a right to the population concerned. Sierra Leone again provides an example:

> *Leasing is an important form of conveyance, and the concept of leasehold has been extremely flexible and useful in facilitating a separation between the ownership of land and the use of land. Most fundamentally leasehold creates a 'proprietary interest in land'. But significantly relevant to Sierra Leone, the landlord retains what is known as 'the right of reversion,' whereby at the termination of a lease for whatever reason, full rights are returned. This is essentially what the landholding lineages in Sierra Leone currently seek to do with strangers – creating or seeking reasons for a quick forfeiture of temporary rights in order to retain the right of reversion. But because formal law did not allow for the effective retention of the right of reversion in a lease, the lineages seek to retain such a right on their own, by prohibiting the planting of trees and making other improvements, by requiring that tenants move off, or re-beg land annually, and by inventing 'offences' through which the right of reversion is exercised – the only way to be assured that the right still exists. That the promotion of leasing in the Commercial Use of Lands Act seeks to strengthen the right of reversion for the landholding lineages may seem counterintuitive, given that the lineages already go to great lengths to retain this right, with considerable negative repercussions on tenancies, land access, reintegration and food security. The problem however is how the security of this right is retained (Unruh, 2005).*

8. THE TIME PROBLEM

There is a significant time issue with regard to land tenure after conflicts, and Liberia is an important example of this. Given that there is a legal, capacity, financial, administrative and equipment vacuum after conflicts, during which individuals and groups, again, must make decisions regarding various aspects of land tenure, it is important to influence aspects of this vacuum so that events and processes do not develop into severe problems. Thus while it takes time to derive new laws and policies – particularly given the poor record of quickly importing legal constructs from elsewhere – filling the period between the end of the war and when such laws and policies come on line is important. In this regard GOL needs to be seen by the population at large to be active in the land issue. This can be accomplished in a variety of ways, including by holding conferences and workshops for stakeholders at different levels and in different locations in the country. This can also be part of the required consultation process that is important to policy formation in land tenure (Unruh, 1995; 2003; 2005).

9. EMERGENCE OF INFORMAL, MICRO "RULE OF LAW" SYSTEMS

There is often significant emergence of informal micro "rule of law" (RoL) systems or "normative orders" regarding land and property rights during and after a war (Kamphius, 2005; Plunkett, 2005), and again Liberia is an example of this. The Mandingo land issue is an important case in which specific ideas of what is or should be norms regarding whether or not the Mandingos should have access to land in Liberia have a widespread effect. In this case the Mandingo population has one set of normative orders that state why they deserve legitimate access to land and how this operates, while neighbouring ethnic groups constitute another RoL system with arguments as to why the Mandingos should not be allowed legitimate access to lands. Other RoL systems that emerge include, but are not limited to, ex-combatants, squatters, divisions based on ethnicity and religion, individuals and communities not allowed to re-access lands, and communities that believe themselves to have been unjustly treated in a variety of land-related issues. While the emergence of such informal RoL systems is not in itself a problem, given that some can serve specific needs and contribute to effective policy reform, others, and the way in which they are operationalized can cause problems if not attended to. Such informal RoL systems need to be taken into account in the derivation and implementation of new land laws and policies (Kamphius, 2005; Plunkett, 2005).

10. THE EVIDENCE PROBLEM

Evidence for proving claims to land and property is a particular problem after wars and in Liberia in particular. Much of the desire to untangle the legal and transactions history of the land tenure problem in the country stems from the need to perform some kind of "proving" as to who should get legitimate access to what lands. The lack of registries and deeds, and the problem of attempting to resolve conflicts whereby one party has a deed, title or other document, and another party does not, are manifestations of this evidence problem. Over-reliance on a need for documentary evidence in such cases can cause significant problems. Other countries emerging from conflict (Mozambique, Sierra Leone, East Timor) have found utility in reworking rules about evidence, to allow a very wide variety of evidence into attestations of claim (Unruh, 2006). In Mozambique customary evidence involving testimony (parol evidence) is now equal to possession of a title in land disputes – with positive results (Unruh, 2005). While in a strict, legal deterministic sense it may be argued that equating documentary evidence to forms of customary evidence can detract from the integrity of the

document in matters relating to land, such a concern is out of place where most do not have documentary evidence, and is very much out of place after a prolonged conflict. At the same time it is well within the Western legal tradition (wherein Liberia's own legal history resides) to hold that "relevancy" is the primary evidence rule in civil cases. With such a rule, and with a wide variety of formal and informal evidence admissible, Mozambique has found that many disputes became "self-resolving", thus sidestepping the problem of lack of courts or tribunals (or the capacity to run them) to hear land cases after a war (Unruh, 2006).

11. THE DUAL LAND TENURE SYSTEM

The existence of both statutory and customary land tenure systems in Liberia is seen in a number of ways, including in the context of leading to problems. However virtually every country in Africa has this duality, and it exists as well in a number of developed countries. Such duality *per se* is not problematic, but the way it is handled can be. In Liberia there needs to be much more mutual recognition and connection between the two systems than there currently is. The purposeful separation of the two systems over a good deal of time has led to their non-integration, discrimination when they do come into contact, and has prevented the evolution of positive and mutually beneficial ways of interacting. In addition, the lack of a robust effort by Liberian researchers, particularly lawyers, to derive innovative ways in which the two systems can interact, has further isolated the two systems from each other in functioning, recognition, and integration. New land and property laws and policies would do well to pursue considerable connection with customary forms of land tenure, particularly in terms of court systems, evidence, levels of dispute resolution and appeal structure, claim, consultation, and issuance of concessions, titles, deeds and use. This of course coincides with efforts at decentralization. The advantage of encouraging such connection is that the state will not then be in a position of attempting to administer and enforce statutory law in all areas of the country – which it will not be able to do in any case. Thus recognizing and cooperating with customary law offers the advantage of obtaining a free good by GOL –administrative capacity and function located pervasively in rural Liberia at no cost to the state. Such a connection between formal and customary tenure systems is, however, different from re-instituting aspects of the customary tenure system that contributed to the onset of war. The customary tenure system itself needs to evolve to meet the current needs of the population. It can be argued that the isolation and neglect of the connection with statutory law and the lack of awareness of legal developments in other countries has led to the stagnation of parts of customary tenure in Liberia, which has resulted in the problem of rural youth and women being unable to gain effective land access. The lack of connection that could have resulted in considerable positive co-evolution between the two tenure systems has in one sense led to the non-consultative approach of GOL in issuing concessions, titles and deeds, as well as the claim that all rural land belongs to the Government.

The primary suggestion here would be to begin a more robust process of connection and co-evolution between the two tenure systems. In this regard the recovering legal sector, the university, NGOs and donors can provide a good deal of quality input into the process. Neighbouring Sierra Leone has the position of a "customary law officer" in a number of rural areas who stands at the interface between the two systems. While there is a need to strengthen this in rural Sierra Leone, the example is instructive as to how to build a better flow of information, cases, examples, decisions, needs and aspirations between the two tenure systems, thus assisting them to co-evolve. Zambia also employs such an approach in quite a successful way with its "Law Development Commission".

12. RECOMMENDATIONS

- The Governance Reform Commission (GRC) is currently undertaking policy reform and coordination in land tenure for the country. The GRC has considerable capacity and has a mandate to lead on the land tenure question in the country. The World Bank and other donors will need to work with the GRC in this coordination, support and reform role.
- The World Bank needs to consider adopting something akin to a "components approach" to land tenure work in Liberia. Such an approach would entail outlining the suite of relevant components in existence (and needed) for the broad complement of services, policies and laws regarding land tenure, and then working with the GRC to coordinate these and assist in funding and building capacity with the "weak links". An initial description of such components together with related recommendations is described below in the section "*Overview of Land Tenure Components"*.
- Capacity is extremely low within the different institutions that will need to play various roles and functions within the land and property domain. Capacity building and retention in this regard is greatly needed.
- There is a serious need to review the rubber concessions. The continued claim of very large areas under rubber concessions, while only a small fraction of the total area has ever been developed, presents significant problems for local communities, food security, and potentially stability. The precedent set by the FDA in reviewing all forestry concessions sets an important example for the rubber sector. Such a review might hold as a priority the reduction in size of the area claimed to more appropriately reflect actual or potentially realistic development under rubber.
- The legal construct of "concession" in Liberia needs thoughtful review. A common use of concessions is for a specific use right, for a specific business proposition. Such an issuance comes with penalties, including forfeiture of the concession if the business plan is not realized in due course, or if violations in use occur. In Liberia concessions have historically been issued for certain purposes, rubber, timber, mineral, etc., but in reality the concession holder can exploit the concession area for virtually any use, with no effective review of the proposed business plan nor consequences for non-compliance with the plan. There also appears to be (at least in practice) the notion that concessions include the right to exclude others, and this has presented considerable animosity among local communities that are then either evicted or subject to conditions in order to remain. As it stands, many concessions operate as a form of private property.
- Along with the review recommended above, the options of leasing, licensing and other forms of conveyance can be explored in order to pursue commercial exploitation of land resources, while not relieving local communities of their lands, use rights and livelihood. Forms of leasing and licence are much easier to provide to foreign and other investors in a secure way than is private property, which for rural areas includes the right to exclude over large acreages. The non-cooperation that the latter would provoke would then impact on the security of the holding for the investor.
- The land and property sector is in need of a comprehensive document retrieval effort, in order to copy and store in an archive(s) the laws, deeds, titles, registries and other forms of land and property related documents that exist.
- The Liberian Law Journal needs to be revived and provided with assistance to become a link that takes on issues such as the co-evolution of the formal and informal tenure systems. The reporting in such journals is, in other countries, used in deriving innovative approaches to legal and policy problems.
- The ambiguity issue is leading to significant problems, delays and, most importantly, tenure insecurity. Research would show the degree to which such ambiguity is a reality in

the rural tenure sector, or whether local leadership and the reworked social relations regarding land have resolved such "who owns what land" issues. In other words is the rural tenure situation primarily ambiguous from the perspective of Monrovia, while from a more local perspective claims, disputes, norms and institutions are becoming resolved, or is there real ambiguity and confusion that is "stuck" in its present state with local actors unable to move forward on resolving local land tenure issues? There is some evidence that the former is the case.

13. Overview of land tenure components – Liberia

This is a brief overview of some of the existing and required land tenure components as currently understood. There is a need to bring the different components into a cohesive whole, and support should be provided to the weak links. Each component listed below includes its present status and need in order to be coordinated with a broader land tenure programme in the country.

1. *Governance Reform Commission (GRC)*
   a. Headed by Amos Sawyer.
   b. Has the lead on the governance reform and legal reform aspect of the land tenure issue in the country, as appointed by the President. Reports directly to the President.
   c. World Bank consultant to work with the GRC on issues of research to inform policy reform, law and land reform issues. Consultant also to make available the experiences of other postconflict countries.
   d. GRC has overview of the different components of the land issue in the country.
   e. GRC has expressed interested in putting on a national and then regional level (in the counties) stakeholder conferences and workshops to:
      - initiate the consultative process;
      - indicate relatively quickly to the populace at large (as well as GOL and potential investors) that movement is underway regarding land and property issues.
   f. Both items above are significantly important particularly in the short term. Funding is needed to support the conference/workshops.
2. *National Information Management Centre (NIMAC) within UNDP*
   a. Margaret Hall, Manager
   b. Ms Hall has a team that is currently putting together an array of spatial and relevant legal information in order to come to an understanding of the situation in rural and urban Liberia regarding boundaries – county, district, city, town, clan, chiefdom, etc. The work NIMAC does is crucial to the eventual formation of a cadastre, registry and other administrative aspects of a functioning land tenure system.
   c. The units within GOL that would do this work have an extremely low level of capacity, to the degree that the required work cannot be accomplished, at any pace.
   d. NIMAC is in need of additional funding to continue operating and this should be a priority.
      - This funding should include a significant capacity-building effort that connects with the Ministry of Lands, so that its personnel can be trained and move into the creation and operation of cadastre, registries, etc.
3. *The different concession review processes are very worthwhile and much needed: forestry (completed); rubber plantations (needed); oil-palm concessions (needed); mineral concessions (needed); church holdings (needed?)*

a. The UNMIL/GOL Rubber Plantation Task Force is currently reviewing some rubber concessions for, among other issues, congruence between land areas claimed and the land areas actually developed.
   - The Task Force is in need of additional funding.

b. The approach towards other concession problems (oil-palm, minerals) should be determined.

4. *Customary (smallholder) issues over land and property*
   a. The University of Liberia Institute for Research is now well placed and currently has appropriate capacity to assist with the "research-to-inform-policy" effort on a variety of customary land tenure issues.
      - The connection between this Institute and the GRC is well established, and so the linkages exist for the transmission of research findings to the policy domain.
      - Funding is needed for the "research-to-inform-policy" effort.
5. *Ministry of Agriculture*
   a. Currently has a role (in need of greater definition) in land tenure issues, but is in considerable need of capacity building.
   b. It could be envisioned that personnel within the MOA could be attached to the NIMAC effort, as well as the research and policy reform efforts, in order to contribute to such capacity building.
6. *Ministry of Lands*
   a. Has a significant interest in the land issue. Its potential expertise is in cadastre, registry and survey, but its capacity is quite low. It could be paired with NIMAC in particular.
7. *Forestry Development Authority (FDA)*
   a. Has conducted an impressive forestry concessions review effort, in order to comply with UN timber sanctions.
   b. Has also derived, and received approval for "An Act Adopting the National Forestry Reform Law of 2006".
      - Now working on the regulations to the new law (currently in draft form).
   c. Do they have the needed support to move ahead with implementation and enforcement of the new regulations once approved?
8. *Ministry of Internal Affairs*
   a. Has a large role in local governance in the counties, including land tenure.
   b. There is a 1972 Local Government Law, what is the current status of the law; are there efforts to implement/enforce the law?
   c. What is the current role of the MIA in the land tenure issue, and what can it take on?
   d. The potential role of the MIA is large, but capacity is not high. The MIA is a potentially good partner, and significant component of the rural (local government) land tenure effort.
   e. The MIA could gain in capacity from NIMAC, GRC and university connections.
9. *UNMIL – several units*
   a. Environment, Legal and Judicial, and other units within UNMIL, currently hold considerable amounts of spatial data (satellite imagery, population, infrastructure, etc.), which would be of significant utility to the overall land and property effort.
   b. Efforts should be made to obtain such material and have NIMAC and the Ministries of Lands, Agriculture, the FDA, and the university make use of this valuable resource.
   c. Is there an ability to archive, process, and disseminate such information in the Ministry of Lands (perhaps with NIMAC help)?

10. Local advocacy - NGOs

a. Green Advocates, which is comprised of lawyers, have a keen interest in land tenure issues, especially for smallholders.
b. Green Advocates is currently working with IUCN and a World Bank consultant to derive a legal analysis of relevant legislature.
c. Other NGOs can be of use in a variety of dissemination, monitoring and smallholder assistance issues.

11. Donor community (USAID)

a. Has completed a legal analysis, workshop and report (and probably more) that have discussed a variety of issues on the land and property rights question in the country.
    - Their workshop efforts, in particular, can be seen as part of a larger consultative effort (involving a variety of Liberian and other stakeholders, such as the investment community) and could be built upon.
b. The proceedings of the workshop, and the report, need to be better disseminated.
c. The legal analysis is, in particular, difficult to obtain, but is particularly valuable and needs to be made much more widely available, so as not to duplicate efforts.
d. What do GRC and USAID think that USAID is best positioned on (and interested in) to take the lead on within the broader land issue?
e. USAID could be better linked with GRC to discuss workshop/conference priorities and the consultative process, among other issues.
f. Can other donors besides the World Bank, the UN and USAID be brought into the land tenure set of actors?

ANNEX 1

Institutional map as it relates to land tenure

This annex describes the current institutional constraints and opportunities in Liberia with regard to land tenure. The section focuses primarily on formal institutions, but also mentions important customary institutions. Further work is needed in exploring the postwar character of customary institutions with respect to land tenure and their utility in policy reform.

Formal institutions

Governance Reform Commission (GRC)
The GRC is the lead institution on the land tenure issue in the country. The Chairman is Dr Amos Sawyer, and the commission reports directly to the President. The GRC was initiated under the Accra Peace Accord and has been tasked by the President to move forward with land policy reform. The strengths of this institution are that Dr Sawyer has considerable experience with governance in Liberia (he was President of the country from 1990 to 1994) and with institutional reform (he is codirector of a research and policy centre on political theory and policy analysis, at Indiana University in the United States, which focuses on institutional reform). Dr Sawyer's experience also means that he has numerous contacts on which to call for a wide variety of support. When Dr Sawyer is out of the country Mr David Kailain is acting chairman for day-to-day affairs. The GRC is carrying out reform on a number of issues apart from land and property rights. This includes the related judicial reform, decentralization, and security sector reform.

While the GRC has offices, vehicles and support staff, they are thinly staffed otherwise and are looking for both people and funding for personnel support. At present the staffing issue is dealt with by Liberian and foreign consultants.

Functionally the GRC is to take the lead in policy design and from there the actual law-making is a legislative function. This said, the GRC envisions a "law reform commission" to be proposed in the near future. The GRC also envisions the creation of a "committee on land tenure", which would be a working group that takes the lead on the actual work of policy reform. The committee would exist under the GRC and be comprised of representatives from the Ministry of Lands, Mines, and Energy; the Ministry of Internal Affairs; the Ministry of Agriculture; the Ministry of Justice; the Ministry of Planning, among others. The actual composition of the working group will be decided by the GRC.

Ministry of Land, Mines, and Energy
The GRC and the Ministry of Lands have not yet divided the components of the land issue between them with regard to exactly what responsibilities each will have. While the GRC clearly has the lead on policy and legal reform, it would be logical for the Ministry of Lands to be responsible for elements of cadastering, survey, etc. The Ministry of Lands is intending to constitute a land commission, but it has not yet been determined what the responsibility of the commission will entail.

Institute for Research, University of Liberia
This institute has significant emerging social science research capacity. It is currently being upgraded, with the addition of Dr Jeanette Carter as codirector. Dr Carter is also a consultant

with the GRC, and so constitutes an important link between the GRC, the university and social science research.

Forestry Development Authority (FDA)
This institution was the primary entity working with the international community to fulfil the requirements to get the timber sanctions lifted, and so has higher capacity in comparison with most other institutions. The newly completed Forestry Reform Law was derived and operates through the FDA. As part of the process to lift timber sanctions there was a review of all forestry concessions, with the goal to cancel those not acquired according to legal procedures, and to update, regularize and modify others. The FDA is supported by the Liberia Forestry Initiative.

Ministry of Agriculture (MOA)
The MOA reports considerable disarray in the agricultural lands sector. Very large acreages are still claimed and held via historical transfers of unknown legality and legitimacy. Subsequent transfers have not been recorded, so that currently there is much confusion over who owns what agricultural land. Capacity in the MOA is quite low, and the loss of documents makes their land administration efforts more complicated.

Ministry of Internal Affairs (MIA)
This ministry will deal with land tenure issues from a local government perspective, and so will have a large role to play in land policy reform. The MIA deals with the chiefs and clans, and also has a land commission. The commission is intended to be a land conflict commission, focused on Nimba County first and perhaps others subsequently. The need for this commission, the Minister argues, is great, given that the courts systems in the country is currently clogged and has a problematic history. The Minister will also chair the Boundary Harmonization Commission that UNDP is planning to organize.

The Liberia Agency for Community Empowerment (LACE)
This agency has a local community perspective, and finds that in the process of engaging in local community development they are in the position of needing to deal with land tenure problems, particularly land disputes. Thus they see themselves as dealing with land conflicts in the process of pursuing community development without it being a specific, stated objective.

UNDP – NIMAC
The National Information Management Centre (NIMAC) is a unit within UNDP, and while not a Liberian institution, it is nonetheless mentioned here because of its important current role in mapping, and administrative and legal boundary work. It also has a large potential role in capacity building in these areas within the Ministry of Lands, Mines, and Energy. Directed by an expatriate, the unit is currently working on bringing together the legal documents that attest to the locations of subnational boundaries in the country, both rural and urban. Such an exercise is important to land and property rights administration, cadastre and survey.

Liberian Refugee Repatriation and Resettlement Commission (LRRRC)
This institution provided support for the reintegration (including reportedly land access) of IDPs as long as they were in camps and registered. There is some indication exists of the effectiveness of its programmes and its capacity needs.

Other formal institutions

Additional institutions of interest to land tenure include the Ministry of Planning and Economic Affairs, the National Bar Association, the University Law Department, the Liberian Law Journal and the National Information Centre – who will conduct a census in early 2008 that will include a mapping exercise.

Customary Institutions

Clans

Clans, as a set of local customary institutions, do play a role in land tenure. They played a role in the IDP camps and worked with the LRRRC in reintegration. A (partially) kin-based group, the clan leadership knows the happenings in rural areas intimately, and so would be an asset in land tenure considerations.

Chiefs and chiefdoms

Chiefs assisted with reintegration under the auspices of the LRRRC, and will continue to have significant local authority regarding land issues. Chiefdoms are spatial areas and constitute a boundary and group-level land claim consideration that will need to be incorporated into the broader institutional efforts regarding land tenure. However considerable animosity was generated between chiefs and some senior members of rural communities on the one hand, and the rural youth on the other. There is some concern that reinstituting the chieftaincy in full might lead to problems with reintegration, including land issues.

Poro Societies

In rural areas, Poro Societies can reportedly be of utility for governance issues including land tenure, in some ways. These may include issues of social discipline (enforcement of land tenure decisions) but perhaps not resource allocation, and certainly not in terms of transparency. There is some indication that Poro Society institutional involvements in land conflicts tend to take one side or another, as opposed to operating in a way that objectively resolves such conflicts.

Other customary institutions

There are a variety of customary institutions in postwar Liberia that pertain to specific groups. These are connected to what are referred to as local, informal, micro "rule of law" systems. The extent to which these prove to be positive contributions to postwar land tenure reform or instead create problems or operate more neutrally remains to be seen. Some of these rules of law systems regarding informal forms of land tenure include: squatters, ex-combatants, refugees and IDPs, rural youth, women's groups, specific ethnic groups, religious divisions, etc.

ANNEX 2

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ANNEX 3

People met

- David Kailain, Governance Reform Commission, Acting Chair
- Phillip Banks, Governance Reform Commission, Legal Advisor
- Lois Bruthus, Lawyer, President of the Association of Female Lawyers of Liberia
- Jeanette Carter, Co-Director, Institute for Research, University of Liberia
- James Logan, Acting Minister of Agriculture
- Mr. Johnson, Minister, Ministry of Internal Affairs
- Alfred Brownell, Lawyer, Director, Green Advocates (NGO)
- Benedict Ksagbeh, Lawyer, Green Advocates
- Daniel Charles, Lawyer, Green Advocates
- Kieth Jubah, Director, Rubber Planters Association
- Ramses Kumbuyah, Executive Director, Liberian Agency for Community Empowerment LACE)
- John Woods, Managing Director, Forestry Development Authority
- Margret Hall, Management, National Information Management Centre
  Isabelle Marle, INGO Liaison Officer, Management Steering Group of International NGOs in Liberia
- Beverlee Bruce, Development Alternatives International, USAID
- Amos Sawyer, Chair, Governance Reform Commission
- John Nyumah, Deputy Executive Director, Liberia Refugee Rehabilitation and Resettlemnt Commission (LRRRC)
- Mike Dzakuma, Judicial Affairs Officer, Legal and Judicial System Support Division, UNMIL
- Emanuel Faustino, Economic/Governance Cluster Leader, World Bank Liberia
- Johnathan Davis, Agricultural Economist, Forest Sector Management Project, WorldBank
- Luigi Giovine, Country Manager, World Bank Liberia
- Eric Sirleaf, Records Specialist, World Bank Liberia
- Jaime Thomson, Senior Associate, Associates in Rural Development, Burlington VT
- Ramzy Kanaan, Associate for Liberia, Associates in Rural Development, Burlington VT
- Rebecca Gruby, Environmental Law Institute
- Carl Bruch, Environmental Law Institute

III. MECHANIZATION AND POST-HARVEST STUDY

By

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Liberia 2007

III. MECHANIZATION AND POST-HARVEST STUDY

1. INTRODUCTION

A study was carried out on mechanization and post-harvest activities in Liberia as part of the overall Comprehensive Assessment of the Agriculture Sector of the country.

The study was expected to generate appropriate information on the status, potential and constraints of the sector to facilitate decisions on the direction, methodology and scope of actions for the sector to contribute to national priorities of policy development, food security and nutrition, productivity, investment income and employment.

The team that carried out the study included: Lovell Thomas, International Consultant Mechanization &Post-harvest, Franklin Henries, National consultant, Food Crops (Liberia) and Mr. Robert Van Ottertail, Agro-industries, FAO Regional Office for Africa.

2. METHODOLOGY OF THE STUDY

The study was carried out using the following approaches:

- discussion among the team members on the methods to be used to conduct interviews and undertake field visits;
- desk studies of relevant reports and literature on the sub-sectors;
- field visits to key areas of action in a number of counties;
- interviews with officials from the Government of Liberia (GOL), NGOs, private sector businesses and farming communities in various parts of the country;
- assessment of completed projects implemented by NGOs;
- interactions with other team members

The team met with the CAAS-Lib team leader, Dr Spencer, and other national and international consultants in the CAAS-Lib team, Mr T.E.C. Palmer (FAORAF) and Dr Brandy, National Project Coordinator, CAAS-Lib. The purpose was for general introductions among team members, and briefings on the overall methodology of the CAAS-Lib and the format for reporting. The Deputy Minister of Agriculture and Dr Hammond, the FAO Country representative, participated in the introductory meeting.

The team met to prepare the programme of work, indicating the various places to visit and persons to meet in the Monrovia environs during the first week, plus the programme for the field trips. The proposals were discussed with Dr Brandy for organizational arrangements for the team's work. Sample questionnaires were also prepared and discussed with the team leader, Dr Spencer.

The team held meetings with the Minister of Agriculture in his office and attended a meeting of the Agricultural Coordination Committee, during which the team interacted with the NGO community engaged with agricultural delivery.

Meetings were held with the USAID Liberia Community Initiatives (LCIP), who are engaged in providing support for farm machinery for the processing of oil-palm, rice and cassava

through donations to farmers' groups and cooperatives, particularly in Bong and Nimba counties.

The team visited representative areas in the country, particularly Bong and Nimba counties in the central and northern region, Cape Mount and Bomi counties in the west, and the greater Monrovia area. The team could not visit the southeastern areas of the country owing to difficulties in accessing these areas.

The team reviewed the past and ongoing activities in mechanization and post-harvest processing being carried out with the support of projects, and by those farmers who did not have such support. This review covered practices for rice, the main staple food commodity in the country, cassava, oil-palm, fish and vegetables. The team reviewed the situation on processing and packaging of fish, livestock (pigs and bushmeat) and oil-palm. Discussions were held with a variety of persons, including small-scale farmers, farmers in projects, fish-smoking processors, extension workers for the government and NGOs, and individuals involved in various aspects of post-harvest activities.

Discussions were held with importers of farm machinery and hand tools to assess the types and quality of tools and equipment ordered; where they were ordered from; the conditions of import, sale and distribution; the cost of machines and tools. Samples of the machinery and equipment found in various places during the study included an oil-palm mill (costing $2 226), a cassava mill ($2 157), a palm kernel mill and separator ($2 157), a rice mill and engine ($2 910), planters, diggers, hoes, cutlasses, and other tools of various categories. Importers also deal with petrol and diesel engines to power the various mills. They sell the machinery but do not provide installation and training or back-up services. TR Enterprise was found to be the main importer of agricultural equipment and machinery, most of which was imported from the Marketing & Business Development Association in Ghana, which is a group supported by the European Union and the Canadian International Development Agency (CIDA). This Foundation is a technology transfer, training and manufacturing organization that was incorporated in Ghana in 1999.

The team held meetings with the Rubber Planters Association (a local association of rubber producing farmers) for the purpose of obtaining data and information on the mechanization and post-harvest activities involved in production rubber by smallholders or cooperatives. The Association has over 2 000 members with plantations ranging from 15 to 1 000 acres in size.

The team held consultative meetings with PACESL – a local NGO – on blacksmithing activities and the role blacksmiths play in support of farm mechanization. Discussions were also held with individual village blacksmiths on their operations and needs.

The team visited one (Tubmanburg) of the four regional centres established in 2005, with the support of FAO, for the training of metal artisans and blacksmiths, to facilitate the production of agricultural tools and equipment used in food production. The project was also designed to provide cheap and reliable tools for the production of food to the farming community.

The limited duration of the mission in the country did not allow the team to visit other places to obtain a wider level of information on post-harvest and mechanization practices in the country. However, some additional information on the subject was later provided by the national consultant on the team.

This report focuses on findings and results of assessments carried out of the following:

a. cultivation and production methods utilizing the following:
   - mechanical cultivation and Post-harvest handling of rice using high horsepower tractors and associated equipment, and power-tillers and associated equipment;
   - animal draught power;
   - blacksmithery.

b. post-harvest handling and processing of the following:
   - vegetable oils (oil-palm);
   - cassava;
   - fish;
   - vegetables.

3. MECHANIZATION

3.1 Tractorization

3.1.1 Review of past experiences

Before the war, agricultural mechanization in Liberia was practiced on an ad hoc basis, and not as a result of a specific programme of GOL. The practice focused on the following activities: rice production (mainly upland and to some extent lowland), post-harvest processing of crops (rice, maize and cassava), extraction of vegetable oil, particularly oil-palm, and processing of livestock, fish and meat products.

The most common use of mechanical production in agriculture was during rice production, and in particular land preparation on both the uplands and the lowlands. The machines used were mainly tractors (crawlers and wheeled tractors), ploughs, harrows and seeders in the uplands, and power-tillers and caged-wheeled tractors in the lowlands. Land preparation activities were each considered as a project or entity, and were supported by parastatals or semi-autonomous companies linked to GOL or a few NGO, or by Liberian indigenous individuals on a commercial basis. Each activity was considered as a project and was not directly linked to the mainstream Ministry of Agriculture (MOA). Various types of tractor were used in such projects, each type reflecting the country from which the support was being provided at the time, which was different from either the preceding or succeeding sponsoring country or entity. Some of the countries involved included Israel, China and the United States of America.

Four such schemes were carried out in the Bong, Lofa, Grand Cape Mount and Grand Gedeh counties. There was no consistent documented information available at the time of the review that described exactly how these mechanized schemes were operated. It is probable that they were applied to plots of land of an average of 2 000 acres and involved large numbers of farmers, generally in their hundreds and in some cases in their thousands, organized into cooperatives. The schemes were carried out mainly in areas of the country where large tracts of land were not difficult to obtain, and close to settlements. The services rendered by the projects were mainly ploughing and harrowing, operated on a cost recovery basis, with payments made by the farmers at the end of the planting and harvesting season. No documented information was available to make an analysis of the cost-efficiency of these

operations or to determine their comparative advantages against alternative systems of land preparation.

Selected workers, not farmers or beneficiary groups, were trained in repairs, maintenance and operation of the machines. However, farmers participated in the key production operations, particularly broadcasting of rice, weeding, bird scaring and partial harvesting, in areas that combine harvesters could not safely operate. Most of the spare parts used in the machines were imported by the projects and few were obtained from local stores.

Farm mechanization was also carried out by large commercial farmers, many of them Liberians, who could afford the cost of such operations. Many such farms had tractors with tilling implements, and some could even afford the hire of land-clearing equipment, which usually cost around US$150.00–US$350.00 per acre. Smallholders could not afford the hire of such earth-moving machines, and so for the most part engaged the services of chainsaw groups to assist in the felling of large trees after completion of initial underbrushing at a fee of around US$30.00 plus fuel for a day's operations. Operation was initially on a loan basis to be paid back at harvest at an interest rate of 25%.

Along with tractors, large combines were used for harvesting, threshing and bagging paddy rice, again in the selected areas where large tractors were operating. The enterprise provided maintenance and service facilities for the combine harvesters, and the communities were charged for each operation. The schemes were linked to mechanical production of rice operated by varying concerns, contracted by parastatal companies.

3.1.2 Strengths

If properly organized and operated, tractorization offers much greater opportunity for economies of scale in land use and cost-effective use of improved technologies for production of rice, which in turn will attract greater chances for investment by farmers' groups and communities, or by private individuals.

The schemes provided farming communities in the areas of operation with opportunities to galvanize themselves into groups through which consolidated actions could be taken to increase their access to essential inputs such as improved seeds, fertilizers, other agrochemicals, hand tools and equipment. The publicity of these activities attracted extension services to the communities, firstly from the agencies that operated the mechanization practices and secondly from the national Ministry extension services. The schemes also provided opportunities for employment of young people as drivers, mechanics and farm hands.

Mechanical cultivation of rice was a response to the priority GOL and the people of the country were putting on self-sufficiency in the commodity and reducing their reliance on external supplies, especially because the country at the time could not rely on the vast number of smallholdings, each with less than one hectare to meet national requirements for the staple food crop. Although there were few such projects, their outputs did provide a means to increase production of rice to meet national needs in the shortest possible time.

Large numbers of farming communities in the area of these projects participated in the mechanization schemes, because the practice relieved them of the labour-intensive manual preparation of land for upland farming, and the pressures for timely sowing of the crop

before the heavy rains, especially since their farm family labour was decreasing with increasing outmigration of able-bodied young men and women to the urban areas. There were indications that these farmers sought credit from diverse sources just to enable them to pay for the services, demonstrating their commitment to the practice.

3.1.3 Weaknesses

Notwithstanding their apparent strengths, mechanical cultivation, (particularly tractorization) of rice, as carried out at the time, had a number of shortcomings that would have limited their ability to meet the overall objectives of large-scale production of rice in the shortest possible time.

Lack of regulations and proper institutional framework to support mechanization
There was no clear policy from GOL to guide the nature and scope of the application of the practice. More especially, guidance was needed on the prioritization of land areas for the application of such activities, given the geoclimatic conditions of Liberia. The country is heavily forested, receives heavy annual rainfall (1 600–5 000 mm), and has relatively heavy soils, which would have required special management using such heavy machinery. Conditions should have been established for application of the practice, especially participatory development, which would have encouraged direct involvement of the participating farmers, not just for the use of machines but for sustainability of the achievements and environmental protection. More importantly, the schemes should have been used to build viable farmer groups with input/output objectives, such as farmers getting access to inputs and forming a large group for marketing and other economic purposes. There was no obvious unit in the MOA with technical staff qualified to monitor or eventually take over from the expatriate service providers, or to retain an institutional memory for such mechanization operations. Such an institutional arrangement would have been invaluable to collate lessons learned from such practices and to improve on the systems for future actions. For these reasons the achievements of the mechanization activities were not retained after the expiration of the projects.

Inappropriate technologies:
The intensive cultivation of land using heavy machines such as crawlers can have negative effects on soil structure, texture and eventually its fertility, if no proper procedures and guidelines are applied. Extending the practice throughout the country would have compounded the problem. The tractors and implements used for the projects were not standardized, thus promoting different models and therefore different methods of operation, adjustments, repairs and spares. There was no evidence that the machines and equipment used were tested or adapted to the prevailing soil conditions to avoid degradation of the soils. More importantly, there was hardly any evidence that the farmers had the sense of ownership of these machines, mainly because of their negligible financial capacity to purchase, operate and maintain such complex technologies and make profit from them. This was especially true because the primary purpose of the farmers for mechanical cultivation of rice at that time was for consumption rather than marketing. As such, there was a visible dependency on the GOL or other bodies that provided such technologies.

The increase in cultivated acreage created a greater need for weeding, and there was no organized strategy to address the problem. This increased the workload of the women who carried out such operations on the farms, to the detriment of other equally important activities such as the production of short-term crops for sale and supplementary feeding.

Inappropriate government interventions
The schemes were operated by non-governmental entities on an ad hoc commercial basis. The operators of the schemes provided the equipment and expertise with relatively no control from GOL. The MOA had a passive involvement in the schemes, and when they did make an attempt to register control it was mainly on revenue generation, to the detriment of the schemes. The schemes charged at least 25 percent of the harvest of each participating farmer. When the MOA intervened in the schemes, they changed the terms of payment without reference to stakeholders, and decided to charge 75 percent as a land preparation cost – this made people less interested in the operations and resulted in a gradual decrease in participation.

Lack of participation by farmers and communities
The operations were managed and operated by the bodies that introduced the schemes on a cost recovery basis. The high level of skills and technology required to operate the schemes was available mainly through the expatriates brought in by the providers of the schemes. Recipients of the schemes or their representatives did not participate in the planning and management of the operations. Feedback from user satisfaction with the services or cost appropriateness was limited to negligible. There was no clear linkage between service providers and users. Although farmers were organized into cooperatives, the object was mainly to register them for participation in the schemes according to their area of residence and to organize their repayments as set out by the scheme's organizers. When the services were terminated, there was no clear point to restart the process, as sustainability of the practices was not a major consideration when mechanization was being considered as a strategy to increase land preparation and consequently rice production in the country.

The cooperatives established to collaborate with the schemes were not well organized, and could not successfully intervene in setting the costs of operations in order to establish fair charges for their members for using the services offered through the schemes, in establishing capacity-building programmes for their groups to eventually take over the operations, or in ensuring effective output marketing activities of their members.

Lack of cost data
Statistics were not available on the costs of production per unit (tonne or 50 kg bag) for rice under the mechanization schemes, nor under the traditional manual method. There were indications, however, from records of food imports into the country during the period that the cost of a 50 kg bag of imported rice in the 1970s and 1980s averaged US$20, compared with US$28 for that produced under the mechanized schemes. Cost analysis would have given a clearer indication of the reasons for the higher costs under the schemes and how these could have been avoided or improved upon.

3.2 Power-tillers

3.2.1 Past experiences

In the past, power-tillers were used in the swamplands operated by cooperatives, mainly in Bong, Cape Mount, Lofa, Maryland and Nimba counties. The tillers were introduced by the Chinese on bilateral arrangements and were operated under their supervision. The Chinese trained the first generation of operators, who in turn were expected to provide on-the-job training to selected members of the beneficiary communities to allow them to operate and maintain the power-tillers.

There were no service workshops for repair and maintenance of the machines and accessories, nor stores and sheds to protect the equipment from adverse weather conditions. The main constraints were the lack of a continuous supply of spare parts, the unavailability of skilled mechanics for repairs and maintenance and finance to support the cultivation scheme, the untimely availability of seeds and fertilizers, and bad roads.

3.2.2 Strengths

The power-tillers were introduced under a promotional scheme, with the machines provided free of cost to the beneficiaries, except for operational costs. The scheme was gradually becoming popular and sought after by many communities, because the alternatives were mainly labour-intensive manual operations of land preparation and cultivation. Several results became apparent.

- Members of the farming community were trained and had become capable of operating the power-tillers, albeit with some limitations in management.
- There was more cohesion among the communities and groups operating the power-tillers during training and cultivation practices. This was the result of a sensitization process that preceded the operations and the training provided on a group basis.
- More land was brought under cultivation by smallholders and more rice was produced.
- Farmers became very interested and willing to form groups to facilitate purchase, ownership, use and maintenance of such equipment, because the activities were carried out on their lands, closer to their homes and their involvement in everyday management of the operations. In addition, the projects provided inputs and access to markets through groups, which were organized and managed by the participants themselves.
- The costs and maintenance of the machines were being met when farmers operated them at group level, because they were involved in the factors for which the costs were incurred.
- The use of the machines fitted the relatively small sizes of the holdings, and could be easily managed at family level or by small groups.

The practices showed much promise, more for the participatory approaches with which they were introduced, and their ability to be managed by the users.

3.2.3 Weaknesses

There were a number of noticeable shortcomings with the schemes that limited sustainability of the achievements of their application.

User groups were not properly sensitized to ownership and investment in the machines on a continuous basis, nor were needs assessments carried out and appropriate capacity-building programmes prepared and carried out, particularly in management of groups and equipment.

There was inadequate training of the operators in repairs and maintenance, and even management of the enterprises, especially after the departure of the Chinese, who provided such services at the height of the application of the practices. Unfortunately, the MOA were not directly involved in the schemes and provided negligible technical backup services.

Similar to the schemes involving large tractors, the machines were not always appropriate for local conditions. They were Chinese made and imported. Unavailability of adequate spare

parts became problematic because the items were not universal and common to other manufacturers of such products. This problem increased when the Chinese could no longer be contacted after their departure from the country.

Infrastructure problems limited the effectiveness of the schemes. Transportation costs to the production areas for collection of accessory inputs were as high as those paid for carrying outputs from the farms to the markets. This and the bad roads to and from the farms were disincentives for the willing farmers to adopt the practice.

It was apparent that the enterprises that developed from the introduction of power-tillers were not planned for marketing: no proper storage facilities or processing, handling and packaging of the excess produce were constructed or planned for.

3.3 Rice post-harvest processing

This involves both large-scale mechanization schemes using large tractors and combine harvesters and large mills, and small-scale low-technology rice production and processing schemes using power-tillers, motorized threshers and small-scale rice mills.

3.3.1 High technology

3.3.2 Combine harvesters (large scale)

Along with tractors, large Chinese combines were used for harvesting, threshing and bagging of paddy. The mechanization schemes provided maintenance and service facilities for the combines. The services were also extended to the farming community with large acreages of smallholdings. The community was charged for each operation.

3.3.2.1 Strengths

Large areas of land were harvested within a shorter time and losses during harvesting and threshing were reduced. The paddy harvested was immediately bagged, minimizing handling losses and introducing standardized packaging. Farmers participating in the schemes expressed satisfaction with having more time on their hands for other tasks such as trading and vegetable production. There were high opportunities for saving labour.

3.3.2.2 Weaknesses

- High levels of skill were required for operating and maintaining combine harvesters, and these were not available from local experts or technicians.
- The cost of the equipment and its maintenance were high, and not affordable by the communities using them.
- The farmers were incapable of purchasing such equipment, and even if this were possible through group collaboration, they were not prepared to or capable of undertaking maintenance and paying operational costs by themselves.
- The combines were either self-propelled or attached to tractors and could not be used when the engines were faulty. They were heavy and required hard ground to operate effectively. However, not all areas are dry at harvest and prolonging harvesting because of soft ground conditions causes losses.

3.3.3 Rice mills (large scale)

The rice processing equipment used includes large combine harvesters complemented by mills of 1 to 2 tonnes/hour capacity equipped with rubber rolls that produce few broken grains. The processing services are extended to communities without conditions of membership of projects or cooperatives providing the services, with the user paying the charges set by the providers. Milled rice for the project is temporarily stored in silos, bagged in 25 and 50 kg bags, and later transferred to warehouses where it is stored for the market.

3.3.3.1 Strengths

- Large quantities of paddy are milled in one season, with reduced damage to the crop, compared with that which occurs when rice is left in the field and processed manually in very small portions. There is a high recovery rate of milled rice (8–15 percent of grains are damaged). Post-harvest loses due to milling are greatly minimized.
- The availability of such technologies could be used in participatory development, and in encouraging smallholders to operate in groups for economies of scale. The practice reduces labour input, mostly by women, in processing rice using a mortar and pestle.
- Investors can plan their opportunities with reasonable levels of success.

3.3.3.2 Weaknesses

The cost of the milling operation is very high because of high fuel and transportation costs; the cost of maintenance is also high, with high spares costs and few skilled technicians. The operation requires highly skilled operators and the mills cannot be used for small quantities of paddy that are often brought in by small farmers for home consumption. Only farmers with large volumes of paddy can benefit from mechanized milling of rice; for a sustainable scheme, a smaller mill with a capacity of about 250–500 kg/hr can be purchased, operated and maintained by the farming community.

3.4 Low technology

3.4.1 Small-scale rice mills

Processing of rice by the traditional manual method is prevalent in all the areas visited by the team, especially because rice mills are very few and are expensive to hire.

Rice milling activities are gradually increasing in the country. Donor agencies such as USAID and LWS are adding to this development through the provision of milling equipment with capacities of 200 kg/hour to communities, particularly in Bong, Grand Gedeh, Nimba, and Grand Cape Mount counties. Private milling enterprises are also being established, although slowly, and mainly in suburban areas. Alongside the mills are also small-scale multicrop threshers to complement the rice mills. Their output ranges from 500–800 kg/hr and they are powered by 7 hp petrol engines. When properly adjusted, they can be used for maize, sorghum, cowpea and other crops.

The donor agents provided technicians to install and demonstrate the operation of all the equipment, and training to a few members of the community in operating and managing the equipment.

3.4.1.1 Strengths

The introduction of low technology, low cost rice processing equipment fitted the scale and operation of rural farmers. There is an apparent awareness by the farmers of the benefits and responsibilities of owning and using the equipment and the need for their commitment to their responsibilities. The farmers realized that more rice was processed and losses were reduced; the chores of threshing with the feet or sticks and hand pounding were eliminated and more time was available for the women to undertake other activities. The threshers are portable and this enhances threshing in the field on paved drying floors, which minimizes transportation and shredding losses. There was a clear indication of the urgent need for such equipment and willingness by the farmers to participate in the process.

3.4.1.2 Weaknesses

The management and operational training period for the selected members of the communities was too short. The demonstrations to introduce the equipment were not widespread and were carried out in too short a time frame. The donors did not assess the eeds of the farmers that complement the acquisition or operation of the mill and the thresher. Very few, and in some cases no, government extension officers were involved in such schemes because they were provided by NGOs who had their own extension workers posted in the projects. There is no institution that can provide support in management, maintenance, repairs and backup to the scheme. There was and currently is no policy or regulation regarding the implementation of such support activities in the country.

There was little use of drying floors or storage and packaging of the paddy or milled rice after processing. Few drying floors were observed in the places visited. Instead, drying of rice and other crops still occurs on mats and on the ground. Not surprisingly, there were unwanted materials (stones, grit, pieces of glass) among the rice grains.

3.5 Draught animal power

Not much activity was reported using this type of farm power. The few attempts made revealed difficulties in maintaining the animals, especially during the wet season. During the dry season, the land still was too heavy for successful activity. In addition, there is no specific Technology Unit in GOL that could develop, promote and disseminate the activity even if the climatic conditions were favourable.

3.6 Local blacksmithery

3.6.1 Past experiences

Widespread local manufacture of small hand tools and equipment for farming was not evident to the reviewers, which is understandable given the the long period of civil war when the operators became displaced, which may have destroyed the trade. The local blacksmiths shops seen by the team were very rare and not functioning well. There were, however, indications of viable business before the war. The major problems observed were inadequacy of funds to procure the equipment (forge, blower, welding machines, grinders/cutters), the lack of consumable materials, particularly scrap metals, and more importantly the lack of availability of credit to ensure their activity as a business.

PACESL, a relatively large local NGO that was involved with blacksmithing, is no longer operating because of lack of support, apparently from a major donor. Before the war, it had a

grant of US$1 500 to fabricate rakes, cutlasses and small items of equipment such as manual rice threshers and cassava graters. FAO supported a programme in cooperation with PACESL that trained blacksmiths who, after the training, were subcontracted to fabricate agricultural tools, buckets, watering cans, etc. Their biggest constraint at that time was the availability of proper scrap material to reduce the cost of fabrication. All their equipment and machinery was lost during the civil war. They expressed willingness to restart their operations should there be support provided to them.

An FAO TCP/LIR/3003(E) project has provided support to GOL in the past to strengthen the capacities of blacksmiths to enhance production of farm hand tools and equipment for resettlement and building livelihoods. The support was directed at:

- rehabilitating four regional Tool Production Centres;
- training individual blacksmiths to upgrade their knowledge and skills.

A total of 120 trained village blacksmiths (professionals) were used to train 139 ex-combatants (graduates) in the production of various agricultural tools and small items of equipment, including hoes, hammers, rakes, shovels, coal pots, cutlasses, chisels, pick axes, other axes and spades.

At the end of each session, each trainee was provided with a package of tools to enhance their village blacksmith work. The package consists of the following tools:

- one anvil (2 feet long on a rail track);
- two double-faced hammers (4 lbs and 6 lbs);
- one pair of tongs;
- one chisel.

The FAO strategy has been to empower the graduates through awarding of contracts and free access to apprenticeship for volunteer trainees. To this end, 21 000 bells are currently being produced for the integrated pest management initiative of the FAO/MOA. In the past, 15 000 scratching hoes and 1 000 feeders were contracted to the graduates within the four regions. These contracts also served to build the capacity of the blacksmiths and to keep the centres operative.

Another recent development is that the International Labour organization (ILO) is looking at the possibility of engaging some of the graduates in the production of tools for future development purposes.

According to the regional coordinator of blacksmiths (FAO), a national plan to have such training centres in each county is being proposed to FAO and stakeholders to give wider access to blacksmithing technology in Liberia.

3.6.1.1 Strengths of the blacksmithing activities

- Four regional blacksmiths' centres were rehabilitated, in Fendell, Tubmanburg, Voinjama, and Zwedru, and could serve as focal points to develop the trade.
- Village blacksmiths were trained as master trainers who could be used as reference points for extended training of other blacksmiths.

- A large number of trainees from host communities (residents), returnees, and ex-combatants were trained, including women.
- Forty village blacksmiths' workshop facilities were rehabilitated.
- A large quantity of tools and equipment, including two mobile welder/generators (5 kVa) were procured for the programme.
- Many tools were fabricated and sold at the end of the programme. The market orientation of the activity could encourage investment in the trade by the local blacksmiths, as perceived by the regional coordinator of blacksmiths for FAO.
- Contracts were awarded to trained blacksmiths to fabricate scratching hoes, bells and chicken feeders to increase their capacity and sustain their operations.
- The provision of officers to monitor the performance and progress of the programme and to report to FAO and GOL could provide the nucleus for a Unit on Blacksmithery to be established within the MOA.
- At the end of the programme, trainees were provided with a package of tools to help them in their village blacksmith work.

3.6.1.2 Weaknesses

- There was little evidence of sustainability of the achievements of the project, including the fact that there were no immediate plans for the effective use of the training centres and the equipment retained in them after the end of the FAO project. The Tubmanburg training centre, which was rehabilitated under the project, now has no activities, but it has a Chief Trainer employed as a caretaker for the building. The equipment used for the training was in disrepair. This included the two welders and generators, the blowers, fire furnaces and seats for the track anvils. There are samples of the tools fabricated, some of which are left on the floor and a few are shelved in a small store. Some of the tools are rusting because they were not treated with anti-rust compounds and subsequently painted.
- There was little evidence of any assessment of the local blacksmith centres in order to ensure that the tools provided to each trainee would be adequate for the beginning or continuation of effective production of tools at the village level.
- The project is the first of its kind in Liberia and could have been better implemented in phases over the medium term so that lessons learned from the first phase could be used in the next.
- Quality standards were not set for the fabrication of tools and equipment to compete with imported equivalents.

3.6.2 The way forward

The GOL has established among its priorities food security at household and national levels, and to a very great extent import substitution of its key staple food crop, rice, and other staple food commodities such as short-cycle livestock meat and vegetable oils. Mechanization, particularly land preparation for cultivation of cash crops, and production of poultry and swine will no doubt be critical in any strategy for the recovery of agriculture in Liberia in the medium to long term. It is also an important input in the value chain of a number of commodities of urgent importance, particularly the production and processing of rice, maize and selected oil crops (vegetable and fruits). Some important considerations are necessary to ensure the optimum use of best practices.

3.6.2.1 Policy

Mechanical cultivation

Past experience of mechanical cultivation does not appear to give the country a comparative advantage in the achievement of self-sufficiency in the country's staple food commodities of rice, cassava and other cereals through this approach. The costs of operations are higher than those of external markets and appear to be beyond the capacity of the farmers who are expected to be the focus of the production drive. More importantly, there are indications from this study that the farmers themselves will find it difficult to sustain such operations, except with support from GOL or other interested parties. If past experiences are anything to go by, such supported schemes, particularly those involving government, may not be sustainable given the purpose of the mechanization activity, and the relatively low returns on operations.

On the other hand, past and present experiences point to the advantages of using power-tillers in the cultivation of swamps for production of rice and other short-cycle crops. The potential of the swamp resources for multiple cropping within a year has been proven. The intensive cost-effective use of such machines during the year will ensure a positive cost-benefit ratio of the machines, and will in turn increase sustainable productivity of the farmers and their resource areas. In addition, the machines could be easily owned, operated and maintained by farmers themselves. All farmers the team interacted with expressed interest in, and enthusiasm for, such an approach.

Given the strong desire of GOL for self-sufficiency in the production of its staple food crops, rice, cassava and vegetables, and the importance of mechanical cultivation in advancing the process, the key policy options for mechanical agricultural cultivation in the country currently and in the immediate future could be to:

- promote mechanical cultivation for self-sufficiency through the use of small machines, particularly power-tillers, focusing on swamps and lowlands in view of the proven use of the swamps for such purposes;
- strengthen institutional technical support units for sensitization, awareness, and participatory involvement of farmers' groups and communities in the adoption of the technologies;
- encourage the establishment and strengthening of farmers' cooperatives, organizations and groups in the ownership, use, operation, maintenance and repair of the machines, and linkages to various sources of input/output markets (cost recovery technical services, credit, markets, machinery importers, equipment and implement fabricators, etc.);
- encourage interested private sector parties to be involved in mechanical cultivation in the uplands, through:
  - provision of proper technical advice and guidance in the establishment and maintenance of such enterprises, enhancing generation of information and data on the types, models and number of tractors to be utilized, and the areas and lands in the country suitable for mechanical cultivation;
  - inclusion of mechanization in the country's investment code or portfolio of investment opportunities in the country, in view of the interest shown by indigenous Liberians and foreigners in introducing mechanical cultivation to the country;
  - establish a regulatory framework on standardization and pre-testing of tractors and accessories to be supplied and practices to be carried out in the country, essentially to ensure that they are appropriate to the soil and environmental conditions of the country; establish measures that will ensure that spare parts are easily obtained, and

that quicker and cost-effective technical services are provided without detriment to smallholder farmers.

3.6.2.2 Institutional strengthening

The government should, as a matter of urgency and priority, set up in the MOA a small Unit for Mechanization staffed with at least two qualified agricultural engineers and agronomists, mainly to coordinate activities in the sub-sector, monitor them and advise GOL on actions to take. The Unit could undertake a more detailed investigation into the operations of the recent schemes and activities in land preparation and processing in the agriculture sector, so that a much better picture of lessons learned could be obtained. They would also be involved directly in regulatory matters such as charges for operations, evaluation of activities, testing, and adaptation of all machines and equipment for agricultural development.

The Central Agricultural Research Institute (CARI) of Liberia should be involved directly with mechanical cultivation activities for selected crops, primarily to provide advice on seed varieties, and soil and machine relationships.

3.6.2.3 Programming

Because GOL wishes to accelerate the process of agricultural recovery, and particularly food production, at household level, and because mechanization could contribute greatly to such processes and the sustainability of the achievements, the following actions are proposed.

The Government should seek support urgently to undertake a programming exercise mainly to prepare strategies for mechanization in the sector in the short to medium term, paying attention to the following:

- use of power-tillers by small groups at community level, primarily within its proposed National Programme on Food Security, because this programme will focus on food production from lowlands aided with irrigation to ensure production throughout the year;
- establishment of tractorization schemes for mechanical cultivation and processing of selected agricultural commodities.

4. POST-HARVEST HANDLING AND PROCESSING OF VEGETABLE OILS

4.1 Background

Mechanical processing of vegetable oils was not widespread in the country. The activity was limited mainly to processing of oil-palm fruits, which gives the highest yield of oil per unit area of any crop and produces two distinct oils, palm oil and palm kernel oil, both of which are important in world trade. There was some isolated small-scale processing of legumes, groundnuts and some sunflower seeds, mainly by NGO-supported groups and private individual commercial entities. Such activities were too limited and the information on them is too scarce to make a calculated input to the study or to provide a systematic assessment of their comparative advantages.

Approximately 45 percent of agricultural households process palm oil from natural groves. After the civil war, the main methods of oil-palm cultivation and extraction continued to be manual, using local methods. Semi-motorized methods and fully automated plantation

production schemes exist but almost all the machinery and equipment used before the war was destroyed and only a few of the small-scale processing schemes have been restored.

4.2 Oil-palm processing

4.2.1 Manual production process

About 80 percent of farming communities produce oil through the traditional manual process. The process produces oil of a low quality with low efficiency. It has hygiene and sanitation constraints.

After harvest, the fruits are stripped from the bunch and steamed in local 44–50 gallon drums. The fruits are then macerated using wooden mortars and pestles. The mixture of oil, water, kernels and fibre is agitated in a bath of water and boiled. The oil rises and is scooped off.

The procedure is the same for both intermediate and large-scale processors, only varying in the scale and choice of equipment. The oil is usually stored in used drums, used plastic containers or used ordinary bottles of different sizes and sold in litres or according to the size of the containers.

4.2.1.1 Strengths of local manual oil production

- Production is usually carried out at the household level at the family's convenience.
- Labour is cheap and processing is usually done by members of the family or solicited labour from the neighbours and is paid for in kind.
- Training on the job is carried out by other members of the family at no cost.
- Production provides household needs, with surpluses being marketed to boost household incomes.
- The household does not require a loan to own an extraction facility as the equipment involved is cheap and can be obtained locally.

4.2.1.2 Weaknesses of manual production

- Production is done on a small scale mainly for domestic consumption.
- Sanitary and environmental conditions are usually poor.
- Quality and efficiency of production are low.
- Pollution of the environment with effluent is apparent in most production centres.
- Most of the traditionally produced oil varieties are only available during certain seasons of the year, which leads to low market prices at harvest time.

4.2.2 Small scale mechanical oil mills

Small-scale mechanical mills were introduced to the country by NGOs for use by communities and farmers' groups for extraction of vegetable oils, particularly palm oil, groundnut and sunflower oils, in a participatory way. A few individual indigenous entrepreneurs also established similar milling processes on their commercial farms. On average, the outputs of the digester machines are generally about 500–800 kg/hr. They were generally installed close to the community settlements and operated by the providers with some involvement of the beneficiaries.

Small-scale palm oil extraction plants provided by a donor through an NGO, in Bong County for example, comprised:

- a mobile and motorized stripper with an output of 2 tonnes/hr, powered by a diesel engine of 8 hp capacity;
- a palm fruit steamer with a capacity of 693 litres;
- a fruit digester with 800 kg/hr output also powered by a diesel engine of 8 hp capacity;
- two screw presses producing 60 litres each at each press, both manually operated;
- a palm kernel cracker and separator with an output of 500 kg/hr powered by a diesel engine of 8 hp capacity;
- one oil clarifier of 250 litres capacity.

Limited training was provided to selected persons, in groups identified by the NGO or private companies, to operate the machines. The mills provided by NGOs received support from the Cooperative Department of GOL to organize the beneficiaries into cooperative groups. These units provided limited oversight responsibilities to the operations and management of the machines and the associated activities of marketing the products from the mills. These approaches allowed for some level of cost-effective use and management of the mills with positive outputs.

Spares were made available by the agencies that provided the machines, although there were some delays and loss of working time while initiating demonstrations on the newly installed machines and also waiting for the arrival of spares. Nonetheless, the machines were greatly appreciated by the beneficiaries who started building livelihoods around the establishment of such investment in rural areas.

4.2.2.1 Strengths of small-scale oil mills

The small-scale low-cost oil processing machines and equipment suited the capacities of rural farmers; more oil was being produced with the semi-manual method with a reasonable improvement in quality over the traditional method. Hygiene and sanitary problems were minimized and more time was released for women to undertake other activities.

The operation of the mills also created employment opportunities for young people and income improvement for the beneficiaries. The production processes were independent of electrical energy as the machines used diesel fuel, which could be easily obtained, stored and used as needed. Reasonable quantities of spares were available from local stores, and this assisted greatly the maintenance and repair of these machines. The establishment of cooperatives around the mills provided a baseline from which to build up participatory development processes that could underpin the sustainability of such investments.

4.2.2.2 Weaknesses of small-scale oil mills

It was apparent from observations and interviews that a number of organizational and technical shortcomings limited the impact of the schemes provided by small-scale mechanical processing mills. The schemes operated by NGOs were neither adequate in assessment of needs and requirements for communal use and management of the machines, nor in sensitization of the beneficiaries to participatory involvement in such investments, which would have ensured sustainability of the support.

Ownership of the machines was unclear, and the beneficiaries were reluctant to make repayments for the services provided, or to contribute to the maintenance of the machines. The cooperatives established in support of the mills were also not well organized and their management was unable to produce the desired cooperation from their members, giving the impression that they were only established for the convenience of obtaining a basis for concessions on the lands and casual labour for the mills.

Government interventions in these activities did not go beyond being informed of and taking note of the establishment and operation of the schemes and the supply of the machines to the communities. It also organized the communities into cooperatives for collaboration with the investing agencies. There were no technical backup visits from the MOA for monitoring, advice or input into the management of the operations, mainly because of the very weak institutional capacity that existed in the MOA for post-harvest or agro-industrial activities in the country.

Other shortcomings and institutional inadequacies included the lack of policy measures to underpin the importance and operation of such activities; the failure to establish technical units to provide guidance, technical backup, monitoring and regulation of the safety and quality of accessories and products; information outreach on the success of the schemes and the need for participatory involvement in such mechanization activities were almost non-existent or were badly organized.

The design of the milling units did not make adequate provision for the output of the produce in the community, or for the storage and packaging of the products after processing or the effective utilization of all the different by-products. The review team was informed that buyers of the oil products had to bring containers with them, which indicated a lack of standardization of packaging, and an inadequate level of safety and hygienic conditions to ensure the quality and safety of products for their final destination and use. Milling operations had to be stopped or interrupted to await disposal of the processed oil, because of the lack of storage facilities.

The communities/beneficiaries had no input into the choice of the equipment and machines used, or into whether they were appropriate for the scale of operation or economically justified.

Generally, the housing of the mills was too small and the quality of the ancillary equipment not proven; the material used in sections of the mill could not be verified by independent experts as being of sufficiently high quality to meet hygiene and sanitation standards.

The donors did not have a checklist to ensure that the mills were utilized effectively, nor did they provide a management strategy for the replacement of the mills at the end of their depreciation period; this includes backup services.

Storage and packaging of the oil after processing were not included in the design of the support, nor was proper training on the quality of the material required for processing to ensure a quality product.

4.2.3 Large-scale mechanical oil mills

Large-scale mechanical oil-palm processing was largely carried out in the 1970s, before the civil war, by large establishments controlled by parastatals including the Liberia Palm Products Corporation (LPPC), the Liberia Produce Marketing Corporation (LPMC) and government-owned enterprises including the Butaw Oil Palm Company (BOPC) and the Decoris Oil Palm Corporation (DOPC). Donor governments and their agencies, particularly USAID, also provided support to communities in mechanical processing of oil-palm, albeit for relatively smaller plants. The total production from mechanical processing was estimated at 25 000 tonnes *per annum*, which was above the national requirements, then estimated at about 20 000 tonnes.

Large-scale processing activities were carried out in areas of large plantations of more than 1 000 acres in selected parts of the country, including Bong, Bomi, Nimba and Sinoe counties. Although the companies operated the mills, cooperatives were formed from the communities in the areas of the plantations to manage the plantations and provide a stock of workers to provide labour for running the plants.

Butaw Oil Palm Company in Sinoe and Maryland counties operated one of the largest oil-palm plantations in the country, producing approximately 550 gallons of palm oil per day during the pre-war years. Unfortunately, because of the protracted civil war, the mill has long been closed and the palm trees are now too old to provide oil on an economic basis and therefore need replacement.

These large plants were managed and serviced by expatriates and a limited number of indigenous Liberians trained in selected areas for operating them. There was no indication of involvement of the cooperatives of communities in the management of the mills. Rather, the communities provided manual labour for harvesting and transporting the fruits to and residues from the mills, and casual labour for packaging the products for distribution to the marketing agents. Cracking the kernels was also mechanized for the production of palm kernel oil and cakes, which were both exported as very little of the oil is consumed in Liberia.

4.2.3.1 Strengths

Much larger quantities of oil were apparently produced by these large processing establishments, exclusively for industrial purposes. Although detailed information on their performance was not available, there were indications that the activities provided many opportunities for employment for skilled, semi-skilled and non-skilled Liberians. Communities also participated in maintaining the plantations from which the palm fruits were obtained.

The companies and entities that operated these establishments also provided basic social services such as health centres, schools, transport, electricity and water supplies, free medical care, subsidized housing on the estate and even rice for the workers and communities in the immediate vicinity of the plantations, particularly those closest to the processing plants.

The impact of such opportunities was noticeable in the rural areas near these establishments, as they served as a nucleus for rural development, and attracted the development of many other services and businesses in those areas. Unsubstantiated reports indicate also that the opportunities for employment from these establishments reduced outmigration from the rural

areas, and supported a more organized rural administration of those areas with linkages to central government in Monrovia.

Other strengths of these establishments included the use of mechanization to exploit the comparative advantages of the country for production of tree and industrial crops, increasing value added in the value chain of commodities such as leguminous oil crops and sugar cane, and producing raw materials for the manufacture of items such as soap, margarines and cooking oils that were produced from the outputs of the mechanized processing activities.

The extraction rate of the machines was reported to be between 95 and 100 percent, compared with 50–60 percent for the small-scale manual or semi-mechanical equipment. The differences in performance reflect the high level of organized management that went into the mills from the large establishment, compared with that of the smaller mills and enterprises.

4.2.3.2 Weaknesses

The large milling establishments acquired large acreages of peasant lands for the plantations by leasehold for very long periods of time (30–90) years, with little or no involvement of the people or compensation paid to them, except for payment of royalties to local authorities, which apparently did not filter down to the majority of the people.

The communities were not directly involved in the management nor were they offered shares in the businesses, which would have at least ensured some level of commitment of the people to the continuation and security of the enterprises.

The presence of the mills in these rural areas with the promise of quick income from wages, and the campaign by the companies for supply of raw materials to operate the mills, led to initial cooperation of the communities with the NGOs and companies and allowed large areas to be planted with the crop. However, some of the mills did not have the capacity to handle the large volumes of harvested fruits, including those sold to the companies by the community outgrowers. This latter group could neither find outlets for their products nor smaller mills to process the unsold fruits. The lack of marketing strategies for these surplus fruits led the communities to engage in premature tapping of the palm trees for the production of local wine, which of course led to loss of quality and production of the fruit. Confidence in the establishment of the mills began to fall and agitation regarding the continued tenancy of the establishments started to rise, which led to disruption of operations, and in some cases to vandalization of the installations.

As the processing activities progressed in some areas more land was cleared within the concession areas. This increased deforestation, adding to the growing cost and scarcity of forest products such as bushmeat (game), medicinal plants and wood.

Agrochemicals used to boost palm yields and control pests and weeds, especially in the large plantations, had a visible polluting effect on the environment. The production chains of the processing plants were closely interlinked, or rather interdependent, to the extent that the breakdown of one link impaired the progress of the whole process, and caused costly delays (downtime) first to repair and then to restart operations.

4.2.4 The way forward

The introduction of mechanical processing of oils was conceptually appropriate to Liberia's objectives of self-sufficiency in staple food commodities and diversification of its exports base, as it is now. A necessary strategic input is the use of the agriculture sector to generate other important socio-economic benefits, such as employment, income, agro-industrial growth and export earnings.

This policy objective is still valid to the country in the present situation and medium term, in view of the high priority GOL has placed on self-sufficiency, food security at the household level and competitivity in the production of the staple food commodities of the country. However, from the strengths and weaknesses of both large- and small-scale processing activities, as observed during the review, a number of lessons have been learned on the design, implementation, management and linkages of such activities within the sector and the economy as a whole.

Some of these lessons will set the road map for the immediate future of such activities in the country currently and in the medium term. The most important among them are listed below.

- Manual processing is inefficient and has high labour input and low output. The war has reduced considerably the availability and opportunities for using such sources of farm power. In addition, the cost of employing the scarce available labour will be much higher and render the activity not cost effective.
- Semi-mechanical processing schemes could be owned and operated by small groups. They can produce outputs far higher than manual operations run by individual farm families; they could be cost effective and offer promise for investment and expansion, in view of their potential to ensure sustainable supplies to much larger communities.
- Large-scale processing mills could be strong sources of growth for the economy, offer strong opportunities for employment and foreign exchange, and give opportunities for smallholders to increase employment and income from outgrower arrangements.

The country currently needs the sub-sector to contribute meaningfully to its priority objectives of food security at household level, by the availability of rice, employment, foreign exchange and income. In view of the past experience in the sub-sectors, and the very low capacity of the country currently to invest in such activities; the way forward could be selected from among the options given below.

4.2.5 Policy options

Small-scale processing

- Accelerate the transition from traditional processing to highly efficient semi-mechanical processing over the next five to ten years, essentially to eliminate manual labour, increase efficiency and productivity of the limited labour available in the production areas, increase productivity in outputs per unit, increase capacity for investment by the increased number of participants to take advantage of the opportunities for income, increase the opportunities for employment, and ensure larger numbers of competitive markets in the country.

- Facilitate the establishment or strengthening of producers' groups, associations and cooperatives, and increase or strengthen their linkages to input/output markets, particularly credit and finance, markets and technical services.
- Promote private-sector agribusinesses – both small and large scale initiatives.

Large-scale processing

- Review the operations of selected large-scale processing enterprises established during the pre-war era, such as the Eutaw Oil Company and the Decors Oil Palm Company, for reactivating and rehabilitation. Review the agreements establishing such companies, particularly to ensure the involvement of communities in their activities; promote linkages between large companies and small-scale producers in order to increase the outlet markets of the small producers.
- Promote the establishment of outgrower plantations.
- Provide an enabling environment for value addition, development of new products and increasing competitiveness of products.
- Establish within the country's investment framework and code a priority list of commodities for mechanical processing and for which investment would be needed; include participatory involvement in the establishment of such activities, particularly in rural areas and on communal lands.
- In collaboration with relevant institutions involved with land tenure, administration and use, set guidelines for the acquisition, tenure and use of lands relating to plantations that will produce raw materials for such processes (oil-palm, vegetable oils, etc.).
- Promote joint ventures and other appropriate partnerships in such processing activities and make environmental protection assessments a condition for embarking on such ventures.
- Organize policy dialogues with interested investors present and past, on possible arrangements and incentives for establishing processing activities in the country and rehabilitating existing plants.

5. POST-HARVEST HANDLING AND PROCESSING OF CASSAVA

5.1 Introduction

Cassava is largely a subsistence crop, which is cultivated throughout the country and is particularly important during the hunger season just prior to the rice harvest. To over 80 percent of the population, cassava is the closest substitute for rice as the main staple food commodity. The crop has excellent drought resistance and is adaptable to low soil fertility conditions. Its production requires a low level of technology and it adapts well in the field. High-yielding mosaic-resistant varieties to be cultivated for different purposes had been bred and distributed by the country's main research station, the Central Agricultural Research Institute (CARI). Cassava is a perishable crop that deteriorates rapidly after harvest. The major current constraint on the expansion of the crop is its post-harvest handling, particularly storage and marketing.

5.1.1 Cassava processing

Cassava is generally processed manually to produce fufu (cassava dough), dumboi (pounded boiled cassava), gari and starch. Gari is the most widely marketed commodity because of its longer shelf life. There are no efficient storage methods to maintain the quality of the freshly harvested crop for a number of days; therefore it is processed almost immediately in order to increase its value and provide a stable state for prolonged storage.

Manual processing methods for cassava have remained unchanged prior to and after the war; they are laborious, tedious, slow and mostly done in unsatisfactory conditions. The advent of improved high-yielding varieties of cassava and planting methods led to increased production. Production became more sustainable when farming communities were joined into cooperatives, which made resources for labour and finance more affordable and could be consolidated in increasing production. With increased production, manual processing could not cope, therefore better options had to be identified.

The foot pedal grater was one of the acceptable options, especially in villages without electricity, mostly because children liked playing with it and in the process provided labour. Unfortunately, it could not cope because of its limited and interrupted output. This led to the development of motorized processors powered preferably by diesel engines, which were also useful in villages without electricity. The motorized processors gradually replaced the manual process because they can be operated for long hours continuously.

Mechanized processing of cassava became popular during the emergency postwar period when donor agencies provided such equipment as part of their support of emergency food production, and particularly to produce gari. Because of its longer shelf life gari could contribute to accelerated food security at household levels, particularly in the camps for displaced persons. The most common motorized equipment used has a capacity of 1000 kg/hr (of cassava tubers), and is driven by an 8 hp diesel engine. Provision of such equipment was accompanied by training of selected members of community beneficiaries in the operation and management of the equipment. There was, however, very little evidence of communities buying the equipment themselves from their own resources.

5.1.2 Strengths

Mechanized processing of cassava has generated tremendous interest among communities throughout the country, mainly because of the following:

- the technology processes 10–12 times more cassava (1 000 kg/hr) than the manual practice (40–60 kg/hr);
- considerable savings are made on manual labour for more productive alternative uses;
- much cleaner (grit free) and better quality products are produced and these are accepted by the general public;
- the technologies currently in use are user-friendly and affordable, and are being used to mobilize community and cooperative activities at communal levels, especially to build up economies of scale for growing and marketing the crop;
- the processing machines fit the capacities of rural farmers and they appear to be happy to own and operate such technologies.

5.1.3 Weaknesses

Use of cassava processing equipment for gari is not widespread in the country, and from the limited operations that have been carried out in the country through projects, donors and NGOs, a number of weaknesses have been observed.

- The management and operational training period for the selected members of the communities/beneficiaries and the demonstrations of the operations of the equipment appeared too short, and many of the operators have had difficulties managing the equipment, especially in avoiding breakdowns and repairing the equipment when such breakdowns occur.
- Assessment of needs for the beneficiaries was limited or not carried out, especially to ensure ownership and sustainability by the users and owners, and complementarity of their contributions to such support.
- Government technical offices were not directly involved in such activities to provide follow-up technical backup, nor was the technical unit for post-harvest and processing in the MOA strong enough technically and operationally to follow up on such activities.
- There was no policy or regulation to guide post-harvest activities in such rapidly perishable crops.
- The communities/beneficiaries had no choice in the equipment and machines used, and could not ascertain whether they were appropriate for the circumstances.
- The housing of the equipment was too small, and the quality of the ancillary equipment and the material used in sections of the mill could not be verified by independent experts as being of sufficiently high quality to meet hygiene and sanitation standards.
- There was no provision of equipment components for roasting and de-watering of the products, or for milling, sieving and drying of the dough.
- The cooperatives set up around the equipment were not well organized and their management was too poor to take meaningful responsibility for sensitization and mobilization of resources for further group work.
- The lack of proper storage and packaging facilities for the products reduced significantly the quality and quantity of products for the markets.
- There was inefficient utilization of the cassava leaves for human consumption in the diasporas, the peel from the tubers for animal feeds and the starch for industrial or domestic purposes, all of which could have added income to the enterprises.

5.2 The way forward

5.2.1 Policy options

In the light of the government's established priority of food self-sufficiency in its staple food commodities and because cassava is the second most important food crop in the country, the supplies of its products are a major consideration in the short to medium term. The current manual production of cassava products cannot be sustained against the increasing demands for supplies. Mechanized processing of the crop will have to be fully considered as the way forward for the crop. Such a decision will have to be underpinned by a very clear demonstration of GOL's commitment to promoting mechanical processing of cassava, since such an activity, although widely known in the country, has not been practiced or established as such.

The policy options, therefore, for cassava should focus on the following:

- promotion of mechanized processing of cassava at small-scale community and group levels countrywide for a specified period of time. This activity will aim at supporting the drive to food security at household level, creating opportunities for income and employment at community levels and widening the base for supplies of cassava products countrywide, and to larger processing and manufacturing interests;
- creating an enabling environment for large-scale private sector mechanical processing of cassava to improve the value chain of the crop, particularly processing of cassava for high-value products such as cassava flour, composite flours, chips, starch, etc.

A number of actions could be taken to make these policy options operational. First, GOL has sought assistance from FAO to rehabilitate cassava multiplication in the country. This may be the nucleus action required to establish a national programme on the crop, from which various strategies could be developed for various purposes, including small-scale and large-scale processes for specific products.

Second, GOL should in the shortest possible time frame request assistance to undertake a detailed value chain analysis on the crop; this will provide valuable information on recent developments on the crop, in particular:

- guiding the actions of CARI on the Institute's intended research on the crop;
- guiding the actions of development partners and NGOs on the multiplication of cultivars of the crop to determine priorities among the purposes for cultivation of the crop;
- identifying the opportunities for investment in any of the components of the value chain of the crop.

6. POST-CATCH HANDLING AND PROCESSING OF FISH

6.1 Background

Liberia has an Atlantic coastline of approximately 570 km, with a continental shelf averaging 34 km in width; it affords an area of about 20 000 km^2 of fishing ground that extends to 200 nautical miles. The fisheries sector is important for the following reasons:

- Liberia's continental shelf abounds with various species of edible fish;
- over 10 000 people are employed in the industry;
- it is a potential source of foreign exchange (tuna, shrimps, lobsters, etc. abound in both freshwater and marine waters).

The national fisheries comprise three main components:

- marine fisheries, involving industrial and artisanal activities;
- inland fishery, mainly artisanal;
- aquaculture, through fish farming, which is limited in scope and investment.

Techniques for post-catch handling and processing of fish used both before the war and currently include smoking in *chokor* and kilns, salting and drying by artisanal fish workers, while freezing is used by industrial entities.

6.2 Review of past experiences

Smoking of fish is a major occupation of women. The process involves the use of metallic drums of varying sizes from 2 to 8 ft in diameter. About 12 percent of the drums are of the smaller type made from 55 gallon drums. Two 55 gallon drums each split into two parts can be joined together by wires to constitute a medium-sized container. The larger size, which is made from thick and stronger culvert plates 8 to 10 ft wide, is the preferred choice of the majority of the women but it is expensive.

The improved method of smoking using clay mud bricks was introduced by the Ghanaian fishing community mainly in Magibi, located in Marshall City, an old base for the training of sailors that was founded in 1835. A smoking oven made from clay mud, known as a "chorkor", utilizes the heat and smoke more effectively and lasts much longer than the drum type. It is gradually being adopted in Robersport.

Fish for smoking are symmetrically arranged over a mat of bamboo canes or a circular wire mesh separated by thin bamboo canes, supported by three or four wooden sticks (2 to 3 inches in diameter), crossed beneath to support the load of each circular mesh of wire. In most areas, the sticks are being replaced by thin iron rods because of the fire hazard. Successive layers of fish are spread one on top of the other depending on the size of the drum. Large drums can take six to ten layers. The final layer is then covered with either metal sheets or jute bags to retain the smoke and heat. Fire is slowly introduced beneath the drum or clay drum and the fish are dried and smoked. After several hours, the order of the layers is reversed and the fish at the bottom are placed at the top to achieve even drying and smoking.

The smaller ovens of 2 to 4 ft in diameter usually take three to six layers of fish; each layer contains approximately 18 to 24 kg of fish. The larger ovens have six to eight layers and can hold about 40 to 60 kg of fish per layer. The ovens are also used to store fish after smoking, when the quantity can be increased.

The metallic drums often rust, especially at the bottom where contact is made with salty water. They are often unpainted and therefore become weak at the bottom and may collapse when loaded.

The smoking houses are generally made from mud blocks or heavy ventilated sheets of metal. The roofs are made from various materials ranging from thatch, tarpaulin and jute bags to zinc sheets. Some houses are open and can only be used in dry spells.

Fish is smoked on a daily basis according to the catch but imported fish obtained from cold stores is also smoked, depending on market demands. Fuelwood is the main source of energy used for smoking and drying and is brought by boats from the mangrove swamps. Fuelwood is scarce and expensive. It is sold at L$25 (US$0.43) per bunch of four pieces about 2.5 ft long. A pile of wood between two sticks about 6ft high and 1.5ft apart is known as a "core" and sells for L$150 (US$2.60).

The volume of fuelwood consumed in smoking is very large. The depletion of vegetation due to fish smoking can be clearly seen along the route to Marshall City. The land is becoming bare and the only vegetation consists of low shrubs and grassland.

6.2.1 Storage

Before the war, there were many cold storage facilities owned by fishing companies and private businessmen. Currently, few cold stores with large holding capacities (4–25 tonnes) for various types of imported fish, meat and poultry products are available in the fishing areas, and they are owned by private businessmen. The artisanal catch from local fishermen is also stored at a cost, as indicated in the Table 1.

6.2.2 Strengths

- The quantity and sizes of smoking drums for each fishing family is increasing, indicating an increase in the volume of catch.
- The "chorkor" or clay oven has been recognized to increase the effective use of wood energy and improve the quality of the product. It is gradually being accepted and is used by many women.
- Handling and smoking activities are increasingly being carried out close to the sea ports where the catches are landed, with advantages of proximity to seawater for cleaning purposes.
- Mangrove wood, the main source of fuel, is in the vicinity of the smoking areas, reducing transportation costs of the wood.

Table 1

Types and prices of frozen fish sold at a cold store in Robertsport

(24-tonne container with three freezers)

Type of fish	Weight of package (kg)	Cost (L$)
Sardine	30	1 750
Zipper	10	2 150
Bonie	20	1 250
Bonie	30	1 800
Snapper	20	1 600
Pojoe	20	1 100
Jacob	20	1 350
Silver	27	450
Mixed	27	1 350
Fresh fish	20	900

6.2.3 Weaknesses

- Access to credit was and is very difficult for fish traders who want to expand or improve their operations to accomplish their objectives, and when available it is mostly from businessmen whose repayment conditions are harsh to the debtors.
- The lack of appropriate infrastructure for processing (smoking houses are dilapidated with damaged roofs, and are exposed to rain, dust, insects, flies and fire).
- Handling, storage, distribution, packaging and transportation facilities are very limited, and relatively expensive when available.
- The lack of chilled or frozen facilities on board the trawlers and canoes to maintain the quality of the catch throughout the fishing operation.
- The lack of cooperatives among the fishermen and the fish processors to seek and protect the interests of participants.

- The absence of regulations or policies ensuring quality and safety of fish products, which in turn would create greater access to high-value markets within the country and the subregion.
- The extensive use of fuelwood as the main source of energy without the replacement of trees, thus depleting the environment.
- Bad roads leading to the fishing villages.
- The lack of appropriate cutting tools and work benches, especially for the processing of big catches.
- The absence of electricity, which limits cold storage and prevents effective smoking after dusk.
- The absence of a standard weight or measure for selling fish, which would automatically lead to standardized packaging and resultant fixed prices.
- The poor sanitary and environmental conditions of the processing centres lead to low quality produce that does not meet international standards as a result of inefficient processing equipments and technology.

6.3 The way forward

The post-catch/harvest losses in small-scale fisheries in Liberia can be among the highest for all the food commodities in the entire food production chain in the country. The inefficiencies of the prevailing post-catch handling, processing, preservation, storage, packaging and transportation practices are major contributory factors. Other contributory factors include ineffective formation and management of farmers' cooperatives, lack of training of women, who are exclusively the fish processors and the preponderance of inadequately designed and maintained fish smoking houses. Improvement of the situation of post-catch/harvest of fish in the country will no doubt have a measurable impact on food security and nutrition at the household levels, on the income of women who predominate in the industry and on widening the opportunities for employment for the wide range of supporting labour (labourers, traders, marketers, etc.). The action must, however, focus on small-scale artisanal fisheries, which provide over 60% of the fish products for the country, because the industrial fisheries are already highly mechanized with high levels of efficiency in post-catch operations.

In view of the identified weaknesses of the small-scale fisheries, the way forward therefore can be considered to include the actions listed below.

- Mobilize support and establish appropriate infrastructural facilities for handling and storage of fish by small-scale users, on a cost-recovery basis.
- Mobilize resources to provide, on a cost-recovery basis, appropriate infrastructure and improved equipment for smoking fish by small-scale users.
- Encourage private sector interests and create an enabling environment for investment in infrastructure and equipment for packaging and distribution of processed fish.
- Facilitate the establishment or strengthening of producers' groups, associations and cooperatives, and increase or strengthen their linkages to input/output markets, particularly credit and finance, markets and technical services.

Some of the strategies that could accompany the policy options include those listed below.

- Mobilize support to establish a fish harbour with large buildings for marketing of incoming catches with standardized weights or packaging, cold stores, marketing outlets and pricing regimes that could spin-off to other local markets in the vicinity.
- Establish inter-relationships with other sectors, particularly forestry for the wood energy on which processing is dependent.
- Enhance cooperatives in order to enhance community participatory activities for development programmes. Such groups will also facilitate data generation and processing with regard to the volume of daily catches and the quantities processed, marketed and stored, etc., which is almost always lacking, especially for planning and programming purposes.
- Train fish smokers and handlers to manage their cooperatives, applying new improved technologies for reducing spoilage and for handling, preservation, packaging, transporting and marketing of their produce. Special training should be provided in the use of weights and measures in the metric system.
- New improved technologies for reducing spoilage, and for smoking, handling, preservation, transporting and marketing are developed from time to time and the transfer of such technologies will raise the competitive level of the products significantly, targeting subregional and other high-value markets.
- Improve smoking houses. The current structures housing the fish smoking ovens are dilapidated, with unpaved floors and limited ventilation; they are dirty and prone to fire, flies and insects. The structures are small in capacity and the ovens are crowded and not well spaced. Appropriate structures should be provided with improved clay ovens and equipment such as weighing scales, workbenches, cutting and packaging tools and adequate water supply and storing facilities.

7. POST-HARVEST HANDLING AND PROCESSING OF VEGETABLES AND FRUIT

7.1 Background

Vegetables are a major component of the crops produced in the country. They include okra, bitter ball, pepper, tomatoes, potatoes, cassava, amaranths greens, cabbage, spinach and lettuce. All of these are produced mainly for home consumption, and are also sold in local markets or from street market stalls. A few other vegetables are produced as exotic crops mainly for the supermarkets and high income residents in the urban areas. They include cucumbers, cabbages, carrots, tomatoes, leaf and shallot onions and sweet peppers. The major fruits produced include mangoes, pawpaw, bananas, oranges, avocado pears and pineapples, and apples, peaches, berries are among the common imported fruits.

Although no specific vegetable producing centre was visited, visits were made to a few markets to investigate the extent of the following:

- the production and marketing of fruits and vegetables;
- the handling/marketing of fruits and vegetables with special attention to partial storage, display/presentation of commodities, prices, packaging, processing, etc.
- structures of market buildings and environmental conditions;
- the role of government and other officials in the operations of the traders.

7.1.1 Production and marketing of vegetables

The large quantities of vegetables and fruits observed in the markets are mostly produced from the surrounding villages and conveyed by trucks or vans to urban areas, particularly Monrovia, the capital. Others are produced around the swampy periphery of the city.

Some vegetables are sold at the farmgate and others through traders; still others are taken to and sold in markets by producer groups, essentially to maximize profit. Producers are responsible for the movement of the produce to the farmgate. This is usually done by head portage mostly provided by members of the producer's household and/or farm labourers. Traders can either buy from the farmgate or send appropriate vehicles to pick up the produce from the farmgate after making payment arrangements for the produce.

7.1.2 Handling and processing methods

Vegetables are separated into staples and exotic commodities for marketing purposes; the exotic vegetables .such as lettuce, cabbage, carrots, cucumbers, collard greens, red peppers and string beans are usually sold on a table by a single owner, while staple vegetables (leaves and fruits) are likely to be owned by different people and handled separately. Some staple leaf vegetables require additional handling, either cutting into smaller pieces (potato/sorrel leaves) or grinding/pounding (cassava leaves) for improved texture or added value. There are no additional charges for this extra handling or processing activity, as it is usually undertaken to secure more customers.

The non-leaf vegetables such as okra, pepper, tomato, onions, and eggplant are retailed by traditional measures such as in baskets and bowls, in which the quantities are often falsified by filling the bottom of the container with leaves, grass or earth. To further hide the deceit, the trader often adds a small quantity of the produce as gift after concluding the sale. Sales are packaged and delivered in plastic bags, and black plastics are often used because they conceal the product.

Of the numerous varieties of fruit observed in the market, mangoes seem to be in abundance, because the fruit grows successfully in the wild under various soil conditions in the country. Locally produced fruits are sold based on their size and the level of bruising and maturity in the common markets. Apples are among the few imported fruits sold mostly in supermarkets or by street venders.

Fruits are generally displayed in ungraded trays or bowls of various shapes and sizes based on their demand. They are not wrapped but most often open to contaminated environmental conditions of heat, dust and rain, a condition which reduces the quality and affects the general appearance and taste of the fruit. In such conditions, fruit is exposed to attack by insects, flies and micro-organisms, etc. Fruits were observed to have no standardized packaging; they are usually sold in plastic containers.

Various locally accepted methods of measurement of weight by which horticultural produce is retailed have been identified (e.g. the use of heaps or bunches, in bowls, buckets or baskets, or pre-packaged and tied in plastic bags). There are no standardized methods of measurement of produce or commodities, such as using scales for measuring weights, except for meat and in some cases fish. The price setting process is not fully understood by buyers and sellers alike, and is a major question for consideration in improving marketing of such commodities. Retailers have a dislike of scales but the consumers prefer them at all times.

7.1.3 The structure of market buildings and environmental conditions

Market houses are usually designed with tall roofs and a peripheral wall of about 4–6 ft in height. The floor area is well paved and spacious to accommodate as many traders as possible. Therefore, during a time of plenty, it becomes overcrowded with all sorts of produce. It is not uncommon therefore to see vegetables being sold alongside other produce such as fish and meat, which attract flies when left in the open.

Regrettably, the area between the peripheral wall and the roof is generally open, leaving all market produce unprotected from dust, flies, insects and sometimes rain. The stalls for packing and display of produce are provided by traders themselves; therefore they are not standardized nor are they packed uniformly to reduce congestion, which appears to be the norm. Traders with their produce in single bowls or trays set their produce at the entrance to attract the attention of the entering customers. The market is further congested with trading mothers who bring along their children because they do not have helpers to care for them if left behind.

Trading is usually carried out outside the market, especially when the markets are congested and when it is not raining. This situation encourages littering of plastics, damaged produce and papers. Boxes for waste disposal are limited and are not emptied in a timely fashion. There are no toilet facilities allocated for use by the market community, thereby creating an environmentally hazardous situation.

7.1.4 The role of government officials and other bodies

The traders are aware that the government provided their market facilities and that they in turn have to pay taxes. The formal and legal roles of cleaning, taxing, upgrading and rehabilitating the markets lies in the hands of government officials such as sanitary health inspectors, Ministry of Health officials, Environmental Protection Agency staff, the Liberian Marketing Association, the City Corporation and the local government administration staff. Irrespective of all the controls from these bodies, some traders lament the poor and unhygienic environmental conditions of their markets, especially during the rainy season. In contrast their perception and opinion of the roles of the informal traditional administrator are reportedly very familiar and positive, particularly the collection of market taxes.

7.1.5 Strengths

- There is a coordinated produce marketing link from the farmgate through retailers to the consumer at the city markets.
- Despite the absence of a formal distinction of allocated places for the traders, few commodities are sold in selected areas, which enhances information dissemination amongst traders with the same commodities, and promotes growth and cooperation.

7.1.6 Weaknesses

- There is an absence of regulation with regard to the provision of partitions between the various types of produce to be sold in each market, and the limited capacity of market places observed.
- The market buildings were constructed with limited consideration for formal services and facilities (banks, schools, pharmacies, daycare centres, water, etc.), facilities for sanitation and hygiene, and environmental controls.

- There is an absence of standardized stalls for different commodities.
- There is a lack of strong government implementation agencies for to monitoring of hygiene, sanitation and other health and safety regulations.
- There is a lack of standard weights and measures/packaging for sale of commodities.
- There is a lack of efficient processing and storage methods and fruit processing plants for effective utilization of excess fruits which would prevent large quantities of wastage and add value to the commodities.

7.2 The way forward

Vegetables constitute a significant composite of the food basket of Liberia, and as such are a major consideration for food security in the country. The sub-sector provides a potential opportunity to meet GOL's key objectives of food security and nutrition at the household level, employment, income and investment (in processing). For the next 2–3 years the focus of action could be on productivity and competitiveness in view of the use of the commodities as staples, the fairly large quantities of exotic vegetables that are imported from neighbouring countries, and the country's apparent comparative advantage in land and water for producing the commodities.

Post-harvest losses in vegetables are relatively high but the nature and scope of this has not been systematically assessed. Based on observations, however, there are inefficiencies in the prevailing practices of handling, processing, preservation, storage, packaging and transportation that should be addressed.

Vegetable and fruit production, like fish processing, is occupational and gender biased and can contribute to employment, income and increased nutrition at household level. It should therefore be recognized as a very important commodity and it deserves effective support for sustainable growth.

7.2.1 Policy issues

In view of the above, policy measures for improvement of horticultural commodities should focus on ensuring availability, quality and affordability. This will require that action be taken to improve handling, processing, and packaging of vegetables and fruits. Policy options should focus on the following:

- mobilizing support and establishing appropriate infrastructural facilities, particularly specialized market structures for handling and storage of vegetables and fruits by small-scale producers, on a cost-recovery basis;
- mobilizing resources to provide, on a cost-recovery basis, appropriate infrastructure and improved equipment for preservation of vegetables and fruits by small-scale producers;
- encouraging private sector interests and creating an enabling environment for investment in infrastructure and equipment for packaging and distribution of vegetables and fruits.

These policy measures could be accompanied by a number of strategies, listed below.

- Organization of vegetable growers and processors into cooperatives to increase participatory levels in development programmes. The cooperatives will also facilitate data generation and processing with regard to quantities produced, processed, marketed and stored.

- Training producers and handlers to manage their cooperatives; applying new improved technologies for reducing spoilage, handling, preservation, packaging, transport and marketing of their produce. Special training should be provided in the use of weights and measures in the metric system for different types of produce.
- Establishment of roles and responsibilities of the public and private sectors in the monitoring of hygiene, sanitation and other health and safety regulations. Grounds around the market centres must be free from improperly stored equipment; litter, waste or refuse; excessively dusty roads; inadequately drained areas with potential for foot-borne contamination or breeding places for insects or micro-organisms.
- The construction and design of the market should provide sufficient space for hygienic arrangement of equipment and storage of materials; floors, walls and ceilings must be constructed so that they are cleanable and they must be kept clean and in good repair; any operations that may cause cross-contamination of food products with undesirable microorganisms, chemicals, filth or other extraneous material should be separated by partition, location, time or other means; provide effective screening or other protection to keep out birds, animals and vermin such as insects and rodents. Provide adequate ventilation to prevent contamination of foods with odours, noxious fumes or vapours.
- For medium- to long-term actions, establish dialogues with entrepreneurs interested in investing in fruit processing and related industries.

A well planned fruit and vegetable processing centre that is designed to operate for as many months of the year as possible is required. This means that the facilities, the buildings, the material handling and the equipment itself must be inter-linked and coordinated properly to allow as many products as possible to be handled at the same time, and yet the equipment must be sufficiently versatile to be able to handle many products without major alterations (See Box 1).

Box 1: A typical fruit and vegetable processing centre

A typical processing centre or factory should process four or five types of fruit harvested at different times of the year and two or three vegetables. This processing unit must also be capable of handling dried/dehydrated finished products, juices, pickles, tomato juice, ketchup and paste, jams, jellies and marmalades and semi-processed fruit products.

There are three types of processing systems: small, intermediate and large. Historically, however, small- and intermediate-scale processing has proved to be more successful than large-scale processing in developing countries.

Small-scale processing is done by small-scale farmers for personal subsistence or for sale in nearby markets. In this system, processing requires little investment; however, it is time consuming and tedious. Until recently, small-scale processing satisfied the needs of rural and urban populations. However, with the rising rates of population and urbanization growth and their more diversified food demands, there is need for more processed and different types of food. The most appropriate type is the intermediate scale of processing.

With intermediate-scale processing, a group of small-scale processors or cooperatives pool their resources. This can also be done by individuals. Processing is based on the technology used by small-scale processors with differences in the type and capacity of equipment used. The raw materials are usually grown by the processors themselves or are purchased on contract from other farmers. These operations are usually located on the production site in order to assure raw material availability and reduce the cost of transport. This system of processing can provide quantities of processed products to urban areas.

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INVESTMENT PROPOSALS

CAAS-Lib – Investment proposal for: Promotion of small-scale mechanized extraction of vegetable oils (palm oil and legumes) and processing of cassava

Name of activity (project?)	Small-scale mechanized extraction of vegetable oils (palm oil and legumes) and processing of cassava.
Institutional responsibility	Farmers' groups/organizations, NGOs, MOA
Objectives of the activity	1. Widespread mechanized extraction of vegetable oils and processing of cassava countrywide. 2. Small- to medium-scale farmers' groups and cooperatives directly involved in and managing activities of mechanized processing of oils and cassava. 3. Large quantities of quality vegetable oils and cassava products being produced from small- to medium-scale mechanized processes in the country, and utilized in the country. 4. Measurable increase in employment and incomes of rural communities in agro-industrial activities, particularly women and young people.
Description of main activities	1. Situation assessment: identification of target groups and communities; needs and requirements for promoting mechanized processing of agricultural commodities for food security, employment and income of small producers. 2. Establish organizational arrangements for the project; plan of work, timetable and responsibilities to carry out activities of the project, etc. 3. Procure and distribute equipment and machines; establish and carry out demonstration and management arrangements. 4. Establish the post-harvest losses and sanitation problems involved in the processing of the crops indicating methods of prevention or minimizing them. 5. Assist target groups/communities to comply with quality control measures; marketing and distribution outlets. 6. Strengthen MOA and other institutions for advice, quality control, training in management of enterprises and monitoring of activities. 7. Assist beneficiaries to establish linkages with other support sources.
Expected result(s)	1. Noticeably increased availability of locally produced vegetable oils and cassava products affordable countrywide; greater consumption/intake of such commodities with increased nutritional levels of the people. 2. Increased levels of production of the selected commodities with the corresponding processing of the commodities. 3. Noticeable increase in incomes of the producers, employment of people in the processing enterprises and increased interest in, and investment by, rural people, particularly women and other private sector interests in various segments of the value chain of the selected commodities.
Impact on food security, poverty reduction & economic development	1. There will be a measurable increase in nutritional levels of people, food security at household levels, increased livelihood and incomes, particularly in rural areas. 2. A significant percentage of women will find gainful employment and increased incomes in various aspects of the value chain of the selected commodities (production, preparation for processing, marketing, product development, etc.). 3. Significant numbers of young people will be employed in the enterprises, particularly in the operation of the mills and marketing of products. 4. The establishment of cooperatives around the mills will provide a baseline from which to build up participatory development processes that could underpin sustainability of such investments. 5. The climate for large-scale investment in the value chains of the selected commodities (product development, manufacturing, export, etc.) will have increased significantly.
Period of execution	5–8 years
Estimated cost	US$2.6 million

Inputs

INPUTS – Oil palm, cassava and groundnut processing	**Budget (US$)**
20 Units and accessories for processing oil palm@ US$30 000/unit	600 000
20 Units and accessories for processing vegetable oils @US$20 000/unit	400 000
30 Units and accessories for processing cassava @US$20 000/unit	600 000
Building construction and infrastructure	350 000
Training and demonstration	150 000
Materials and supplies	100 000
Vehicles and accessories	120 000
Technical services, travel,	250 000
General operating expenses and support costs	80 000
Total	**2 600 000**

Estimates of cost of equipment for oil-palm (factory costs valid to December 2006)

Item	**Description**	**Qty**	**Total cost US$**	**Lister* diesel 8 hp**	**15% spares**	**Total US$**
1	Stripper-1t/hr mobile	1	1 854	618	370	2 842
2	Steamer – 500 kg/batch	1	1 685	-	-	1 685
3	Digester – 800 kg/hr	1	753	618	205	1 576
4	Single press – 60 litres	2	2 472	-	-	2 472
5	Clarifier – 250 litres	1	1 045	-	-	1 045
6	Nut cracker and winnower	1	562	618	177	1 357
7	Palm-kernel oil expeller(400 kg/hr)	1	2 921	618	530	4 070
8	Tractor – 28 hp & trailer**	1	3 890	-	583	4 474
9	Water tank and accessories*	2	620	-	-	620
10	Garbage manual push truck – 1.9m^3	2	1 080	-	-	1 080
					total	**21 221**

*The use of the same Lister engine for all machines enhances training, operation and maintenance.
**Transport system in the form of a small-scale 28 hp tractor/trailer also used to pull the stripper through the plantation farm. This facilitates collection and transportation of fruit to the site and finished produce.
***The need for water cannot be overemphasized.

Estimates of cost of equipment for cassava

Item	**Description**	**Qty**	**Total cost US$**	**Lister diesel 8 hp**	**15% spares**	**Total US$**
1	Chipping machine – litre/hr	1	449	618	160	1 227
2	Cassava grater –1 litre/hr	1	607	618	184	1 309
3	Double screw press	2	1 056			1 056
4	Cassava mash/gari sifter – 350kg/hr	2	360	618	147	1 125
5	Bagging stand – 100kg	10	450	-	-	450
6	Fermentation rack – 250–500kg/hr	2	270			270
7	Aluminium pans – 5 kg/batch	10	560			560
8	Aluminium tray (610x1220 mm)	10	2 810			2 810
9	Burnt bricks/clay, hearth for 5 pans	2	786			786
10	Mild steel tray (10x1220 mm)	10	2 470			2 470
9	Water tank and accessories	2	620	-	-	620
10	Garbage manual push truck – 1.9m^3	2	1 080	-	-	1 080
8	Tractor – 28 hp & trailer	1	3 890	-	583	4 474
					total	**18 235**

Estimates of cost of equipment for groundnuts

Item	Description	Qty	Total cost US$	Lister diesel 8 hp	15% spares	Total US$
1	Mechanized groundnut cracker/separator – 250 kg/hr	1	1 434	618		
2	Rotating drum roaster – manually operated – 30kg/batch (45 min. processing) – 40 kg/hr.	5	1 240			
3	Groundnut paste kneader – 30 kg/batch processing for 45 minutes	1	843	618		
9	Water tank and accessories	1	310	-	-	310
10	Garbage manual push truck – 1.9m^3	1	540	-	-	540
8	Tractor – 28 hp & trailer	1	3 890	-	583	4 474
					total	**18 235**

CAAS-Lib – Investment proposal to strengthen the capacities of blacksmiths for agricultural production

Name of activity (project?)	Strengthening blacksmithery capacities for production of small-scale tools and equipment for increased agricultural production and productivity of smallholders
Institutional responsibility	FAO, GOL and the local blacksmith networks at county level; NGOs
Objectives of the activity	1. Well structured Blacksmith Centres (at least four), established at regional level, functional and operational, and producing common and much-used small agricultural hand tools and equipment for small- to medium-scale producers and processors; providing training and advice to blacksmiths at local level. 2. Blacksmiths in counties in each of the four regions are being trained and facilitated in maintenance and repair of the tools and equipment being produced by the Centres and encouraged to produce other tools in their respective areas. 3. Strengthened institutional framework/environment in small- to medium-scale tools and equipment (government; private sector) to ensure sustainability of the capacities built, quality control of tools and equipment; availability of and access to the products.
Description of main activities	1. Four regional Blacksmith Centres set up previously by government, but currently in various states of disrepair will be assessed for rehabilitation, production of agricultural tools and equipment, training and product development. 2. Identification, selection and recruitment of experienced blacksmiths and engineers to manage the Centres and carry out their activities. 3. Establishing a programme for the rehabilitation of the Centres including work plans and activities to be carried out in the short and medium terms. 4. Setting up the organizational arrangements for the management and operation of the Centres, and the start-up of preparations. 5. Procuring, installing and testing of the machines, tools and equipment of the Blacksmiths Centres. 6. Assisting the organization of networks of blacksmiths, other support services (particularly distributors, farmers' groups and NGOs) in the counties under each region; sensitizing and training them on their commitment and responsibilities in regard to the project. 7. Establishing linkages between the project beneficiaries and financial services, particularly savings and credit schemes.

Expected result(s)	1. The four regional Blacksmith Centres rehabilitated and functioning, ensuring continuous availability and increased access to essential production inputs, particularly tools and equipment, for small- to medium-scale producers. 2. Large quantities of small tools, in the range of cutlasses, hoes and rakes, are available and being fabricated appropriately to suit the local standards thus eliminating the modification of newly acquired tools and equipments for the same purpose. 3. Locally made cheaper tools and equipments with spare parts will be available in the country and access to repairs available through local blacksmiths working individually or in cooperatives. 4. Agricultural tools and equipment will have been standardized, quality control established and both will be enforced. 5. The country will have established a capacity through the equipped production centres to undertake contracts for mass production of simple agricultural tools and equipment.
Impact on food security, poverty reduction & economic development	1. Over 90 percent of food produced in the country is from smallholders, and one of their major constraints is inadequacy of farm power, particularly tools and equipment. A successful implementation of the project will increase access to such inputs significantly. This will result in a significant increase in production and productivity, and a corresponding increase in food security in the country, particularly at household level. 2. There will be a noticeable reduction in imported tools and equipment, widespread availability and affordability of locally produced tools and equipment because of lower costs of the items and their appropriateness to the users, and greater activity, which will increase employment and income. 3. The small-scale agro-based equipment necessary in the processing and product development of basic commodities such as rice, cassava, oil seeds/fruits, fish and poultry can be easily serviced by the centre and encouraged to thrive within the local communities, increasing incomes, employment and consequently reducing poverty in the rural areas.
Period of execution	3–5 years
Estimated cost	US$4.58 million

Inputs	**Budget (US$)**
1. Rehabilitation of four Blacksmith Centres	4 000 000
2. Training and demonstration of technicians to manage the four Centres	100 000
3. Equipment and vehicles	100 000
4. Training of blacksmiths' cooperatives	30 000
5. Various technical services and travel	300 000
6. General operating expenses and support costs	50 000
TOTAL	**4 580 000**

CAAS-Lib. – Investment proposal for mechanized farming in food and cash crops

Name of activity (project?)	Promoting mechanized farming in food and cash crops (upland) for increased production and productivity
Institutional responsibility	Farmers' associations/groups, cooperatives; private sector agricultural enterprises; MOA
Objectives of the activity	The project will focus mainly on promoting mechanization to improve specific segments of the value chain (production and processing), of selected crops (cereals, legumes, tubers) and will be directed at small- to medium-scale producers. The project will be designed in two components: • Strengthening the capacities of selected existing commercial agricultural enterprises as nucleus entities in promoting mechanized farming involving small producers. • Assistance will be provided to community agricultural groups/cooperatives to practice sustainable mechanized farming. **In component 1** • Selected enterprises will be fully engaged in sustainable mechanized farming, linked to markets and directly involved with small- to medium-scale producers. • Outgrowers' schemes involving small-scale producers with direct linkages to selected commercial farms will be receiving and providing services for mechanized farming. **In component 2** • Small- to medium-scale farmers' groups/cooperatives will be fully engaged in mechanized farming activities in various parts of the country, with linkages to a number of support services (financial and technical services, distributors/suppliers, market outlets, development support agencies).
Description of main activities	**Component 1** • Select existing commercial enterprises to be used as nucleus entities, and provide on a cost-recovery basis capital inputs (selected machines and equipment) and technical support services; facilitate them to obtain other inputs (from funding and support sources) relevant to mechanized farming of the selected commodities. • Organizational arrangements established for linkages and ongoing activities between the commercial enterprises and input/output markets (credit, equipment, research and extension agencies; partnerships, south–south cooperation). • Technical units including research services established at regional or county levels to provide cost recovery services in advice, maintenance, repairs and management of equipment, machines and enterprises. • The establishment of centres in strategic areas fully equipped for training of tractor operators, mechanics/apprentices, bench fitters, vulcanizers and a mobile workshop vehicle for the service, operation, repairs and maintenance of the tractors and equipments. **Component 2** • Undertake feasibility studies to identify farmers' groups involved and their needs and requirements for mechanized production of food and cash crops. • Provide assistance in establishing promotional hire purchase schemes for obtaining capital inputs for mechanized farming. • Assist in the establishment of support services centres or service groups for the training in management of the enterprises, and cost recovery support for repairs, service and maintenance of equipment and machines. • Assist in establishing linkages between beneficiaries, support services and development partners for mobilizing resources to build up enterprises.

Expected result(s)	1. The project will bring out the opportunities that tractorization offers, especially economies of scale in land use and cost-effective use of improved technologies for production of crops, which in turn will attract greater opportunities for investment at group levels. 2. Farming communities in the areas of operation will be organizing themselves into groups through which consolidated actions could be taken to increase their access to essential inputs such as improved seeds, fertilizers, other agrochemicals, hand tools and equipment; the publicity of these activities will attract cost-recovery polyvalent extension services to the communities, firstly from the agencies that operate the mechanization practices and secondly from the national Ministry extension Services. There will be much greater opportunities than before for employment of young people as drivers, mechanical engineers, agronomists and farm hands. 3. Mechanical cultivation of crops, particularly rice, will have produced large quantities of the crop to the extent that the priority of GOL and the people for self-sufficiency in the commodity will be met and seen to be reducing reliance on external supplies, and meeting national requirements in a much shorter time. 4. Large numbers of farming communities in the area of the projects will be relieved of the labour-intensive practices of land preparation, sowing and harvesting, increasing the opportunities for their labour and time.
Impact on food security, poverty reduction & economic development	1. Increased production with correspondingly increased supplies of locally produced food commodities, with increased affordability and increase in the nutritional levels of the people. The impact will be noticeable in the rural areas where poverty and malnutrition are currently predominant, and income and employment, apart from subsistence farming, almost negligible. 2. Outmigration from the rural areas will slow down, and with the presence of more people the development of rural areas will increase at a much faster rate.
Period of execution	5–10 years
Estimated cost	US$4.5 million

Inputs – 1 centre with 10 tractors	**Budget (US$)**
1. Equipment and machinery with implements (at least 100 tractors and accessories)	1 500 000
2. Processing equipment, vehicles and accessories	1 000 000
3. Support services centres	600 000
3. Infrastructure (buildings, storage, roads, drying floors, etc.)	1 000 000
4. Training	80 000
5. Various technical services, travel	250 000
6. General operating expenses and support costs	70 000
TOTAL	**4 500 000**

CAAS-Lib – Investment proposal for reduction of post-harvest losses of fish

Name of activity (project?)	Reduction of post-harvest losses of fish and improvement of quality through handling and processing technologies
Institutional responsibility	Non-governmental organizations in collaboration with GOL and the fish farmers' cooperatives
Objectives of the activity	1. Women, communities and other agents involved with the post-catch handling of fish possess improved capacities for handling, processing, preservation, storage and marketing of fish products. 2. New improved technologies and support services for reducing spoilage, and for handling, preservation, packaging and marketing of fish products are introduced and being used by women and other agents involved in fish products. 3. Improved institutional capacities are established in the country and providing technical, advisory and other support services to fisheries post-catch activities.
Description of main activities	1. Identify participating groups; their needs and requirements for improved post-catch activities in fisheries; carry out sensitization and training programmes for the management of post-catch fish groups and cooperatives in the use of improved technologies to reduce fish post-catch losses. 2. Prepare appropriate programme of work plans and timetable of activities for the project; initiate implementation including: construction of equipped market houses, storage, processing and smoking houses and clay ovens. 3. Assess capacities and provide appropriate support to strengthen the fisheries subunit in MOA and other support institutions (NGOs etc) for advice, training, monitoring, quality control and regulation. 4. Establish guidelines and regulations for post-catch handling and marketing of fish. 5. Undertake feasibility studies of the value chain within the commodity. 6. Establish linkages between the beneficiary groups of the project and support sources including financial services (credit and savings), packaging agents, exporters, etc.
Expected result(s)	1. Women and other groups involved in post catch handling of fish are operating at organised levels of their enterprises, applying improved methods in their business with a corresponding increase in the quality and quantity of fish being supplied in the country. 2. Much greater availability of fish in the country at affordable levels, with a corresponding increase in the intake of the commodity and nutritional level of the people. 3. More women and youths are gainfully employed in the industry in most aspects of processing, marketing and distribution of fish in the country. 4. Losses in post catch handling of fish are significantly reduced with a corresponding increase in returns to the enterprises of the women groups and agents operating in the industry.
Impact on food security, poverty reduction & economic development	1. Fish being the cheapest form of protein in the country, the activities of the project will contribute measurably to increased intake of fish, and therefore increased levels of nutrition, food security at household level and increased livelihood and incomes. 2. New improved technologies will be used in smoking, handling, preservation, transporting and marketing, raising the competitive level of the products significantly, and targeting external markets, particularly subregional and other international high-value markets. 3. A high level of employment opportunities for young people and women will be available and the prospects for increased income will have been established, all of which attract increased investment in other segments of the value chain of fish products in the country. 4. The establishment of cooperatives provides a baseline from which to build up participatory development processes that could underpin sustainability of such investments.
Period of execution	5 years
Estimated cost	US$3.53 million

Inputs – Fish production processes – three sites	**Budget (US$)**
1. Building and infrastructure	1 500 000
2.Equipment and machinery	1 200 000
3. Vehicles and accessories	80 000
4. Training	150 000
5. Technical services, travel	400 000
6. General operating expenses and support costs	200 000
Total	**3 530 000**

Inputs in one site.

1. A large building (80x60 ft) equipped with aluminium-dressed work benches, knives, scales.
2. Ten smoke houses (60x40 ft) equipped with chorkor clay ovens and ancillaries (bowls, trays, cartons, scales, gloves, benches, etc).
3. Two cold storage containers (each 4 tonnes).

CAAS-LIB investment proposal for development of lowlands

Name of activity (project?)	**Promoting use of small-scale machines and equipment for sustainable productivity of lowlands**
Institutional responsibility	MOA; Chinese bilateral Assistance Agency; farmers' organizations and cooperatives; NGOs
Objectives of the activity **Description of main activities**	• Widespread use of improved sustainable technologies (intensive mechanical cultivation) of lowlands for food production (rice and vegetables) operated by farmers' cooperatives, groups and communities through use of small-scale mechanised farm power. • Introduction and sustainable use of low-cost mechanized technologies for value addition, operated by small- and medium scale-producers. • Widespread awareness of the benefits and responsibilities of owning, using, and managing for profit small- to medium-scale mechanized equipment for agricultural production and productivity. • A special unit established in the division of engineering and construction in MOA, with decentralized operational subunits in regional locations/producing areas to provide advice, training to user groups and monitoring activities for policy and investment. • Functioning support service centres and arrangements at local level for cost recovery, technical services and advice (operations, maintenance and repairs to machines and equipment) especially power-tillers, processing equipment; carrying out medium- to large-scale processing for value addition and product development; also used for storage of spare parts, fertilizers, agrochemicals and equipment. • User groups of small-scale producers trained and managing machines and equipment for mechanical cultivation of lowlands, and added value activities and product development in their enterprises. • Guidelines and procedures will be enforced to ensure standardization and pretesting of all small- to medium-scale machines, equipment and accessories to be supplied for the activity, essentially to ensure appropriateness to soil and environmental conditions of the country. • Securing support urgently from development partners particularly the Chinese Government and indigenous private sector interested parties. • Clear policy guidelines established on the nature, strategy and scope of the project in the short to medium term. • Identify suitable lowlands and farmer groups/communities and cooperatives to be involved in the project; confirm their needs, requirements and inputs for the implementation of the project. • Establish special unit with subunits within MOA and community support services in the regions/counties and programme for their involvement in the project. • Prepare plan of work of the project indicating construction of centres, assessment, procurement and installation of equipment and machinery, determination of the technologies to be applied; training; assistance to establish farmers' groups/cooperatives; establish linkages with support sources, etc. Train beneficiaries to operate and manage machines.
Expected result(s)	1. Increased economies of scale in land use and cost-effective use of improved technologies for production of crops, enhancing investment by farmers' groups. 2. The activity will stimulate farming communities in the areas of operation to form groups through which consolidated actions could be taken to increase their access to essential inputs such as improved seeds, fertilizers, other agrochemicals, hand tools and equipment. The group activities will attract extension services to the communities, firstly from the agencies that operate the mechanization practices and secondly from the national Ministry extension services. 3. The mechanized service activities will provide opportunities for employment of young people as drivers, mechanical engineers, agronomists and farm hands. 4. The accelerated production of rice will promote the self-sufficiency of the commodity, reducing the reliance on external supplies. 5. There will be concrete evidence that self-sufficiency in rice production could be achieved in the shortest possible time to meet national needs.

	6. Large numbers of farming communities in the area of the projects will participate in the mechanization schemes because the practice will relieve them of the labour-intensive manual preparation of land. 7. The availability of such technologies will have enhanced much greater participatory development, and encouraged smallholders to operate in groups for economies of scale, reducing high labour input, and maximizing profits.
Impact on food security, poverty reduction & economic development	1. There will be a noticeable increase in the availability of staple food commodities, particularly rice and vegetables, throughout the year, resulting from continuous cultivation of the lowlands and extending the production base; this will increase food security measurably at household level and improve access to food by the most vulnerable social groups. 2. Increased incomes of the smallholders through increased and continuously improved production, marketing and value addition. 3. Through the promotion of improved labour saving and post-harvest loss reduction techniques, and the introduction of double/triple cropping of rice, reduction in costs of production of staple food commodities will be seen; the country will dramatically increase its competitive advantage in rice production, and compete reasonably with cheap imports. 4. Much greater willingness and significant movement towards lowland cultivation of rice compared with uplands. A noticeable change in land use by the rural people (uplands for tree crops and lowlands for rice and vegetables) and dry season commercial production increasing productivity and economic development.
Period of execution	5–10 years
Estimated cost	US$4.5 million

Inputs per centre	**Budget (US$)**
1 Equipment and machinery*	2 500 000
2. Infrastructure (buildings, storage, roads, drying floors, etc.)	1 000 000
3. Support service units	75 000
4. Training	150 000
5. Materials and supplies	80 000
5. Various technical and operational services, travel	350 000
6. General operating expenses	70 000
TOTAL	**4 225 000**

***Equipment and machinery includes:**

- power-tillers and equipment/trailers
- transplanters
- medium-size mobile combine harvesters
- mobile, motorized small-scale threshers (1 000 kg/hr)
- 250–500 kg/hr rice mill & accessories
- storage facilities and packaging materials
- ancillary equipment and services

IV. LIBERIA'S RURAL FINANCE AND AGRICULTURAL MARKETING SUB-SECTORS

By

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with contributions from
Alfonso J. Wesseh, National Rural Finance and Marketing, Consultant, FAO

Liberia 2007

ACRONYMS

ACDB	Agricultural Cooperative Development Bank of Liberia
ACDI	Agricultural Cooperative Development International of the United States
ADB	African Development Bank
AFRACA	African Rural & Agricultural Credit Association
AGOA	The United States Government's "African Growth & Opportunity Act" programme to promote African exports to the USA
BIVAC	A private firm certifying the quality of exports from Liberia
BNF	Bureau of National Fisheries
CARE	Cooperative for American Relief Everywhere, an international NGO
CARI	Central Agricultural Research Institute of Liberia (Gbarnga, Bong Country)
CBL	Central Bank of Liberia
CBO	Community-based organizations
CDA	Cooperative Development Authority
CLUSA	Cooperative League of the United States
CRS	Catholic Relief Services, an international NGO
CU	Credit union, i.e. a savings and credit cooperative or association
EAC	A Liberian company formerly owning part of the LBDI
ECOWAS	The Economic Community of West African States
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAOR	The FAO Representative or the entire Representation in Liberia
FFA	Farmers' field school
FX	Foreign exchange
GOL	Government of Liberia
IAS	International Associated Services, a farm inputs and supply dealer in Monrovia
IDPs	Internally displaced persons
IFAD	International Fund for Agricultural Development of the United Nations
IFDC	International Centre for Soil Fertility and Agricultural Development
ILO	International Labour Organization of the United Nations
IMF	International Monetary Fund
INGO	International non-governmental organization
LBDI	Liberian Bank for Development and Investment
LCUNA	Liberia Credit Union National Association
LEAP	Local Enterprise Assistance Programme, a Liberian MFI
LiMFU	Liberia Marketing and Farmers Union
LMA	Liberia Marketing Association
LoA	Letter of agreement
LPMC	Liberia Produce Marketing Corporation
LT	Long-term
LWS	Lutheran World Service
M&E	Monitoring and evaluation
MCI	Ministry of Commerce and Industry
MF	Microfinance
MFI	Microfinance institution
MIS	Market information system OR management information system
MISTOWA	IFDC's Market Information Systems and Traders' Organizations Network and Project in West Africa

MOA	Ministry of Agriculture
MOF	Ministry of Finance
MPEA	Ministry of Planning and Economic Affairs
NCBA	National Cooperative Business Association (of the United States)
NEPAD	The African Union's New Programme for African Development
NFC	National Federation of Cooperatives
NGO	Non-governmental organization
PSI	Pre-shipment inspection
RAF	The FAO's Regional Office for Africa, located in Accra, Ghana
RF&MO	RAF's Rural Finance and Marketing Officer
RO	Reporting officer (i.e. the author of this document)
SIGOA-TOPS	The "Système Informatisé de Gestion des Opportunités d'Affaires" or "Trade Opportunities Management System" created by ECOWAS to promote intra-regional trade
SPFS	The FAO's Special Programme for Food Security
TA	Technical Assistance
TCP	The FAO's Technical Cooperation Programme, its internal project window
UL	University of Liberia
UN	The United Nations
UNCDF	The United Nations Capital Development Fund
UNDP	The United Nations Development Programme
UNFPA	The United Nations Fund for Population Affairs
UNICEF	The United Nations Information, Cultural and Education Foundation
UNIDO	The United Nations Industrial Development Organization
UNMIL	United Nations Mission in Liberia
UNOPS	United Nations Office for Project Services
USAID	The United States Agency for International Development
WB	The World Bank
WOCCU	World Council of Credit Unions, Inc. (United States)
WTO	The World Trade Organization
WVI	World Vision International, an international NGO

IV. LIBERIA'S RURAL FINANCE AND AGRICULTURAL MARKETING SUB-SECTORS

1. INTRODUCTION

This study was carried out jointly by Mr Chet Aeschliman, Rural Finance and Marketing Officer attached to the FAO's Regional Office for Africa located in Accra, Ghana, and Mr Alfonso Wesseh, Rural Finance and Marketing Consultant, based in Monrovia, Liberia. The study results have been derived from a review of relevant documentation (see the References in Annex 2 for a list of documents consulted) and interviews with several informed individuals from over a range of different organizations. These organizations included FAO staff, representatives of donors and other UN agencies, government ministries and agencies, local governments, various NGOs, farmers' cooperatives, farmers' associations, marketing associations, banks, credit unions, microfinance institutions, and a number of independent consultants. A list of the team's principal interlocutors, along with their contact information, can be found in Annex 3. These interviews were carried out in Monrovia, as well as elsewhere in Monserrado County, and in Bomi, Bong, Grand Bassa, Margibi, Maryland and Nimba counties. The team planned to visit even more counties, especially Lofa County because of its position as Liberia's leading agricultural producer, as well as Grand Gedeh County, but ultimately could not because of the unavailability of transport and impassable rainy season roads in these two counties. During the course of their research, the consultants also consulted the FAOR's database of the various institutions involved in the agricultural sector, and started to build up additional databases of (1) farmer cooperatives and (2) larger commercial farms.

Figure 1

The conclusions reached and presented in this report are those of the two consultants named above alone, and may not necessarily coincide with the views of other FAO colleagues or consultants. It is fair to say, however, that there is a wide consensus among those interviewed about the nature of the existing constraints, as well as on appropriate solutions (outlined below) to problems in the Liberian rural finance and agricultural produce marketing sub-sectors.

2. REVIEW OF PAST EXPERIENCES IN THE RURAL FINANCE AND MARKETING SUB-SECTORS

Over the years, many individuals and organizations have been involved in the production, processing, storage, transportation, financing and marketing (including export) of Liberia's agricultural produce. These include the producers and their organizations, produce buyers, banks, NGOs, GOL, marketing associations, input suppliers and other actors. While the role of each of these parties in the various value chains is discussed immediately below, their pre-war relationships are shown in the diagram on the following page.

2.1 Agricultural producers and farmer organizations

These include thousands of individual smallholder farmers, currently estimated to number approximately 350 000 families.[1] These individual smallholder producers need access to farm input, working capital and seasonal loans along with medium- and long-term credit for investment in their farms, as well as savings, insurance and money transfer services. They have been greatly disadvantaged since the failure of the Agricultural Cooperative Development Bank (ACDB), formerly the economic motor of Liberia's rural economy. The number, cohesiveness and effectiveness of the many formal and informal farmer associations existing before the civil war were also greatly reduced by the war, so that farmers are less likely to help each other than was the case in pre-war times.

2.2 Agricultural cooperative networks

Prior to the war, there were approximately a hundred significant farmer marketing cooperatives and associations with approximately 75 000 members[2], and these operated relatively effectively compared to other African countries' agricultural cooperatives, considering that most of other countries' cooperatives failed even without having to deal with a civil war. The following charts illustrate the approximate magnitude of known agricultural cooperatives in Liberia.

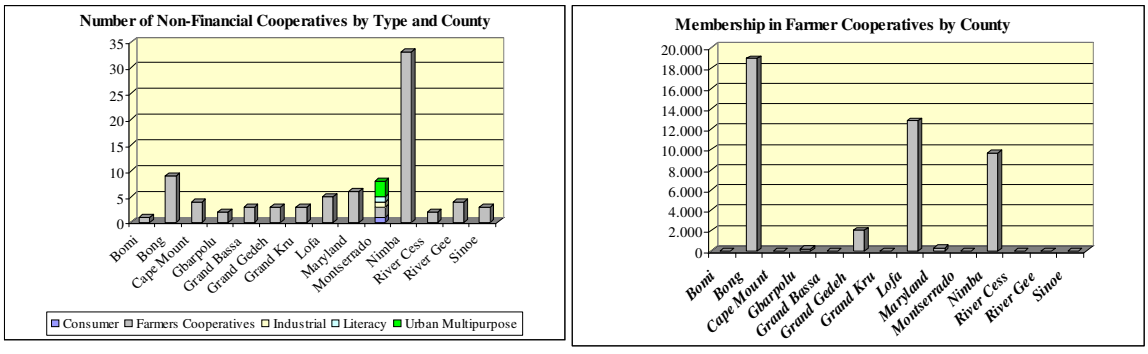
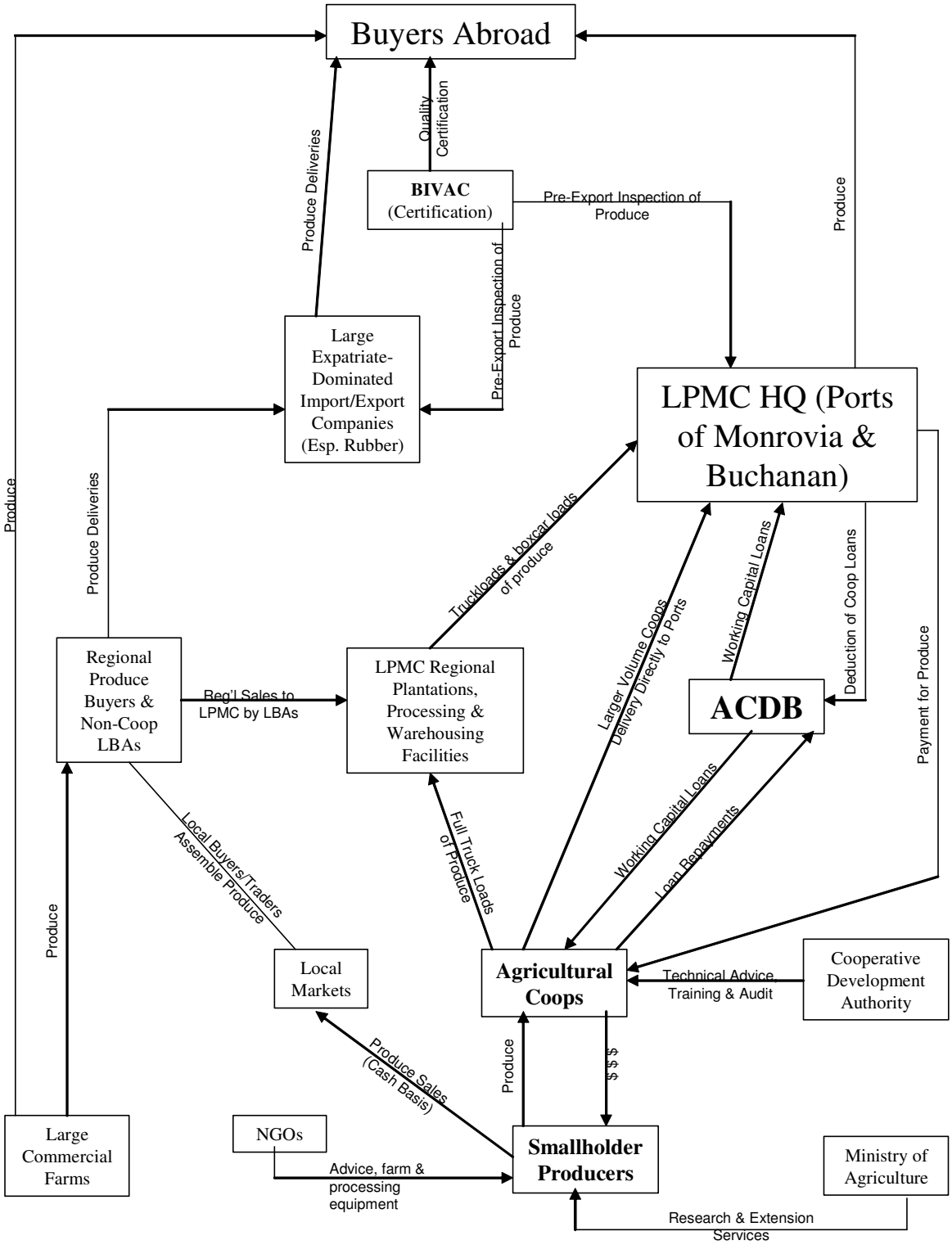


Figure 2

[1] FAO/WFP Crop and Food Security Assessment for Liberia, February 2006, p. 19.

[2] Based largely on statistics provided by CDA and Mr John Willie of the NGO LIDS in Bong County.

Simplified Pre-War Rural Finance & Smallholder Marketing Channels



The principal role of these non-financial cooperatives and associations was to buy cash crops from their members with working capital financing provided by the ACDB, and to deliver the produce to the LPMC, which exported them in a not too inefficient manner, considering that it is a government agency. However, most of Liberia's agricultural cooperatives collapsed during the civil war. In Nimba County, however, new agricultural cooperatives have been formed to beef up a few old ones that managed to survive the war to some extent. In Bong County, Tugban Union Cooperative, an Apex Body, operates the county's entire

cooperative network. Many successful farmer cooperatives also existed prior to the war in Lofa County, but most have ceased operations. Although some of these Lofa County cooperatives could fairly easily be resurrected, according to some interlocutors, by restoring their physical facilities and equipment, the consultants could not verify this on site because of the access having been made impossible by the rainy season. While farmers' cooperatives have existed elsewhere in Liberia, most are concentrated in the country's so-called "bread basket", consisting principally of Lofa, Bong and Nimba counties. Annex 4 contains a list of known cooperatives with limited information on their location and membership. Information on their turnover, assets and other financial aggregates is simply unavailable. Many of the cooperatives, at least in Bong and Nimba counties, have processing and storage facilities that could be restored fairly easily. Moreover, most farmer cooperative members interviewed by the the consultants consistently assured the team that the cooperatives could be easily restored to their former glory if (1) the physical premises and infrastructure were restored and (2) members could be assured that their cash crops can be effectively marketed. The National Federation of Cooperatives (NFC) is an apex body for all cooperatives in the country, and has the responsibility of protecting the interest of farmers and representing them at all levels. The federation, however, is also penniless and overly dependent on and beholden to GOL, i.e. the CDA, in whose offices it resides.

Because successful farmer cooperatives existed for a considerable period prior to the war, the rural population has had a generally positive experience with them. Accordingly, the consultants believe that the fastest way to jumpstart the rural economy is to assist in the rejuvenation and strengthening of these cooperatives, which represent several tens of thousands of rural households.

2.3 Large commercial farms and plantations and their processing facilities

Prior to the Liberian Civil War, there were many large commercial farms operating successfully in Liberia. These large commercial farms were mainly involved in the production and exportation of food crops, including, as incredible as it sounds today, rice. However, most of these traditional enterprises were looted and collapsed during the war. Some of the most successful pre-war commercial food farms included those listed in Table 1 below:

Table 1. Large pre-war commercial food crop farms

No.	Farm	Location
1	Christian Baker Farm	Bong County
2	Stephen Tolbert Farm	Bong County
3	Alfred Mensah Farm	Mount Barclay, Montserrado County
4	Ceril Bright Farms	Bong & Montserrado Counties
5	Daniel Goe Farm	Suakoko, Bong County
6	William R. Tolbert Farm	Gbalatua, Bong County
7	Richard A. Henries Farm	Wensue, Bong County

The extent to which any of these farms could be rehabilitated is unknown.

Recently, several large new commercial food farms, most with highly diversified activities, have emerged, which also produce primarily food crops, but so far their exports are limited principally to garri (farina). These large new commercial farms are concentrated almost entirely in Montserrado, Margibi and Bong counties and they target and serve the central

markets in the city of Monrovia. A few of these farms identified by the consultants are listed in Table 2.

Table 2. Currently operating large commercial food farms

No.	Farm	Location
1	Benoni Urey's Farm	Caresburg, Montserrado County
2	Ceril Allen's Farm	Weala, Bong County
3	Arjay's Farm	Montserrado County
4	Belle Dunbar's Farm	Caresburg, Montserrado County
5	Georges Haddad's Farm	Po River, Montserrado County
6	Roger Francis's Farm	Kakata, Margibi County

There are reportedly many more such farms in Montserrado, Bong & Margibi counties, many belonging to former government officials, but the consultants were unfortunately unable to put together a more complete list of such large commercial farms. Some of these large farms have significant processing and storage facilities, and have indicated they would welcome the development of smallholder "outgrower" schemes that would produce additional raw produce (mainly rice, cassava and palm fruit) for their mills, which have difficulty reaching full capacity with only their own farm's produce. Of course, such schemes would have to be able to guarantee that a minimum level of quality is assured.

In addition to these large food crop farms, a good number of large cash crop plantations are also operating. For example, Table 3 contains a list of large rubber farms currently in operation.

Table 3. Large rubber farms

No.	Farm	Location
1	Arthur Sherman Farm	Margibi County
2	Tommy Bernard Farm	Margibi County
3	Catholic Fathers Farm	Margibi County
4	Dennis Farm	Margibi County
5	Harris Morris Farm	Margibi County
6	Francis Lewis Farm	Margibi County
7	R.E. Bright Farm	Margibi County
8	William R. Tolbert Farm	Gbalatua, Bong County
9	Daniel Goe Farm	Suakoko, Bong County
10	Samuel Wolo Farm	Gbaota, Bong County
11	Plukpeh Farmers Farm	Kpatawee, Bong County

Large cocoa and coffee farms currently in operation include those listed inj Table 4.

Table 4. Large cocoa and coffee plantations

No.	Farm	Location
1	David Gasinie Farm	Botota, Bong County
2	Wesseh Zor Farm	Sayewah Town, Bong County
3	Taylor Dolo Farm	Geolokpah, Bong County
4	Freeman Belleh Farm	Geolokpah, Bong County
5	Daniel Wamah Farm	Wlehta, Bong County
6	Flomo Desso Farm	Yeakai, Bong county
7	Harvey Diggs Farm	Bellefana, Bong County
8	Salomon Weawea Farm	Farway, Bong County
9	David Kweeklay Farm	Saclepea, Nimba County
10	George Kwepee Farm	Tapita, Nimba County
11	Old Man Suomi Farm	Bolay, Nimba County
12	Wodo Farmers Coop. Farm	Kahnplay, Nimba County
13	Peter Gmah Farm	Bahn, Nimba County
14	Mr Korpleh's Farm	Kpein, Nimba County

Linking the processing, storage, transport and marketing capability of all of these large commercial farms with smallholders in the surrounding area might well become a very profitable partnership for all concerned, if properly designed and managed.

2.4 Local village and district assembly markets

There are large markets in all counties. These markets often have branches in outlying villages that are smaller, and operate in almost all cases once a week. Most market infrastructure is in a deplorable condition. For example, in most of those markets visited by the International and National Rural Finance and Marketing Consultants, the market stall roofs generally no longer exist. The feeder roads leading to most of these markets are also deplorable, with the end result that few commercial traders are able to bring their trucks there to purchase produce, and the only way to evacuate the produce to more distant markets is in small quantities, typically carried in head pans, often over a journey lasting several days. This fact greatly discourages farmers from producing more than their families can consume and growing the additional amount that is necessary to sell or barter for other family necessities.

2.5 Produce buyers

Traders purchasing Liberian farmers' produce can be categorized into three groups: small-scale local buyers, wealthy foreign traders resident in Liberia and traders from neighbouring countries. The following section discusses each group:

Small-scale local buyers
Most agricultural produce marketed by small-scale farmers is sold in small quantities to other villagers in local markets. However, some villagers with more financial and transport means also buy local produce and wholesale it to wealthy merchants in Monrovia and secondary cities, in cases where transport is available. Most such village traders have no access to affordable and sustainable financial services; they can count only on friends, families, *susu*s, and wealthy usurers when in need of capital to finance their investments in agricultural production.

Wealthy buyers (foreign traders and commerçants, primarily Lebanese)
Prior to the Liberian Civil War, the country exported considerable quantities of agricultural produce, including rice, the importation of which is currently draining the country's foreign reserves. Exports of food virtually came to a halt during the war, and have still not resumed to any scale. There are only a handful of large- or medium-scale produce buyers, but they lack either the capacity to buy and/or the necessary transport (because of impassable roads) for very large quantities of the farm products produced by local farmers.

Neighbouring countries (Guinea, Côte d'Ivoire and Sierra Leone)
Because of bad roads and the lack of a sufficient number of produce traders in Liberia, considerable cross-border trade exists between Liberia and her neighbouring countries, particularly in areas near an international border, e.g. Ganta and Sanniquellie in Nimba County, both visited by the consultants. Residents of such remote and difficult-to-reach areas (remote despite the fact that Sanniquellie is Nimba County's capital!) find it much easier to market their produce in Guinea, Sierra Leone or Côte d'Ivoire than in Monrovia, Buchanan or any of Liberia's other secondary cities. Local provisions stores in Ganta and Sanniquellie were full of Guinean products, too, indicating that produce traders frequently return from

Guinea with merchandise, rather than money. Repair of the bombed-out former Sanniquellie (Nimba County capital) to Buchanan (Grand Bassa County capital and Liberia's second most important port) railroad would change that considerably, however. Another factor that causes this cross-border trade is the lack of price stabilization for local produce in the country.

2.6 Financial institutions

The Agricultural Cooperative Development Bank (ACDB)
The ACDB was created with the objective of assuring that small farmers could effectively and profitably market their produce through agricultural cooperatives and farmers' associations. The bank operated successfully for many years, granting short-term working capital loans to farmers' cooperatives, farmers' associations and individual farmers, so that they could purchase the cash crops (coffee, cocoa, rubber and palm oil, principally) on a cash basis. However, the bank is no longer functioning, and institutional credit is generally unavailable throughout the country's rural areas, either for individual farmers or the cooperatives, farmers' associations and other rural enterprises that they operate individually or collectively.

Commercial banks
There are five commercial banks[3] in Liberia, but only two have any presence outside Monrovia. Heavily liquid, these commercial banks could theoretically lend a considerable percentage of their total loan portfolio to the agricultural sector, particularly to well-run farmer cooperatives and associations. Lending to such entities would decrease the risk to lenders, compared with loans to individual small farmers. They could be strongly encouraged by GOL and donors to lend at least some minimum percentage of their portfolio to farmers' organizations (cooperatives and associations) to at least partially fill the vacuum created by the collapse of the ACDB. The Liberian Bank for Development and Investment (LBDI) has a branch in Margibi County at Harbel/Firestone, and is nearing completion of another branch in Ganta, Nimba County. The bank's manager hopes to open branches in Buchanan, Grand Bassa County, as well as in Voinjama, Lofa County, in 2007, and in other counties in succeeding years. Ecobank, too, is opening branches in Nimba and Grand Bassa counties, and has plans to open branches in other counties in coming years. Both of Liberia's two principal commercial banks – LBDI and Ecobank – expressed interest in working with FAO and donors in financing farm and off-farm rural enterprises. LBDI would seem to be the better potential partner in that respect, because it insists on doing its own "due diligence" study of each prospective borrower, while Ecobank representatives indicated that they would be happy to lend money to anyone donors instructed them to, as long as the donors covered any loss. Still, the need for rural finance is huge, and both banks will probably need to be involved. Some competition between the two banks for rural business would not be undesirable, either.

Microfinance institutions
The Liberia Enterprise Assistance Program (LEAP) and Liberty Finance are the two most significant microfinance institutions (MFIs) currently operating in Liberia, although some other fledgling MFIs are springing up around the country, mostly through the initiatives of NGOs. Liberty Finance is an outgrowth of the American Refugee Committee (ARC) credit programmes with IDPs in Liberia and neighbouring countries (according to ARC policy, returning refugees that repaid their loans when in Guinea, Sierra Leone or Côte d'Ivoire are

[3] These include the Liberia Bank for Development and Investment (LBDI), Ecobank, Global Bank Liberia Limited, International Bank Liberia Limited (IB) and First International Bank (Liberia) Limited.

almost automatically granted new loans upon their return home). Outside greater Monrovia, these two MFIs currently have branches in Bomi, Margibi and Bong counties only. The consultants also identified some MFIs (credit unions and others) being organized by the national NGO Grassroots Democracy Inc. in Nimba County, but were unsuccessful in meeting with either the NGO or the fledgling MFIs. The UNDP, as part of its Community Base Recovery Programme, has also started promoting credit unions in two counties. Currently, and for the foreseeable future, MFIs as a group will not be in a position to offer significant levels of outreach, especially in rural areas, because they focus primarily on urban women traders. The team also visited one credit union in Nimba County that had not been visited (for examination or otherwise) either by its Apex body, LCUNA, or by CDA staff for many years, and clearly the records were in a disastrous state (when asked by the consultants if they could see a financial statement, the bookkeeper replied, "a financial what?"). Although apparently several dozen young rural credit unions now exist, LCUNA is unaware of them and continues to work exclusively with a dozen older and larger urban member credit unions, all of which survived the war in various states of health. At present, therefore, LCUNA is of little relevance to rural finance. This could quickly change, however, since those organizations supporting the development of new rural credit unions indicated that they would collaborate closely with any USAID project focused on resurrecting the LCUNA credit union network.

BIVAC International

BIVAC is a subsidiary of the internationally recognized Bureau Veritas Group, which specializes in the verification of export product quality and shipments' conformity with contractual obligations, generally known as PSI ("Pre-Shipment Inspection") services. In its laboratories at the Monrovia Port, it typically verifies the quality of agricultural products being exported on behalf of the prospective purchasers abroad. It has not been given a monopoly on pre-shipment verification. Several of the consultants' knowledgeable interlocutors complained about the poor quality of BIVAC's quality assurance services. It may be for this reason that the Ministry of Commerce and Industry is planning to set up its own PST testing laboratory (thanks to a grant from UNMIL) and to offer product quality assurance services (see more on this below), a fairly questionable move in this era of liberalization and disengagement of the State.

NGOs

There are hundreds of both international and national NGOs operating within Liberia. In fact, while constructing a Microsoft Access database of development agencies (mostly NGOs) involved in Liberia's agricultural development, the FAOR inventoried 405 organizations, most of which are NGOs. This FAO initiative, though laudable in its attempt to map agricultural interventions around the country, unfortunately did not receive much cooperation from the inventoried organizations. In fact, only 28 of the 405 organizations even supplied a minimum of information on their operations in the various counties. Accordingly, the type, quantity and outreach of these different agencies are not known with much precision. What is certain, though, is that their operations are quite diversified, with operations in all sectors and districts, often at cross purposes, for lack of coordination. In the area of agricultural finance and marketing, NGO involvement has consisted of training of farmers, assistance in obtaining processing equipment, help in identifying markets, studies of particular commodities, and a myriad of other types of assistance. The consultants recommend that the FAOR database be transferred to the Ministry of Agriculture (MOA), which may have the clout required to insist that all NGOs comply and provide the required information, so that Liberian authorities can effectively monitor and coordinate interventions throughout the

country and eliminate the current considerable duplication of effort. While the database as constructed is useful, the MOA could benefit from some technical assistance in turning this mass of data and seemingly endless tables into information (see Annex 5 for some illustrative reports and charts that suggest how this database could be made much more useful to decision-makers). The database's currently defined reports, basically long lists, do not provide the analysis, or information, needed to know what is happening in the sector, but upgrading the tool to do so would not be difficult for a skilled Microsoft Access developer.

Government:

Ministry of Agriculture

The MOA seeks to establish a Comprehensive Agricultural Policy and Planning Framework for Liberia. In this framework, the role of CARI, as a semi-autonomous agency under the MOA created to carry on basic, applied and adaptive research on all aspects of agricultural needs, takes a central stage.

The years of civil war have had devastating effects on CARI. All its physical infrastructure was damaged or destroyed; all trained staff have left – most are out of the country, while the few remaining in Liberia have entered alternative professions/occupations; all germplasm and research stocks/resources were lost; all past documentation on research achievements were destroyed; worst of all, all financial support linkages have been broken/severed over the years.

As Liberia moves into postwar reconstruction and development, there is the need for CARI and the MOA to play a more meaningful role in an accelerated national agricultural development that will characterize this postwar era.

CARI hopefully will carry on adaptive and applied research in various components of farming systems. A holistic approach is envisaged in which food, protein and cash crop production will successfully interplay with post-harvest processing, value addition and income generation to promote improved and sustainable livelihoods for farm families.

Ministry of Commerce and Industry

Theoretically, the Ministry of Commerce and Industry (MCI) has a role in encouraging businesses, including agri-businesses, through advice, publications and research into attracting potential export markets abroad, etc. The Ministry also has a mandate to conduct business registration of the agricultural sector; the Ministry's inspectors have the responsibility of ensuring that prices of commodities are monitored and feedback provided to the public. In this respect, it claims to be operating a market information system (MIS) which collects information on commodity prices around the country, but when asked what was done with the information thus collected, the team's interlocutors indicated that "if anyone asks for it, we provide it to them" – certainly this is not a very pro-active approach. MCI was, incidentally, ultimately unable to provide any market information to the team. For this reason, the international consultant provided the MOA – not MCI – with an FAO CD containing software for running an effective MIS, thinking that the MOA would be a better host for such an MIS than MCI. Based on the consultants' interviews with MCI officials, therefore, the Ministry does not currently seem to be accomplishing any of these goals. Ministry officials did indicate that they plan to begin testing produce for export on behalf of prospective buyers, but in this era of liberalization and reduced State intervention in the economy, that move, financed by UNMIL and possibly motivated by buyer dissatisfaction

with BIVAC, does seem questionable. At any rate, MCI currently seems largely irrelevant as far as agricultural produce marketing is concerned.

Cooperative Development Authority
Cooperative societies were organized in Liberia primarily to cater to the development needs of less fortunate rural and urban dwellers, using their own self-help initiatives. They empowered their members to achieve socio-economic independence through working together as a united group with a common bond to promote the interest of all their members and their communities. In 1936, the Cooperative Societies Act was enacted by the National Legislature of Liberia; it is still the law of the land.

The Cooperative Development Agency (CDA) was established on 7 April 1981 after Agriculture Cooperative Development International (ACDI) of the United States made a recommendation to that effect to GOL. The current capacity of CDA to fulfil its role as promoter, trainer and inspector is largely unmet, because its current staff are insufficient in numbers and in technical capacity in critical skill areas; senior staff members, for example, have little, if any, technical knowledge of how cooperatives should be properly managed.

LPMC and licensed buying agents
The LPMC was established to develop the export market. It started as a corporation with a 49 percent share owned by a private concern (EAC) and a 51 percent share owned by GOL. It deposited 15 percent of its funds in the ACDB, and these funds were used to provide loans to small farmers. In 1976, the GOL bought the EAC shares and the institution became 100 percent GOL owned. In 1980, between 50 and 80 million US dollars of ACDB funds disappeared while in LPMC's hands. Then the war came and devastated everything. Since the end of the war, no produce has been marketed by LPMC, formerly the principal exporter of produce, thus depleting Liberia's foreign exchange and greatly decreasing GOL tax receipts. The role of LPMC in the supply chain clearly needs to be addressed. LPMC has been unable to stabilize prices in the agriculture sector, although it lamely continues to announce "floor" prices for principal commodities below which farmers should not sell their produce. Because it is no longer the "buyer of last resort", however, traders can and do purchase produce for substantially less than the supposed floor prices. When still operating, LPMC granted LPA ("Licensed Purchasing Agent") status to buyers, who actually assembled most of the produce eventually marketed by LPMC.

2.7 Wholesalers

Small-scale wholesalers of agricultural products are primarily small-scale farmers themselves, the majority being women, residing in rural villages and towns. They try to increase their income by buying neighbours' produce and transporting it to the larger regional commercial markets, or even to the urban areas where it is sold either on a retail basis in markets or to larger buyers and more wealthy produce wholesalers. The relatively small number of commercial farm owner/operators also sell on a wholesale basis.

2.8 Marketing associations

Several marketing associations exist in Liberia, for the most part devoted to dealing with particular commodities and markets.

The Liberia Marketing Association (LMA) and its associated regional marketing associations are the principal distributors of imported food and other basic necessities into the interior of the country. The LMA has overall supervision over all marketing activities in the country. It has branches in all of the counties in Liberia. The LMA itself does not import goods from outside Liberia, but some of its member marketers do. LMA claims to have over 300 000 members – a considerable outreach – who themselves do import from abroad, mostly from neighbouring countries. The LMA is evidently a rather fractious organization, with frequent changes of senior staff and leadership, ultimately proving itself incapable of providing key information to the consultants. The LMA deserves continued monitoring by development agencies, however, and if it could benefit from some effective project or non-project training in management and marketing, may ultimately be an effective development partner. No other Liberian organization has, at least theoretically, the nationwide outreach enjoyed by LMA.

Liberian Marketing and Farmers Union (LiMFU)
This is a new agricultural organization that was organized after the war. Its objective is to assist and empower farmers. LiMFU is organized in a manner similar to LMA, with county and district coordinators. Its trading activities are currently limited to a very small number of products. Being newer and eager to prove itself, it would clearly at the present time be a better development partner than the much larger, but currently fractious, LMA. In fact, the consultants asked LiMFU's leaders to reflect on how the development community could best collaborate with LiMFU, but the union was unable to do so. LiMFU, too, could therefore very profitably benefit from some marketing, management and especially planning assistance, so that it more clearly articulates its mission, vision and key objectives.

There are also some specific commodity-focused producer associations that carry out a marketing role, e.g. the Rubber Planters Association of Liberia. In addition, Tungban Union Farmers' Cooperative is an Apex body for all farmers' cooperatives in Bong County. It markets members' produce, consisting principally of cocoa, coffee, rice, and palm oil.

2.9 Farm input and equipment importers and dealers

Farm input and equipment suppliers exist rarely in Monrovia, and the shelves of even these few stores are mostly bare. Farm inputs are generally unavailable in Liberia outside Monrovia, with the exception of inputs for cash crop – mainly rubber – farmers who obtain them from produce buyers, principally Firestone and Weala. Even if farm inputs and equipment were more widely available, Liberia maintains high duties on these articles, making them effectively uneconomical for farmers to use. The Liberian authorities should, accordingly, give serious consideration to eliminating these duties, which could have a stimulating impact on agricultural production.

Currently, there are three dealers in farm materials in the country: Anarco, Greenland, and International Associated Services (IAS). Farm materials are mostly purchased by NGOs, international organizations and commercial farm owners, because small farmers do not have the necessary working capital to finance their farms' investments. The importers are not bringing in much farm equipment because, as they put it, "there is no business yet". However, they do have the capacity to bring in farm inputs and equipment, should effective demand for these materialize.

2.10 Transporters

Although roads in Monrovia are bad, roads outside Monrovia are often even worse. For this reason, the cost of transportation is high, sometimes unaffordable and often even completely unavailable for market women to transport their goods. Because of these reasons, local food crops brought from the villages to central markets, and even in Monrovia, are sold at exorbitant prices.

2.11 Warehousers

There are bonded warehouses in the Free Port of Monrovia for storage of goods. Local marketers also have warehouses, but many of them need to be renovated and/or expanded. The LPMC also has considerable warehouse space theoretically available for rental by the public, but the premises are dilapidated and do not inspire much confidence, and the fact that LPMC has lost many millions of US dollars' worth of farmers' money further erodes any remaining confidence in that institution. Many of the Lofa, Bong and Nimba county-based farmer cooperatives also had produce warehouses, which could also be renovated fairly quickly.

3. ANALYSIS OF THE CURRENT SITUATION

3.1 Review of the rural finance sub-sector

Essentially, most rural areas are not served by either formal or informal financial institutions, other than the *susu* revolving savings and credit societies. Even the ubiquitous *susu*s, though, are hardly appropriate for agricultural finance, because generally one has to wait one's turn, frequently a number of months, before receiving the periodic "pot", and agricultural finance, to be useful, needs to be timely. Saving up for the purchase of farm tools or other equipment through a *susu*, however, is an effective method of financing. The existing, nascent provision of formal rural financial services in Liberia is limited to the following sources.

- Limited, mainly scattered, small in-kind loans from NGOs, principally international NGOs with donor funding (mostly from USAID and the EU).
- Little formal research has been carried out on the demand and supply of microfinance services. However, in 2003, UNCDF estimated that roughly 9 200 households had access to credit with an unmet demand of 71 000 households. WOCCU's own recent studies showed huge unmet loan demand in existing credit unions, resulting in credit rationing, but that demand for savings services is generally universally higher than the demand for credit. Two nascent microfinance institutions (Liberty Finance, operating principally in Monrovia) and LEAP (the Evangelical Church's "Local Enterprise Assistance Programme"), operating mostly in Montserrado County, and to a lesser extent in Margibi, Bomi and Bong counties, do not currently provide rural financial services, focusing instead on the traditional micro-credit target group: poor urban market women and small-scale traders with quick turnover permitting small weekly loan repayments. UNDP, in a new project just starting up, hopes to help these two and other nascent MFIs to develop appropriate rural products and to help the MFIs to extend their services into rural areas over the next 5 years, but the extension of MFIs into most rural areas will take 5, 10 or even 20 years before their outreach will be very widespread. The development of sustainable networks of MFIs is a generational endeavour. UNDP is, accordingly, almost

certainly overly optimistic about the likely results from its microfinance development project.

- There is growing interest (and competition), but so far little actual experience, on the part of the two largest commercial banks operating in Liberia, i.e. LBDI and Ecobank, in the micro-credit field. Both have experimented with urban micro-credit, and are planning to expand into rural micro-credit. Both are opening branches this year in Ganta (Nimba County), and plan several new branches in other counties in coming years, with branches in Margibi, Voinjama (Lofa) and Buchanan (Grand Bassa) being next year's main targets. Both have expressed interest in working with the MOA and FAO in developing appropriate tools and products to serve this market. LBDI probably has the soundest approach, insisting on doing its own "due diligence" of clients recommended by FAO or MOA, while EcoBANK would be satisfied to simply grant loans to anyone donors recommend, and expects all losses to be covered by the donors.
- There is a growing number of rural credit unions, primarily in Nimba County, being promoted not by LCUNA, the national credit union apex, but rather by the NGO Grassroots Democracy, Inc., a dangerous situation for LCUNA. UNDP, too, is organizing credit unions in two counties, also independently of LCUNA. The World Council of Credit Unions, Inc. (WOCCU) has submitted a $5 million proposal to USAID to rebuild the Liberian credit union industry, and the donor appears to be looking favourably on this proposal, which is designed to resurrect the Liberian credit union industry, formerly one of Africa's strongest.
- Seasonal input (chemicals and planting material) loans are granted to small cash crop (mainly rubber) farmers by produce buyers.
- The Agricultural Cooperative Development Bank (ACDB), formerly the financial "motor" of rural Liberia, has failed. In fact, it is dead, and like any dead body needs to be officially buried.
- Still, the infancy of rural microfinance in Liberia, the rarity of bank branches outside Monrovia and the conservative approach of commercial banks mean that for the foreseeable future, at least for the next 5 to 10 years, rural financial services will not be available to the vast majority of creditworthy farmers, at least through currently available channels. Even when the MFIs finally arrive in a majority of villages, most will be reluctant to invest large sums of money in agriculture because of the perceived high risk of doing so.

3.2 Conclusions on rural finance

- MOA and FAO should support the UNDP/UNCDF initiative to expand existing fledgling microfinance institutions into rural areas, but should recognize that this is a long-term process, and their penetration into the majority of rural areas will take decades.
- Development agencies can and should also work with the two principal commercial banks and help them to develop appropriate products and services to serve farmers and other rural entrepreneurs, by providing the banks with seed funds to finance loans to farmer organizations, as well as technical assistance in managing loans to farmer organizations and other rural enterprises.
- However, if development agencies (including FAO) genuinely wish to place substantial needed resources into the hands of farmers and other rural entrepreneurs in any

foreseeable future, the creation of a new agricultural development bank may well be necessary. Because of the history of the ACDB, this should not just be a recapitalization of that failed bank and re-hiring of its former staff. The bank and its managers failed, as did most of Africa's other agricultural development banks, and cannot be expected to do better a second time around. However, we know why they failed (mainly because they were run by agriculturalists and politically oriented civil servants, instead of by experienced, professional profit-oriented bankers), and hopefully one could avoid making the same mistakes in the future. There are several successful agri-banks in Africa and elsewhere that can be emulated and learnt from. In fact, the African Rural and Agricultural Credit Association (AFRACA) holds periodic forums of its several agri-bank members, one of which took place recently in Accra, and these successful agri-banks can be counted on to help. Only a new agricultural development bank would be willing to take the risks necessary in Liberia's current circumstances to jumpstart Liberian agriculture. In short, because of the infancy of Liberia's microfinance industry, and the non-existence of any formal financial institutions in most of the country, an agricultural development bank is probably indispensable to the renewal of the country's agriculture sector. Any alternatives to the creation of a new agri-bank would probably take so long that demobilized combatants and IDPs may be tempted to return to violence to achieve their goals.

Of course, the difficulty with this approach is that, for more than a decade now, most donors have for good or bad decided no longer to support agricultural development banks. Accordingly, if the GOL agrees with the consultants that a new agri-bank is absolutely necessary, then it will almost certainly have to finance the establishment of the new bank all by itself, with little, if any, donor support. Considering the current state of the GOL treasury, though, such a State investment does not seem likely or even possible.

If it is the judgement of Liberian authorities that it cannot afford a new agri-bank, then for the several decades it will take for MFIs to be present throughout the country, the only remaining alternative is to encourage the two principal commercial banks – LBDI and Ecobank – to finance farms and other rural enterprises in rural Liberia. This possibility will be further developed below in Section IV, The way forward.

One of the financial products to be further developed, whether for a new Agri-Bank or for the two commercial banks, is inventory credit. In fact, the ACDB frequently provided inventory credit in pre-war times, but not in the conventional triangular manner involving a producer or trader, a financial institution and a bonded warehouse. Basically, the latter bonded warehouses were not a part of the old ACDB scheme, and credit was granted based on the bank's inspection of the borrower's stocks of produce located in the borrower's own warehouse – obviously a much more risky loan than if the inventory is held by a trusted third party. Development of the practice of "triangular" inventory credit, however, would obviously require an increase in the capacity of bonded warehouses.

- Liberia's war-depleted livestock herds should be built up through the in-kind provision of infant poultry and small ruminants to farmers that are also repaid in kind (chicks, lambs and kids) and the "repaid" infant animals provided in a cascading manner in turn to other farmers, as successfully done by FAO in Chad, Niger, Burkina Faso, Mali and elsewhere around the world by the international NGO Heifer International, etc. This is a known technology that works, with very high repayment rates.
- Because rural finance is likely to be very limited for quite some time, the consultants also propose some prioritization of clients. Credit should be provided on a priority basis to the country's best farmers, those having participated successfully in the FAO's SPFS

programme or other farmer capacity-building programmes (mostly those carried out by international NGOs), and as their capacity improves, to operationally sustainable farmer cooperatives, concentrated mostly in Lofa, Bong and Nimba counties. By best or "model" farmers, the consultants do not necessarily mean the largest, but rather those that are most technically competent, commercially oriented and, most importantly, profitable. Lending should focus on those farm households whose overall net cash flow is high enough to permit the repayment of the loan, with reasonable interest rates and other charges. No loans should be granted to unprofitable subsistence farmers until their combined farm and non-farm operations begin to generate the marketable surpluses and profits that would make loan repayment possible. Government agencies and donors wanting to help such poverty-stricken subsistence farmers should provide grants and gifts, not loans. The granting of loans that we know will never be repaid to such farmers would only undermine the sustainable rural financial markets we all want to build.

3.3 Review of the agricultural produce marketing sub-sector

There are gluts of produce in some rural areas, but because farmers have no way to evacuate these in many cases except by carrying small head load quantities long distances to the nearest market, and because there is in most cases no post-harvest processing or preservation, much produce that would fetch a good price somewhere else in the country simply spoils. Farmers have had enough such bad experiences that they are discouraged from growing any more than is needed for their own family's consumption, and a small extra quantity to carry by head pan load to the closest markets to barter for other family necessities.

Because of the above, no matter what innovative ideas we may have to improve agricultural marketing in Liberia, most will be impractical unless the country's physical infrastructure is greatly improved. This includes repairing the primary national (inter-county) highways, reconstructing destroyed or damaged bridges and making or improving farm-to-market roads to open up producing areas that will attract buyers, as well as putting in place minimum physical facilities in villages, towns and assembly markets. Experience throughout Africa is that if rural producing areas are connected to markets by reasonably good roads, traders and buyers will come to buy, but they will not do so if the roads are not passable. Critical infrastructure needs also include having a stable source of electricity that will run the cold stores required to deal in perishable produce. Using generators is impractical, because generators cannot run 24 hours a day 7 days a week – unless the marketer has several generators, which would almost certainly be uneconomical or unaffordable.

In the diagram of the pre-war rural finance and marketing system shown earlier, readers should note the critical roles played by the LPMC, the ACDB, agricultural cooperatives and railways, highways and bridges in the country's rural economy. Then the reader should imagine this diagram in the absence of the LPMC, the ACDB and the agricultural cooperatives; essentially, the rural economy would be crippled, as in fact it now is. To get produce moving again, Liberia must be assisted to build an alternative financial and marketing structure.

One of the problems faced by the team of FAO/MOA staff and consultants was the almost complete lack of current information on most sub-sectors being studied. To be able to make the right choices, all concerned simply need to have better information. Accordingly, it would seem appropriate to carry out a series of studies, including those listed.

- The appropriateness and management effectiveness of existing and potential new State marketing institutions and private marketing associations, and the policies and regulatory framework affecting agricultural produce marketing should be studied, both domestic and with regard to imports and exports. This study would also examine duties, tariffs and non-tariff barriers, and identify policies that are adversely affecting the marketing of agricultural produce, both domestic and imported, as well as recommend appropriate institutional reforms.
- A review should be performed of eligible products that qualify for importation under the product listings of the United States (AGOA) and the European Union, as well as ECOWAS' own export promotion programme (SIGOA-TOPS), and products and markets should be identified that Liberian farmers could most easily produce in the required quality and timeframe. Once identified, Liberian authorities and development agencies should actively promote these non-traditional crops.
- A full agricultural sector census (comprising agriculture, fisheries and agroforestry, including the population's food preferences) should be undertaken. This would respond to desires expressed in the Statement of Policy Intent: "A coordination and policy unit will be established with the following tasks:
  - rehabilitation of agricultural statistics;
  - processing and dissemination of information and statistics."

This is alternatively stated earlier as "…the Government will support early rehabilitation of core statistical capacity and associate it with information processing and dissemination to all users in the agricultural production chain, including on both domestic and external markets."

In this vein, FAO should consider updating the Liberia Agricultural Atlas compiled prior to the war. This should be an easier task now, considering the advances in satellite, database and imaging technology during the past quarter of a century.

The importation of foreign rice into a country with a comparative advantage in growing the commodity is crippling Liberia's balance of payments, and simply cannot continue. However, because rice is such an emotional issue in Liberia, and because its marketing involves powerful, profitable interests that can be expected to vigorously resist changes to current practices, the consultants recommend that the President of the Republic herself name a "Blue Ribbon" Panel of widely respected and broadly knowledgeable people with no financial interest in the rice market who would be aided by FAO staff and consultants to carry out a thorough study of the Liberian rice market, and make recommendations for its rationalization. This would only be successful, however, if the panel is seen as impartial and fully credible in the public's eye.

Existing farmer cooperatives and farmer associations need to be strengthened so that farmers can increase their bargaining power and as a group obtain better prices and terms, instead of each small producer being a price taker and accepting the often exceedingly low prices many traders are willing to pay for produce. Properly functioning cooperatives and associations would also facilitate the procurement and distribution of economic orders of farm inputs. Particular focus should be given to the Liberian "bread basket" composed of Lofa, Bong and Nimba counties, because these provinces already have dozens of farmer cooperatives and associations that only need management and marketing training, and some facilities require restoration and equipment to regain their previous glory. At least eleven of these cooperatives have warehouses that could be refurbished and used to store produce and begin an inventory credit (warrantage) program. It is suggested that USAID be requested to fund a cooperative

development project to be executed by CLUSA (preferably), ACDI/VOCA or the ILO, all recognized authorities on cooperative development. Such a project could also target farmer associations that are not owned and run by cooperative members, as long as they are focused on production and marketing of produce or inputs. The formulation of such a farmers cooperative-focused project, however, needs to be preceded by a mini-census of the farmer cooperatives, to identify all operating and "resuscitatable" agricultural cooperatives, their number of members, economic activities, inventory priority training needs, etc., as well as taking stock of what facilities and equipment still exists, and what needs to be rebuilt or restored. Without such information, formulation of such a project would prove difficult. Towards this end, Annex 6 contains a draft questionnaire that could be used by a consultant over a two- to three-week period to carry out the agricultural cooperative census. The survey could profitably make use of the farmer cooperative database created by the International Rural Finance and Marketing Consultant. In fact, that database should be considered an integral part of this report.

NGOs have in recent years experimented with post-harvest, value-adding processing of agricultural produce, particularly rice and cassava. The experience to date, however, suggests that the capacity of the mills being employed is too high for the quantities typically needing processing in Liberian villages. There is a great need for processing to preserve and add value to produce, but mills currently available on the market are largely inappropriate for all but relatively wealthy large commercial farmers. This situation can be overcome in two ways:

- Procurement of lower-capacity mills. Assisting the larger commercial farmers to build significant processing capacity on their premises, and assisting them to organize contract farming arrangements with surrounding smallholders, i.e., "outgrowers". Such an arrangement would also facilitate the economic provision of farm inputs to the outgrowers. This would require particular work to ensure that the smallholders delivered produce to commercial farms of at least a minimum quality. It would also probably need some mechanism to make sure that the outgrowers were not exploited by the larger commercial farmers. Such an association of smallholders with larger commercial farmers is foreseen in two places in the Statement of Policy Intent. The document calls for "a vibrant commercial agriculture providing support and incentives to smallholder agriculture". Later, one notes that "…Government will promote partnerships between smallholders/associations and commercial farms/international firms (e.g. outgrower model) and who in turn will inject capital, provide access to inputs and facilitate technology transfer and marketing opportunities that are critical for increasing agricultural productivity and market competitiveness". Note that considerable "South–South" assistance can be inexpensively brought to bear from nearby Ghana's many successful outgrower programme managers and technicians.
- Building processing (and storage) capacity within existing farmer cooperatives and associations.

There needs to be greater communication and coordination among development actors (donors, NGOs, contractors) to avoid duplication of coverage areas and programmes, and to share successful techniques. It is suggested that the MOA begin to play this role. One way of getting everyone involved would be to encourage cooperation in building a market information system (MIS), which could be quickly started using FAO's Agri-Market MIS software (a copy has been left with the project coordinator). As previously stated, FAO

should also assist the MOA to take over the FAO's database that was used to collect, input and analyse the annual returns from the 405+ agencies intervening in the agricultural sector. Other possible measures that might make a difference in the marketing arena are listed below:

- Consider supporting the various existing marketing associations (LMA, LiMFU, Rubber Planters Association, Coffee and Cocoa Association, etc.) through training in improved management and marketing (including exporting) techniques.
- Train farmer cooperatives, associations, NGOs, regulators and extension workers and their supervisors in marketing, entrepreneurship, management and business plan development.
- Promote diversified diets in the media.
- Develop branding.
- Participate fully in existing MIS, including that of IFDC-run MISTOWA and ECOWAS-operated SIGOA-TOPS on-line regional agricultural marketplaces and, in general, take better advantage of all IFDC regional programmes.
- Improve norms and standards, etc.
- Create a marketing and rural finance professorship at either Cuttington University or the University of Liberia.

Some of these measures would require donor or GOL funded projects to carry out, while others could be done as ongoing programmes of ministries or NGOs.

Section IV of this report, "The way forward", explores some of the possible ways, means and approaches to implementing some of these strategies and techniques.

4. THE WAY FORWARD FOR RURAL FINANCE AND MARKETING

4.1 Improved financial services

As indicated in the preceding sections, practically no formal financial services are available to Liberia's farmers and other rural entrepreneurs, especially smallholders. Commercial banks and microfinance institutions (MFIs) are only at the early stages of penetrating rural areas, and cannot be expected to provide financial services to significant numbers of creditworthy individual rural dwellers in the foreseeable future. Development agencies should assist MFIs (the UNDP microfinance support project now starting up and the credit union rejuvenation project being considered by USAID are important parts of this effort) and commercial banks (LBDI and Ecobank, the only two operating outside metropolitan Monrovia) to expand into rural areas as fast as possible, but it must be recognized that attaining significant outreach in rural areas will take decades. At the same time, if assistance is not provided in a timely manner to the country's many ex-combatants, they may be tempted to return to violence or even take up arms again to obtain by force what they cannot achieve by peaceful means alone.

For these reasons, it would make sense to create a new agricultural development bank to replace the now defunct ACDB. However, because of donors' reticence to finance agri-banks, and the GoL's lack of sufficient capital of its own to invest in one, this clearly optimal solution to the critical need for rapidly making a large volume of financial services available to rural areas is unlikely to come to pass. For this reason, the consultants recommend a

focused three-year project to assist LBDI and EcoBANK to serve this market as best they can. Such a project would probably need approximately US$1 million for a mixture of short-term and long-term technical assistance to (1) develop appropriate micro-finance products, services and techniques, including classic triangular inventory credit; (2) develop improved bank management systems, including introduction of improved management information systems (MIS); (3) train the rapidly expanding bank workforce involved in this sector. The project would also need to put in place a guaranteed fund of from US$1–2 million that would protect the commercial banks from losses from first-time loans granted to previously untested clients.

For the particular case of livestock herders, and in order to re-establish the national herds decimated during the civil war, the consultants recommend implementation of an in-kind livestock credit scheme similar to that used by FAO elsewhere in Africa, and by the NGO Heifer International throughout the world. In these schemes beneficiaries receive infant animals and repay in kind, the new infant animals (chicks, kids, lambs, etc.) being provided in a cascading manner to a growing number of additional beneficiaries. Such a project, to last five years, could cost between US$2 million and US$3 million.

That's on the supply side of the financial market equation.

On the demand side, development agencies need to assist the banks and MFIs to identify and groom creditworthy clients. The consultants therefore recommend that the focus be placed on working with the more cohesive and successful farmer groups, cooperatives and associations, because working with millions of individuals would simply not be possible. Groups of capable farmers trained by the SPFS or similar projects and programmes should be given priority. A separate 3- to 5-year project should, furthermore, be urgently put in place to assist existing farmers' cooperatives and associations in Liberia's three leading counties in the agriculture sector (Lofa, Bong and Nimba), which constitute Liberia's "bread basket", to re-establish themselves, re-build their physical infrastructure, and recruit and train management and service personnel in all aspects of cooperative management and development, including assistance with marketing, effective record-keeping and planning. Development of cooperative and association business plans to assist in acquiring bank financing would be a priority. Such a project would also require substantial short- and long-term technical assistance, and probably cost between US$2 million and US$3 million. The consultants believe that, apart from an improved national road network, ***this is the single most important investment that can be made at this time to jumpstart the rural economy.*** Considering the considerable expertise available in the field of cooperative management in their respective countries, the preferred source(s) of funding and expertise for such a project would be the United States (USAID) and/or Canada (CIDA).

4.2 Improving agricultural marketing

Strengthening farmer cooperatives and associations along the lines just mentioned should also have a salutary effect on marketing. Other priority measures, projects and investments in the marketing sub-sector include the following.

1. One of the larger international NGOs with considerable experience in marketing, such as CARE, Technoserve or CLUSA, should be asked to take over the marketing and export of cash crops on a provisional basis until a permanent structure can be built up to take its place. This is urgently needed, because much of the 2006 cocoa and coffee crop is now

being harvested and may spoil if it is not speedily collected and disposed of. To the extent possible, the chosen operator should negotiate with WFP, whose trucks usually return to port empty after food deliveries, but could, theoretically at least, transport cash crops to port cities for export.

2. Development agents need to better understand the agricultural marketing situation before jumping in with ill-conceived projects. Accordingly, to facilitate the formulation of appropriate projects and non-project interventions in this field, a number of studies should be carried out, including the following:

   - an assessment of the appropriateness and management effectiveness of State marketing institutions and private marketing associations, and the policies and regulatory framework affecting agricultural produce marketing, both domestic and with regard to imports and exports;
   - identification of those products that Liberia could best deliver to various export markets, especially the United States' AGOA programme, the European Union and ECOWAS through the SIGOA-TOPS system, followed by their vigorous promotion to farmers;
   - carrying out a full agricultural census, possibly including an updating of the Liberian Agricultural Atlas;
   - a thorough assessment of the rice market, both domestic and imported, should be carried out with the objective of greatly reducing rice imports as quickly as possible.

   These could be handled through a single project or through multiple projects, depending on donor interest.

3. Assist the larger commercial farmers to develop outgrower programmes to feed their processing capacity. This would make considerable use of Ghanaian expertise in this domain. A two-year FAO TCP project would seem most appropriate for this activity.

4. Introduction of an effective marketing information system based on the FAO Agri-Market MIS software recently provided by the International Consultant to MOA. Part of this effort would include integrating Liberia into the IFDC-managed and Internet-based MISTOWA subregional market information system, as well as into the ECOWAS SIGOA-TOPS system, so that Liberian producers and their organizations can be better integrated into the subregional economy. One could possibly combine this activity with the transfer of the FAOR's NGO agricultural intervention database to the MOA. These objectives, too, could be effectively carried out through an FAO TCP project.

5. Other interventions (mostly non-project) that could produce a significant and quick impact on agricultural marketing in Liberia include the following:

   - training of the various existing marketing associations (LMA, LiMFU, Rubber Planters' Association, Coffee and Cocoa Association, etc.) in improved management, especially for marketing, including exporting;
   - creation of a marketing and rural finance professorship at either Cuttington University or the University of Liberia.

ANNEX 1

CAAS-Lib – Investment proposal – Rural finance

Name of project	Expansion of financial services to Liberian farmers and other rural entrepreneurs.
Institutional responsibility	Central Bank of Liberia (CBL)
Project goal and objectives	Formal sector finance and microfinance in Liberia is almost exclusively limited to Monrovia and its surrounding area. The microfinance development project currently being implemented by UNDP and UNCDF will not greatly change this in the foreseeable future. Accordingly, the goal of the project proposed here is to substantially expand financial services to Liberia's rural dwellers, both farmers and other creditworthy rural entrepreneurs. To accomplish this goal, the project will have as core objectives the following: 1. Development of appropriate financial products, services and techniques to serve farmers and other rural entrepreneurs. Credit to such borrowers will be financed from commercial banks' existing substantial excess liquidity. 2. On the supply side, building capacity of those banks having significant outreach outside Monrovia (LBDI and Ecobank) in the serving of rural clients and improving general bank management, including introduction as appropriate of the FAO-GTZ MicroBanking System for Windows ("MB Win") banking software. On the demand side, building the capacities of farmers, farmer organisations and other potential borrowers. 3. Networking with related institutions and projects (UNCDF/UNDP microfinance development project, microfinance association, existing MFIs, CBL, Ministry of Finance, Ministry of Agriculture, SPFS and other agricultural development projects, FBOs, NGOs, etc.) to avoid duplication of effort.
Description of main activities	1. Development of appropriate financial products, services and techniques to serve farmers and other rural entrepreneurs in collaboration with other providers of rural financial services (credit unions, MFIs, NGOs, etc.) in close collaboration with participating commercial banks, and training staff at all branches with rural clients in their use. 2. Identification of most creditworthy farmers and rural entrepreneurs (upgrading of FAO database of development organizations intervening in rural Liberia and its transfer to MOA). Priority will be given to SPFS beneficiaries and participants of similar NGO-sponsored agricultural development programmes, members of farmer cooperatives and other FBOs. Resurrection, re-equipping and provision of management training to the country's formerly significant agricultural cooperatives and other rural associations will be a major activity, which could conceivably be spun off as a separate project. 3. Set-up and operation of a rural credit guarantee fund to guarantee lenders against part (probably 50 percent on first loans, 25 percent on second loans and 0 percent on subsequent loans) of the risk of lending to basically creditworthy clients who have unproven credit track records. 4. Institute confidence-building measures and develop linkages between participating commercial banks, agricultural cooperatives and other FBOs, MFIs (linkage banking), as well as assure full project participation in the national microfinance association and sharing of information and successful techniques among the community of rural financial service providers.
Expected result(s)	1. Both LBDI and Ecobank will have the capacity to provide significant volumes of increasingly diversified and sophisticated financial services to Liberia's rural population, both farmers and non-farmer entrepreneurs, and actually provide increasing volumes of such services to rural dwellers. 2. Several dozen formerly significant farmer cooperatives and associations will be resurrected, re-equipped and trained in business management and marketing, and begin to market significant quantities of agricultural produce domestically and internationally. 3. A national microfinance association will be strengthened and successful products and techniques widely shared among rural financial service providers.

Impact on food security, poverty reduction & economic development	Lack of affordable credit in rural areas is, according to nearly all knowledgeable observers of rural development in Liberia, one of the greatest roadblocks to rural development. By providing significant and growing volumes of credit and other financial services to farmers and other rural entrepreneurs, and particularly to farmer cooperatives and associations and other well trained farmers and entrepreneurs, this particular bottleneck will be alleviated, and increasing numbers of such people will be able to invest in and profit from the many currently available opportunities.	
Period of execution	Four years: mid-2007 through mid-2011.	
Estimated cost	Technical assistance and training	US$1 250 000
	Re-equipping farmer cooperatives, associations and self-help groups	US$1 500 000
	Establishment of credit guarantee fund	US$1 500 000
	Total	US$4 250 000

ANNEX 2

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ANNEX 3

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ANNEX 4

List of existing cooperatives

Basic Liberian non-financial cooperative data listing

County/District	City Or Town	Cooperative Name	Count	Current Members	Male Members	Female Members	DateCreated
County: *Bomi*							
	Suehn Town	Suehn Mecca Farmers Cooperative Society		0			
	Sub-Totals		1	0			
County: *Bong*							
	Raymond Town	Pulukpah Farmers Coop. (Unaffiliated to Union)		1.486	613	373	12/02/1975
Fuamah	Bong Mines	Fuamah District Coop. Soc.		192	104	88	06/02/2002
Jorquelleh		Loitor Farmers Coop.		2.496	1.537	959	
Korkoya	Botoeta	Alafama District Farmer Cooperative		1.631	806	825	
Panta Kaaii		Gborma Farmers Coop.		1.879	987	892	
Salala		Wele Kema Farmers Coop.		465	290	175	
Sanoyea		Suitor Farmers Coop.		3.495	2.506	989	
Suakoko		Alukukor Farmers Coop.		5.896	4.507	1.389	
Zota	Belefanai	Kpanckapangan (Kponikpayah) Farmers Coop.		1.405	830	425	14/10/1977
	Sub-Totals		9	18.945			
County: *Cape Mount*							
		Gonelo Farmers Cooperative		0			
	Garwulu Tombe	Porkpa Development Cooperative Society		0			
	Kpososeimarula	Kpossoseimarula District Cooperative Society		0			
Tewor		Tewor District Farmer Cooperative Society		0			
	Sub-Totals		4	0			

County: *Gbarpolu City*	*Cooperative Name*		*Total members*	*Date created*
Bokomu Town	Molowaimu Dev. Coop.		125	29/10/2003
Gbarmah City	Eyain-Gunn Multi-purpose Coop.		69	12/05/2004
Sub-Totals		2	194	
County: ***Grand Bassa***				
Buchanan City	Bassa Rubber Multipurpose Cooperative Society		0	
Gbarsee Giah Town	District #3B Multipurpose Coop. Society		0	
Gbeeboan Town	District #3A Multipurpose Coop. Society		0	
Sub-Totals		3	0	
County: ***Grand Gedeh***				
Zieh Town	Konobo Dist. Farmers Coop.		650	06/08/1980
Zleh Town	Amenu Farmers Coop.		750	28/11/1972
Zwedru City	Work & See Farmers Coop.		600	20/09/1974
Sub-Totals		3	2.000	
County: ***Grand Kru***				
Barclayville City	Barclayville Multipurpose Cooperative Society		0	
Blebo City	Belbo Farmers Produce Marketing Cooperative Society		0	
Trembo City	Trembo Multipurpose Cooperative Society		0	
Sub-Totals		3	0	
County: ***Lofa***				
Foya Airfield	Intofawor Farmers coop.		8.000	19/04/1971
Kolba City	Gbandi Farmers Coop.		850	31/07/1972
Valhun City	Guma Mende farmers Coop.		550	18/12/1973
Voinjama City	Voinjamah Dist. Farmers Coop.		2.500	31/08/1972
Zorzor City	Zorzor Dist. Farmers coop.		900	18/08/1972
Sub-Totals		5	12.800	

County/District	City Or Town	Cooperative Name	Count	Total Current Members	Current Male Members	Current Female Members	DateCreated
County: *Maryland*							
	Harper City	Barrabo Farmers Cooperative Society		0			
	Harper City	Gbenelu Cooperative Society		0			
	Harper City	Maryland Farmers Coop.		269			25/04/1978
	Harper City	Toukpe Farmers Cooperative Society		0			
	Karluken City, Karluway	Gedebo Farmers Cooperative Society		0			
	Plibo City	Plibo Multipurpose Cooperative Society		0			
	Sub-Totals		6	269			
County: *Montserrado*							
	72nd, Paynesville	Gbandi Literacy Cooperative Society		0			
	Chicken Soup Factory	Chicken Soup Factory Cooperative Society		0			
	Monrovia	Association of Liberian Professional Organisations Multipurpose Cooperative Society		0			
	Monrovia	Liberia Marketeers Multipurpose Cooperative		0			
	Monrovia	Local Building Material Cooperative Society		0			
	Monrovia	Monrovia Poultry & Piggery Marketing Coop		0			
	Point 4, Bushrod Island	Kongee Konwroah Women's Multipurpose Cooperative Society		0			
	West Point, Monrovia	West Point Development Multipurpose Cooperative Society		0			
	Sub-Totals		8	0			

County: Nimba City		Cooperative name	Total members	Date created
		Gblein Womens Multipurpose Coop.	300	
		She Leh Tur Farmers Coop.	0	
		Vanta Multi-Purpose Cooperative Society	0	
		Warposeh Farmers Coop.	0	
		Zaihnop Multi-Purpose Cooperative Society	0	
		Zokarkrah Farmers Cooperative Society	0	
		Zorssehtowah Farmers Coop.	0	
	Bayleglay Town	Zean Gbondiah Multi-Purpose Coop.	936	16/03/2006
	Behplay Town	Zowea Farmers Coop. Soc.	1.152	20/07/2001
	Beo Yoolar Town	Bro Sehgren Coop. Soc.	460	25/02/1988
	Bonglay Town	Nimba Kwaplah Coop.	209	06/10/2005
	Forhlay Town	Nequopi Kwado Multi-Purpose Coop.	155	27/06/2005
	Gbedin Town	Dokodan Farm. Coop. Soc.	2.500	12/02/1975
	Gonpa City	Zodomon Farmers Coop.	59	30/06/2005
	Karnplay City	Gbeh Facos Farmers Coop. soc.	289	22/02/1987
	Karnplay City	Zoyah Farmers Coop. Soc.	500	22/10/2002
	Kpaiplay Town	Zodo Farmers Coop.	436	20/07/2001
	Nyao	Nyao Multi-purpose Coop. Soc.	55	29/05/2002
	Nyor Chiefdom	Nyor Kalokakou Coop. Soc.	245	28/11/1980
	Saclepea Mah	Wonpulu Farmers Coop.	168	26/11/1981
	Sanniquellie	Benkomah Farmers Coop.	0	
	Tunukpuyee	Vanco Agri. Multi-purpose Coop.	65	31/12/1996
	Zahglay Town	Kpodo Farmers Coop.	960	20/07/2001
		Kpatawee Oil Palm Coop.	0	
Buu-Yao	Nyao, Diaplay	Zoduah Multi-pur. Coop. Soc.	89	18/03/2005
Gbedin		Gbedin Farmers Coop.	0	
Gbehlay Geh	Duoplay Town	Duoplay Farmer Cooperative Society	0	

				Total Current	Current Male	Current Female	
County/District	**City Or Town**	**Cooperative Name**	**Count**	**Members**	**Members**	**Members**	**DateCreated**
Gbei Vonwea	Town-Gbehlay	Sroh Kwando Multi-Purpose Coop.		325			15/05/1998
Geh	Gbloulay, Zoe	Buu-Yao United Lib. Farmers Cooperative		81			19/07/2005
		Soc.					
Kpein		Lao Farmers Coop		0			
Tappita	Tappita	Substainable Agri. Dev. Coop.		300			20/08/2002
Tappita	Zuatuo Town	Boe & Quella Multi-purpose Coop. Soc		66			04/10/2000
Yekepah	Sanniquellie	Wale-Laakeh Farmers Coop.		296			28/10/1977
	Sub-Totals		33	9.646			
County: *River Cess*							
	Darsaw Town	Darsaw Farmers Cooperative Society		0			
	Morwah Town	Morway Multipurpose Cooperative		0			
		Society					
	Sub-Totals		2	0			
County: *River Gee*							
Chedepo	Kalipo Kanweaken	Kalipo Multipurpose Cooperative Society		0			
Chedepo	Putuken	Chedepo Multipurpose Cooperative Society		0			
Ketteabo Sarbo	Yalatoken	River Gbeh Farmers Cooperative Society		0			
Putopo	Jotoken	Pallipo Multipurpose Cooperative Society		0			
	Sub-Totals		4	0			
County: *Sinoe*							
Juarzon	Balabokree Town	Juarzon District Farmers Cooperative		0			
		Society					
Kpayan	Kpayan	Kpayan District Farmers Cooperative		0			
		Society					
Shaw	Shawsekon Town	Shawsekon Farmers Cooperative Society		0			
	Sub-Totals		3	0			
Grand Total		**Grand Total**		**86**	**43.854**		

ANNEX 5

NGO activity database summaries

Breakdown of "NGO" Beneficiaries by County

Organisation / County	BOMI	BONG	GBAR-POLU	GRAND BASSA	GRAND CAPE MOUNT	GRAND GEDEH	GRAND KRU	LOFA	MARGIBI	MARY-LAND	MONT-SER-RADO	NIMBA	RIVER GEE	RIVER CESS	SINOE	Grand Total
Action Contre La Faim		1.500										1.999				**3.499**
Adventist Development and Relief Agency												2.000				**2.000**
Agriculture Relief Services Inc												4.600				**4.600**
Association of Evangelicals of Liberia		2.000														**2.000**
Caritas Cape Palmas							3.000									**3.000**
Caritas Liberia						417										**417**
Christian Children's Fund	800		1.400		800											**3.000**
Concern		130						4.868								**4.998**
Danish Refugee Council							1.000			1.000			1.000			**3.000**
Farmers Against Hunger											2.000					**2.000**
Food and Agriculture Organization						2.400										**2.400**
German Agro Action	100		4.200		4.700	500							500			**10.000**
Grand Bassa Agriculture Group				3.995										3.000		**6.995**
Integrated Rural Development Organization		8.000							2.000							**10.000**
International Committee of the Red Cross	7.854	3.424	11.241		3.870			35.000				8.190		4.466	450	**74.495**
KRUDF												3.400				**3.400**
Kweatornor Development and Relief Organization								4.000								**4.000**
Liberia Agro Systems													3.000		9.000	**12.000**
Liberia Environmental Care Organization		6.000														**6.000**
Lofa Educational and Agricultural Foundation								4.000								**4.000**
Lutheran World Federation/World Service		860						24		920	300					**2.104**
Samaritan's Purse			4.000													**4.000**
Save the Children Fund - UK	3.974	800	3.176			2.600										**10.550**
South-Eastern Agricultural Relief Agency										3.000						**3.000**
Sustainable Livelihood Promoters Program					2.059											**2.059**
TEARFUND												1.848				**1.848**
Visions in Action								8.000								**8.000**
Zao Development Council												7.000				**7.000**
Grand Total	**12.728**	**22.714**	**24.017**	**3.995**	**11.429**	**5.917**	**4.000**	**55.892**	**2.000**	**4.920**	**2.300**	**29.037**	**4.500**	**7.466**	**9.450**	**200.365**

* Source: FAOR Agricultural Activities Tracking Database

Breakdown of "NGO" Beneficiaries by Type of Activity

Organisation / Type	Rice	Vegetables	Roots & Tubers	Fisheries	Livestock	Grand Total
Action Contre La Faim	1.999	1.500				**3.499**
Adventist Development and Relief Agency	2.000					**2.000**
Agriculture Relief Services Inc	4.600					**4.600**
Association of Evangelicals of Liberia	2.000					**2.000**
Caritas Cape Palmas	3.000					**3.000**
Caritas Liberia	417					**417**
Christian Children's Fund	1.500	1.500				**3.000**
Concern	4.868	130				**4.998**
Danish Refugee Council	3.000					**3.000**
Farmers Against Hunger	2.000					**2.000**
Food and Agriculture Organization	2.400					**2.400**
German Agro Action	7.000	1.000	1.500		500	**10.000**
Grand Bassa Agriculture Group	6.995					**6.995**
Integrated Rural Development Organization	10.000					**10.000**
International Committee of the Red Cross	74.495					**74.495**
KRUDF	3.400					**3.400**
Kweatornor Development and Relief Organization	4.000					**4.000**
Liberia Agro Systems	12.000					**12.000**
Liberia Environmental Care Organization	6.000					**6.000**
Lofa Educational and Agricultural Foundation	4.000					**4.000**
Lutheran World Federation/World Service	2.104					**2.104**
Samaritan's Purse	4.000					**4.000**
Save the Children Fund - UK	9.350			1.200		**10.550**
South-Eastern Agricultural Relief Agency	3.000					**3.000**
Sustainable Livelihood Promoters Program	2.059					**2.059**
TEARFUND	1.848					**1.848**
Visions in Action	8.000					**8.000**
Zao Development Council*	7.000					**7.000**
Grand Total	**193.035**	**4.130**	**1.500**	**1.200**	**500**	**200.365**

* Source: FAOR Agricultural Activities Tracking Database

Number of "NGO" Beneficiaries by County and Type of Activity

County \ Activity	Rice	Vegetables	Roots & Tubers	Fisheries	Livestock	Grand Total
BOMI	11.928	400	0	300	100	**12.728**
BONG	20.784	1.630	0	300		**22.714**
GBARPOLU	22.317	900	300	300	200	**24.017**
GRAND BASSA	3.995					**3.995**
GRAND CAPE MOUNT	9.829	800	600		200	**11.429**
GRAND GEDEH	5.117	200	300	300		**5.917**
GRAND KRU	4.000					**4.000**
LOFA	55.892					**55.892**
MARGIBI	2.000					**2.000**
MARYLAND	4.920					**4.920**
MONTSERRADO	2.300					**2.300**
NIMBA	29.037					**29.037**
RIVER GEE	4.000	200	300			**4.500**
RIVERCESS	7.466					**7.466**
SINOE	9.450					**9.450**
Grand Total	**193.035**	**4.130**	**1.500**	**1.200**	**500**	**200.365**

* Source: FAOR Agricultural Activities Tracking Database

Number of "NGO" Agricultural Activities by Type of Activity

Organisation \ Activity	Rice	Vegetables	Roots & Tubers	Fisheries	Livestock	Grand Total
Action Contre La Faim	1	7				**8**
Adventist Development and Relief Agency	16					**16**
Agriculture Relief Services Inc	20					**20**
Association of Evangelicals of Liberia	5					**5**
Caritas Cape Palmas	12					**12**
Caritas Liberia	60					**60**
Christian Children's Fund	35	70				**105**
Concern	50	4				**54**
Danish Refugee Council	168					**168**
Farmers Against Hunger	4					**4**
Food and Agriculture Organization	18					**18**
German Agro Action	20	5	5		5	**35**
Grand Bassa Agriculture Group	57					**57**
Integrated Rural Development Organization	28					**28**
International Committee of the Red Cross	38					**38**
KRUDF	8					**8**
Kweatornor Development and Relief Organization	8					**8**
Liberia Agro Systems	64					**64**
Liberia Environmental Care Organization	32					**32**
Lofa Educational and Agricultural Foundation	8					**8**
Lutheran World Federation/World Service	6					**6**
Samaritan's Purse	1					**1**
Save the Children Fund - UK	53	40	8	32		**133**
South-Eastern Agricultural Relief Agency	12					**12**
Sustainable Livelihood Promoters Program	40					**40**
TEARFUND	5					**5**
Visions in Action	8					**8**
Zao Development Council*	28					**28**
Grand Total	**805**	**126**	**13**	**32**	**5**	**981**

* Source: FAOR Agricultural Activities Tracking Database

Number of "NGO" agricultural activities by type of activity							
County	**District**	**Rice**	**Vegetables**	**Roots & tubers**	**Fisheries**	**Livestock**	**Grand total**
BOMI	Klay	5 016	200	0	150		5 366
	Mecca	6 912	200	0	150	100	7 362
	Bomi Subtotals	11 928	400	0	300	100	12 728
BONG	Fuamah	3 400	1 500				4 900
	Jorquelleh	1 715					1 715
	Kokoyah	2 727					2 727
	Panta-Kpa	2 618	30	0	300		2 948
	Salala	2 900					2 900
	Sanoyea	5 424					5 424
	Suakoko	2 000					2 000
	Zota		100				100
	Bong Subtotals	20 784	1 630	0	300		22 714
GBARPOLU	Belleh	1 040	233	0	150		1 423
	Bokomu	1 548					1 548
	Bopolu	13 893	0	0	150	100	14 143
	Gbarma	3 766	434	300		100	4 600
	Kongba	2 070	233				2 303
	Gbarpolu Subtotals	22 317	900	300	300	200	24 017
GRAND BASSA	District #1	1 670					1 670
	District #2	1 725					1 725
	District #3	350					350
	District #4	170					170
	Owensgrove						0
	St John River	80					80
	Grand Bassa Subtotals	3 995					3 995
GRAND CAPE MOUNT	Commonwealth	200					200
	Garwula	472	200				672
	Gola Konneh	2 370	200	300		100	2 970
	Porkpa	6 226	200	300		100	6 826
	Tewor	561	200				761
	Grand Cape Mount Subtotals	9 829	800	600		200	11 429
GRAND GEDEH	Gbarzon	1 912	0	0	100		2 012
	Konobo	1 182	0	0	100		1 282
	Tchien	2 023	200	300	100		2 623
	Grand Gedeh Subtotals	5 117	200	300	300		5 917
GRAND KRU	Buah						0
	Lower Kru Coast	2 208					2 208
	Sasstown						0
	Upper Kru Coast	1 792					1 792
	Grand Kru Subtotals	4 000					4 000
LOFA	Foya						0
	Kolahun	14 000					14 000
	Salayea	11 446					11 446

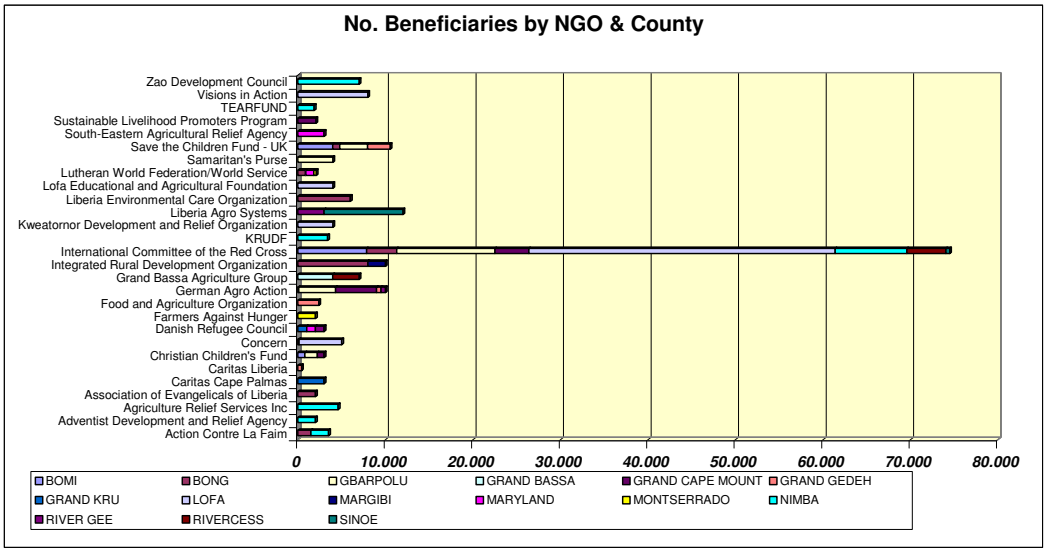
Number of "NGO" agricultural activities by type of activity							
County	**District**	**Rice**	**Vegetables**	**Roots & tubers**	**Fisheries**	**Livestock**	**Grand total**
	Vahun	5 000					5 000
	Voinjama	4 000					4 000
	Zorzor	21 446					21 446
	Lofa Subtotals	55 892					55 892
MARGIBI	Firestone						0
	Gibi	1 000					1 000
	Kakata	1 000					1 000
	Mambah-Kaba						0
	Margibi Subtotals	2 000					2 000
MARYLAND	Barrobo	2 014					2 014
	Pleebo/Sodeken	2 906					2 906
	Maryland Subtotals	4 920					4 920
MONTSERRADO	Carysburk						0
	Greater Monrovia						0
	St Paul River	1 000					1 000
	Todee	1 300					1 300
	Montserrado Subtotals	2 300					2 300
NIMBA	Gbehlageh	3 600					3 600
	Saclepea	3 220					3 220
	Sanniquelleh-Mahn	2 500					2 500
	Tappita	9 347					9 347
	Yarwein-Mehnsohnneh	6 970					6 970
	Zoegeh	3 400					3 400
	Nimba Subtotals	29 037					29 037
RIVER GEE	Gbeapo	1 751					1 751
	Webbo	2 249	200	300			2 749
	River Gee Subtotals	4 000	200	300			4 500
RIVERCESS	Morweh	2 920					2 920
	Timbo	4 546					4 546
	River Cess Subtotals	7 466					7 466
SINOE	Butaw	1 600					1 600
	Dugbe River	1 500					1 500
	Greenville	1 000					1 000
	Jaedae Jaedepo						0
	Juarzon						0
	Kpayan	3 850					3 850
	Pyneston	1 500					1 500
	Sinoe Subtotals	9 450					9 450
Grand Total		193 035	4 130	1 500	1 200	500	200 365

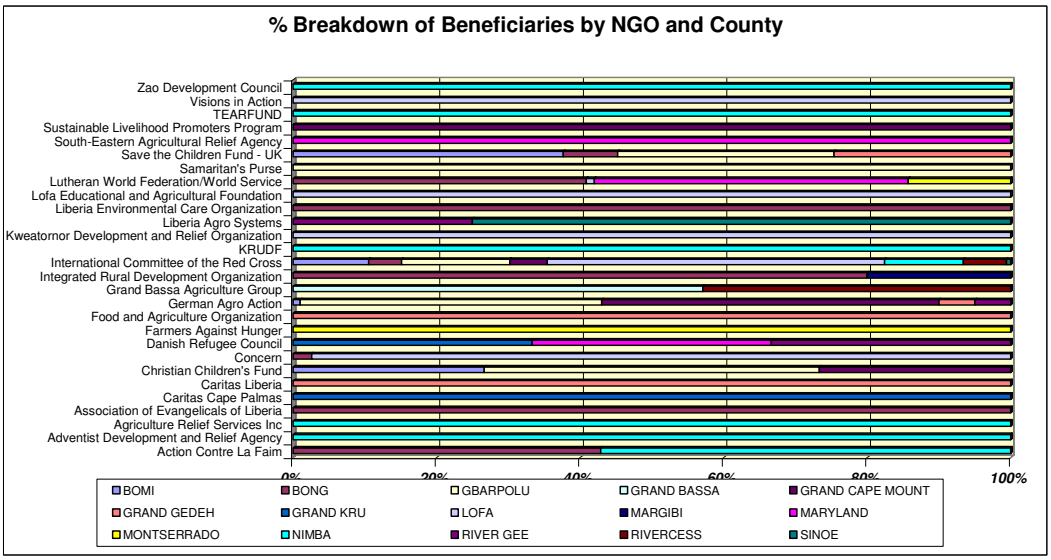
Summary of Quantities of Inputs Provided by Type and County

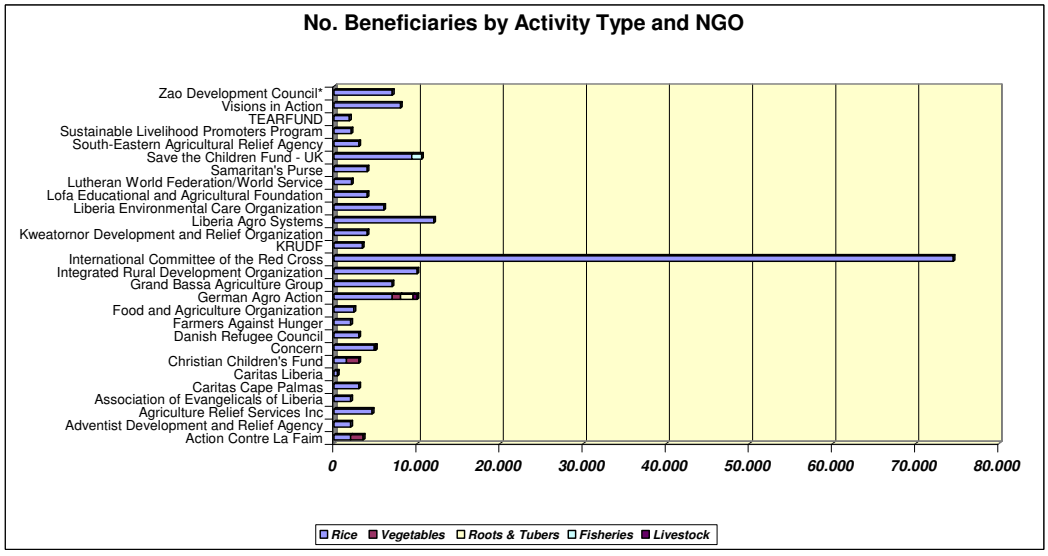
Input Type	County	Unit	BOMI	BONG	GBAR-POLU	GRAND BASSA	GRAND CAPE MOUNT	GRAND GEDEH	GRAND KRU	LOFA	MARGIBI	MARY-LAND	MONT-SER-RADO	NIMBA	RIVER GEE	RIVER CESS	SINOE	Grand Total
Cassava	Cassava cutting	Bundles	20	10	20			30										80
Fishing Equipment	Fishing Hooks	Pieces	84	42	84			126										336
	Twine (3mm)	Yards	60	30	60			90										240
	Twine (4mm)	Yards	20	10	20			30										80
Livestock	Assorted Animals	Animals	0		0		0											0
Rice Seeds	Bouaké 189	Kgs.		12.500	37.500					50.000				25.000				125.000
	Idessa 10	Kgs.	25.000	25.000	82.500		20.000			47.500						50.000		250.000
	Idessa 85	Kgs.		25.000	5.000		20.000							75.000				125.000
	LAC-23	Kgs.	25.000	131.270		37.500		10.000	9.480	193.750	25.000	15.000	25.000	150.020	28.125	30.800	78.740	759.685
	NERICA	Kgs.								100.000								100.000
	ROK-3	Kgs.		8.770	25.000			5.000	18.600	241.250		7.875		10.340	9.375	6.700	26.260	359.170
	S-8	Kgs.	25.000	35.000			10.000	15.000	9.420	105.000		14.625		27.180		12.500	7.500	261.225
	Unspecified Seed Rice	Kgs.	223.200	260.600	407.925	62.500	195.725	97.925	62.500	641.500	25.000	62.500	25.000	488.450	62.500	86.650	123.750	2.825.725
	Total Rice Seeds	Kgs.	298.200	498.140	557.925	100.000	245.725	127.925	100.000	1.379.000	50.000	100.000	50.000	775.990	100.000	186.650	236.250	4.805.805
Other Seeds	Assorted Vegetable Seeds	Grams		135	1.000		2.000	1.000							1.000			5.135
	Bitter Ball	Grams	256	28	356		200	84										924
	Cassava Cuttings	Sticks			15.000		30.000	15.000							15.000			75.000
	Collard Greens	Grams	200		300		200											700
	Corn	Grams	112	176	112			168										568
	Cowpea	Grams	10	5	10			15										40
	Eggplant	Grams	200		300		200											700
	Groundnuts	Grams		66														66
	Okra	Grams	256	28	356		200	84										924
	Pepper	Grams	256	28	356		200	84										924
	Pumpkin	Grams	200		300		200											700
	Red Beans	Grams		7.500														7.500
	Sweet Corn	Grams	200		300		200											700
	Watermelon	Grams	200		300		200											700
Tools	Assorted Farm Tools	Pieces		7.500														7.500
	Axe[1]	Pieces		2.000		7.260	2.059							1.848				13.167
	Axes[1]	Pieces	2.250	17.558	4.750		3.500	1.217	1.002	7.164		1.000		11.500	1.000		5.145	56.086
	Cutlass[1]	Pieces	4.900	27.140	10.200	6.534	11.518	2.434	2.004	14.928		2.000		28.696	2.000		10.990	123.344
	Cutlasses[1]	Pieces		5.988														5.988
	Digger	Pieces				3.497				1.364								4.861
	File[1]	Pieces		2.000		2.819	4.118							1.848				10.785
	Files[1]	Pieces	4.900	18.058	10.200		7.400	1.600	2.004	10.928		2.000		13.500	2.000		5.145	77.735
	Rain Boots	Pieces	400		700		400							2.000				3.500
	Rain Coats	Pieces												0				0
	Rake	Pieces	400		600	3.277	2.459			1.364								8.100
	Regular Hoe	Pieces	2.650	500	1.850	3.421	2.459	1.217	1.002	1.964		1.000			1.000			17.063
	Scratching Hoe	Pieces	6.750	15.070	14.250	10.022	16.677	2.400	3.006	13.492		3.000		18.196	3.000		5.145	111.008
	Shovel[1]	Pieces				3.373	2.059			1.364								6.796
	Shovels[1]	Pieces	400		700		400							1.000				2.500
	Other Tools	Pieces		181														181

[1] More care needs to be taken during data entry to avoid such duplication; use of pull-down menus would help in this.

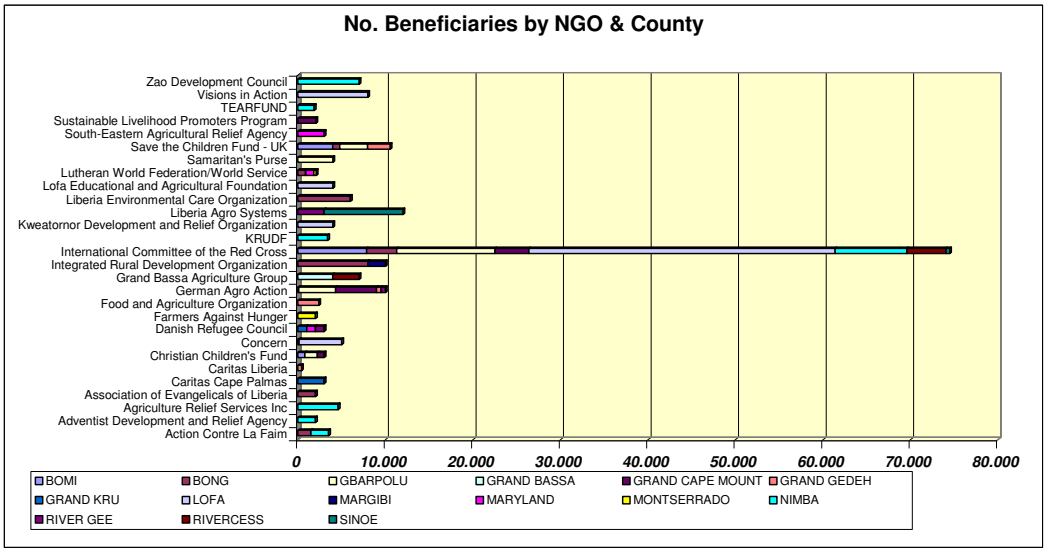
FAOR Agricultural Activities Tracking Database
Illustrative Charts Based on the Database

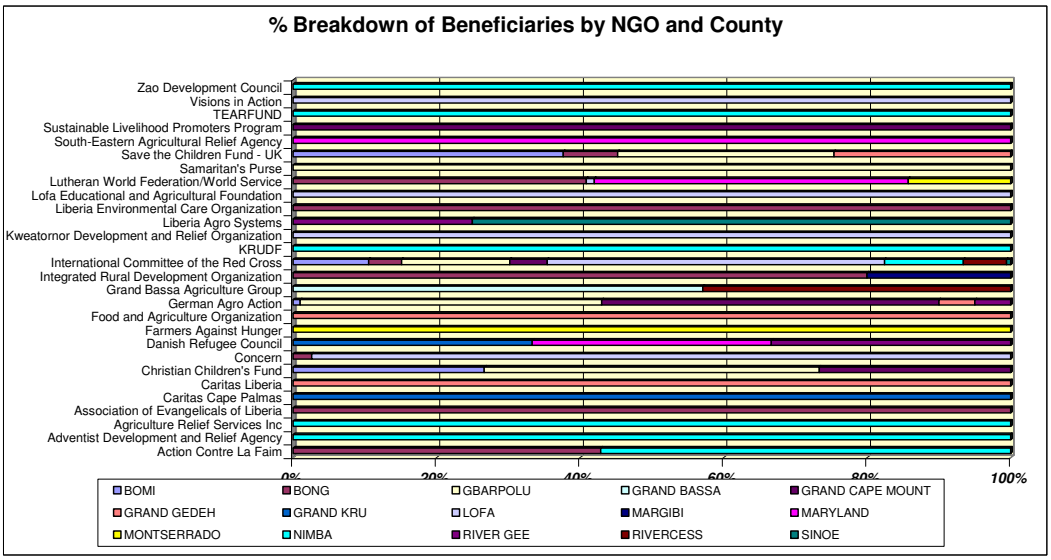


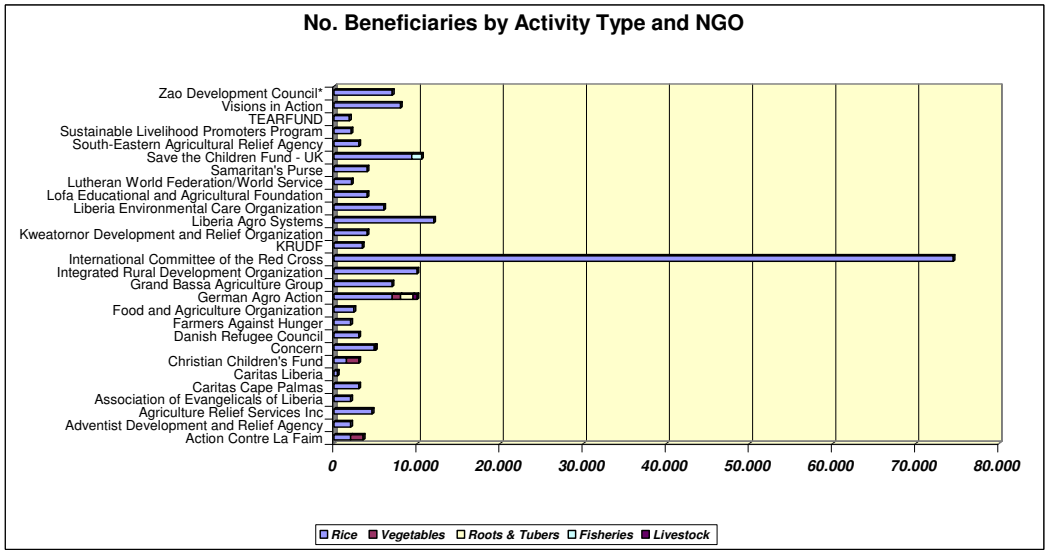


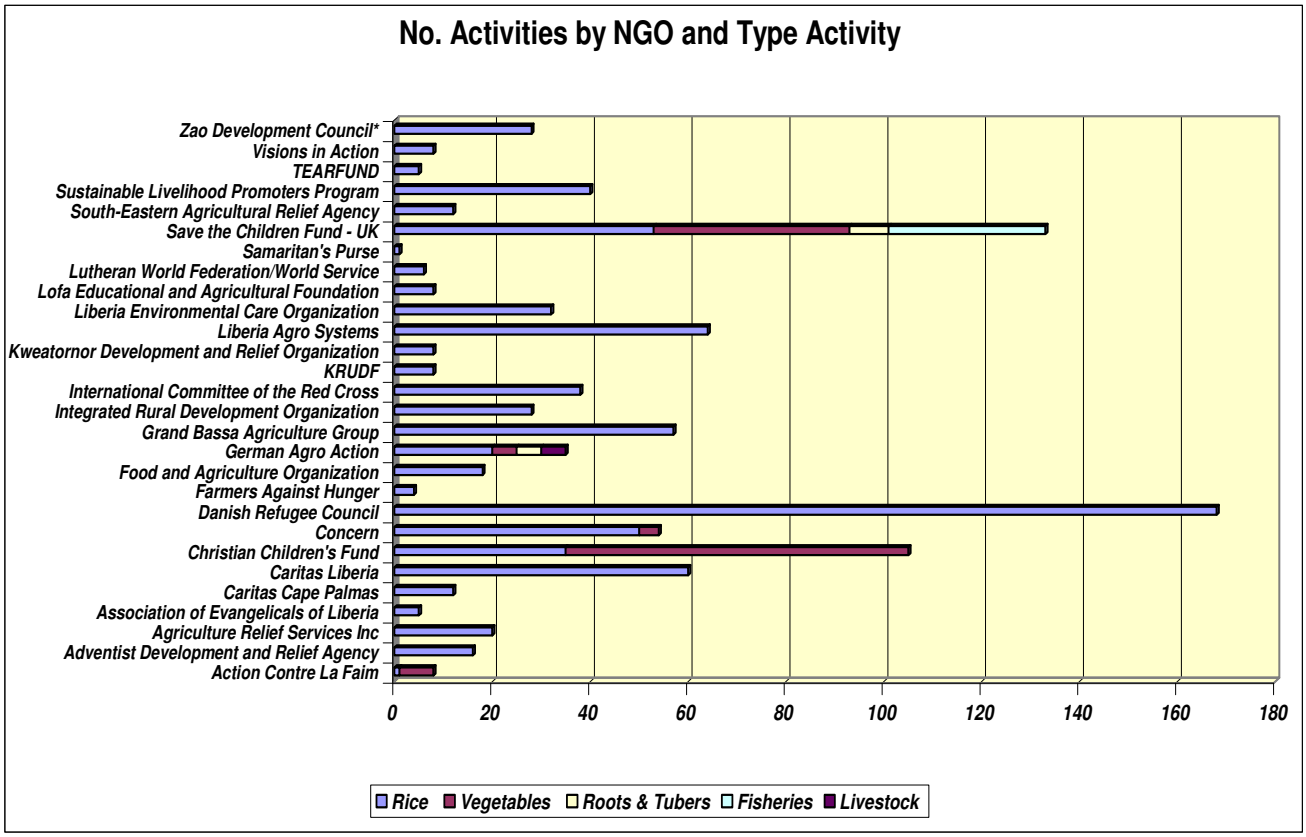


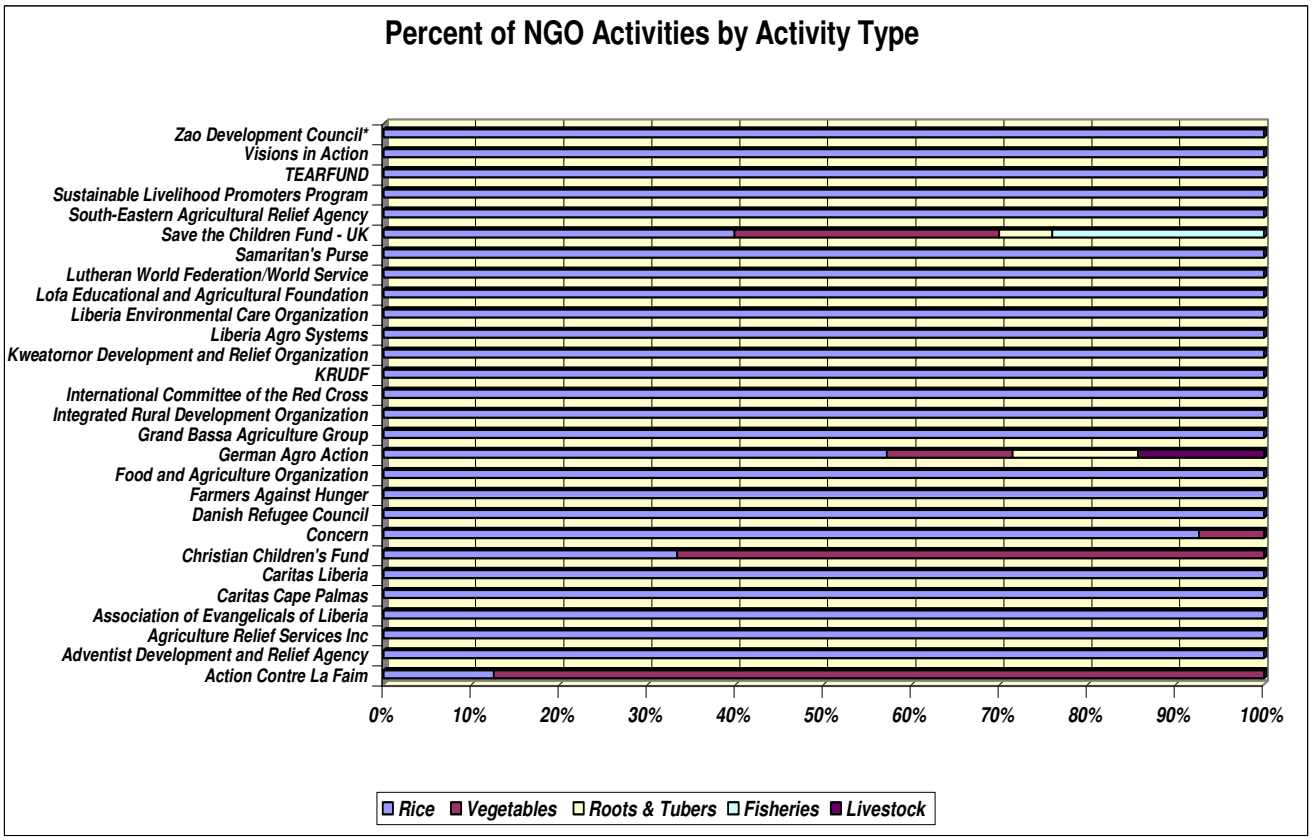
FAOR Agricultural Activities Tracking Database
Illustrative Charts Based on the Database





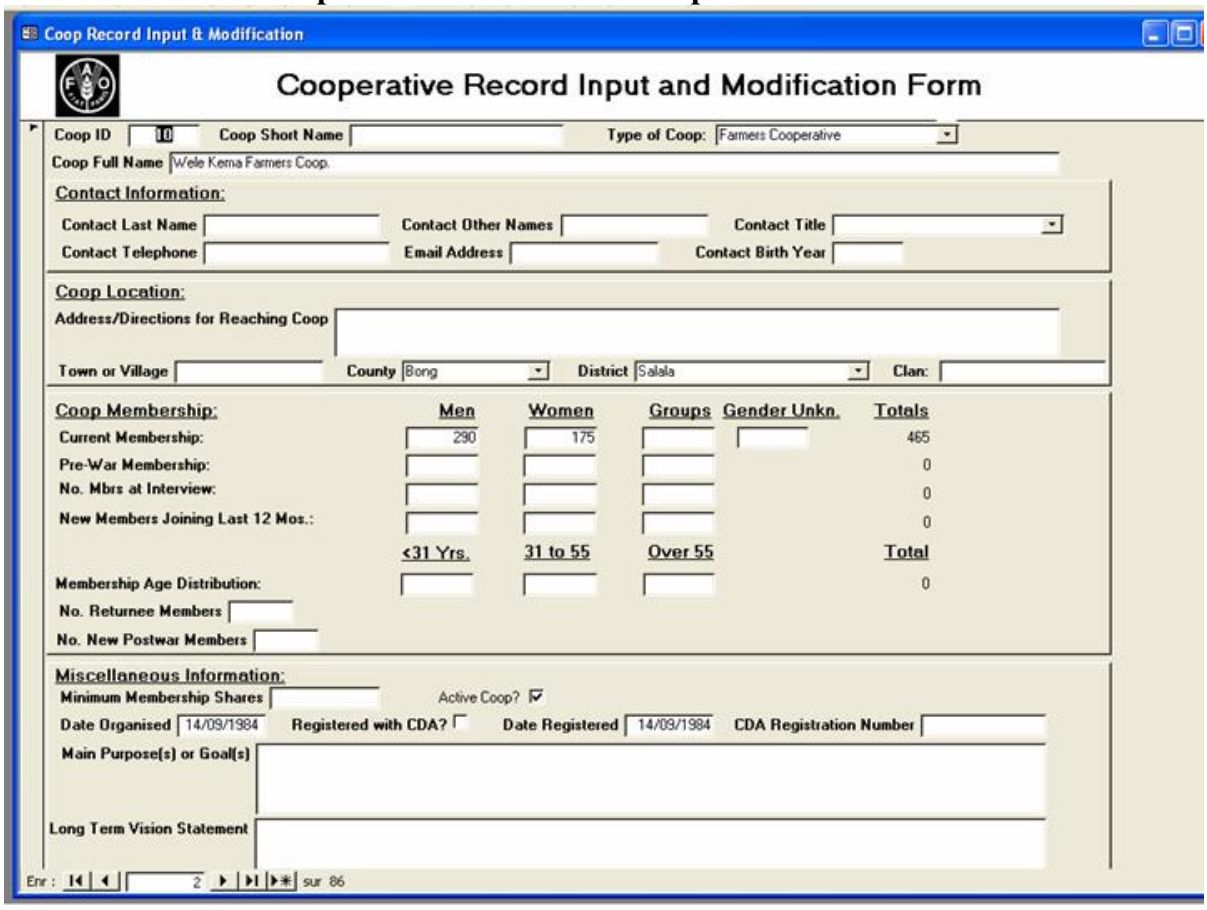


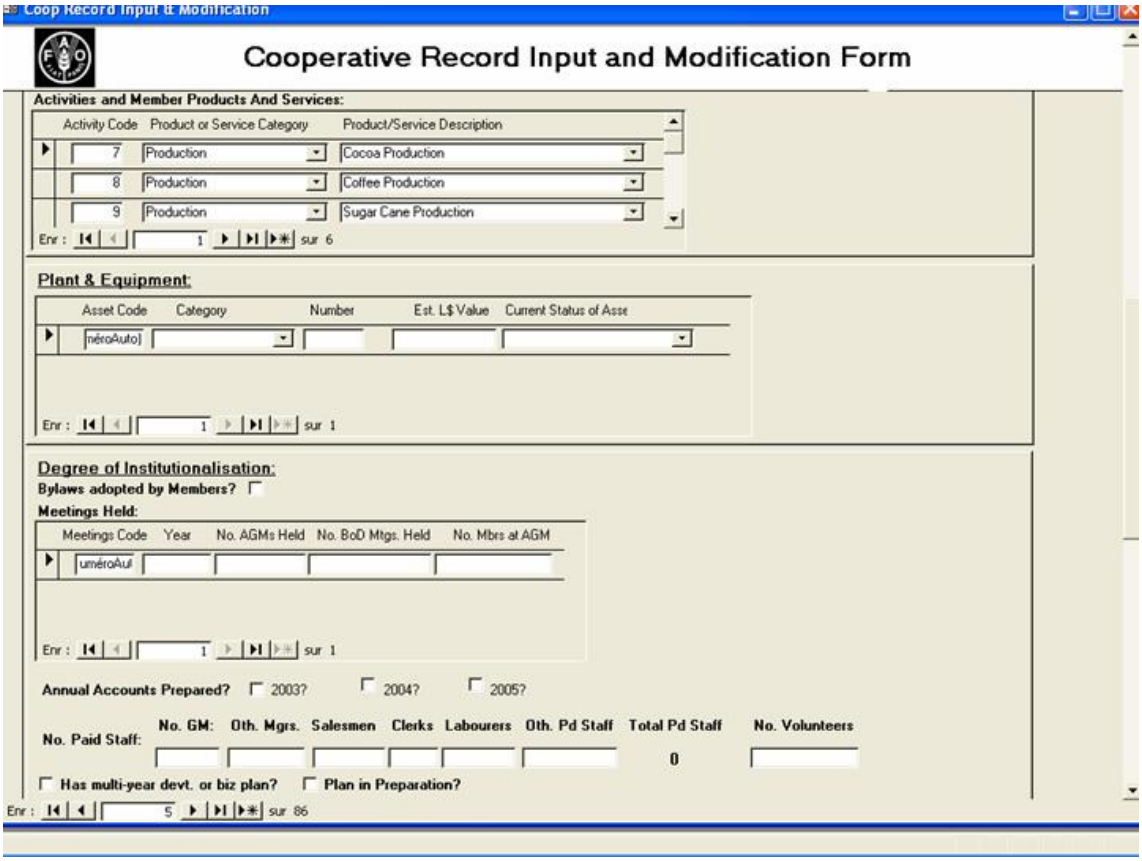

No. Activities by NGO and Type Activity
Zao Development Council*
Visions in Action
TEARFUND
Sustainable Livelihood Promoters Program
South-Eastern Agricultural Relief Agency
Save the Children Fund - UK
Samaritan's Purse
Lutheran World Federation/World Service
Lofa Educational and Agricultural Foundation
Liberia Environmental Care Organization
Liberia Agro Systems
Kweatornor Development and Relief Organization
KRUDF
International Committee of the Red Cross
Integrated Rural Development Organization
Grand Bassa Agriculture Group
German Agro Action
Food and Agriculture Organization
Farmers Against Hunger
Danish Refugee Council
Concern
Christian Children's Fund
Caritas Liberia
Caritas Cape Palmas
Association of Evangelicals of Liberia
Agriculture Relief Services Inc
Adventist Development and Relief Agency
Action Contre La Faim
0
20
40
60
80
100
120
140
160
180
Rice
Vegetables
Roots & Tubers
Fisheries
Livestock

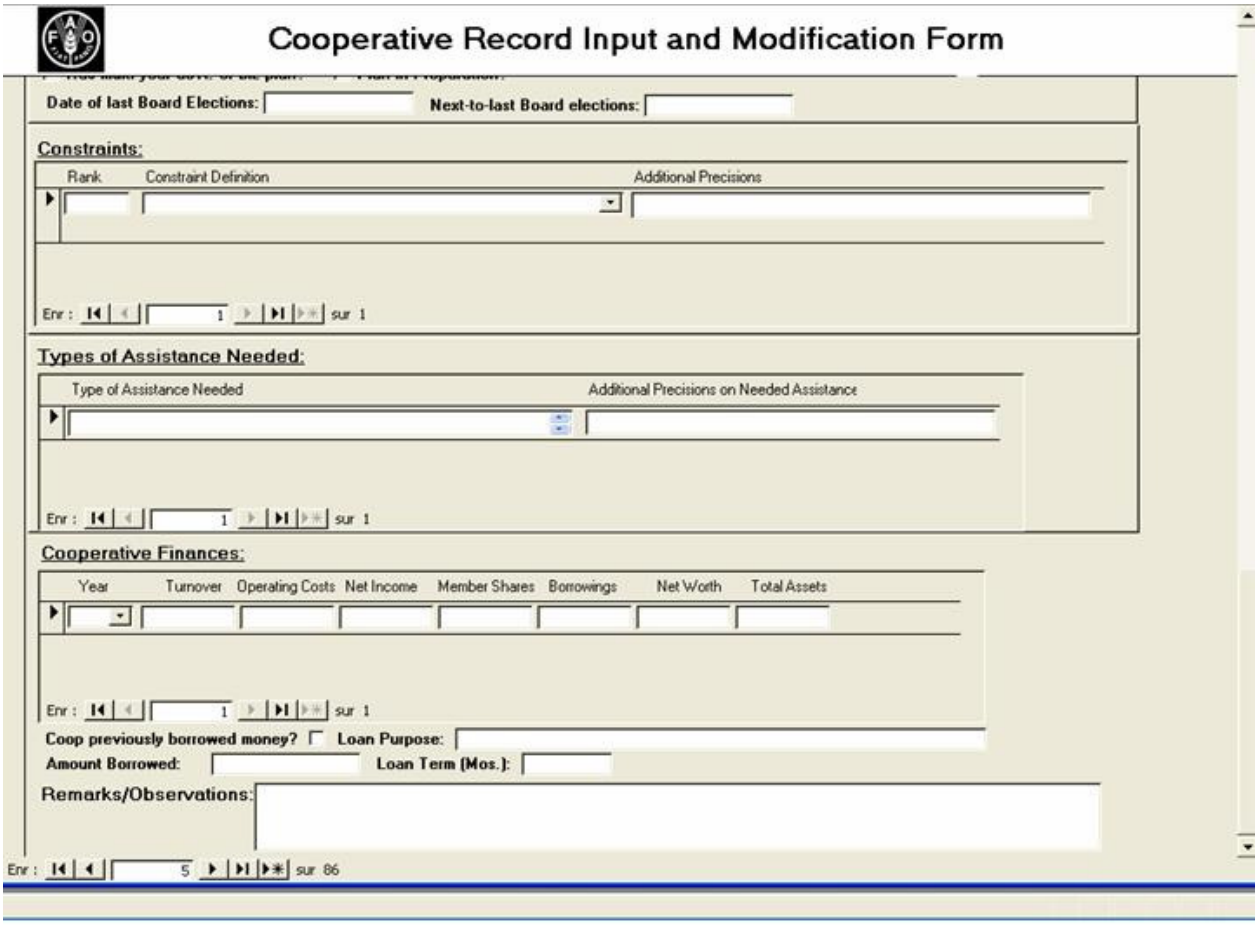

Percent of NGO Activities by Activity Type
Zao Development Council*
Visions in Action
TEARFUND
Sustainable Livelihood Promoters Program
South-Eastern Agricultural Relief Agency
Save the Children Fund - UK
Samaritan's Purse
Lutheran World Federation/World Service
Lofa Educational and Agricultural Foundation
Liberia Environmental Care Organization
Liberia Agro Systems
Kweatornor Development and Relief Organization
KRUDF
International Committee of the Red Cross
Integrated Rural Development Organization
Grand Bassa Agriculture Group
German Agro Action
Food and Agriculture Organization
Farmers Against Hunger
Danish Refugee Council
Concern
Christian Children's Fund
Caritas Liberia
Caritas Cape Palmas
Association of Evangelicals of Liberia
Agriculture Relief Services Inc
Adventist Development and Relief Agency
Action Contre La Faim
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
Rice
Vegetables
Roots & Tubers
Fisheries
Livestock

ANNEX 6

Cooperative database record input/modification form

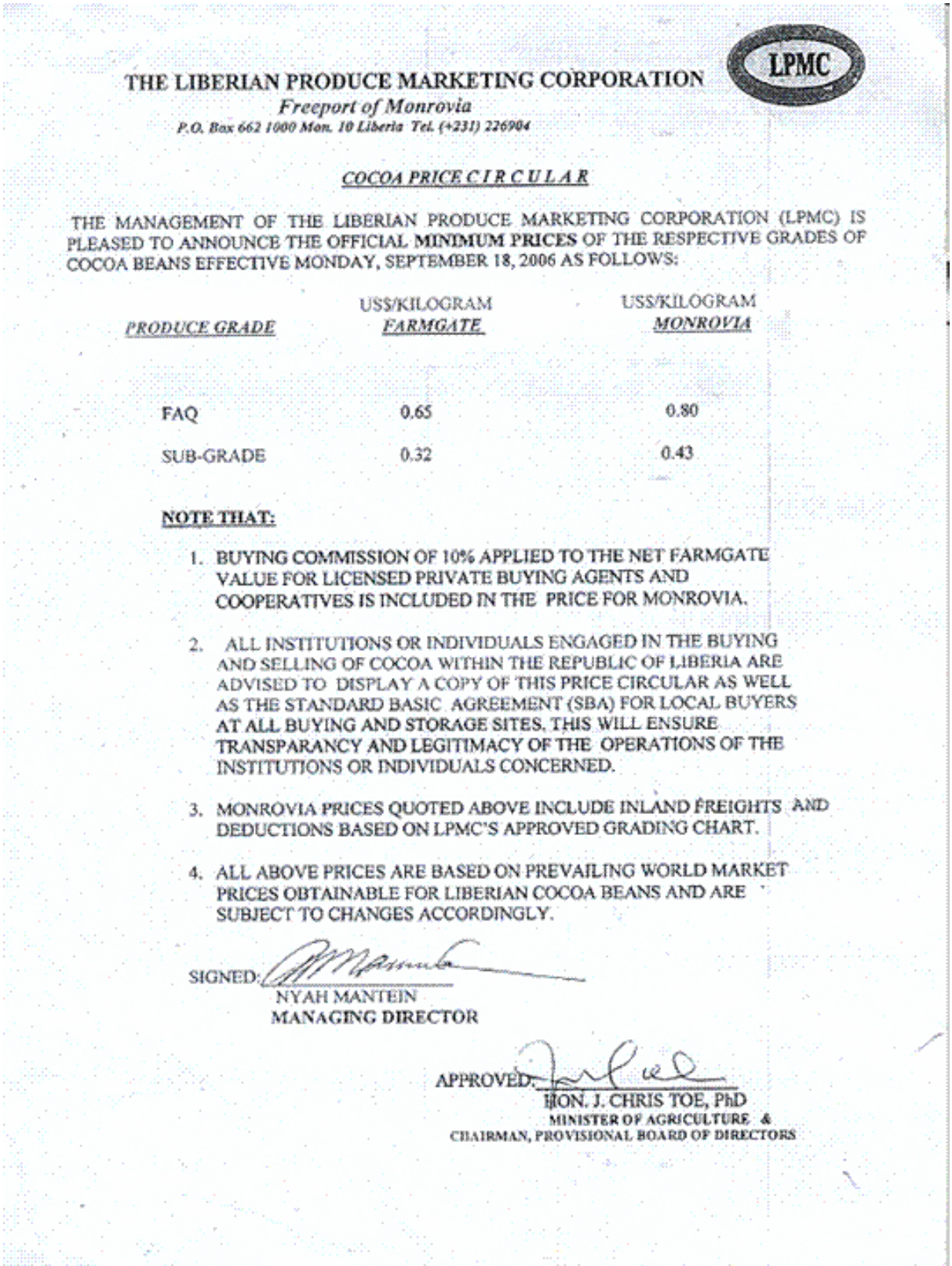





Cooperative Record Input and Modification Form
Date of last Board Elections:
Next-to-last Board elections:
Constraints:
Rank
Constraint Definition
Additional Precisions
Enr : 1 sur 1
Types of Assistance Needed:
Type of Assistance Needed
Additional Precisions on Needed Assistance
Enr : 1 sur 1
Cooperative Finances:
Year
Turnover
Operating Costs
Net Income
Member Shares
Borrowings
Net Worth
Total Assets
Enr : 1 sur 1
Coop previously borrowed money?
Loan Purpose:
Amount Borrowed:
Loan Term (Mos.):
Remarks/Observations:
Enr : 5 sur 86

ANNEX 7

LPMC 2006 cocoa price circular



THE LIBERIAN PRODUCE MARKETING CORPORATION

Freeport of Monrovia

P.O. Box 662 1000 Mon. 10 Liberia Tel. (+231) 226904

LPMC

COCOA PRICE C I R C U L A R

THE MANAGEMENT OF THE LIBERIAN PRODUCE MARKETING CORPORATION (LPMC) IS PLEASED TO ANNOUNCE THE OFFICIAL **MINIMUM PRICES** OF THE RESPECTIVE GRADES OF COCOA BEANS EFFECTIVE MONDAY, SEPTEMBER 18, 2006 AS FOLLOWS:

PRODUCE GRADE	US$/KILOGRAM *FARMGATE*	US$/KILOGRAM *MONROVIA*
FAQ	0.65	0.80
SUB-GRADE	0.32	0.43

NOTE THAT:

1. BUYING COMMISSION OF 10% APPLIED TO THE NET FARMGATE VALUE FOR LICENSED PRIVATE BUYING AGENTS AND COOPERATIVES IS INCLUDED IN THE PRICE FOR MONROVIA.
2. ALL INSTITUTIONS OR INDIVIDUALS ENGAGED IN THE BUYING AND SELLING OF COCOA WITHIN THE REPUBLIC OF LIBERIA ARE ADVISED TO DISPLAY A COPY OF THIS PRICE CIRCULAR AS WELL AS THE STANDARD BASIC AGREEMENT (SBA) FOR LOCAL BUYERS AT ALL BUYING AND STORAGE SITES. THIS WILL ENSURE TRANSPARANCY AND LEGITIMACY OF THE OPERATIONS OF THE INSTITUTIONS OR INDIVIDUALS CONCERNED.
3. MONROVIA PRICES QUOTED ABOVE INCLUDE INLAND FREIGHTS AND DEDUCTIONS BASED ON LPMC'S APPROVED GRADING CHART.
4. ALL ABOVE PRICES ARE BASED ON PREVAILING WORLD MARKET PRICES OBTAINABLE FOR LIBERIAN COCOA BEANS AND ARE SUBJECT TO CHANGES ACCORDINGLY.

SIGNED:
NYAH MANTEIN
MANAGING DIRECTOR

APPROVED:
HON. J. CHRIS TOE, PhD
MINISTER OF AGRICULTURE &
CHAIRMAN, PROVISIONAL BOARD OF DIRECTORS

V. INSTITUTIONAL CAPACITIES AND RENEWAL STRATEGIES FOR RURAL DEVELOPMENT IN LIBERIA

By

Consultants, FAO:
Dr Michael Connolly
Dr Peter Smith
Dr Othello Brandy
and
Dr Ponniah Anandajayasekeram, Consultant, IFPRI

Liberia 2007

ACRONYMS

ACDB	Agricultural Cooperative Development Bank
AIDS	Acquired immune deficiency syndrome
BCADP	Bong County Agricultural Development Project
BOB	Bureau of the Budget
BWI	Booker Washington Institute
CAC	County Agricultural Coordinator
CARI	Central Agricultural Research Institute
CBO	Community-based Organization
CDA	Cooperative Development Authority
CDT	County Development Team
CGIAR	Consultative Group on International Agricultural Research
CIPs	County information packs
CST	County Support Team
CD	Capacity development
CFA	Core functional analysis
CMP	Change management programme
DDC	District Development Committee
DEC	Decadal computions of crop water requirements, irrigation water requirements, rainfall, and effective rainfall.
DRDE	Department of Regional Development and Extension (in MOA)
FAO	Food and Agriculture Organization of the UN
FARA	Forum for Agricultural Research in Africa
FDA	Forestry Development Authority
FFS	Farmer field schools
FOD	Farmer organization development
FY	Financial year
GDP	Gross domestic product
GOL	Government of Liberia
GRC	Governance Reform Commission
GTZ	German Technical Cooperation
HIV	Human immunodeficiency virus
ICT	Information and communication technology
IITA	International Institute of Tropical Agriculture
i PRS	Interim Poverty Reduction Strategy
Kuu Liberian	Local cooperative labour groups involved in planting, plantation rehabilitation, house construction, savings clubs or trading associations
LCADP	Lofa County Agricultural Development Project
LCCC	Liberia Cocoa and Coffee Corporation
LD&HS	Liberian Demographic and Health Survey
LEC	Liberia Electricity Corporation
LIPA	Liberian Institute for Public Administration
LOD	Local organization development
LPMC	Liberia Produce Marketing Corporation
LRDA	Liberia Rubber Development Authority
LRDU	Liberia Rubber Development Unit
LWSC	Liberia Water and Sewer Corporation

MDGs	Millennium Development Goals
MIA	Ministry of Internal Affairs
MPEA	Ministry of Planning and Economic Affairs
MOA	Ministry of Agriculture
MOF	Ministry of Finance
MOH	Ministry of Health
NARDA	New African Agricultural Research and Development Agency
NEPAD	New Programme for African Development
NIMAC	National Information Management Centre
NGO	Non-governmental organization
NI	Neuchatel Initiative
NIC	National Investment Commission
NCRDP	Nimba County Rural Development Project
NPC	National Palm Corporation
NSA	Non-state actor
OD	Organization development
PDA	Participatory development approaches
PEA	Participatory extension approaches
PJB	Provisional Joint Board for Parastatals
PRSP	Poverty Reduction Strategy Paper
PSIP	Public Sector Investment Programme
Ramsar Sites	International union for the conservation of nature designated protected sites according to the Ramsar convention
RPO	Rural Producer Organization
SME	Small and medium-sized enterprises
SPI	Statement of Policy Intent
SSA	Sub-Saharan Africa
SWOT	Strengths, weaknesses, opportunities & threats
TNA	Training needs assessment
ToT	Transfer of technology
UL	University of Liberia
USAID	United States Agency for International Development
VAMs	Vulnerability assessment maps
WARDA	West African Rice Development Association
WB	World Bank

V. INSTITUTIONAL CAPACITIES AND RENEWAL STRATEGIES FOR RURAL DEVELOPMENT IN LIBERIA

1. INSTITUTIONAL BACKGROUND AND CONTEXT FOR DEVELOPMENT

1.1 Current institutional milieu and challenges

The institutional situation in Liberia is in flux with both public and non-public organizations seeking to shape a viable transition from an environment of overwhelming dependence on emergency relief towards engagement with the challenges of reconstruction and longer-term development. Capacity development of a public sector decimated during the protracted 15-year war is one of the most formidable challenges facing GOL, national stakeholders and donor partners over the coming decade. How effectively GOL and its development partners respond to this challenge will centrally determine outcomes for national economic and social progress in improving livelihoods and employment over coming years and decades.

The Ministry of Agriculture (MOA) is endeavouring to rebuild threshold management and staff capacities while in the shorter-term seeking to be relevant and action-oriented in reclaiming its pre-war role as the lead public sector actor in agricultural and rural development. In effect it is struggling to balance responsiveness to the acute short-term demands and needs of rural communities to emerge from poverty with the clear long-term need to develop enduring capacities in policy, planning, coordination and oversight of implementation of programmes and projects. NGOs also have to respond to the "flux of change", with those whose remit is primarily for relief and emergency work now needing to re-orient their activities or be replaced by others that are more oriented towards long-term development processes and programmes.

One of the major challenges facing MOA is the need to lead new partnerships with the range of national stakeholders and non-state actors through continual processes of dialogue on national development priorities and subsequent joint planning and programme development at national and county levels. Such pluralistic partnerships are crucial to ensure harmonization of planning and implementation strategies and optimal deployment and utilization of scarce expertise and limited financial resources in support of renewed development of mostly impoverished rural communities.

The array of challenges confronting MOA and partners becomes even more formidable in a national context where the tradition and legacy of Government in Liberia, even under the conditions prevailing in pre-war decades, have been highly centralized in cultures of predominant hierarchy, autocracy and weak participation in development processes by rural communities and wider civil society. Understanding of and insight into the evolution and nature of Liberian Government administration and structures over recent decades, especially at local government level, is therefore essential in the context of considering and proposing institutional development approaches based on decentralization and emancipated participation of rural civil society in local planning and development.

1.2. Local government systems and structures

1.2.1 Brief recent history and evolution

In 1943, legal provisions structured the country into three political subdivisions, namely Western Province, Central Province and Eastern Province, which were further divided into ten subdivisions. In 1964, Provinces were abolished and the three Provincial areas were transformed into the counties of Lofa, Nimba, Bong and Grand Gedeh, which in addition to the five commonwealth districts brought the total to nine. The title of Provincial Commissioner was changed to County Superintendent, partly reflecting the changed scope of responsibility and control in counties. By the end of 1980 there were 13 counties and, with the creation of two more in 1999, the current total is 15.

The Liberian state is characterized by centralization of power with the Ministry of Internal Affairs (MIA) as the *de facto presidium* at the top of a local government system that is organized and operated in a very hierarchical mode. The structure is composed of both rural and urban semi-autonomous entities that are functionally and financially dependent on central government. The rural entities of local government include counties, statutory districts, administrative county districts, chiefdoms and clans, while urban entities include city corporations, municipalities, cities and townships.

In total, the country has 15 counties, 32 statutory districts, 119 county districts, 215 chiefdoms, 476 clans, 126 cities and 237 townships. Some local government divisions, in particular cities and districts, were established without following the technical procedures that had been laid down, and some counties and districts have not been properly demarcated. Local government institutions are effectively subjugated, and the system does not yet provide for local revenue generation or effective participation in planning or development processes by communities. Elected local leaders have not been functionally and administratively accountable to their constituencies, but rather to Presidential appointees, and by extension to the President.

Under the existing highly centralized structures, local government financial resources and operations are dictated by the budget of MIA. Local government or county inputs into the formulation and execution of county budgets are severely limited, as budget planning takes place at national level. The implications include exclusion of locally determined priorities in programmes/projects and a consequent lack of local community ownership of initiatives or activities. A recent capacity development study recommended the establishment by GOL of a local grant development fund incorporated in a participatory budgetary process to finance local economic development[4].

1.2.2 Decentralization in Liberia

Liberia's traditional system of local government poses some major problems in the context of moving towards a modern, democratic form of governance.

[4] Liberia Local Government Capacity Assessment Study. (2005) Mitullah, W, Poe, M and L. Haines. UNDP/GRC. Liberia.

- The entire structure is heavily centralized, with most local government positions, such as county superintendents, district and township commissioners, appointed by the President or appointees/representatives of the President.
- The lack of clarity on the functions and administrative roles of, for example, district and township commissioners on the one hand, and county and statutory district superintendents on the other hand, leads to confusion and conflict.
- Local government is not free to raise revenue or generate any resources for its local needs and plans.
- There has been no provision for local community emancipation or empowerment through participation in local planning and development processes.

Democratizing local authorities now requires two critical steps:

- restructuring the state system to give the people greater authority to manage their own affairs at the local level;
- making local authorities and other institutions of local self-governance more representative, participatory, accountable to the local population, and more autonomous from the central government.

A team of consultants working with the Governance Reform Commission (GRC) has recommended a decentralization policy framework. The team stated that:

> *"decentralization, in as far as it puts emphasis on community organization and participation at the lowest level, will provide the political and administrative framework and structures to meet the challenges of post war reconstruction and development of the country".*

The paper further states that decentralization will:

> *"provide the rural communities with the autonomy, flexibility and opportunity for popular participation in the process of planning and implementation of development programmes".*

Box 1 provides the steps and principles that should be upheld during derivation of a decentralization policy framework.

Box 1. Steps and principles for developing a decentralization policy framework

The steps include:

- defining the forms of decentralization, basic principles, pillars, systems, institutional roles and responsibilities of actors;
- obtaining consensus and ownership of policy initiatives by stakeholders;
- formulating a GOL decentralization policy framework that is based on the principles of devolution, popular participation, partnership, non-subordination and subsidiarity.

Source: Wagaba Francis X.K. 2005. Developing a Decentralization Policy Framework for the Republic of Liberia: Draft Discussion Paper. Monrovia: Governance Reform Commission

The UNDP facilitates County Support Teams (CSTs) that seek to ensure a coherent and consolidated UN approach to addressing county challenges, provide support to government through the County Superintendents, and build capacity of local government institutions as they assume increased responsibility for security, reconstruction and development. Capacity

development by CSTs is focused on enhancing the skills and performance of local government officials (Superintendents, Mayors, Development Superintendents, project planning staff, county officials, District Commissioners, Chiefs and traditional leaders) and providing training in support of the Millennium Development Goals (MDGs), notably in HIV/AIDS awareness raising and training.

To assist counties in obtaining the latest available data in areas related to the Interim Poverty Reduction Strategy (iPRS) pillars, the CSTs are putting together County Information Packs (CIPs) to support and strengthen the emerging capacities of local authorities for programme and project planning. The CSTs meet monthly with the County Superintendent and the Assistant Superintendent for Development in all counties to discuss and plan countywide activities with key ministries, NGOs and CBOs.

Currently the focus is on cluster approaches in areas such as human rights, food security, early recovery and the rule of law. The CSTs are seeking to facilitate transition from emergency conditions to recovery and more normative development processes, and as such are providing interim orientation in the transition towards the participatory planning and local level decision-making processes that would eventually characterize decentralization of line ministries and their local service provision functions to county levels.

Problem areas that need to be addressed under forthcoming decentralization processes include the lack of clarity on roles and responsibilities of key actors such as County Superintendents and their assistants appointed by MIA, centralized budgeting and financial administration, poor functional linkages between County Assistant Superintendents for Development and DDCs, and MOA and MOH county-level management and staff still reporting centrally to their head offices in Monrovia.

In early 2007 the GRC, with the support of the UN Capacity Development Fund, embarked on a national process of studies and workshops (ongoing) to shape a new policy and legal framework for decentralization with the ultimate objective of drafting a new Local Governance Act to provide an enabling legal framework for national decentralization policy and accompanying strategic guidelines and measures for implementation across all levels of local government. The initial outputs from this process will be available by mid-2007 and should provide the basis for the legislation needed to bring coherent national policies and enabling measures into effect across all government ministries and departments.

1.2.3 The District Development Committee (DDC) approach

Various participatory development frameworks are being tested on the ground, with the District Development Committee (DDC) framework being the most elaborate and operational in all counties since 2006. Although the framework is still at an embryonic stage, it has the potential to enhance the engagement of local communities in local economic development, and provide a link to resources within and outside districts.

The DDC approach (Box 2) was first launched in 2004 and relaunched in July 2005 and is now operational in most of the 73 districts. Although the approach is still at a fledgling stage, it has the potential to improve the involvement and engagement of local communities in local economic development (LED) and in turn shape their own development. Furthermore, it provides a link between local communities and various development agents operating at the local, regional and national levels.

Box 2. District Development Committees (DDC)

The DDC is a fourteen-member elected institution composed of the District Commissioner/Superintendent (ex-officio), Chairperson, representatives of chiefs, representatives of all women's groups, representatives of youth groups (two persons: one male, one female), representatives of elders (two persons: one male, one female), representatives of CBOs (two persons: one male, one female), and representatives of sectors, namely agriculture, education, health, water and sanitation (four persons: minimum two females). The DDCs are local level development and coordinating mechanisms in the districts. They provide an entry point to local economic development (LED).

Overall, the DDCs will take on planning, coordination and monitoring roles. Specifically, their terms of reference (TORs) include sensitizing and mobilizing communities and using participatory approaches in designing projects, and evaluation and formulation of development strategies in collaboration with NGOs and UN agencies.

At a stakeholders' workshop held to discuss the preliminary findings of the Wagaba study (see Box 1 above), it was suggested that the County Assistant Superintendent for Development be part of the DDC as an ex-officio and a liaison development officer between the county administration and the people. Wagaba listed the DDC framework as one of the first phase activities in the development of devolved local government structures. The MOA County Agricultural Coordinators (CACs) will need to ensure active involvement in these processes at the appropriate local level as key agricultural sector representatives alongside their development partners (NGOs, CBOs, NSAs).

Currently the UNDP Community Based Recovery Programme (2004–2007) is providing support (US$9.0 million) through DDCs for community participation in planning and programme development for local rehabilitation projects in water and sanitation, education and rural roads and bridges. Chairpersons of DDCs are currently receiving basic orientation and training in participatory approaches to community-level planning and development; the New African Research and Development Agency (NARDA), a local NGO, is providing this initial training for UNDP.

1.3 Ministry of Agriculture – functions, structure and capacity development

1.3.1 Mandate and mission

The Commission for Government Reform (CGR) is currently engaged in a process of revising the mandates of all GOL ministries. The MOA's core general areas of responsibility will most probably continue to consist of agriculture, both smallholder and commercial, plantation crops, fisheries on-farm woodlands. In June 2006, GOL produced a Statement of Policy Intent (SPI), which outlines the role of agriculture in Liberian society:

- a generator of employment through facilitating processes of rural resettlement and stabilization (especially through the provision of opportunities/livelihoods for ex-combatants);
- a source of income and prosperity in rural areas;
- an important engine of growth in wider economic development.

Agriculture's contribution to the economy is sufficiently important for its recovery to be crucial to GOL's declared goal of changing from a low-income developing country to a middle-income, medium human development country by 2015.

1.3.2 Interim policy and development strategy

The SPI defines five main *principles* of MOA policy.

- That the Ministry's policies and measures, while focusing on smallholders and previously neglected areas, should have a wide geographical coverage, in the interests of equity, justice and national cohesion.
- Priority should be given to policies and measures that would have an "immediate" impact on food production, household food security, and local business development. The urgent need to achieve "quick wins" in these areas is increasingly accepted and supported by the donor community.
- Policy and decision-making processes should be participatory and mobilize local knowledge.
- The formulation of policy and strategy should be sensitive to the need to empower women, and to provide incentives and training for young people to pursue careers in agricultural and rural development.
- Governance, including regulatory oversight, should be decentralized.

In *operational* terms, the MOA Planning Directorate articulates the focal goal of the Ministry as contributing to post-conflict recovery and reconstruction through the following specific thrusts:

- resettling displaced farm families;
- providing employment for unemployed and underemployed persons, particularly the war-affected;
- developing Liberia's rural areas, to reduce poverty and increase food security;
- pursuing agricultural development in a way that is sustainable in terms of managing and conserving the national natural resource base.

1.3.3 MOA structure and staffing

At the end of the war, MOA emerged with its old structure still largely intact. This structure consisted of four departments, Planning, Technical Services, Administration and Extension. The Central Agricultural Research Institute, CARI, came under Extension. Technical Services was responsible for quarantine, and a number of activities that are somewhat distinct from field agriculture, such as aquaculture, and fuel and tree crops; however, it also held responsibilities for land and water resources, and animal resources. Senior staff in MOA state that there was a significant amount of interdepartmental conflict arising from unclear or overlapping roles/areas of jurisdiction, and the resultant competition for resources.

The MOA has decided that its current structure should comprise four departments: Planning and Development, Extension and Community Empowerment, Technical Services, and Administration. A Deputy Minister, who would be supported by an Assistant Minister, would head each department. The GRC states that the general GOL policy is to have permanent, technically qualified staff in all positions at or below head of department level. Ministers and departmental directors are currently working on the organogram of MOA and constituent departments.

A major challenge is how to decentralize the current skewed staff deployment in MOA, where, out of a total of 327 staff, only 84 are outstationed with 243 based in Head Office in

Monrovia[5]. Under decentralization, this 75:25 ratio probably needs to be reversed to a situation where three out of four staff are directly deployed in counties/districts. The MOA envisages an eventual total staff complement of circa 250 – about a quarter of the estimated total of 1 000 that MOA had before the war. The MOA is currently conducting a systematic exercise to reassess all staff on its books to remove ghostworkers and poor performers and to provide renewed opportunities for those with relevant skills and potential.

1.3.4 Department of Planning and Development

Three divisions are currently proposed, each headed by a director: Planning and Policy, Coordination, Monitoring and Evaluation, and Statistics. The Planning and Policy division takes the lead in policy formulation and in liaison and planning with national stakeholders on sector-wide development. One of its key current challenges is the integration, harmonization and coordination of the activities of the estimated 600 NSAs/NGOs (UNDP estimates) involved in food security/rural development into mainstream national agricultural development plans and how to ensure that resources are not overly concentrated in the Monrovian headquarters of some of these organizations, in line with the impending need for decentralization across state and non-state actors. To do this effectively, the division will need to conduct a services analysis exercise in collaboration with the Department of Extension and Community Empowerment to obtain the knowledge and insights necessary to fulfil its role in the provision of oversight and guidance in planning of services and training for farmers.

Box 3. Key steps in a services analysis exercise

- Workshop(s) on planning and partnerships with MOA and stakeholders in programme and project implementation.
- Implementing partners complete questionnaires on agricultural service provision.
- MOA and consultants conduct an exercise to identify the outputs, i.e. the deliverables (products or services) that are provided currently for farmer client(s) by providers (MOA and other partners).
- Conduct a costing exercise to obtain estimates of the actual costs of each output. The results constitute a key input into core functions analysis (CFA) exercises in MOA – a specific review of functions, roles and relationships.
- MOA establishes Service Coordination Teams at national and county levels.
- Service Coordination Teams undertake capability assessments of service providers.
- Outcomes of capability assessments feed into the MOA planning process at national and county levels where all actors harmonize and coordinate their plans and activities.
- All service providers monitor their programmes and conduct evaluations with MOA and Service Coordination Teams.

At county and district levels, the Planning department needs to link closely with CBOs (circa 800; UNDP estimate) and the National Information Management Centre (NIMAC) to strengthen its knowledge base and management of the array of actors active in agriculture and community development. The strategy and research division focuses on two key activities: the groundwork for the identification of viable agricultural development initiatives, and knowledge management in the wider sense of knowing what is going on across the agriculture sector and maintaining institutional memory.

[5] Personnel Listing, Civil Service Agency GOL/MOA. Fiscal Year 2006/2007.

The Monitoring and Evaluation division may pose some problems, however. Monitoring is really part of management; it has to be able to feed information back to management promptly, so that timely responses are made to both problems and opportunities – and it has to be action-oriented. Despite the long-hallowed practice of linking it with evaluation as 'M&E', the separation of monitoring from management will greatly weaken the latter, especially under pressurized operating conditions where "fast track" assessment of progress will have primary importance. By contrast, evaluation answers the question "has what we did given good value for the money and other resources we committed, and would we do it differently another time?" – it is about *impact*. Evaluation needs to be independent of both planners and managers so that its output will be of optimal use in framing future policy and plans.

1.3.5 Department of Regional Development and Extension

This will have two divisions: Extension and Community Empowerment. See the organogram (February 2007) below. The most important task is to clarify roles, responsibilities and relationships through renewed job descriptions across the divisions and to have flexible programme approaches in the five areas of field service provision within the divisions. The Department of Extension and Community Empowerment is a proposed title to replace the Department of Regional Development and Extension and has to receive legislative approval – a process that takes time.

1.3.6 Department of Technical Services

This comprises five divisions: National Agricultural Quarantine, Fisheries, Plant Resources, Animal Resources, and Agricultural Engineering. Each of these divisions is headed by a Director, but under the new paradigm shift, if approved through legislative enactment, it is proposed that a technical coordinator will supervise and coordinate the above-mentioned divisions.

1.3.7 Department of Administration

This comprises Human Resource Management, Financial Management, Information Management Services, and Asset Management.

1.3.8 Review and reform of parastatals.

There are six parastatals:

- The Liberia Produce Marketing Corporation (LPMC) was mandated to procure farm products from farmers' cooperatives and farmers in general, and to package them for subsequent export to buyers. It was also charged with the responsibilities of providing farm advisory services at all levels. However, it went beyond its mandate by involving itself in production, to the disadvantage of the small farmers. Along the way, it failed to reimburse farmers for their products to the tune of an estimated US$3.5 million.
- The Liberia Cocoa and Coffee Corporation (LCCC) was set up to build the capacity of cocoa and coffee growers with the provision of farm advisory services such as nursery development, farm layout and planting operations.
- The National Palm Corporation (NPC) was charged with the responsibility of overseeing and managing government-owned oil-palm holdings. The NPC failed to survive not only because of the civil crisis, but primarily due to poor management.

- The Liberia Rubber Development Authority (LRDA), formerly the Liberia Rubber Development Unit (LRDU), was established to build the capacity of smallholder rubber producers with farm sizes within the range of 2–5 acres with improved seedlings, extension services and marketing.
- The Cooperatives Development Authority (CDA) was set up to build awareness of the cooperative movement and the benefits to the economy, and to assist in the organization and development of cooperatives, in registering and certificating cooperatives and advocating on their behalf.
- The Agricultural Cooperative Development Bank (ACDB) was set up as a farmers' bank with the provision of loan services but failed to accomplish its set objectives to improve farmers' livelihoods. Lending procedures were cumbersome and in most instances limited the chances of farmers obtaining loans. Rather than providing loans to needy farmers, it targeted "high level" farmers who, in the end, failed to pay back borrowed loans. Government's own indebtedness to the bank through borrowing an estimated US$3 million paralyzed the normal functions of the bank.

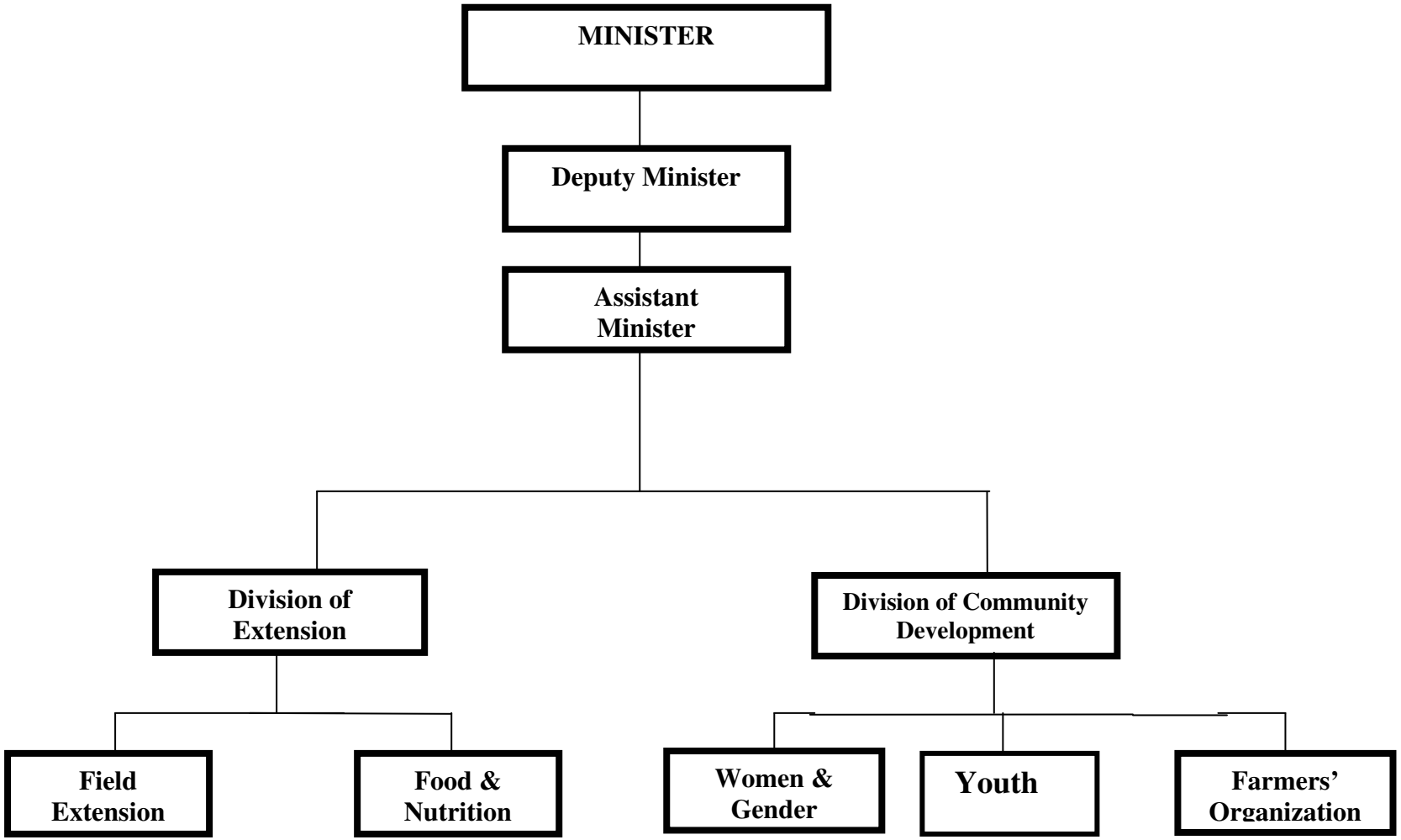
In addition to the above six parastatals are the Lofa County Agricultural Development Project (LCADP), the Bong County Agricultural Development Project (BCADP) and the Nimba County Rural Development Project (NCRDP). These were projects funded by the World Bank for a ten-year period. The objectives of these ADPs were to boost the production of cocoa, coffee and rice, targeting small farmers as the main beneficiaries. To a large extent the projects succeeded but could not continue beyond 1985 due to GOL's inability to repay its debts.

Participants observed that there is a need to indicate the performance levels of the abovementioned institutions, while also defining their legislative mandates within the context of sector development. Discussion of the way forward or future of these institutions could be considered to be premature because a Provisional Board has been set up by GOL to determine their future.

The GOL has created a Provisional Joint Board (PJB) comprising the directors of the parastatals, which is currently chaired by the Minister of Agriculture, and has a senior representative of the Ministry of Planning and Economic Affairs among its members, together with representatives of the private sector. It is currently engaged in reviewing the future of the above bodies. There are a number of criteria that should govern the decision as to whether a particular parastatal should continue to receive support. The key one relates to the extent to which the private sector is likely to provide the same goods/services comparatively better in terms of quality and cost – but also in line with strategic long-term national goals for economic and social development of rural areas and communities.

The MOA is currently considering legislation to rationalize some of the functions and structures of these entities, including options to create a new Liberian Agri-Export Development Board replacing entities such as LPMC and LRDA. Also under consideration is a comprehensive study of rural finance and microfinance for agricultural and agri-enterprise development to review in detail the potential roles and contributions of existing commercial banks (Ecobank/LBDI) in credit provision, and the merits and demerits of a renewed entity for strategic long-term finance of agricultural and rural development, e.g. a Liberian Agricultural Development Bank to possibly replace ACDB.

DEPARTMENT OF REGIONAL DEVELOPMENT AND EXTENSION



1.3.9 GOL budgetary process

The budgetary system is a dual one, with a development budget and a recurrent one. The latter does contain capital items, relating to GOL's permanent need for buildings and equipment. The annual budget cycle is initiated by requests for proposed budgets from the Bureau of the Budget (BOB); these are subject to certain guidelines, which may be ministry specific but are usually general. The current guidelines for FY06/07 are: that the economic and fiscal situation demands continuing austerity; that the costs of leasing premises are still too high, and actually increasing; that personnel costs remain too high and should be trimmed. On the last issue, there has been an across-the-board 73 percent increase in salaries, which nevertheless remain far below a living wage (estimates put salary levels at between 15 percent and 25 percent of the living costs of a typical household). The guidance also covers the format in which the proposals should be submitted.

As part of its contribution to the capacity-building aspect of recovery, the Ministry of Planning and Economic Affairs (MPEA) provides a detailed set of guidelines for the preparation of these estimates. They advocate a number of standards for budgetary practice, which include the need for consistency between declared policy and budget; that individual budget initiatives should be clearly focused and time-bound; that each proposal must specify content, objectives, strategy, and where, when, and how the activity is to be implemented. Within each ministry, the Minister and heads of departments respond to BOB's request by meeting to discuss the work plan, and to develop the budget proposal for submission to BOB. When this has been done, a date for the particular ministry's budget hearing is set, wherein the Ministry defends its proposals at the Ministry of Finance (MOF). The MOF and BOB will rule on the level of the total budget; it is then left to the individual ministries to allocate the reduced amount. For example, in FY05/06, MOA proposed US$6 million, but actually received US$3.06 million. This is the highest amount for 9 years; often, during the war, it was less than $0.5 million. The GOL will have to seriously consider its ongoing and future investment in and commitment to agriculture in the context of the "Maputo Declaration" that recommends a 10 percent of allocation of annual budgetary spending to agricultural development by African governments.

Box 4. Development implications of the GOL budgetary process

Some features of the budgetary process have important implications for the management of future development initiatives and could lead to problems, especially if they are not recognized in advance.

- There is a deadline for the submission of estimates; where counterpart funds are needed, it is important that the Ministry is the position to include these in its estimates for the next financial year. If this is not done, it will normally be impossible to make any of the counterpart expenditure during the following financial year.
- The current form of the project performance report appears to place too much emphasis on expenditure as a measure of progress. It would be good if either the form of the report itself could be modified or it could be supplemented with appropriate indicators/measures of progress in achieving milestones/results.
- The otherwise excellent MPEA guidelines for the preparation of budget estimates should be supplemented with more appropriate advice on the scheduling of expenditure on development initiatives – poor practice in this area is widely recognized as contributing to the uncertainty of government expenditure.
- There should be provision for expenditure to run over at the end of the financial year, and most countries' budgeting systems do now permit this. Similar points apply to start-of-year expenditure.
- Similarly, caution should be exercised in applying the time-bound criterion. In both cases, because the time scales of projects and programmes in development are difficult to forecast accurately, the dates of actual payments are often uncertain; either of these measures could "punish" initiatives that had suffered relatively minor delays.
- It is important that donors/lenders do not press for earmarking of counterpart funds, as this can only increase the pressures elsewhere in the public sector budget.

1.4 Development implications of the GOL budgetary process

Some features of the budgetary process have important implications for the management of future development initiatives and could create problems, especially if they are not recognized in advance.

- There is a deadline for the submission of estimates; where counterpart funds are needed, it is important that the Ministry is the position to include these in its estimates for the next financial year. If this is not done, it will normally be impossible to make any of the counterpart expenditure during the following financial year.
- The current form of the Project Performance Report appears to place too much emphasis on expenditure as a measure of progress. It would be good if either the form of the report itself could be modified, or it could be supplemented with appropriate measures of physical progress (see below).
- The otherwise excellent guidelines for the preparation of budget estimates should be supplemented with more appropriate advice on the scheduling of expenditure on development initiatives – poor practice in this area is widely recognized as contributing to the uncertainty of Government expenditure.
- There should be provision for expenditure to run over at the end of the year. Ministries make quarterly requests for allocations; for the first quarter they are made against estimates, but for the other quarters, they are made against the prescribed project performance report. The lowest level of control on expenditure is, at present, in the Minister's office (as in virtually all ministries): the development budget is not allocated to counties but is managed centrally by the Minister, supported by a Comptroller and a small staff, who are currently part of the Administration Department – with the advice of the heads of departments. Two explanations are given for this: (i) that it is a relic of former practices (when the budget formed part of a patronage system), and (ii) that it is part of the "multiple levels of control" in place. In so far as the latter explanation is correct, this arrangement is probably inevitable at present; however, as the volume and complexity of activity picks up, it will become unmanageable. There is a need for MOA to start thinking about how it will prepare for and integrate with the forthcoming decentralization process (see 2.2 above), specifically in proposing measures for programme, administrative and financial decentralization to county levels.

1.4.1 Major recommendations for action by MOA, stakeholders and partners

> *"There is another reason why a national capacity-development programme is urgent. Over the last two years, a wide variety of capacity-development initiatives have been initiated – public sector reforms, civil service reorganization, institutional support and management reviews, amongst others. These initiatives need to be anchored to a coherent and coordinated framework. In the absence of strong and coordinated support for capacity development, the efficacy of ongoing and planned reform initiatives would be unsustainable in the long term."*
>
> … ***National Human Development Report, Liberia, 2006***.

The need for a coherent institutional capacity development framework and accompanying programme for MOA and partners is very apparent and all recommendations are put forward in that context for the cogent reasons outlined in the recent human development report mentioned above and in line with the *UNDP 10 Default Principles for Capacity Development* (2004).

A. *Broad, strategic long-term recommendations*

1. Renew and develop MOA systems and capacities for improved performance in sectoral policy and strategy formulation, programme development, implementation and evaluation in a decentralized paradigm for rural development.
2. Design, plan and implement a Ministry-wide Management and Institutional Performance Programme in the six major areas outlined in the investment proposal below and based on the institutional analysis and conclusions highlighted in this report.
3. Form interdepartmental and interdivisional task teams in MOA (and where necessary with partners) to address key cross-cutting issues/focal assignment areas with group purpose and cohesion; build ministry team spirit and facilitate optimal collaboration and synergies among management and staff across the ministry.

B. Short- to medium-term recommendations

4. Convene a National Workshop involving major NGOs operating in the agricultural sector on the theme of *Planning for New Partnerships in Agricultural Development* to address issues of registration, programme and project activities, MOA's role in planning and coordination of the agricultural sector, impending decentralization, mandates and capabilities of actors, and funding issues. Principal donors of participating NGOs should also be invited and the workshop should be the first in a continual process of engagement to improve the contributions of MOA and its partners to overall sectoral planning and development. The process should also lead gradually into a service analysis exercise by MOA with partners.
5. The Planning and Development Department with the Department of Administration in MOA should establish a *Joint Task Team* with NIMAC/UNDP to explore options to develop a modern computerized knowledge management system in MOA. This should include the renewal of central filing/registry capacities, the development of information database(s) on partners and consultants, a design for a farm enterprise and management information system and MOA documentation facilities.
6. Given the apparent MOA commitment to devolve programme decision-making on headquarters allocated county budgets to the CAC and staff from 1 July 2008, it is recommended to set up a *Task Team on Decentralization* comprising headquarters and county staff to plan and prepare for this process and to liaise with Assistant County Superintendents and DDC Chairpersons for integration with local government planning processes.
7. Plan and select participants (MOA, farmers, agribusiness, NGOs) for study tours to African or other countries where the ministries of agriculture and partners have substantive experience of implementing institutional change for improved performance in facilitating and assuring service provision to various categories of farmers under pluralistic, decentralized paradigms.
8. Facilitate stakeholder participation processes in counties where new farmer training or programme activities are getting underway (e.g. FAO-supported farmer field schools under the National Food Security Programme) with an early focus on

counties/districts where capabilities/resources/logistics permit such exercises – which should be comprehensively analyzed and documented.

9. Set up a *Task Team on Farmer Training and Organization Development* comprising MOA management/staff from planning, technical and extension departments/divisions, farmer organization leaders/members, NGOs and universities/colleges. The team would, among other TOR, examine the possibility of setting up a National Farmer Organization Development Council to lead commercially oriented initiatives and training in the three major agricultural producing counties (Lofa, Nimba and Bong) replacing the CDA.
10. Conduct a training needs assessment across MOA, review job descriptions and develop a comprehensive *Management and Staff Training and Development Plan* for MOA with the full participation of all divisions and staff categories and a budget for implementation. The plan should provide centrally for orientation of management and staff towards the new role of MOA (especially under decentralization at county level) and their responsibilities under the new paradigm for agricultural development and service provision to farmers.
11. Conduct *National Stakeholder Consultations on the Proposed Reforms of Parastatals* including the studies planned to inform the process with respect to (i) the study of rural finance/microfinance ahead of decision-making on the possible abolition of ACDB, and (ii) a national strategic study on agri-enterprise development and diversification to explore potentials/feasibilities for the production of fruit crops, spices, beans and other alternative enterprises before setting up a possible *Liberian Agri-Export Development Board* to replace LPMC and LRDA.
12. Build *Programme and Project Planning and Development Capability in MOA* - preferably across divisions through inter-disciplinary teams. The MOA needs to strengthen its skills in programme and project identification, design, planning and implementation to provide (i) guidance, training and support to MOA county management and staff, and (ii) oversight to processes involving management and implementation of agricultural programmes or projects by NGOs or private actors.
13. MOA should develop closer and more systematic collaboration with UNDP programmes, especially at county level where, through the CSTs, UNDP is the leading agency in institutional capacity development, especially through its district and community development initiatives. There is considerable scope for co-learning in meeting the challenges of decentralization together in coming years.

CAAS-Lib – Institutional investment proposal 1

Name of programme	**Institutional Renewal and Capacity Development for Ministry of Agriculture (MOA) and Stakeholder Partners**
Institutional responsibility	Government of Liberia/MOA/Stakeholder partners
Aim(s) of activity	Renew and develop MOA systems and capacities for improved performance in sectoral policy and strategy formulation, programme development, implementation and evaluation in a decentralised paradigm for rural development.
Description of main activities	• Refocus and reorganize MOA functions and organizational systems and structures in line with the new paradigm for public sector roles in agricultural development, stakeholder involvement and decentralized services coordination and provision to farmers. • Reorientation and training of management and staff in their emerging roles and responsibilities. • Strengthening MOA oversight and coordination capabilities in sector-wide planning and coordination of agricultural programmes and service provision. • Developing an updated financial management and administration system in conjunction with the modernization processes of MOF. • Strengthening of MOA capacities in knowledge management to inform policy, programme and services development across departments, including system-wide programme/project evaluation and staff performance management. • Operationalizing decentralization of MOA personnel, planning processes, programme budgeting and financial administration to counties.
Expected result(s)	• A streamlined MOA (total staff complement circa 250) with clearly established functions and responsibilities in discharging its mandate to lead and facilitate the development of the agricultural sector. • MOA and multi-stakeholder partners cooperate through agreed platforms/fora in shaping national agricultural policy, programme planning and services provision to farmers. • MOA management and staff capacities developed to high standards of performance supported by comprehensive monitoring and evaluation systems. • MOA has a state-of-the-art knowledge management system at central and county levels with local agricultural knowledge/information centres geared to the specific needs of various farmer groups. • MOA fully decentralized to all counties with county teams integrated into planning processes with local government institutions.
Impact on food security, poverty reduction & economic development	• MOA will be better positioned to develop coherent policy and strategy for the sector and provide leadership, oversight and coordination for all actors involved in programme implementation and service provision. • Decentralization and integration of MOA activities into county development systems will help to ensure that programmes and services are relevant and responsive to the local demands and needs of farmers and that training and services are provided cost effectively to farmers (subsidiarity). • Integrated and farmer-centred planning with all actors will lead to the emergence of self-reliant farmer groups and organizations contributing optimally to local food security and producing surpluses for income generating agri-enterprises that will lift the income base and livelihoods of rural communities.
Period of execution	2008–2012
Estimated cost	US$6 million

2. THE AGRICULTURAL RESEARCH SYSTEM

2.1 Introduction

Until fairly recently, Liberia has been the classic "failed state", with many national institutions destroyed or neglected to the point of non-functionality. The country's human development indicators (UNDP, 2003) reflect the miserable conditions that resulted from the decades of conflict and the collapse of governance institutions and structures. Almost an entire generation missed out on formal primary education because of the war (only 35 percent received primary education in 2001/2002). The gross domestic product (GDP) is estimated at US$438 million, which equates to a per capita income of US$151. Unemployment in the formal sector is estimated at 85 percent. Daily expenditure on food by the poor in 2000 constituted more than two-thirds of household income, making the country one of the most food insecure in the region. Seventy-six percent of the population live below the poverty line with the poor primarily living in rural areas (86 percent). Twenty-six percent of the population have access to safe drinking water and 45 percent to sanitation facilities.

The agricultural sector has long played a significant role in the Liberian economy. It accounted for about 37 percent of the GDP prior to the beginning of the civil war in 1987. The sector's contribution to the GDP picked up after the war and currently stands at 53 percent (MOA, 2006; NEPAD-FAO, 2006). The increased reliance on agriculture is largely attributed to the collapse of iron ore mining, which was the largest contributor to the GDP by 1987. Now, nearly 70% of the economically active population of Liberia is engaged in agricultural sector with the majority engaged in the subsistence farming of rice and cassava (MOA Liberia, 2006; NEPAD-FAO, 2006). However, despite the devastation caused by the war, the cash crop sub-sector remains lucrative and employment opportunities are available, notably on rubber plantations.

The market plays a key role in food security in Liberia. According to the Liberian Demographic and Health Survey (MP&EA, 1999/2000), it accounts for 51 percent of the supply of household food, compared with 48 percent from own produce. In urban areas, 95 percent of households depend on food from markets as their main source of food. However, large numbers of rural dwellers have moved to urban centres since 1990, reducing food production in rural areas and increasing food shortages in urban areas.

The average cereal production of Liberia is 188 tonnes, which is 0.21 percent of the total production of sub-Saharan Africa (87 715 tonnes). The percentage change in cereal production since 1979–81 is 26 percent for Liberia and 54 percent for sub-Saharan Africa. The equivalent figure for the world is 32 percent. The average crop yield for Liberia is 6 840 kg/ha while for sub-Saharan Africa it is 7 694 kg/ha. The world average is 12 985 kg/ha. Average yields of cereals, roots and tubers, and pulses have been flat since the 1960s. Net cereal imports and food aid as a percentage of total cereal consumption from 1961 to 1998 was 56 percent. These figures suggest that improved food security depends in large part on improved agricultural productivity, research and extension. The focus in this analysis is on what the research system can do to improve the situation.

2.2 Agricultural research in the GOL recovery and development strategy

The GOL's vision for the agricultural sector is a holistic one, focusing on the transformation of smallholder agriculture into a sustainable, diversified, income-generating, modernized and

competitive sector, well integrated into the domestic and international markets. To realize this vision, MOA has defined three short- and medium-term strategic objectives for the sector:

- supporting the transition from relief to recovery and development;
- ensuring food security;
- building capacity.

Strategic long term objectives include:

- food and nutrition security;
- productivity enhancement and employment generation;
- sustainable development of natural resources;
- strengthening institutional and human resources;
- rehabilitating and expanding the rural productive infrastructure and roads to facilitate cost-effective movement of inputs and produce in order to enhance competitiveness of domestic production.

The national agricultural research system (comprising public, private and civil society sectors) has a critical role to play in the pursuit of these objectives. The following sections highlight the challenges and opportunities facing public, private and civil society agricultural research in Liberia.

2.3 Public sector research: The Central Agricultural Research Institute (CARI)

The Central Agricultural Research Institute (CARI) was established on 18 August 1980 as a semi-autonomous organ of MOA. It evolved from the Central Agricultural Experimental Station (CAES), which was established between 1951 and 1953. This change gave the institute relative autonomy and flexibility to operate with minimum interference from the line ministry (of Agriculture). This status allowed it to develop rapidly into a reputable centre of excellence in applied and adaptive research in West Africa before the war. However, the civil war devastated CARI. The physical infrastructure was destroyed through the looting of offices, laboratories, residences and research fields. The entire germplasm collection (the germplasm bank, including the rice germplasm bank) was lost and most of the research staff moved to other organizations. Currently, most of the buildings and other infrastructure of the institute are occupied by the UN military personnel.

CARI was established with the mandate of carrying out adaptive and applied research. A number of committees were put in place to facilitate the smooth functioning of CARI in delivering its mandate. The biggest challenge facing the institute is how to revitalize itself to achieve its mission and mandate. This not only requires building the necessary capacity (human, financial and infrastructural) to conduct effective research but also developing appropriate, effective and efficient organizational and management structures. The task is daunting but achievable. Given its admirable past record, the institute has critical residual institutional memory, networks, partnerships and physical facilities that it can easily tap into to facilitate its quick rejuvenation. These include past relationships with the University of Liberia, CGIAR centres such as WARDA and IITA and rejuvenated regional and continental agricultural programmes and networks such as CORAF, FARA and NEPAD. However, a newly reconstituted CARI will have to face the changing paradigms in agricultural research management and organization, especially the realization that it is only one among many other actors that can play a crucial role in national agricultural development.

Even before the war, research organization and management in Liberia could not be said to be efficient and cost effective. The Minister of Agriculture had responsibility over the overall coordination of the national agricultural research programme. He served as Chairman of the Agricultural Research Committee. The Agricultural Research Committee was a policy-making body established as an independent committee to decide and approve policies for applied and adaptive research in agriculture. The technical committee provided broad direction for the research program at the institute level. The chairman of this committee, the Deputy Minister for Technical Affairs, acted as the link between the Agricultural Research Committee and the institute. This committee examined the various proposals for research in agriculture. The Advisory Committee provided advisory services to the Research Committee.

Within CARI, research was organized in seven technical departments under the research coordinator. These were:

- Crop Sciences and Propagation;
- Land and Water Resources Management;
- Animal Science and Production;
- Plant Protection;
- Food Technology;
- Engineering and Appropriate technology;
- Fisheries.

Despite this elaborate organizational structure, the system did not function efficiently. The agricultural research committee seldom met. The few times the technical committee met, technical matters were hardly discussed. Moreover, technical committee members showed little interest in research matters. In the absence of a functioning agricultural research committee, the technical committee had assumed its role but only in administrative and peripheral matters instead of the technical issues of planning and formulating meaningful research programmes. As a consequence, research policy formulation, which normally should be at three levels, existed only at the research institute level. These types of organizational and management inefficiencies must be addressed during the current restructuring programme (Liberian Medium Term Reconstruction and Development Plan, 2001).

Public sector research in Liberia is not limited to CARI. Other public agencies that conduct sub-sector research include the Forest Development Authority (FDA), the Liberia Rubber Research Institute (LRRI), and the Department of Fisheries. These agencies have had little if any interaction in the past. There is a need for greater collaboration, cooperation and coordination between these agencies, CARI, universities, extension systems, private and civil society sector actors, and users of research results. This would build on the synergies and complementarities that already exist among them.

2.4 Research by universities and institutions of higher learning

There are no clearly defined and well-thought-out programmes for agricultural research at some of Liberia's well-known agricultural institutions such as the Booker Washington Institute (BWI), the University of Liberia and Cuttington University. These universities mainly serve as training centres for undergraduate students. The University of Liberia offers a Bachelor of Science degree in general agriculture, general forestry, wood science technology, agronomy and related science and community development courses. Extension is offered as a support course. Currently, the university does not offer any postgraduate training in

agriculture. In the past, university staff used to undertake collaborative research with international agricultural research centres such as the IRRI, WARDA and IITA. There is no such external collaboration currently. Cuttington University has recently launched a research project in aquaculture (tilapia breeding) and adaptive trials for New Rice for Africa (NERICA), whilst the Booker Washington Institute (BWI) is currently engaged in adaptive trials with a couple of rice varieties.

The major problem facing university research is the lack of qualified and experienced staff due in part to inadequate remuneration and favourable incentives. Table 1 gives an overview of the research capacity in the two universities and one institute of higher learning in Liberia.

Table 1. Research capacity in learning institutions

Name of Institute	Number of graduates/year		Existing staff			Involvement in research	Area of focus	External partners supporting research and related activities
	Undergraduate	Postgraduate	Ph.D.	M.Sc.	B.Sc.			
Cuttington University	1 400	-	4	20	18	Limited form of research	Adaptive research in New Rice for Africa (NERICA), breeding of tilapia species, pig breeding	AZUR – Association of Researchers of Social Sciences & Agronomy
University of Liberia	14 000	N/A	N/A	N/A	N/A	Not currently	-	N/A
Booker Washington Institute (BWI)	250	150		3	6	Limited	Rice	Chinese Govt.

Source: Independent Consultant

As mentioned, there is limited interaction between CARI and the institutions of higher learning at present. Possible mechanisms for collaboration include:

- collaborative agreements, such as memoranda of understanding (MOUs) to undertake research and extension;
- joint staff appointments;
- staff secondments (i.e. between research and extension, universities and research);
- joint research projects;
- innovative sharing or joint use of existing physical facilities;
- competitive research grant systems that put a premium on inter-organizational collaboration or partnerships.

2.5 Private sector research

For the most part, the private sector is not involved in agricultural research. It tends to be heavily concentrated in the rubber sub-sector and is mostly involved in plantation expansion or rehabilitation. Table 2 presents an overview of private sector activities.

Table 2. Private sector involvement in research

Name of company	Country coverage	Focus enterprise	Priority activities	Involvement in research
Liberian Agriculture Company	Grand Bassa County with considerable capacity to absorb existing smallholder products within its surroundings and other parts of the country	Rubber (latex production in various forms and shapes). Extension of existing holdings and provision of extension service.	Some form of research, or better still-adaptive research of clones to local conditions from Ivory Coast., and expansion of plantation	Germplasm multiplication
Firestone Plantations Company	Margibi County, largest rubber plantations company in Liberia, with considerable capacity to absorb existing smallholder products within its surroundings and other parts of the country	Rubber (latex production in various forms and shapes). Plantation rehabilitation and replanting	Plantation rehabilitation and replanting	In the past was involved in adaptive and applied research in rubber (Firestone Botanical Research Institute). No intention to resume this activity
Weala Rubber Company	Margibi County	Rubber (latex production in various forms and shapes)	Rubber (latex production)	Not currently

Source: Independent Consultant

2.6 International agricultural research Centres (IARCs)

Before the war, CARI had useful linkages with research organizations within and outside Liberia. These included useful partnerships with the University of Liberia and with WARDA. Outside Liberia, it had working relationships with many international research institutes such as IRRI, IITA, ARVDC, CIMMYT, CIAT, IRAT, ICRAF and ILRI. Most of the germplasm used in CARI's crop science programme was obtained from these IARCs. It also had working relationships with foreign universities and other scientific institutions such as the International Foundation for Science (IFS) of Sweden, and the International Research Development Center (IDRC) of Canada. Although many of these relationships were destabilized by the war, opportunities to revive them – and indeed to expand such partnerships – abound. Developing working relationships with the IARCs could be particularly helpful in the following areas:

- germplasm acquisition and testing;
- training of technicians and research staff;

- collaborative research projects;
- development and implementation of a research and development (R&D) strategy, results-based planning, and monitoring and evaluation;
- building and strengthening of regional and global networks.

2.7 Non-governmental organizations (NGOs)

The New African Research and Development Agency (NARDA) is a consortium of Liberian NGOs formed in 1987. Prior to 1990, there were only four major international NGOs operating in Liberia (Partners for Productivity, Plan International, SOS Children Village and Experiment in International Living). Currently there are more than 34 local NGOs in the country, working (with line ministries) in four sectors: agriculture and food production, business development, education, and sanitation. NARDA coordinates the activities of NGOs, which operate through county networks. Major NGO activities are currently concentrated in the following areas:

- the soybean programme;
- agricultural relief services for cassava, swamp rice and vegetables (okra, peppers, bitter ball) for consumption;
- supply of seeds and farm equipment.

NGO research activity has included socio-economic research such as developing vulnerability assessment maps (VAMs), conducting food security assessment studies, and developing participatory forestry management methodologies.

While not all the NGOs listed are currently involved directly in agricultural research, during the survey many of them reiterated the importance of agricultural research, observing that without the existence of research little progress can be made in agricultural development in Liberia. They also stressed the importance of research for food security, urging that research efforts should be geared towards specific crops that satisfy the needs of the population (e.g. rice and cassava). For a detailed discussion of institutional arrangements that facilitate or constrain the operation of NGOs please refer to the review of institutions.

2.8 Donor interest in agricultural research

The major donors in the Liberian agricultural sector include the United Nations, the United States (USAID), China, the European Union, Germany (GTZ) and the World Bank. Currently, there is limited donor commitment to agricultural research, although previously USAID provided tremendous support to agricultural research – particularly to CARI – in terms of human resource development and basic inputs. USAID currently provides seeds and equipment under an assistance program for poor countries following conflict.

2.9 Linkages between research and extension

Lack of closer collaboration between research and extension has long been a cause of great concern. There are no clear organizational frameworks or institutional mechanisms (e.g. competitive grant systems) to encourage interagency or interorganizational partnerships and linkages. For instance, there is no formal mechanism for bringing together researchers, extension agents, producers, processors, policy-makers and the private sector. The only opportunity for interaction at the moment is World Food Day. Some of the measures that can

be taken in the short term to address this situation include locating some extension staff in CARI offices, and joint planning, implementation, monitoring and evaluation of programmes and projects. It is also necessary to incorporate research collaboration with Cuttington University alongside research performed at CARI. For more on extension, see the review of extension.

Table 3. An overview of key NGOs engaged in research in Liberia.

Name	Focus county	Focus enterprise	Primary activities	Involvement in research and research-related activities
Catholic Relief Services (CRS)	Bong, Lofa, Nimba, Sinoe, Maryland & Grand Kruru	Seed multiplication: vegetable & rice seeds, cassava	Input distribution: seeds and tools, marketing & training towards fulfilment of resettlement programme	Not currently
World VisionLiberia	G/Cape Mt., Montserrado, Bomi and Maryland	Cassava, rice, groundnuts, pig farming, small ruminants & food preservation	Rehabilitation, germ plasm multiplication & distribution, agribusiness	Not currently. In the past, germplasm collection and seed multiplication (rice and cassava) and vegetable seed selection
Mercy Corps	Margibi, Montserrado,	Food crops	Cowpea multiplication	Not currently
Concern Worldwide	G/Bassa	Cassava, rice, goat breeding		Not currently
Catalyst	Nimba	Food crops, rehabilitation of tree crop plantations, fish pond development, training	Transforming ex-com into productive elements of society, fish pond development, tree crop rehabilitation	Not currently
Pulukpeh Multi-purpose Cooperative Society	Bong	Rice, oil-palm, seedling raising	Oil-palm production and marketing	Not currently
Professional Agricultural Consultancy & Expertise Services of Liberia (PACESL)	Gbarpolu, Montserrado, G/Bassa	Local hand tools and related implement fabrication, swamp development, vegetable production	Local hand tools and related implement fabrication, training and extension	Not currently
Sustainable Development Promoters (SDP)	Bong, Nimba, G/Gedeh	Micro-credit, goat breeding, crop production, seed & tool distribution	Micro-credit, rice seed multiplication	Not currently
Integrated Rural Development Organization (IRDO)	Nimba, Bong, Margibi, Montserrado	Rehabilitation of schools & roads, seed & tool distribution	Seeds & tool distribution, training and extension	Not currently
Conservation International (CI)		Strengthening capacity of environmental organizations	Training, information sharing	Not currently

Source: Independent Consultant, 2007.

2.10 The role of women and indigenous knowledge

A revitalized research and extension system must take into account the technology, information and learning needs of female farmers, especially given their critical role in food security and natural resource management. Liberia has had some interesting experiences with indigenous farming strategies (communal farming) based on traditional forms of organization (*kuus* and *susu*). Women play a critical role in this system, indeed it was women and their involvement in indigenous farming systems that provided the bedrock of the agricultural research system during the war. Nonetheless, the civil war caused mass displacement of people from their villages and farms (the number of IDPs in 2003 was estimated at 464 000, including 350 000 returnees and 100 000 ex-combatants, including 21 000 child soldiers). This caused a serious disturbance to indigenous farming knowledge. A major task of resettlement, reintegration and retraining, including training for improved productivity and livelihoods (e.g. agriculture, forestry and fisheries) and efforts to recapture, research and document indigenous farming knowledge, should be carried out as an integral part of the agricultural recovery process. For a summary of the opportunities and challenges facing the system, see Box 1.

Box 1. Strengths, opportunities, weaknesses and threats (SWOT) of Liberian agricultural research system

Strengths
- Government commitment to providing a favourable macroeconomic environment.
- Government commitment to agriculture.

Opportunities
- Renewed continental, regional and donor interest and commitment to agriculture, through CAADP and FAAP for example.
- Prevailing political stability and emerging new leadership.

Weaknesses and Threats
- Limited availability of trained human resources.
- Inadequate funding and dilapidated infrastructure.
- Inadequate linkages/partnerships between key stakeholders.
- A moribund extension service.

3. KEY CONCLUSIONS AND RECOMMENDATIONS

This report has argued that agriculture remains critical to economic recovery in Liberia. The sector is expected to contribute to increased food security, generation of employment, increased exports and foreign exchange earnings. However, the national agricultural research system, which should spearhead agricultural recovery, is currently in tatters:

- the policy and institutional framework for agricultural research policy – including clear and transparent mechanisms for priority setting, national strategic plans and results or performance measurement – frameworks is non-existent;
- the existing organizational structures are neither efficient nor effective;
- there are few if any linkages between the various actors in the national agricultural research system – CARI, universities, the private sector, NGOs, extension services;

- the public research sector, especially CARI and public universities, are understaffed and under-resourced.

Agricultural R&D in the developing world has undergone major paradigm shifts in recent decades. These include: a redefinition of the role of government in agricultural R&D; decentralization and privatization of R&D activities; broader and active stakeholder participation emphasizing the need for new partnerships and networks; new funding arrangements; orientation of R&D toward client needs; impact considerations. These shifts have been stimulated by changes in political and socio-economic environments; changes in domestic and international markets; changing demand for R&D services; emerging technologies (biotechnology, nanotechnology, and information and communication technologies). Increasingly, agricultural R&D in many developing countries is guided by one or more of the following perspectives: innovation systems, value chains, research for development, and impact orientation.

The national agricultural research system in Liberia might benefit from explicitly considering these perspectives in designing its R&D strategies. Subsequently, the proposed strategies should inform the organizational structures, management models and resource endowment (human, financial and infrastructure) needed to achieve the strategic objectives of the research system. Given the magnitude of the crisis facing the system, we propose a two-stage plan of action for revitalizing the R&D system: short-term priorities and medium- to long-term priorities.

3.1 Short-term priorities

These are "quick win" measures that need to be undertaken immediately in order to launch the revitalization of the national research system. Primarily, this stage should focus on the following: re-initiating adaptive and applied research; capacity building activities (human and physical); formation of strategic alliances and partnerships with key stakeholders; resource mobilization; the development of a long-term strategy for national agricultural research for development. Activities that can be undertaken during this phase include those listed below.

- Using participatory techniques, identify (including selective borrowing), test, multiply and distribute appropriate germplasm for priority agricultural crops, livestock and fisheries. Create and manage a suitable germplasm bank and a germplasm working collection.
- Conduct an inventory of available germplasm of major food crops (rice, cassava, vegetables) and livestock.
- Re-establish links with specific CGIAR centres that may assist in recovering the germplasm that has been lost (for instance rice from the Africa Rice Centre/WARDA; cassava from IITA).
- Identify, test and adapt existing/proven or new agricultural technologies at subregional/regional level.
- Initiate system-wide strategic planning processes.

These early action steps will help with the following objectives.

1. Identifying and developing sites for participatory and multi-location testing to reflect the diversity in the agro-ecological and production systems in Liberia.

2. Establishing the necessary partnerships both domestically (learning institutions, farmer organizations, civil societies, private sector, NGOs) and globally (international agricultural research centres, donors, and regional and continental bodies such as CORAF, NEPAD, FARA) for mobilizing resources; joint programme and project formulation; technical backup; germplasm acquisition; dissemination of proven technologies and feedback from farmers and users.
3. Building critical capacity (physical and human) to address the immediate challenges:

   - *Human resources:*

   This would help to (i) assess training needs, (ii) assess technical assistance needs at subregional/regional level, and (iii) develop a coherent strategy that will sustain the national strategy and vision of the role of NARS in sustainable food security and poverty alleviation.

   - *Physical resources:*

   This should be aimed at mapping the current status of various research facilities across the country (laboratories, equipment, experimental fields, etc.).

   - *System-wide strategic planning:*

   This would aid the development of long-term agricultural R&D policy and strategy. The strategy should specifically address the mission, mandate, priorities, governance, and resources (human, financial and physical) needed to deliver the long-term objectives. Due consideration should be given to:

   - establishment of a clear development-oriented vision, mission and mandates for CARI, public universities, the extension system and related organizations;
   - demand-driven or needs-based research;
   - resource mobilization strategies;
   - mechanisms for linking research, extension, policy-makers, farmers and universities;
   - establishment of an appropriate monitoring and evaluation system for assessing system performance, effectiveness and impact.

Given its limited financial and human resources, CARI should rationalize its current activities. Some of the activities related to export crops could be rationalized and transferred to the other relevant stakeholders. For example, the research capacity of the Forest Development Authority could be strengthened and the mandate and responsibility for forestry research could be transferred to FDA. The Director General of CARI could be a member of the board of FDA, and a technical advisory committee could be created to guide research in FDA. Similar arrangements could be considered for rubber (with Firestone). In the case of cocoa and coffee, substantial research has been conducted in Ghana and Nigeria (cocoa) and Côte d'Ivoire (coffee). Liberia could benefit from the progress already made by these countries through innovative cooperative or collaborative research agreements or partnerships. CORAF could play a role in designing mechanisms and incentives for facilitating such arrangements. This would free up resources for CARI to focus on food crops, other cash crops and livestock. The responsibility for fisheries research is another area that should be critically looked into.

3.2 Medium- to long-term priorities

The experiences of the immediate action plan should guide the medium- and long-term priorities. The priority activities could include:

- Development of a realistic research strategy for the short and medium term in view of further long-term development of appropriate strategies for agricultural research for sustainable development.
- Implementation of the long-term strategy. Expand research activities based on the priorities identified and a rationalized mandate for CARI. The research agenda should include both strategic and applied research.
- Development of substations to enable decentralization of activities to appropriate locations.
- Aggressive recruitment and a long-term training programme for CARI and other public sector agencies.
- Sustainable enhancement of human resources through group training in the following areas:
  (i) research project planning, management and monitoring;
  (ii) impact assessment of agricultural technologies on food security at national level;
  (iii) scientific writing;
  (iv) data collection/management and analysis.
- Support to academic degree training for students and young scientists (at M.Sc. and Ph.D. levels).
- Rehabilitation and reconstruction of adequate facilities for germplasm conservation.
- Development of diversified and sustainable funding mechanisms.
- Enhanced public–private–civil society partnerships.
- Mechanisms for the strengthening of farmer organizations.
- Development of a policy and socio-economic research capacity within CARI.
- Mechanisms for documenting and disseminating research results and impacts of research.
- Institutionalization of systems thinking, innovation system perspectives, and agricultural value chain approaches, etc.

The uptake of research output and the relevance of that output depend on a well functioning extension (and farmer education) system and relevant, high quality education in agriculture. Therefore there is a need for a fully integrated agricultural research, extension and education system.

CAAS-Lib – Institutions investment proposal 2

Name of Programme	**Rehabilitation and revitalization of the Central Agricultural Research Institute (CARI), Liberia**
Institutional responsibility	Ministry of Agriculture (MOA), CARI technical committee and stakeholder partners
Aim(s) of activity	To rehabilitate and renew CARI as the lead national research institution in developing innovations in support of a revitalized agriculture sector, contributing to improved household food security and smallholder commercialization for export markets. NB. CARI was one of the institutions that experienced virtual total destruction during the civil war (1989–2003).
Description of main activities	• Rebuild and refurbish research buildings and facilities at CARI headquarters in Suakoko. • Recruit, establish and train/re-train a critical mass of research expertise and support staff across focal disciplines and programme areas with a central focus on technology borrowing (from neighbouring and other countries/institutes) and adaptive, participatory research. • Revitalize field research programmes for co-knowledge development with farmers and extension personnel in areas such as crop improvement and multiplication (rice and cassava), peri-urban agriculture, pasture rehabilitation, livestock, fisheries, fruits and new areas such as mushrooms, beekeeping, snail farming, biotechnology for fuel, pesticides and fertilizers, and floriculture. • Renew and develop a decentralized agricultural knowledge system in collaboration with MOA departments of extension, and planning and policy. • Design, commission, equip and staff three new decentralized substations in the coastal, derived savannah and forest ecologies.
Expected result(s)	• A revitalized and high-performing CARI producing relevant innovations that contribute demonstrably to increased food production across its focal programme areas in collaboration with farmers and extension personnel. • CARI's approaches and outputs recognized and valued by national stakeholders, peer institutes and regional and international research organizations/fora in the region e.g. FARA, CAADP/NEPAD, CGIAR.
Impact on food security, poverty reduction & economic development	In producing innovations for improved crop and livestock productivity across the major agro-ecologies, CARI will contribute to increased smallholder food production and security, decreased over-reliance on food relief and imports, realisation of smallholder export potentials, improved management and conservation of natural resources, increased rural income and employment through agri-enterprise development, and an overall improvement in the incomes and livelihoods of the rural poor.
Period of execution	2008–2015
Estimated cost	US$10 million

4. AGRICULTURAL ADVISORY AND EXTENSION SERVICES

4.1 Background and introduction

Since 2003, and following a period of protracted conflict over fourteen years, Liberia is currently grappling with the challenges of moving from an emergency situation to rehabilitation and long-term sustainable development. At the heart of those challenges is the need for a transformation process to renew and revitalize the public and non-public sectors and allied institutions so that they can lead the restoration of national economic and social development through strategic investment, employment creation, service provision and local self-reliance among rural communities, many of whom were displaced and rendered vulnerable and dependent during the years of conflict.

Liberia's agricultural sector has traditionally been characterized by a dual system of production consisting of a commercially oriented plantation sector and subsistence producers. The majority of rural Liberians have worked as labourers on commercial plantations or as subsistence farmers. A distinct and dynamic smallholder sector has not been a feature of Liberian agricultural development, yet the potential for its development is certainly there. In contrast, the majority of Liberia's West African neighbours have experienced at least some development of viable smallholder sectors in which households manage integrated cash and food production systems including crops, livestock, fisheries and agroforestry. The achievement of a viable smallholder sector will depend critically on fundamental transformation of a low input/low output system based on shifting cultivation to one that involves broad-based farmer participation and emancipation as organized groups involved in integrated and productivity-led food production, processing and marketing systems.

Side by side with the development of a commercially oriented smallholder sector, there is also the need to move towards reducing the dependency syndrome through optimizing household food security for poor rural smallholders with the potential to achieve it fully or partially. While GOL policy commitments are the starting point for achieving the above goals, the crucial factors for their enduring achievement lie in sector-wide institutional capacities and the quality of systems in place for service provision to farmers.

Currently, public agricultural institutions are severely debilitated in the country with few active personnel at national and county levels, low budget allocations, few programmes/projects and low morale among personnel. Under the prevailing emergency conditions, NGOs (circa 600) are very active across the country with a very wide scope in the range and reach of their activities in food relief and security. The National Information Management Centre (NIMAC) has a database tracking the humanitarian activities of international and national NGOs – the latter are frequently implementing for the former and generally do not have their own distinctive profile of services/activities. Information is on the "offer or supply side" of activities that are primarily involved in food relief/security. While such activities are undoubtedly useful under emergency circumstances, they generally lack the approach, content and quality assurance of "demand-led" extension services required under the new services paradigm for sustainable development of smallholder farmers in the medium to long term.

Based on findings from interviews with national-level MOA personnel and field visits to counties during this sub-sector assessment, we found that the current public system lacks threshold management and operational capacity to plan and coordinate extension services effectively from national to county delivery levels. Clearly, the public extension service system, including associated partners and institutions, has to be revitalized and renewed as stated in the GOL *Statement of Policy Intent for Agriculture* (SPI), March 2006:

> *" MOA will direct its long-term policy efforts to the restructuring of the central units in the Ministry and related agencies and towards a more cost efficient and effective decentralized structure… the imperative is to address the technical and management capacities of the agricultural institutions at the central and decentralized level and at the revitalization of the public services, with special focus on research and extension… select community areas for pilot support to institutional and organizational strengthening of producer groups, specifically in support of kuu associations… restructure and build capacities of associated farming unions, cooperatives and agencies…"*

This presents both formidable challenges and opportunities. This framework delineates the salient challenges that MOA and partners will have to engage with and the kind of responses that will be necessary in the context of international and African regional experience and lessons over the past fifteen years. The opportunity for Liberia is to design and develop a renewed national extension service system based on the lessons and successes of other African countries, while avoiding, as far as possible, any shortcomings or failures encountered in those efforts.

Liberia's extension system in pre-war decades was characterized by the "transfer of technology" approach in which clan extension agents provided field training for farmers in the then-prevailing hierarchical "expert teaching" mode. That paradigm was predominantly technical and had little emphasis on emancipatory or participatory approaches to planning and development with rural communities. In the mid-1980s, however, there was a GTZ rural development project in Nimba and Bong counties that was acknowledged to be pioneering in terms of bringing all ministries and key NSA rural actors together in combined and integrated planning processes at district and county levels. The benefits and impacts of those approaches are still remembered by senior MOA personnel, national agricultural consultants and representatives of farming organizations.

The central focus for renewal of the extension system is on facilitating processes that will elaborate the vision, strategy and knowledge to give practical effect to the desired ends of national policy intent for the provision of agricultural extension services to farmers. This will involve a flexible and iterative "learning by doing" approach to ensure that change management in rural institutions and in approaches to local development is grounded in the specific contexts and needs of Liberian communities. The guiding value is "learning and growth in collective and participatory local ownership" by Liberian actors across the agriservice system, with farmers, their organized groups and allied stakeholders at the centre of demand-led agendas for responsive service provision and enduring capacity development at central and local levels.

4.2 Lessons and institutional challenges arising in the new paradigm for extension systems

> *"Extension reform is in flux, and the reforms are moving extension toward institutionally pluralistic rural knowledge and innovation networks. However, in most cases these networks are not conceived with a clear understanding of the broad implications of such a system. The immediate challenge facing Governments is to reform extension in ways that increase client-oriented services, while still responding to continually changing social needs and economic pressures. For Governments that have not undertaken extension reform, the challenge is to establish a strategic vision and build commitment within the public sector (in ministries of agriculture, finance and stakeholders throughout the system). They then have to identify local change managers and maintain realistic expectations of what can be accomplished in given periods of time. Reforms in extension systems and services are ubiquitous, ongoing and probably a permanent feature of the sub sector's institutional and programmatic development".* [6]

[6] *Extension Reform for Rural Development* (2004). Salient conclusions from proceedings of an International Workshop on *A Convergence of Views on Extension* hosted by the World Bank, USAID and the Neuchatel Initiative (FAO & Bilateral Donors) in 2002. Washington, DC, USA.

4.3 Lessons from international experience

Against a backdrop of changing public policies driving fundamental changes in public extension services, the World Bank, USAID, and the Neuchatel Group (see Box 2) convened a workshop of about 70 extension experts to review recent approaches to revitalizing extension services (World Bank, 2002). Participants generally agreed that the key to reform has been the strengthening of demand for services through participatory approaches and stakeholder involvement processes. The lessons learned from past experience with reforms were summarized as follows.

- Extension is a knowledge and information support function for rural people that have a broader role than merely providing agricultural advice.
- A mature extension system is characterized by a pluralistic system of extension funders and service providers. The public system continues to be a major player, both in providing funding and in coordinating operations.
- Poverty reduction should be the focus of public funding whether services are provided by public services or contracted out to non-state organizations.
- Extension policies and strategies need to define an effective division of labour between public extension and other providers, and to identify overall objectives for public sector involvement in extension in line with PRSPs and NEPAD.
- Long-term commitments should be made for new approaches to be fully institutionalized within a widely shared vision and strategy at different levels – international, national, regional and community.
- Stakeholder coordinating mechanisms are important to provide a common framework in which all actors can participate and operate.
- Building capacity of rural producer organizations (RPO), the public sector and other service providers is necessary to empower users and expand the pool of qualified service providers. This requires links with, and implies modernization of, the agricultural education system.
- Extension services should be part of the decentralization and devolution agenda, engaging full involvement of local government units and grassroots organizations.
- There is greater scope for cost-sharing and fee-for-service programmes than is usually acknowledged. Realism is necessary as to the limits of fully private extension.
- Extension, whether public or private, cannot function properly without a continuous flow of appropriate innovations from a variety of sources, local and foreign. Knowledge creation and access remain weak in most developing countries.
- All service providers need a system to assess extension outcomes, and to feed this information back to policy and coordination units.

4.4 Paradigm change in field extension approaches

The replacement of top-down, supply-driven approaches and methods of extension by demand-led participatory approaches has been the most significant and challenging change for directors, managers and practitioners socialized in the traditional research and extension systems pursued in most African countries from the 1960s through the 1980s. Given the legacy of centralization and hierarchy in the Liberian Government system, especially at local levels, embracing new pluralistic and participatory processes under decentralization will pose immense challenges for all actors in extension services provision.

The central lesson arising from experience since 1990 is that the learning processes of farmers, researchers and extension personnel are more cyclical than linear, and problem identification and solution seeking at farm level, to be valid and legitimate, has to be conducted through bona fide participatory processes in which all knowledge and experience is valued, analyzed and exchanged. See Box 2 below.

Box 2. Contrasting extension paradigms

Through the 1970s and 1980s, extension systems essentially focused on the transfer of technology (ToT) model that conveyed technical messages and packages to farmers, either individually or in groups. It tended to be a highly structured, top-down, prescriptive approach to technology transfer. The paradigm was centred on the belief that outside experts (planners, extension and research) know the priority problems encountered by farmers and communities and are able to prescribe the appropriate solutions. Building on the wealth of indigenous knowledge and experience of farmers and blending this with "modern" technology received little if any serious consideration. Moreover, the old supply-driven system paid little attention to the capacity empowerment of communities, and their capacity and the confidence to decide upon their own development priorities. Grassroots communities often did not "own" the development process.

Pluralistic extension systems began to evolve in the 1990s and involved participatory extension approaches (PEA) that aim to develop demand-driven services by engaging in a totally different paradigm. This involves listening to farmers and other stakeholders through engaging in interactive dialogue with farm families and their communities, in which the communities define their problems, needs and priorities and participate fully in the search for solutions. It results in a true sense of community and individual "ownership" and thereby a greater commitment and interest by participating beneficiaries. Promoting self-reliance and self-help – a belief in themselves – within communities is an important goal of participatory extension. The involvement of non-public as well as public actors is also central to the success of pluralistic, participatory systems. The need for change is increasingly recognized in some countries. While the trend is to consult more closely with communities about development priorities, the culture of "we-know-best" is still deeply embedded. Moreover, "consultation" is not the same as "participation". In the latter case it is the community that decides, while with the former decisions are still made by authorities or agencies.

As has been successfully demonstrated in various initiatives in the SSA region, participatory development approaches can simultaneously contribute towards meeting rural community needs in production, capacity building, natural resource conservation and improved livelihoods. Participatory extension does not abandon the concept or practice of technology adaptation or adoption or, where applicable, commercialization. On the contrary, it facilitates an environment under which these aims and processes are more likely to be accepted by farmers and are more likely to be sustained. The emphasis under the new pluralistic paradigm is on emancipation and empowerment of farming communities and organizations and facilitating agricultural education, development and service institutions to change and renew their systems and structures to better support farmers in their efforts to improve their food security and livelihoods.

Source: Connolly, M. & Ashworth, V. 2005

5. POLICY AND GUIDING PRINCIPLES FOR THE DEVELOPMENT OF A PLURALISTIC EXTENSION SERVICE SYSTEM

5.1 Extension policy development

This is an inherent part of agricultural sector policy formulation processes and, in the emerging pluralistic paradigm for services development and provision in Africa, is increasingly based on the principles of the Neuchatel Initiative (Box 3) and the lessons arising from experiential learning and field case studies at regional, country and district/local levels. It is important for Liberia's agricultural policymakers, professionals and practitioners in extension, education and research/innovation to understand the context in which regional

extension policy, strategy and service provision has been changing and evolving over the past fifteen years and to engage with the implications of these outcomes in their visioning and planning processes for a renewed national system.

A key insight from recent regional experience is that extension policy development is a process that can commence with acceptance and engagement with the above Neuchatel Principles and be further developed and gradually adapted and refined based on experiential learning in national institutions and at local service development and delivery levels. Investment in premature and elaborate policy development exercises that are not informed by robust in-country learning processes to assimilate local lessons and practice have been found to be academic and imprudent in terms of relevance, local learning and utilization of scarce financial resources. A guiding framework for policy development based on the Neuchatel Principles is currently recommended as the best starting point for provision of ongoing pilot learning across the range of extension functions and service provision that continually captures and incorporates key lessons from local practice. Task teams formed to advance policy development processes should be composed of a broad range of disciplinary specialists (e.g. planners, economists, agronomists, agribusiness, livestock experts and farmers).

5.2 Lessons and guiding principles from recent experience in Africa

Under the current pluralistic and decentralized paradigm for extension services delivery in sub-Saharan Africa, the following are some of the important lessons and guiding principles derived from recent practice and experiential learning from reform programs and projects across the region.

- To assure enduring national capacities and impacts, institutional reform and development programmes need to be strongly rooted in *local ownership, commitment and accountability* for change processes and outcomes. This includes engagement with processes, implications and outcomes of core functional analyses and role review exercises in MOAs and technical service departments.
- Renewed extension systems need to develop and demonstrate a *strong service and client orientation* that is responsive to the specific demands of different categories of farmers, from poor or marginalized smallholders seeking household food security to those with potential for commercialization.
- The desired ends for reform and transformation of extension systems (i.e. policy goals and objectives) can only be brought into effect through well conceived and *systemic change management strategies and processes* (e.g. organization development) that facilitate holism and interdependence among all actors. Piecemeal or disjointed efforts have often resulted in a slow pace of institutional learning and sometimes failure to foster viable partnerships between actors in improving service arrangements.
- Programmes/projects need to engage in pilot learning and innovation with alternative frameworks for extension service provision at local delivery levels (community and district) before outscaling or mainstreaming to wider provincial or nationwide levels across the system.
- Reorientation towards their changed roles and ongoing competency development for managers is an important thrust in reform programmes for extension services provision. Programmes in leadership/management development combined with mentoring and

coaching have proven very useful – especially for those with responsibility for service development, coordination and provision.

- Extension capabilities at field level have to be extended beyond imparting mere technical knowledge/skills. Staff competencies need to be developed/strengthened in social and organizational development areas such as participatory problem-solving for food security with resource-poor smallholders, supporting the development of self-reliant farmer groups and associations, and identifying and training lead or contact farmers to conduct farmer-to-farmer extension.
- While national systems embarking on institution-wide change and capacity development programmes require substantial initial advice, support and facilitation from external specialists in extension reform processes, there is a need from the outset to plan and develop partner and counterpart competencies to manage, facilitate and evaluate internal change processes and outcomes.
- A crucial factor in assuring sustained progress in service reform programmes is the realization that there are no easy prescriptions for change as circumstances in each country are different. The preparedness of all actors to engage in open experiential learning processes is crucial for success as this facilitates the growth of leadership and self-confidence to support partners/colleagues in testing alternative, innovative approaches while taking responsibility for their shared efforts, outcomes and lessons.
- As the roles, competencies and expected contributions of public sector staff are changed and geared towards improved performance, there is a need to revisit *reward and incentive systems* as part of the wider reform of the national public service.

Box 3. The Neuchatel Initiative for paradigm change in agricultural service systems

The commitment to change and renewal in agricultural services provision in Africa comes in the context where international donors and development agencies have come together under the Neuchatel Initiative (NI) to engage in clearer and more strategic dialogue with national partners to develop a common and shared vision for the future role, delivery arrangements and funding of extension services in rural development. The NI Common Framework for Extension (1999) advanced some key principles to guide and inform transformation processes. Those principles include:

- the importance of *sound agricultural policy* to providing a conducive and enabling environment for rural sector development;
- *pluralism* i.e. various state and non-state actors providing a diverse range of services under coordinated arrangements;
- the importance of the *market* and *demand-led impetus* in the supply of goods and services;
- *facilitation and problem solving approaches* for more heterogeneous and resource-poor communities;
- *decentralized provision of services* in processes of continuous dialogue with local stakeholders.

Extension service providers are, therefore, increasingly challenged to open up to new demands in more businesslike ways and, through broadening their horizons and approaches, to renew their roles as more active and effective players in assuring food security, improving rural livelihoods and supporting smallholder farmers and organizations with potentials for commercialization.

6. PRIORITIES AND PROCESSES FOR RENEWAL OF THE NATIONAL EXTENSION SYSTEM

6.1 Starting over with fresh thinking and openness to new approaches

> [7]*Prior to the conflict, many observers claimed that Liberia's public sector was characterized by a chaotic regulatory environment, a derelict public administration with unwieldy procurement and financial systems, and a large parastatal sector…This state of affairs will need to be changed if a smallholder strategy is to be successful…Given the opportunity for Liberia to "start over" in developing new approaches to problems the country is facing, Ministries need to think "out of the box" and not just adopt "the before war" institutional context. Experiences from other countries could provide useful examples.*

The above comments, combined with some of the earlier findings under institutions, which explain current multiple levels of budgetary controls as partly "a relic of former practices", underscore the magnitude of the challenge facing MOA and its partners in changing mindsets and bringing in fresh thinking and approaches to renew its performance in planning, management and implementation practices in provision of extension services.

Given the principles of the SPI and the core focus on measures that will have an immediate impact on production, food security and rural commerce, it is the redefinition and reshaping of the role and capability of MOA that poses the biggest sectoral challenge to GOL over the coming years. To gear effectively itself to manage the transition from ad hoc emergency measures for vulnerable groups to long-term development of farmers and their organizations, MOA – specifically the Department of Regional Development and Extension (DRDE) – will have to learn and grow from an "old paradigm" implementation agency into a new role of coordination, facilitation, regulation, partnership, collaboration and evaluation with its focal partners in the public and non-public sectors. Therefore, the process of managing that change effectively merits overarching priority as the *sine qua non* in building human resource capacity in DRDE and MOA.

6.2 Department-wide change management programme

Recent experiences from other African countries (e.g. Ghana, Malawi, South Africa, Zambia) indicate that, to engage purposefully with the formidable challenge of re-orientation and capacity development, the DRDE will need to embark upon a *Change Management Programme* (CMP) specifically designed for facilitation across all levels of staff in the department. The programme would initially be of medium-term duration (2–3 years) with staff devoting about 20 percent of their time to its activities in the inception phase over the first 18 months. This would allow the programme to be implemented concurrently with, and without disruption to, ongoing work plans and commitments of management and staff. The programme would be based on the principles and practices of organization development (OD) to assure openness to new thinking, learning and self-development, individual and group accountability for performance, and institutional ownership in the process through which the department grows progressively into its new or revised functions and roles. For coherence and cohesion, MOA should give serious consideration to the implementation of a similar type of programme Ministry-wide.

[7] Tefft, J. *Agricultural Policy and Food Security in Liberia.* (2005) ESA Working Paper No. 05-11. FAO.

Programmes that aim substantively to change extension institutions and services have to focus strongly on processes that review roles, responsibilities and relationships (the 3Rs) for institutional units, groups and individuals. This exercise, including preparation of revised job descriptions, needs to be conducted early on in the change programme and should be informed by the findings from system-wide services and functional analyses exercises that appraise the relevance and costs of existing services for clients. The reason for such strategic focus is because, without early clarity on these matters, important related issues of performance and accountability at various levels may subsequently be difficult to pinpoint, assign and assure across the service providers in the system. Personnel need to contemplate and engage with their new roles from very early in the change programme.

The proposed focal areas for a CMP for DRDE are outlined in Box 4.

Box 4. Proposed focal areas for a change management programme – DRDE, MOA

- Study/learning tours by DRDE/MOA, farmers and NSA partners to other African countries to gain knowledge and insights from experiences and case studies in the reform and renewal of extension systems.
- A national multi-stakeholder workshop for initial orientation of key sector actors; formation and orientation of National Change Team and DRDC-led Task/Change Teams to lead major thrusts and exercises outlined below.
- **Service analysis exercise to assess relevance, quality, capabilities and costs of existing service provision to various smallholder farmer categories at county level.**
- Core functional analysis (CFA) exercise followed by a national stakeholder workshop to agree core functions of DRDE, MOA and its relationships with key partners.
- Visioning, planning and reorganization of DRDE, MOA including organizational structure, guidelines for multi-annual and decentralized budgetary allocations, disciplinary specialisms, and staffing from head office to county/clan levels.
- A DRDE skills audit followed by revision of departmental job descriptions at divisional, specialist and county levels; subsequent review and adoption by MOA and staff recontracting/recruitment under a competitive remuneration system.
- DRDE TNAs followed by management training and mentoring programs in agriservices planning and coordination for divisional managers, technical staff and county coordinators.
- Preparation and implementation of new training programmes for county trainers/staff in PEA, FFS, agribusiness/farm enterprise management, farmer group and organizational development.
- Design and facilitation of pilot programmes at county level involving new approaches to local services coordination and delivery under pluralistic and decentralized arrangements with robust stakeholder involvement processes.
- Continual evaluation of learning and progress in accomplishing expected outputs by change teams with the support of external facilitation/expertise as required.

The CMP outlined above would form the core of a *comprehensive management and staff training and development plan* that should be elaborated and included for support as a strategically important public good investment under the PSIP, integrally linked to the IPRS. The costs of such comprehensive and transformational capacity development programmes are undoubtedly high – but the consequences and costs of not embarking on them can also be grave and high.

> [8]*Capacity, perhaps more than any other variable, will determine how quickly Liberia will turn itself around in coming years. It will need to be rebuilt at all levels – public sector,*

[8] Draft *Interim GOL Poverty Reduction Strategy* (2006).

> *private sector, civil society – almost simultaneously. But while every area could conceivably be considered a priority for capacity enhancing support, clear and decisive prioritization, sequencing and targeting of responses will be crucial.*

Without new and adequate strategic investment in the human capital of its most vital public service department, Liberia and its donor partners may risk piecemeal support for institutions that clearly require and deserve a new and sustained beginning in revitalizing their contributions and services to the rural population, where over 80 percent of households exist as poor subsistence farm families with no cash income. That reality, combined with the instructive international lesson that long-term commitments are needed for sustainable reform of extension service systems, provides the context and makes a strong case for new investments, partnerships and development modalities that have the potential to give effect in practice to the [9]*10 Default Principles for Capacity Development* in shaping a renaissance in Liberia's rural service provision in the years ahead.

7 FOCAL THRUSTS FOR ACTION IN EXTENSION RENEWAL

7.1 County focus in the development, planning and provision of services

With the focus for decentralized and demand-led extension service provision centring on the counties, there is a need to put in place processes that will assure robust local stakeholder involvement and well-planned and coordinated provision of advisory and training services to farmers. Services have to respond to the differentiated needs of various farming groups to take account of agro-ecological zones, smallholder farmer categories, focal commodities and population density.

Based on experiences in other countries, DRDE/MOA need to renew and strengthen agriservices planning, coordination and impact evaluation at county level through (1) facilitating multi-stakeholder fora with specific inclusion of marginalized and vulnerable farming groups, and (2) leading substantive county coordination teams/units for services development, planning and coordination. To be effective, such units will need to conduct services analyses and develop capability profiles for all major service providers in each county to inform and facilitate appropriate and optimal deployment of actors and assure quality of delivery in county extension plans and strategies. In designing new programmes for service provision, MOA/DRDC has to ensure that issues of gender equity and equality are analysed and incorporated into the design of extension service programmes.

The respective functions and specific roles of staff in the DRDE divisions need to be clarified as part of the departmental CFA exercise. In relation to [10]HIV/AIDS, it is important that there is harmonization between MOA and other relevant ministries and that the topic of HIV/AIDS is mainstreamed in extension training programmes and meetings involving rural communities. The social challenges for extension systems in responding to gender and HIV/AIDs issues are described in Box 5.

[9] Lopez, C. and Theison, T. (2003). *Ownership, Leadership and Transformation: Can We Do Better for Capacity Development*? Earthscan/UNDP, New York, USA.
[10] National prevalence estimated at 10–12 percent: Source: Draft *Interim Poverty Reduction Strategy* (2006).

Box 5. Engaging with the social extension challenges posed by HIV/AIDs and gender equality

Many rural communities are struggling to survive in the face of the havoc wreaked by the HIV/AIDS pandemic. Families are being debilitated – even decimated – by the loss of heads of households, decreasing labour for agricultural production, children unable to attend school because of the need to care for affected family members and the loss of family income arising from incapacitation of adults and reduced scope for income-generating activities. Increasingly, minors or orphans have to head affected households.

While there is greater awareness and understanding among rural communities of the impacts of the pandemic in recent years, there are serious challenges for rural service providers in promoting and fostering adoption of mitigation measures to strengthen the survival capabilities of households in nutritional and food security. Those measures involve the use of agricultural production practices and technologies to optimize household food self-reliance while conserving collective family energies and labour.

In addition to improved food production systems at individual household level, there is also a need to facilitate more active community-based approaches to strengthening survival strategies and livelihoods. There is an increasingly recognized need for new conceptual and strategic approaches to provision of extension services at both community and district levels to better interpret and respond to the complex social demands that have become very evident.

As women are often centrally responsible for labour-intensive operations in household food production and utilization, it is critical that social and participatory extension approaches are implemented to facilitate their emancipation and empowerment and progressively develop the potential and competencies of those women in assuming key roles in group and community leadership. The newly evolving decentralized extension systems will have to engage purposefully with these challenges and transform both their approaches and their capabilities to renew relevance and impact in providing services appropriate to the immediate and acute social demands throughout rural society for basic nutrition for survival and, in the medium to long term, more stable and locally sustainable livelihoods.

Source: Connolly, M. FAO/GTZ Study on Practices for HIV/AIDS Mitigation, 2003.

7.2 Services analysis, planning and coordination

While there is an Agricultural Coordinating Committee (ACC) at national level to provide general coordination of international and national NGOs, MOA does not yet have substantive information at county level on the roles and capabilities (especially for farmer training) of the array of non-state "quasi-extension" service providers. It needs to develop such profiles urgently in order to begin to take the lead in its new role of facilitating optimal service planning, coordination, provision, evaluation and quality assurance across the country. The coordination of international and national NGOs is acknowledged by MOA County Coordinators to be one of the foremost challenges they face, and they are manifestly unable to cope adequately with it at present. The dependence of county MOA staff on NGOs for operational funding for transport and project initiation and support has understandably weakened their standing and credibility in taking a lead role in service planning and coordination in counties, especially those that are very dependent on emergency food relief.

Findings from a preliminary exercise to obtain profiles of NGOs involved in extension/farmer training during this assessment revealed that respondents are not yet accustomed to sharing information openly on their activities with MOA. In response to a questionnaire exploring their activities in farmer training, the few NGOs surveyed appeared reticent and unforthcoming; for example in response to a request for examples of the training programmes they conduct with farmers, no sample programmes were furnished. Under protracted emergency conditions where GOL/MOA presence and capacities have been weak, NGOs

have had wide, and perhaps often unbridled, freedom and reach in implementing their activities. In the current national transition to "rehabilitation and development mode" this situation will clearly need to change, and enhanced mutual understanding of what this means for MOA and NGOs is an important area for proactive attention by both parties. MOA/DRDE will need to take the lead in facilitating a process of more active dialogue and interaction via county-level workshops where NGOs present and discuss their profiles and activities with key stakeholders as preparatory inputs to county agricultural planning processes. To do this, County Coordinators and key staff will need training to strengthen their leadership, facilitation and planning skills.

The aim of a wider service analysis exercise (see box under institutions earlier) is to identify the outputs i.e. the deliverables (products or services) that are provided currently for farmer client(s) by providers and obtain estimates of the actual costs of each output. The cost estimates for each service will provide real insights into how existing services are being financed and the relative allocations, contributions and current prioritization of given services under specific functional areas. For example, NGOs sometimes finance the travel and subsistence costs of extension personnel for project advisory activities without making any contribution to the personnel overhead cost of the officers (daily remuneration costs). In such cases the public service is subsidizing the provision of the service. This cost element has to be factored in to establish the true costs of that service – it is not merely the operational costs provided by the NGO. Another issue is that of coverage of farmers by extension service providers. How many farmers in a given area benefit directly from services and at what cost annually? These kinds of issues/questions will be addressed in the service analysis exercise. Based on the recent assessment of NGO activities in agricultural extension undertaken under CAAS-Lib, it is concluded that extension services in counties such as Grand Gedeh, Nimba, Bong, and Grand Cape Mount will have to be funded and delivered, at least in the short to medium term, by GOL.

The service analysis will help to guide service providers on the criteria that should inform their decisions on service prioritization, planning and funding. The analysis will also give some preliminary indication of the effectiveness and efficiency with which DECE and other NSA providers perform their functions. The findings and results of exercises such as the services analysis should be shared with stakeholder fora by service managers/staff so as to gain client feedback and input to policy formulation and programming. Processes of stakeholder involvement in the services system have to be sustainable, which means that eventually they have to be self-led, organized and financed, and this has to be emphasized strongly and prioritized by all actors during the transformation stage. One crucial test of how effectively the vision for the overall renewal of the agricultural services system has been realized will be the extent to which emancipated processes of stakeholder participation are in place and visibly robust in leading and determining the agendas for service provision to farmers in the counties.

7.3 Learning, innovation and knowledge management

Just as planning processes benefit substantially from approaches centred in "learning by doing together", so does the development of appropriate arrangements for service management and provision, field-based approaches to technology development and farmer

knowledge and organization. Recent experiences with PEA in [11]Limpopo Province, South Africa provide some interesting case studies in this respect.

Often there are no relevant models or formulas for framing responses to the challenges presented in services provision to enhance the economic status and livelihoods of smallholder farmers. Based on analysis of experiences at local level and in other countries, farmers and their advisors decide to test approaches and adapt them to their local circumstances through "learning by doing together". These initiatives may be informed by wider macro studies of the potential of given commodities or enterprises in given areas/ecologies, or through focal area approaches that aim to tap the comparative advantages of given areas and communities for specific enterprise development. Such *approach development* would appear to be very relevant for innovation and services development by DECE, CARI and other stakeholder partners and farmers.

The old style research–extension linkages have not worked very well over the past 20 years in most African countries. In the emerging paradigm, both need to demonstrate more relevance and appropriateness to farmers' demands. Research is expected to produce innovations, and extension is expected to provide services. Farmer-centred collaboration involving both research and extension, working closely with farmers, is emerging as the most appropriate way of assuring improved relevance and accountability in their combined efforts. Working together, key actors can develop "home grown" knowledge and institutional capabilities in areas such as:

- viable food production and nutrition programmes for poor households;
- role delineation of actors and complementarity in collaboration/partnerships;
- farmer group and organizational development;
- how commodity and value chains can improve livelihoods;
- provision of appropriate information and farmer training at county and clan levels.

The link to knowledge management rests in the quality of learning during such processes and the sharing and documentation of specific experiences with colleagues and for institutional memory through case studies and lessons to guide ongoing programme and project design and planning. Some reasons why pilot learning and innovation is necessary in the transformation of an extension system are given in Box 6.

7.4 The emerging framework for extension service delivery

Based on experiences in other African countries, conceptual and operational frameworks are evolving that encompass the values, process and modalities of decentralized and pluralistic extension systems. Three pillars form the basis of these emerging frameworks:

- understanding and interpreting farmers' demands based on their real problems;
- organizing appropriate service responses to meet those demands;
- supporting those responses at policy and programme levels in MOAs and MOFs.

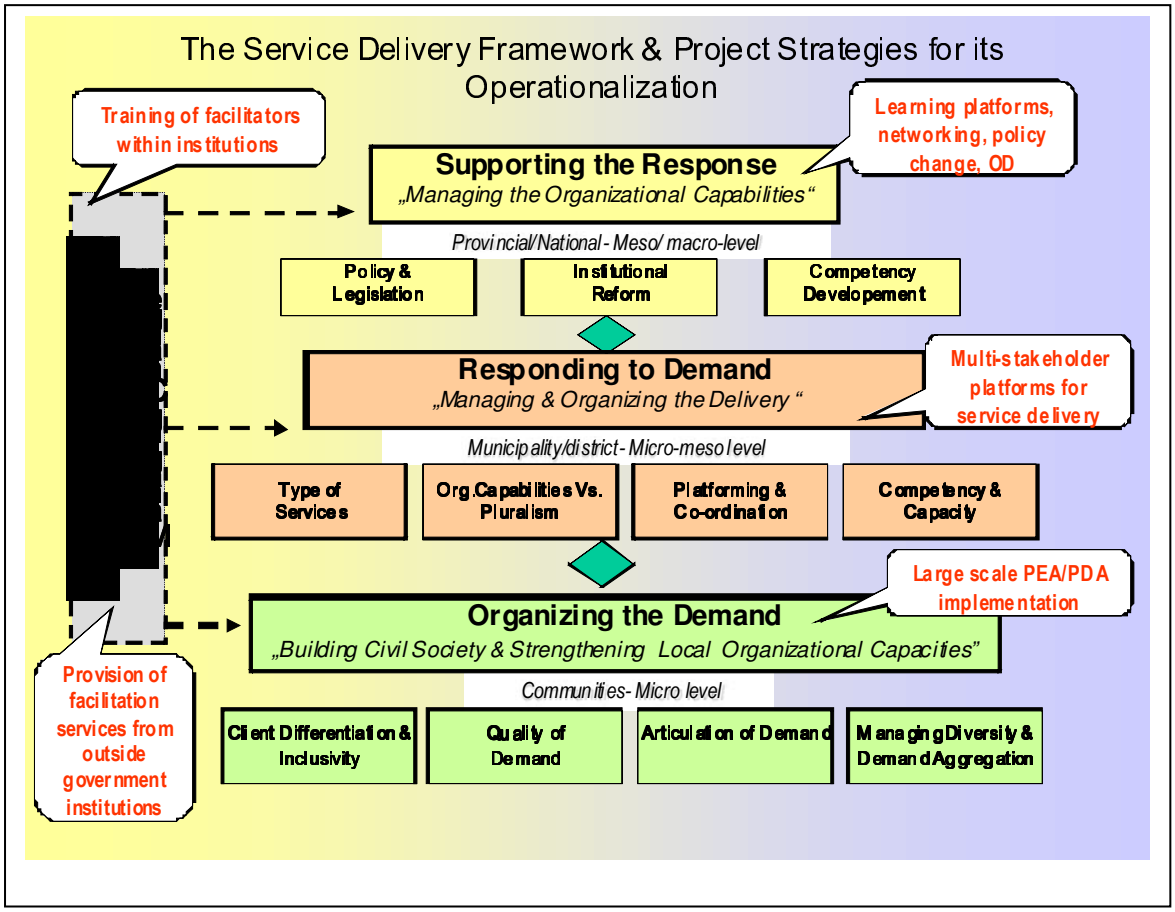
Figure 1 illustrates the components and processes in such an emerging service delivery framework in South Africa and related project initiatives/strategies for its implementation.

[11] Strategic Framework for Re-Orientation and Renewal of Limpopo Department of Agriculture. (2006) DOA, South Africa

Box 6. Why are pilot learning and innovation necessary in transforming an agricultural extension service system?

- Changes to county systems of extension services provision on the scale and depth proposed under decentralized arrangements have not been introduced before in Liberia.
- The agendas for change are complex and cut across many aspects of existing institutional mandates, functions and service responsibilities. County personnel will have to "grow into" their emerging roles and engage actively with the challenges.
- As no comprehensive case studies of good or best practice yet exist for such a system in Liberia, there is a need to explore and test a range of concepts and strategies at local levels *(in situ)* initially in a "learning by doing together" approach.
- There is a need to build gradually the competencies of individuals and capabilities of teams/organizations/institutions across the system to learn and gain the confidence to bring the change agendas into effect.
- There is a need to foster high-quality learning from experiential practice strategies or practices nationally to districts in a discrete number of districts initially, before seeking to outscale or mainstream.
- To seek to introduce such a new system without pilot learning would risk disruption to the entire existing system of service delivery, without the crucial lessons and insights to implement the alternative arrangements with the competencies and demonstrated knowledge necessary to succeed.

Figure 1: **Service delivery framework – Broadening Agricultural Services for Extension Delivery (BASED) RSA, 2002.**



Senior management and staff of DRDE, together with farmers and NSAs, should familiarize themselves fully with new developments in extension services management and emerging

frameworks and processes for field delivery through study and learning tours to other African countries with relevant experiences in demand-led, pluralistic approaches.

7.5 Decentralization of extension services

Services for farm families are delivered at county and district/clan level and thus decisions relating to such local delivery are best made at that level. Where decision-making affecting services delivery in districts is retained at central/national levels, there has often been very poor delivery or quality of services and little valid accountability at the appropriate local level for the shortcomings/failures. Centrally controlled systems of extension services management and delivery have in many instances been supply-driven, remote from reality and not sufficiently responsive to local needs – they have often led to outdated approaches or programmes being imposed or continued long past their usefulness, resulting in wastage of scarce resources.

Decentralization involves the devolution of authority or decision-making to the level at which most knowledge, insight and practical accountability for consequences of decisions and actions exist. In Liberia, MOA intends to "*rehabilitate and adequately equip decentralized structures to ensure high quality and timely delivery of extension services"*. For effective decentralization, however, systems and processes have been shown to be more important than structures. Effective systems involve fiscal measures that allow local control and authority over the budget, under processes of open and due accountability to (1) local communities and (2) central government. Local administrative procedures for devolving agricultural budgets should, for example, include specific provision for programme decentralization to ensure transparent responsiveness to farmer demands under county agricultural development plans.

The aim is to focus decentralization of extension services provision at county level on building local capacity to assure coordination and complementarity of efforts between stakeholders and providers in the new pluralistic paradigm. Gaining consensus and integration of county-level efforts among all actors, together with harmony and accountability within districts to assure client satisfaction and optimal resource utilization, will constitute the key indicators for success in this crucial area.

For decentralization of extension service provision to succeed, it is recommended to:

- Include provision for initial testing of decentralized approaches under pilot learning and innovation (see 5.3 above). For example, through a special derogation, devolve budgets for PEA training in one of the poorer counties directly to the CAC and his/her county training team and see what improvements/differences can be achieved in delivery arrangements and impacts within the existing budgetary allocation system.
- Orient and develop capacities of key local actors in advance of putting decentralization measures in place. This means explaining to local extension management what the new administrative and organizational arrangements will be, how they will be implemented, and what the operational relationships will be with local government entities and other ministries. It is also necessary to provide orientation for local government personnel (mostly administrators) on agricultural extension services and rural development.
- Ensure that extension management participates actively in all county and community planning processes led or facilitated by local government organizations.

7.6 Farmer training and organization development

The MOA will fulfil a facilitating and coordinating role in extension service provision in partnership with other non-state actors in two central areas:

- optimizing household food security for poorer smallholders who have the potential to attain it fully or partially;
- focusing on the development of farmer groups and organizations that have the potential to produce surpluses for the market and commercialize their enterprises.

How the emerging pluralistic extension system responds to those two challenging areas will determine both its relevance and its effectiveness over time in services coordination and provision for farmers. In terms of the extension proficiencies needed at management and field levels to respond to the above priorities, MOA/DECE will need to invest in core capability development in two key areas: (1) participatory extension approaches (PEA), and (2) agribusiness development, including farm management expertise. To provide planning, coordination and oversight for programmes at national and county levels, MOA will need to develop specialist staff in those areas that also possess strong facilitation/training skills to actively support field staff and farmers.

In addition to technical knowledge, the new range of competencies for effective field extension agents *include process facilitation, farmer communication and mobilization, group development and dynamics, organization development, agribusiness and marketing*. Those proficiencies will demand higher levels of ability, qualifications and knowledge from both new entrants and existing practitioners in a performance-based extension service delivery system. Team approaches by extension staff for group training and development of farmers will also be essential in a system where the farmer to DECE extension agent ratio will be probably high (up to 2 500 rural families per clan agent).

For testing and local adaptation of new approaches to extension systems such as PEA and farmer field schools (FFS), MOA and partners should conduct initial pilot learning exercises in about three counties with comprehensive documentation of programmes and local stakeholder evaluation of impacts, training costs and viability before outscaling to further counties or national level. In the context of decentralized extension systems that involve increased commitment to group development and farmer-to-farmer knowledge exchange, it is vital to ensure that new approaches are demonstrably relevant, that trainer capabilities are proven, and that outcomes are viable and enduring for smallholder farmers under their particular local circumstances. In this respect, farmers have to be increasingly involved, initially through robust participation in local stakeholder fora, in assessing the effectiveness and impact of extension services and field personnel.

The central thrust of emerging extension systems in Africa is on emancipating and empowering farmers as full partners in development. With the county as the decentralized hub for agricultural service provision in Liberia, improved local availability and access to knowledge becomes critical. Experience from other countries indicates that making agricultural information available close to farmers makes a difference, especially when extension agent coverage and farm visits are declining. In that context, MOA at county level should consider in concert with NSAs the setting up, on a pilot basis initially, of rural/agricultural knowledge centres in locations that farmers visit frequently (e.g. markets) or in village/community centres. Such centres could provide extension leaflets, periodic

farmer group meetings, training materials and, where possible, access to ICTs – especially to promote and encourage greater interest and involvement by young people in farming as a career.

A comprehensive medium-term staff training and development plan should be prepared by a MOA/NSA task team to develop the core capacity for the renewed Liberian public extension system. Financial support should be sought for this plan under the Public Sector Investment Programme (PSIP). The plan would cover orientation and education of department heads and senior staff, and the reorientation and training of MOA county teams in the new service arrangements, including extension managers, specialists and field staff. New foundation training programmes in agriservices development and management, PEA, farmer group and organization development and agribusiness/SME development could be initial focal areas for action in the plan

7.7 Staffing complement and performance management in MOA/DRDe

Recent experience with reform and renewal of extension systems in other countries indicates that for any new system to be affordable and effective it will need a much reduced overall staff complement compared with that of the 1980s or 1990s (perhaps one-quarter to one-third), but with higher and more flexible/versatile staff competencies and performance contracts.

The CFA exercise should inform detailed decision-making by MOA/DRDE on the future extension system structure, staffing and funding.

The DRDE should focus initially on putting core extension service teams (five to six persons, led by the CAC) in place in each county and providing orientation and active training support to them in planning, coordination and management of agriservices as early as circumstances and resources permit. However, without a competitive, performance-linked remuneration system that is at least as attractive as that obtainable from NGOs, MOA will not attract the more highly qualified and proficient staff that the new extension system will undoubtedly need. MOA/GOL public service policies on public sector remuneration will need to be revised and updated. Without the commitment and means to recruit, re-employ and re-train staff with proven ability or proficiency, MOA will not be able to embark with any probability of success on the major capacity development challenge facing it in developing a renewed extension system.

7.8 Farm enterprise and market information systems

Given the national policy intention to develop the potential for commercialization of smallholder farmers and promote value addition through improved agroprocessing and marketing of commodities and produce, there is an evident need to strengthen and develop the economic and financial analysis and knowledge of farm enterprises. This includes gross margin analysis, project planning and implementation and capabilities to facilitate and supervise feasibility studies in specialist commodity/produce areas. While some NGOs are involved in an ad hoc manner in assessing the margins and profitability of crop and livestock enterprises, the need for enhanced leadership and capability in these areas within a renewed MOA/DRDE is very apparent.

Farm management capabilities need to be developed at national and county levels in enterprise and gross margin analysis and specific training should be provided for farmer groups in these areas and in broader aspects of financial management. Additionally, there is the need for information on regional, national and global markets. MOA with DECE should consider setting up a farm enterprise and market information system/unit involving personnel from policy and extension units to strengthen overall knowledge management in support of sectoral policy development, planning and programme/enterprise development.

7.9 Strengthening partnerships between agricultural extension and education

> [12]*The reform and modernization of national extension systems will remain a dream if measures are not taken for reforming pre-service education in extension. Any serious effort at reforming the national agricultural extension systems should logically start with the reform in extension education at agricultural academic institutions; which currently produce ill-prepared graduates for working in a modern extension service.*

In higher education institutions in many African countries, the academic programmes and curricula in extension are outdated and increasingly out of recent learning loops involving innovation in services development over the past 15 years. In the new competency areas such as PEA/PDA, local and farmer organization development and pluralistic agriservices management, it is clear that, in many cases, learning in the field has moved ahead of that in colleges and university faculties of agriculture – many of which are operating in antiquated paradigms bereft of modern approaches and systems of experiential learning.

From an extension perspective, it is essential that joint task teams from national agricultural extension and education systems be formed to begin the process of sharing and mutual learning in the interests of farmers, students and staff. The education and training of rural people in trades and vocational skills will be critical to providing enhanced rural services for farmers as they seek to modernize, increase productivity and generate local employment.

8. AGRICULTURAL EXTENSION SERVICES DEVELOPMENT AND MANAGEMENT PROGRAMME

The foregoing analysis and focal thrusts for action comprise a complex agenda for facilitation and implementation by MOA/DRDE. The CMP involves a sequence of interdependent tasks or "change inputs" that pave the way for renewal and capacity development of the service system to begin to engage with the array of challenges and deliverables described in section 5 above.

Experience from recent practice in sub-Saharan African countries indicates that the "change agenda" has to be advanced in a systemic and holistic way by taking all thrusts forward in a learning process with optimum and cohesive participation by all actors. In many countries this has led to the design, planning, funding and implementation of agricultural services programmes (also named agricultural service management programmes or support programmes). While there have been mixed experiences with these types of programme, the

[12] Qamar, M.K. (2005). *Modernizing National Agricultural Extension Systems: A Practical Guide for Policy-makers of Developing Countries*. FAO. Rome, Italy

lessons learned have been instructive and have led to improved design and facilitation of more recent programmes by MOAs and donor partners.

As integrated efforts, agricultural service programmes avoid the overly reductionist approaches to agricultural institutional change pursued in the past, which often failed to harness the momentum of change – often diluting its substance and thrusts by overemphasizing single issues or aspects at the expense of the wider, institution-wide processes that make or break the entire effort. They were often "project prescriptions" seeking the ends of change without any means or processes to achieve those ends.

MOA/DRDE should give serious consideration to an integrated agricultural service development programme to take forward the formidable but necessary agenda proposed above to bring about the much-needed renaissance of its national extension system.

8.1 Short-term recommendations

- Representative teams (MOA/CACs/farmers/stakeholders/NGOs) from the agricultural sector should undertake study tours to selected African (e.g. South Africa/Kenya) and other countries.
- Conduct short training programmes for CACs and senior staff to orient them towards management and coordination of agricultural services under the emerging decentralized, pluralistic paradigm.
- A services analysis exercise should be started by the MOA Department of Planning and Development and DRDE following the Planning and Partnership Workshop proposed with MOA/NGOs earlier.
- Design and implement a nationwide programme to train MOA facilitators/trainers at county levels (three to four per county initially) building on recent and current experiences with FFS/NFSP and UNDP/NARDA.
- In conjunction with FAO/NFSP, and building on existing knowledge and practice with CBOs/NGOs, prepare training programmes, manuals and extension support materials on household nutrition and food security – cognizant of current low rural literacy levels.
- Hold consultative workshops with farmer organizations/associations on the development of a new training programme on farmer organization development; develop TOR and set up a task team to advance the process with stakeholders.
- Conduct a study on rural young people and their potential and training needs to become involved in farming as a career; explore prospects for an urgent pilot programme in this area.
- Conduct a TNA of management and staff in DRDE and input proposals for training and development to the wider MOA staff training and development plan.
- Form joint extension–research teams with CARI staff and farmers in areas prioritized for programme development by farmers/stakeholders in county/district planning processes.

8.2 Long-term recommendations

- Design and facilitate the implementation of an *Agricultural Services Development and Management Programme* in DRDE to take forward the agendas for change management outlined in Box 4 above; integrate the programme with wider MOA institutional capacity development and performance improvement programmes.

- Facilitate new partnerships with agricultural education institutions through the setting up of joint task teams, and perhaps programme development, on sectoral education needs/exchange/curriculum development/modernization.
- Establish, initially on a pilot basis, rural/agricultural knowledge or resource centres, preferably at locations where farmers congregate or meet.
- Introduce performance-based contracts and remuneration systems for extension management and staffing in line with MOA/GOL personnel policies.
- Promote and facilitate robust stakeholder involvement processes in all counties and districts in preparation for mainstream decentralization measures.
- Ensure mainstreaming of cross-cutting issues such as HIV/AIDS and gender equity/equality in all extension training programmes and cooperate with UNDP at county level in striving to achieve the MDG targets in these and related areas.
- Devise and agree impact evaluation criteria for local extension service provision with stakeholders and farmers.
- Improve knowledge management on extension policies, concepts and practices, and document learning and case studies to inform policy development and strengthen institutional memory in DRDE/MOA.
- Develop expertise and provide technical inputs for the farm enterprise and management information system in conjunction with the Department of Planning and Development.
- Consolidate learning, approach development and divisional expertise for farmer group and organization development, and facilitate modular training programmes covering areas such as agribusiness, marketing, financial management, organization development and service provision.

CAAS-Lib – Institutions investment proposal 3

Name of programme	**Agricultural Services Development and Management Programme for DRDE and Stakeholder Partners**
Institutional responsibility	MOA/DRDE/stakeholder partners
Aim(s) of activity	Renew and develop DRDE capacity for improved performance in facilitating agricultural services development, coordination, management provision and evaluation in a decentralized system for rural community development.
Description of main activities	• Renew and reorganize DRDE functions, organizational systems and capabilities in line with the new paradigm for pluralism in agricultural services provision, including stakeholder involvement and decentralized services coordination and provision to farmers. • Direct investment in improving the facilities, equipment and mobility of DRDE management and staff through procurement of vehicles, motorcycles and office/training equipment for decentralized/field staff. • Strengthen DRDE coordination capabilities in county and district-level planning and coordination of agricultural programmes and service provision, including stakeholder involvement processes. • Facilitate training of DRDE/CBO facilitators for county- and district-level provision of participatory training programmes in household food security and farmer organization development. • Strengthen DRDE capacities in knowledge management for agri-enterprise development and impact evaluation of extension programmes. • Facilitate and consolidate decentralization of MOA services to counties/districts, including evaluation processes.
Expected result(s)	• A responsive and streamlined extension department facilitating service provision that meets the needs of farmers cost-effectively and efficiently. • Multi-stakeholder partners cooperate with DRDE and are satisfied with approaches to planning and county-level services provision to farmers.

Name of programme	Agricultural Services Development and Management Programme for DRDE and Stakeholder Partners
	• DRDE management and staff capacities developed to high standards of performance supported by comprehensive monitoring and evaluation systems. • MOA/DRDE has a state-of-the-art knowledge management system at central and county levels with local agricultural knowledge/information centres geared to the specific needs of various farmer groups. • Extension services are fully decentralized to all counties, with county teams integrated into planning processes with local government institutions.
Impact on food security, poverty reduction & economic development	• DRDE will be better positioned to deliver programmes for poverty reduction and provide coordination for all actors involved in programme implementation and service provision. • Decentralization and integration of DRDE activities into county development systems will help to ensure that programmes and services are relevant and responsive to the local demands and needs of farmers and that training and services are provided cost-effectively to farmers (subsidiarity). • Integrated and farmer-centred planning with all actors will lead to the emergence of self-reliant farmer groups and organizations contributing optimally to local food security and producing surpluses for income generating agri-enterprises that will lift the income base and livelihoods of rural communities.
Period of execution	2008–2012
Estimated cost	US$8 million

9. AGRICULTURAL EDUCATION

9.1 General overview

Agricultural education and training (AET) is one of the essential building blocks that underpins any effective sustainable agriculture development strategy, and produces the human capital required for agricultural development. Agricultural education programmes provide education and training of agricultural professionals in a wide range of instructional areas at different educational levels, using various pedagogies, and adopting best practices as appropriate. Unfortunately, AET in Liberia has not been seen as essential to sustained agricultural development but instead as a complementary activity, and therefore very few resources have been invested in AET programmes.

The low priority given to AET within the agricultural development matrix during the past fifteen years has resulted in serious deficiencies of available trained agricultural professionals. While this situation has been exacerbated due to disruption and eventual closure of educational institutions throughout the period of the civil conflict, these deficiencies were also evident prior to that period. This deficiency of available trained professionals has undoubtedly contributed to the stifling of agricultural development efforts over the years.

Secondary and college-level programmes developed prior to the civil conflict offered a limited range of instructional areas, and lacked the necessary coordination with agricultural research (at CAF and CARI), local knowledge and information centres, and educational agencies responsible for developing national curricula and for regulating and administrating educational programmes. By and large the same situation exists currently.

Curricula for vocational agriculture training programmes and short-term agriculture training programmes are developed independently by each school, NGO, or agency carrying out the training, with no input from the Ministry of Education (MOE), MOA, the CAF/UL, or CARI. Clearly there is a need to set up a process of collaboration between the aforementioned institutions, through which minimum content standards are developed and proper mechanisms put in place that can provide oversight of the development of all vocational agriculture training curricula and in the administration of vocational agriculture training programmes.

Agricultural education programmes form an important link in the interactive process (the other two links being research and information systems, and extension systems) through which knowledge and information, technology, and advanced methods acquired through study, research, and through interaction with farmers and other actors, are taught to individuals and introduced into farming systems, ultimately resulting in increased incomes and improvements in the quality of life of rural farmers. Currently AET programmes have no such links with CARI, or research being done in Cuttington University's agricultural programme, the national extension service or other agriculture service providers.

Agricultural development can be sustained only when there are adequate numbers of trained agricultural professionals available. Currently there are serious gaps in the total numbers and range of specialization of agricultural professionals, specifically in research, teaching and extension. The current agriculture curriculum at the CAF and CU, which offers a very limited number of areas of specialization at B.Sc. level and no advanced/graduate level training, does little by way of redressing this critical lack of trained agriculturists.

Curricula at both the CAF and CU must be revised to allow for an increase in the number of instructional programme areas offering B.Sc. degrees in agriculture (and related areas), and a real commitment made to introduce, within the medium term, graduate degree programmes in agriculture. This will ensure that a stock of trained agricultural professionals and specialists is available that can augment and/or replenish agricultural human capital, and in relationship to advanced graduate level training, at costs far less than that of equivalent oversees graduate training.

Curricula of AET programmes need to be reviewed and revised at three levels: college level education offered at the CAF/UL and CU; vocational agriculture training, which is currently being undertaken by the Booker Washington Institute (BWI), Tubman High School and Zwedru Multilateral High School; and short-term training programmes, which cover specific topics or targeted areas of intervention and are carried out mainly by NGOs and some government agencies.

Agricultural Education programmes require the full commitment and financial support of GOL and of the donor community. Financial and technical resources must be provided for strengthening and expanding instructional and research capacities of the agricultural colleges (CAF/UL & CU), and for strengthening AET programmes at other institutions. Total GOL expenditure on AET (for both secondary and higher education programmes) over the last 15 years has been dismal. Clearly this trend of low financial support must be reversed.

While GOL clearly has primary responsibility for funding national agriculture education and training programmes at the CAF, BWI and other public secondary vocational training programmes, it currently does not have the required resources.

Table 1: Profile of agriculture education and training programmes by institutions, excluding NGOs

Name of institution	Type of programme	Areas of specialization
CAF/University of Liberia	College level (B.Sc. degree)	• Agronomy • General Agriculture • General Forestry • Wood Science & Technology
CARS/Cuttington University	College level (B.Sc. degree)	• Agronomy • Animal Production • General Agriculture • Rural Development & Rural Science
BWI, Tubman High, Zwedru Multilateral High School	4-year secondary vocational agriculture programme	• General Agriculture – emphasis on food and cash crop production • Livestock production and animal husbandry

Substantial increases in the overall level of donor financial assistance will be required over the next decade or so to help revitalize and expand instructional programme areas, develop administrative and instructional capacity and rehabilitate infrastructure at these institutions. Given the fact that the per capita cost of college-level agricultural training programmes is much higher than primary/secondary level vocational agricultural training (given the relatively high administrative, academic, infrastructural and other costs associated with university-level agricultural education), a significantly greater portion of resources should be allotted to college-level agricultural training programs at the CAF and CU.

Several studies justify increased support for university-level agricultural training programmes by showing a significantly higher rate of return to higher education than to secondary education. It is these programmes that produce the corps of highly trained individuals in all areas of specialization, who in turn become researchers, teachers, and providers of technical support and services for the agricultural sector.

Coordination of AET Programmes is critical to minimizing unnecessary programme duplication, maintaining programme standards, and providing oversight, which ensures that the range of training needs within sector is provided for. Currently there is a serious lack of coordination between the relevant parties; these include MOA, the Ministry of Education (MOE), the College of Agriculture and Forestry of the University of Liberia (CAF), the College of Agriculture, Rural Development and Sociology at Cuttington University (CARS), vocational agricultural training institutes, international non-governmental organizations (INGOs), and local NGOs, all of whom are involved in developing and delivering primary, secondary and higher agricultural education and vocational agricultural training.

Along with severe training needs within the agriculture sector, MOA itself has a range of training needs related to its organizational and institutional capacity building requirements within the context of its new organizational arrangements. High priority should be given to strengthening the capacity of the MOA's human resources development and training unit to assess, monitor and evaluate its internal personnel needs and provide that same coordination of training activities for agricultural programmes sector wide.

10. HISTORY AND INVENTORY OF AGRICULTURAL EDUCATION PROGRAMMES IN LIBERIA

10.1 College of Agriculture & Forestry/UL & College of Agriculture, Rural Development and Sociology/Cuttington University

University-level AET programmes were first introduced into Liberia in the late 1950s and early 1960s, with the establishment of the School of Forestry at the University of Liberia. Around this time an agriculture programme was also started at Cuttington College, now Cuttington University (CU), in Suakoko, Bong County.

Subsequent to the establishment of the School of Forestry, the Government of Liberia entered into an agreement with the United Nations Special Fund (UNSF) and FAO to assist in establishing a College of Agriculture as an integral part of the University of Liberia. The College was formally inaugurated in 1962 and a 4-year curriculum in general agriculture was developed, producing its first four graduates in 1965.

The School of Forestry, which had been had been established earlier with assistance from FAO, produced its first graduates in 1959. That same year the school was elevated to the status of a College offering a 4-year B.Sc. degree programme in General Forestry. Both colleges were merged in 1967 into the College of Agriculture and Forestry (CAF).

The agriculture programme that was started at Cuttington College in the late 1950s offered a 4-year degree in General Agriculture. This programme was, however, soon discontinued. During the late 1970s the Rural Development Institute (RDI) was established at Cuttington University College, now Cuttington University, offering Associate of Arts degrees in Agriculture. This programme, which lasted for about a decade, was in response to the need for trained agriculturists to work in the extension service and throughout the sector, but was discontinued due to lack of funding. While the RDI program did produce scores of graduates many of them were subsequently lost or have relocated abroad due to the civil conflict.

Cuttington University reinitiated its agriculture programme with the establishment of the College of Agriculture, Rural Development and Sociology in 1998, offering B.Sc. degrees in General Agriculture and in Rural Development and Rural Science.

10.1.1 Features of the CAF & CARS Programmes

The University of Liberia and Cuttington University remain the only two institutions of higher learning in the country offering B.Sc. degrees in agriculture; CAF also offers a degree in forestry. Advance graduate degree programmes have not been developed at either institution. The lack of such programmes means that advanced graduate training can only be obtained abroad, at much higher cost than would be the case if it were available locally. The higher cost is indeed a constraint that limits the ability of GOL and donors to provide training of the large number of agricultural professionals required to sustain a highly developed and productive agriculture sector.

10.1.2 Enrolment in both the CAF and CARS has increased since the resumption of classes

Enrolment in CARS increased from 10 students in the 1998/99 academic year, the year in which the programme was introduced, to 264 for academic year 2006/2007.

- Enrolment in CAF for academic year 2004/2005 totalled 71 students. Tabulation of enrolment data for 2005/2006 has not been finalized:

Agronomy	22
General Agriculture	30
General Forestry	18
Wood Science and Technology	1

Table 2a and b. Profile of college graduates earning degrees in Agriculture Sciences

Name of institute	Total number of graduates					
	1995/96	1997/98	1998/99	2000/01	2001/02	2002/03
CAF/UL	40	36	37	45	47	71
CARS/CU	NA	NA	NA	NA	4	40

Name of institute	Area of specialization (B.Sc. degree) total no. of graduates 1995–2005						
	Agronomy	General Agriculture	General Forestry	Animal Production	Wood Science	Rural Development & Rural Science	Home Science & Community Development
CAF/UL	81	87	101	NA	4		3
CARS/CU	5	13		8		18	

The agriculture curricula developed by the CAF and CU provide basic knowledge and skills through a limited number of course offerings combined with some laboratory and practical fieldwork, with very little research being undertaken.

- The instructional content of courses reflects an emphasis on basic knowledge and generic information, but lacks sufficient integration of location-specific knowledge acquired through the harnessing of information from indigenous research and from farmers and local farming systems, which should be integrated into their curricula to ensure relevance.
- CARS is involved in a "limited form of research" focusing on adoptive research on New Rice for Africa (NERICA) and breeding of tilapia species and pigs, but no indigenous research is currently being done at the CAF, and both programmes currently have no interaction with CARI, extension providers or farmers.

An AET programme was introduced into the Teachers College at the University of Liberia in 1980, aimed at preparing vocational agricultural instructors for secondary schools. This programme offers a B.Sc. in Agricultural Education involving the first two years of instruction at the CAF covering content areas in agriculture courses, and the last two years of instruction at the Teachers College covering the professional education courses. A small number of graduates with a B.Sc. in Agriculture Education have been produced since the inception of the programme, with most of these individuals finding employment in agricultural disciplines other than vocational education.

- Of the current total of 500 students enrolled in the Teacher College at UL only 17 are enrolled in Agriculture Education.
- The number of graduates majoring in Agriculture Education since the start of the program in 1984 is 25.

For the most part this programme is self-perpetuating and exists at the margins with low enrolment, limited instructional capacity, and lack of interaction and collaboration with complementary institutions (MoE, MoA, CARI, etc.), which would be essential for maintaining high instructional standards and relevance, and for enhancement of vocational agricultural education in secondary schools in Liberia. Vocational agricultural curricula for secondary schools have not yet been developed.

Both CAF and CU have extremely limited instructional capacity in terms of classroom and lecture facilities, instructional materials, including computing and information technology infrastructure, laboratory and shop facilities, field plots, and quantity and quality of faculty and instructional staff.

- A small number of instructors have advanced degrees. Advanced graduate training in agriculture and related areas of specialization continues to be possible only by training abroad.
- Prior to 1990 virtually all such advanced graduate training was funded by GOL with substantial assistance from foreign donors, principally USAID. The focus of these programmes was on faculty development at the CAF. The discontinuing of overseas advanced training programmes, combined with the loss of most of the highly trained faculty, has severely limited the instructional capacity at the CAF and thus created a gap in the available pool of essential high-level agricultural professionals.

Both CAF and CARS currently have no faculty and staff development programmes in place, and no plans to develop such a programme. Authorities at both institutions recognize this as a major problem and acknowledge the necessity for a training needs assessment, but lack the capacity to do such an assessment. Existing staffing limitations and deficiencies will require a significantly high level of investment in providing advance faculty and staff training. A couple of initiatives have been taken by both institutions in this regard, but much more needs to be done.

- CAF has recently submitted a proposal to the FAO for assistance to improve the instructional capacity for the Forestry and Wood Science programme.
- CARS has recently signed an agreement with the University of Missouri in the United States to assist in the creation of a graduate programme offering a Doctor of Veterinary Medicine degree, which will require a significant amount of advance training of faculty and staff.

Currently only CARS conducts standardized annual programme evaluations. No programme evaluation has been done at the CAF that anyone there can remember. The annual evaluation at CARS looks at three areas: enrolment and graduation, instructional performance, and placement. We were, however, unable to review the evaluation forms, or ascertain what the results of the most recent evaluation were.

Financial support to the CAF is provided solely by GOL; CARS receives financial support from the Episcopal Church in Liberia and from Anglican Universities in the USA. Foreign

donors provide minimal technical assistance. Currently very limited technical assistance (mainly equipment and assistants) is being provided to the CAF by the People's Republic of China; however, based upon their recent statements much more technical assistance will be provided in the future. Other donor assistance provided to these programmes includes:

- UNDP has provided text books and reference books to the CAF.
- UNDP has provided assistance with maintaining animal/livestock facilities.
- The Association of Researchers of Social Sciences & Agronomy (AZUR), in collaboration with Africare, has funded a limited inland fisheries hatchery research project at CARS.

Institution	Faculty profile	
CAF	**Total no. faculty**	**35**
	Total no. of advanced degrees 20 (including 2 Ph.D.)	
	Specializations:	
	Horticulture	1
	Sericulture	1
	Forest Economics	1
	Forestry	5
	Agronomy	4
	Wood Science	1
	Agri.Mech	1
	Agri. Econ.	2
	Food Crops	1
	Poultry	1
	Agri. Engineering	1
	Entomology	1
	DVD	1
CARS	**Total no. faculty**	8
	Total no. of advanced degrees	**5**
	Specializations:	
	Post-harvest tech	1
	Pasture agronomist	1
	Rural development	3

10.2 Vocational education and training programmes

10.2.1 Current programmes

Vocational agricultural training programmes currently being offered at the secondary level can be placed in two categories: (1) 4-year secondary programmes, and (2) accelerated vocational agriculture training programmes. These training programmes provide training for the range of agriculturists, vocational agricultural teachers, students who will matriculate and receive college degrees in agriculture, extension workers and service providers, and farmers.

***Four-year secondary vocational agricultural programmes*:**

Booker Washington Institute (BWI):

A 4-year secondary vocational agriculture programme is offered by the Booker Washington Institute (BWI), with graduates awarded Diplomas in General Agriculture. For many years this was the only such vocational agriculture training programme in the country, producing

hundreds of graduates over the years, and it provided much of the trained workforce for the agricultural sector.

The vocational agriculture programme at BWI was started in 1929 with assistance from Tuskegee University, which had entered into an agreement with GOL to assist in the development of a 4-year vocational agriculture programme at the BWI. Additional donor assistance from the Phelps Stokes Fund was provided for staff training and development, working with Priere View A&M University in the United States, which started in the mid 1970s and lasted until the civil conflict. Over the years this effort was generally very successful in developing a fairly highly trained faculty and staff. Unfortunately well over 90 percent were either killed or left the country during the civic conflict, creating a serious deficiency of adequately trained instructors.

Donor assistance to BWI is again being provided by the Phelps Stokes Fund, with additional assistance from the Government of the People's Republic of China for institutional support including training. Much more donor assistance is needed, particularly for faculty training and development. The current vocational agriculture curriculum that is being offered at BWI provides instruction in the areas of food crops, tree crops, livestock (pig, poultry, cattle, goats and sheep), extension, and agriculture mechanization. Instruction is also provided in soil science, fisheries and farm management.

This curriculum has remained largely unchanged over the years, and needs to be reviewed and revised by integrating advanced knowledge, technology, and specific local-based knowledge of farming systems that could make the training being offered more relevant to the current workforce needs and requirements within the sector. Efforts should be made to ensure that the curriculum development workshop scheduled to be held during the 2007 school year institutes the process through which such periodic revisions can be made.

List of courses offered under General Agriculture Curriculum at BWI:

Introduction to Animal Science
- Pig production
- Poultry production
- Small ruminants (goats & sheep) production

Introduction to Food Crops
- Rice
- Vegetables

Introduction to Cash crops
- Coffee
- Cocoa
- Rubber

Introduction to extension

Agricultural Mechanization

The curriculum incorporates practical field training with subject-matter class room instruction throughout the 4-year programme. Authorities at BWI indicated that efforts are being made, in cooperation with CARI, to reintroduce the in-service training internship programme for seniors, which in the past was conducted annually at CARI. Graduating seniors are also provided internships with agricultural institutions, plantations and large private farms, whenever possible, to ensure placement and eventual employment.

Unavailability of textbooks and other instructional materials, and the destruction of classrooms, research and reference material, laboratories and workshops have limited the programme's capacity to deliver quality instruction. While substantial physical renovation carried out within the last three years has restored many of the physical facilities to near pre-war levels, not much has been done to improve the quality and availability of instructional materials. The authorities at BWI are very conscious of and concerned about this and are looking at a number of innovative solutions, including the use of distant-learning methodologies.

Authorities at BWI recognize the urgent need for staff development and for improving and revising the current curriculum. The current administration recently initiated a faculty development assistance programme that pays 60 percent of tuition, and provides subsistence and transportation allowances for faculty members of the vocational agriculture department who pursue advance training at the CAF. Plans for a long-term staff development programme, including advanced overseas training, have been presented to BWI's Board of Directors, and hopefully will be implemented with assistance through the Phelps Stokes Fund and the PRC.

Profile of agriculture faculty at BWI:	
Total no. of agriculture faculty	**8**
B.Sc. General Agriculture (CAF)	3
AA General Agriculture (RDI)	2
Laboratory Assistants (BWI graduates)	3

Enrolment in vocational agricultural programmes currently ranks third among all programmes being offered at BWI. Enrolment in vocational agriculture has ranged from 11-15 percent of total student enrolment between the 2003/2004 and 2005/2006 academic years. These statistics are encouraging in that they indicate a healthy level of interest in agriculture among students who choose to undergo vocational education, even without special recruitment or promotional efforts, which if introduced could further increase enrolment in vocational agriculture at BWI. financial support to BWI from GOL is minimal and is insufficient to support the institution in spite of an increase, since the current Government came into office, from US$340 000 in 2004/2005 to US$566 000 currently. Additional support is provided through donor assistance for specific programmes and activities.

Despite concerted efforts made by the Principal and Board to engage the donor community, their level of assistance remains extremely low, which reflects the global trend of neglect and indifference within the donor community towards agriculture education and training.

- The PRC currently provides farming and workshop equipment and tools for the agriculture mechanization programme.
- Mercy Corps, an International NGO that is a major USAID implementing partner, has committed to providing assistance to strengthen the extension training programme.

10.3 Vocational agriculture programmes in high schools

Prior to the 1990 conflict all public secondary schools were mandated by the MOE to have agricultural programmes. These programmes were first introduced in the 1970s, with mixed results, and according to the MOE were intended to provide a broad introduction to agriculture with the hope that students' interest would be kindled, eventually resulting in

positive choices of future vocation and careers in agriculture. Two types of programme were offered in secondary schools. One was offered in conventional high schools over 3 years starting in the 10th through 12th grades, and the second was offered by multilateral high schools over 4 years. While these programmes were not compulsory, indications are that enrolment in them was comparable to that in other vocational programmes.

The programmes in the conventional high schools in many instances were limited to school gardening activities, with very little subject matter instruction or exposure to careers in agriculture. For the most part these programmes were poorly administered and resulted in failure. Students were forcibly subjected to traditional labour-intensive farming practices, which made these programmes unattractive and resented by the students. As a result they did not achieve their intended objective of developing and stimulating an interest in agricultural that could have persuaded students to pursue vocational choices and professional careers in agriculture. Currently these programmes are no longer being offered in high schools nationwide.

The aim of vocational agriculture programmes offered by multilateral high schools is to provide rural students with job skills as well as life skills. The programmes were recently reintroduced at Tubman High School in Monrovia and in Zwedru Multilateral School in Grand Gedeh. The MOE plans to expand the programme to Voinjama Multilateral School in Lofa County and to Greenville, Sinoe County. These programmes are 4 years in duration, and offer classroom instruction and practical fieldwork in food and cash crop production, and livestock (poultry, pig, goat and sheep) production.

According to MOE there is no national curriculum for vocational education. Each school is expected to develop its own curriculum. The MOE is studying the situation to "determine the type of institution and needed level of instruction in order to develop a national curriculum with flexibility for location factors and industry/employee demands".

10.3.1 Accelerated vocational agricultural training programmes

Vocational agriculture training is being carried out by a number of NGOs and is aimed at providing practical skills training in specific areas. These programmes are classified as accelerated training programmes of not more than 9 months' duration. Generally these programmes are designed to meet specific needs of NGOs, who usually conduct their own training. Participants in these programmes include NGO field staff and members or clients of community-based organizations (CBOs).

11. PROBLEMS AND CONSTRAINTS AFFECTING AGRICULTURAL EDUCATION

A number of problems and constraints have been identified by the educational institutions, government agencies, NGOs, and other actors involved in the delivery of AET. These include those listed below.

- The low salaries paid to agriculture faculty, at both universities, and to vocational agriculture instructors are reflective of the low priority that is given to AET. This in turn has negatively affected the recruitment of instructors and enrolment of students for agriculture education programmes. Currently there are only two agriculture education teachers in the Teachers College at UL.

- Lack of adequate funding for agriculture education and training, at all levels, coupled with significant reduction of donor support, has resulted in ineffective AET programmes.
- There is a lack of instructional infrastructure such as classrooms, laboratories, field plots, etc., and of instructional materials.
- There is insensitivity to the need for coordination between educational and research institutions, providers of extension services (particularly NGOs), farmers, business and industry in the process of developing educational curricula, and the provision of education and training.
- A lack of appreciation by those involved in the development and delivery of AET programmes of the interconnectivity between research, teaching, and extension within an interactive process, which takes time to develop.
- Fragmentation of planning, regulation and implementation of AET between separate agencies (MoE, CAF, technical vocational institutions, NGOs, etc.).
- Inadequate curricula at institutions of higher learning in terms of both content and instructional areas. Curricula for both Forestry and General Agriculture degrees at CAF, and the Agriculture and Rural Development degree being offered at CU also lack sufficient local relevance. Authorities at the CAF have admitted problems with the Forestry and General Agriculture curriculum and expressed the need for review and revision.
- There is a serious lack of commitment of political leaders to providing adequate financial support for AET.
- The sole dependence on overseas providers for graduate-level AET, and the lack of research at the CAF and CU, seriously limits their capacity to advance both teaching and extension functions.
- Insufficient numbers of vocational agriculture teachers are being trained, thereby limiting the opportunity for establishment of vocational agriculture education programmes at the secondary school level.

12. PLANS AND PROPOSALS TO IMPROVE AGRICULTURAL EDUCATION

From discussions with MOE, CAF, CU and BWI (the major institutions responsible for development and delivery of agriculture education programmes in Liberia), we have discovered that a number of interventions are being planned (some have already started) for enhancing agriculture education and training.

- The MOE recognizes the need to develop a vocational agriculture curriculum that reflects local needs, in collaboration with the MOA, CAF, CARS, and CARI. Efforts to institute such a collaborative process for curriculum development have now begun.
- Authorities at the University of Liberia are looking into the possibility of creating an Agriculture Education Department within the College of Education at the University of Liberia, and establishing a programme to encourage higher enrolment in the vocational agriculture teacher training programme at the University of Liberia's Teachers College.
- MOE is looking at strengthening the relationship with the UL Teachers College through developing and introducing a certification requirement and testing for secondary agriculture vocational teachers by the Bureau of Teacher Education.
- MOE is currently in discussions with the Government of Ghana to enter into an agreement for assistance in providing training for vocational agriculture instructors.
- MOE and the authorities at BWI are in discussions with UNESCO about merging the BWI and the Kakata Rural Teacher Training Institute to create a college offering

vocational and technical teacher training programmes, which would include vocational agriculture.

- The MOE recently convened a national conference on curriculum revision that did not address the issue of vocational agriculture education. However, revision is being made to address this situation given that the West African Examination Council (WAAC) plans to include vocational education in the WAAC examinations by 2008. All secondary graduates are required to pass the WAAC examinations as a prerequisite for graduation.
- An Agricultural and Industrial Training Board has been established with responsibility to set standards based on industry needs, and to certify and evaluate all vocational training institutions.
- The CAF is planning to reintroduce the CARI internship program for graduating seniors, which should enhance their practical knowledge.
- The CARS has recently signed an agreement with the University of Missouri in the United States to provide professors and staff to assist in the establishment of a Doctor of Veterinary Medicine (DVM) programme and a Health and Animal Production (HAP) programme; both will be graduate-level programmes. The programmes will involve two years of study at the CU campus and three years of study at the University of Missouri.

13. RECOMMENDATIONS TO ENHANCE AGRICULTURAL EDUCATION IN LIBERIA

The following recommendations are advanced to improve and enhance agriculture education programmes in Liberia.

- Efforts should be made to seek assistance through the World Bank's "Africa Agriculture Education Training (AET) plan", which is being proposed for strengthening AET programmes in Africa over a 30-year timeframe.
- Clear political commitment at the highest level is required, to give priority to strengthening AET particularly at the college level, which should translate into increased financial support for AET.
- Efforts should be made to develop strong curricula for both secondary and college agriculture training programmes with flexibility for location factors and industry/employee demands.
- Training of agriculture education instructors at all levels should be given the highest priority. Curricula for these programmes should be upgraded and standardized.
- Partnership should be developed between the CAF and CARS, which will allow students from both programmes to take courses at each other's campuses within the context of their graduation requirements. This will expand the total number of available areas of specialization.
- Training and accelerated internship programmes should be developed to provide training in special areas of need and for equipment and technology that has been provided by NGO's to rural communities and remains either unused, due to lack of trained personnel, or under-utilized, due to inadequate training.
- A full assessment should be made of the infrastructural requirements and other material needs at the CAF in light of existing pressing needs and for future expansion.

CAAS-Lib – Institutions investment proposal 4

Name of programme	**Rehabilitation and Renewal of Agricultural Education Institutions in Liberia**
Institutional responsibility	GOL and stakeholder partners
Aim(s) of activity	To rehabilitate and renew the education and training capacities of: • The College of Agriculture and Forestry of the University of Liberia (CAF) • Vocational agricultural training institutes (Booker Washington Institute, Tubman High School, Zwedru Multilateral High School). • College of Agriculture, Rural Development and Sociology, Cuttington University (CARS).
Description of main activities	• Rehabilitate buildings and teaching facilities, principally at the CAF and vocational training centres. • Provide higher education and training opportunities for existing and newly recruited teaching and support staff at colleges and training institutes. • Revise and update curricula for undergraduate and vocational training in line with current regional and global developments and practices in agricultural and related sciences. • Facilitate and support internship programmes for undergraduates in national institutes such as CARI. • Develop partnerships for national capacity development (including twinning and bilateral arrangements) with higher education institutes in Africa, the United States and Europe. • Conduct studies on ongoing national priorities and programmes in higher education in conjunction with MOE and MOA.
Expected result(s)	• A reinvigorated higher education system providing agricultural education and training to international standards for public and non-public institutions in the agricultural sector. • Increased numbers of qualified graduates, postgraduates and postdoctoral workers available for institutions and companies across the agricultural sector. • The quality of teaching and graduates produced by Liberia's universities and colleges will be recognized and valued by national stakeholders and peer regional/international higher education institutions.
Impact on food security, poverty reduction & economic development	• Only through the development of the human capital base of its most important economic sector can a country, emerging from a traumatic post-conflict period, begin to renew its self-sufficiency in food production and optimize its potential for export growth through improved rural incomes and livelihoods. • Significant increases in the numbers of qualified professionals across agricultural disciplines will over the long term lead to enduring capacity development for agricultural research and extension services thereby impacting positively on poverty alleviation and overall social and economic development.
Period of execution	2008–2022
Estimated cost	US$30 million

Note: The total indicative investment for the four preceding institutional areas is US$54 million.

ANNEX 1

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VI. NGOs AND CBOs IN LIBERIA

A brief evaluation and strategies for maximizing their contribution to agricultural development and poverty alleviation

by

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Liberia 2007

VI. NGOs AND CBOs IN LIBERIA

1. INTRODUCTION

A non-governmental organization (NGO) is an independent, non-profit making, non-political and charitable organization, with the primary goal of enhancing the social, cultural and economic well-being of communities in its operational areas. A community-based organization (CBO) is an association of residents of a particular community operating collectively either as a unisectorial or multisectorial sovereign non-profit making body. Cooperative societies, as defined by the Cooperative Development Society (CDA), are societies that are organized as business organizations primarily to cater to the development needs of the less fortunate rural and urban dwellers using their own self-help initiatives. They empower their members to achieve socio-economic independence through working together as a united group with a common bond to promote the interests of all members and their communities.

The involvement of NGOs in the national development initiatives of Liberia can be traced as far back as pre-war days. The pervasive awareness of the significant role of NGOs has continuously attracted support as well as international donor funds to execute specific activities throughout the country since the 1990s. Over the years there has been a rapid increase in the number of NGOs operating in the country. The civil war in Liberia, which caused the displacement of a significant number of people at the time, as well as the huge entry of refugees from Sierra Leone in the 1990s, resulted in the proliferation of both local and international NGOs undertaking relief and developmental activities throughout the country. Many of these NGOs were involved in agricultural activities. Another group that is emerging are the faith-based organizations (FBOs). The FBOs are often organized by NGOs within a community as a strategy to implement certain agricultural project activities.

This paper contains a brief evaluation of NGOs and CBOs in Liberia with proposed strategies to maximize their contribution to agriculture development and poverty alleviation. The evaluation will not place emphasis on critical analysis of the organizational capacity index (OCI) of the NGOs/CBOs.

2. METHODOLOGY

The information contained in this paper was obtained mainly from data provided by NGOs that filled in a questionnaire form (Annex 1) prepared by the Department of Planning, Ministry of Agriculture (MOA), Liberia. The form when properly filled provides the necessary information to allow the Ministry officials to assess NGOs for accreditation. Other sources of information were the FAO database and those of the UN Humanitarian Information Center, the MPEA, and the Cooperative Development Agency.

Based on the information that was provided by NGOs, a cursory evaluation of NGO/CBO activities and involvement in Liberia was undertaken via the following processes:

- review of the content and national coverage of the programmes of the main institutions;
- assessment of the institutional capacity, mandate, mission, structure, staff strength and quality, and the logistical and financial support of the institutions;

- accessing the opportunities and mechanisms for participation of NGOs and CBOs at all stages of agricultural policy decision-making and delivery of services;
- assessment of the efficiency of the mechanisms in place for coordination and monitoring of NGO and CBO activities at national, county and community level;
- examination of the strengths and weaknesses of existing internal and external structures of NGOs and CBOs.

In addition brief field visits were made to six communities in six counties (Bomi, Bong, Cape Mount, Gbapolu, Margibi and Nimba counties) to confirm the presence of NGOs and the activities they were involved with in the counties. An OCI rating for these NGOs/CBOs was not obtained from the above reviews and assessment of data due to time limitations and the terms of reference. However, an in-depth understanding was gathered from the review of these data of the activities of these NGOs/CBOs and the Cooperative Societies.

Some of this information was used to quantify (where possible) the number of NGOs (local and international) operating in the agriculture sector.

Based on the findings from the above, proposed strategies were advanced for maximizing the contribution of NGOs and CBOs to agricultural development and poverty alleviation in Liberia.

3. FINDINGS FROM THE CURSORY EVALUATION OF REGISTERED NGOS/CBOS IN LIBERIA

Comparison of NGOs vs CBOs vs Cooperative Societies in Liberia NGOs in Liberia can be classified as local or international NGOs. These are humanitarian/relief organizations with the ability to response to the needs of people in times of crisis to save lives as well as to undertake active development work in communities. However another group that is also referred to as "CBO" has emerged. A review of documents as well as Articles of Incorporation from the MOA did not show any clear-cut differences between an NGO and a CBO. However, a careful examination of the definitions of NGO/CBO that were given in the introduction shows that CBOs are locally entrenched within villages/communities. CBOs normally should operate within the territorial limits of those communities in which they were organized and registered to undertake specific objective(s). Currently, this is not always the case: some CBOs have registered as local NGOs and operate as NGOs.

The principles of cooperatives were practised in Liberia in the traditional form of *susu* (credit and savings mobilization) and *kuu* (farming through group work). These activities were principally geared towards putting members' resources and energy together to accomplish their aims and objectives, which could not be done easily by an individual. In recent times they have become legally registered business entities with a large membership operating nationwide.

3.1 NGO/CBO eligibility and accreditation

The MPEA is the arm of GOL that is in charge of all NGO/CBO registration, monitoring and evaluation, in collaboration with specific sector ministries. In line with its function, the Ministry of Planning and Economic Affairs (MPEA) has developed draft criteria for eligibility and accreditation. According to MPEA, an organization wishing to operate as an NGO or CBO in Liberia must fulfil the following requirements *inter alia:*

- it must be a legal entity;
- it must have a mission statement, objectives, target beneficiaries, etc;
- it must have an easily located office space with signboard clearly exhibited, an easily reached postal/email address, a bank account in the organization's name and evidence to access funds to support programmes;
- it must have a well defined administrative structure and accounting system that can be audited;
- it must have not have fewer than three permanent staff members;
- it must have a board of trustees or an equivalent policy-making body.

The registration guidelines state that a Community Base Organization (CBO) or Non-Governmental Organization (NGO) must have an annual registration period, i.e. January to December. The annual registration involves submission of documents as defined by the sector ministries/agencies. In the case of MOA the requirements are outlined in Annex 1. Data obtained from MOA show that prominent NGOs operating in the country have not applied for accreditation for the year 2007. It is worth mentioning that annual accreditation is mandatory for all NGOs wishing to operate in Liberia. In 2004/2005 the MOA registered 78 NGOs/CBOs involved in the agriculture sector. There were no data for 2006.

Currently the MOA have only renewed the registration of 17 NGOs/CBOs for 2007 (Annex 3). According to M. Tito, the Officer in charge of NGOs/CBOs at the MOA, many of these stakeholders either have not applied for renewal of registration or have submitted incomplete registration documents.

Annexes 2a and 2b contain a list of 44 international NGOs (Annex 2a) and 113 local NGOs/CBOs (Annex 2b) that are currently involved in the agriculture sector in Liberia (FAO, 2007). However, it was observed from field visits to Cape Mount, Margibi, Bong and Nimba counties that there are other local NGOs/CBOs who have not registered with either FAO or MOA.

Strengths and weaknesses of existing internal and external structures of NGOs\CBOs The existing structures of NGOs\CBOs may be measured by how the entity translates its mission statement into objective(s) that are 'SMART'. This means that the objective must be:

- S = simple
- M= measurable
- A = achievable
- R = realistic
- T = time bound.

The strengths and weaknesses of the existing internal and external structures of NGOs\CBOs are clearly indicative of how the entity project objective(s) are manifested into achievable results within the specified time.

Many international NGOs have strengths in their many years of experience of working elsewhere in the world. They bring with them this experience and are therefore positioned to write grant winning proposals. Because many are from developed countries, they have established strategic fund-raising techniques, enabling these INGOs to raise seed funds to commence humanitarian activities elsewhere in times of need. This is exactly what happened

in the case of Liberia during the 14 years of civil crisis. Additionally their straightforward "internal control systems" have caused donors to build trust in them and readily release funds to them for implementation of activities on their behalf. It can be observed in Annex 2 that INGOs have been funded through donors such as USAID, OFDA, the EU, the EC, ECHO-Aid, DANIDA, UNDP, FAO, Irish AID and the Swiss Development Corporation, etc. Other strengths emanate from their financial accountability, access to information and timely reporting.

The strength of local NGOs lies in their community mobilization abilities. It is believed that, because they are locally based and familiar with the culture and environment, they are an easy entry route into the communities.

The main weakness of INGOs, in our opinion, is their reluctance to work through local NGOs. Perhaps this is due to a lack of confidence in financial accountability and timely reporting, i.e. poor internal control systems. It is widely believed that many INGOs spend considerable sums of money on logistics, international staff and consultancies, etc. Many do not build the capacity of the local NGO. However, Mercy Corps is one INGO that states "capacity building of local NGOs" as one of its many project objectives. Mercy Corps have built the capacity of about 11 local NGOs, many of which (eg. AGRA, PBRC, CJPS) are now operating independently and winning donors' confidence (stated from personal experience of working with the organization for 2 years). Other weaknesses could be the "top-down approach" in project proposal development. Often the projects are brought to the beneficiaries for implementation without consultation.

The main weakness of local NGOs is poor internal control systems; in addition many lack offices, logistics, the ability to source funding and qualify staff.

Content and national coverage of programmes of NGOs/CBOs and cooperative societies The civil crisis in Liberia resulted in displacement of farming families as well as destruction of storage facilities, thus farming activities were halted. During the crisis period (1990–2005) most NGOs were involved in "life saving" emergency work, i.e. distribution of food and non-food items, construction and management of camps for internally displaced persons (IDPs).

Liberia has now emerged from conflict to peace via a period which most refer to as "transition". During this period IDPs began to return to their places of origin; some Liberians that were residing in neighbouring countries also began to return home. Most NGO activities during this period involved distribution of seeds and tools as well as involvement in crops and livestock/fishery production to assist the returnees in various communities around the country. In addition, training in agricultural best practice was conducted in these communities. During this period FAO, MOA and NGOs in the agriculture sector had a consensus whereby the activities of NGOs would be tracked. A tracking mechanism (datasheet) was jointly developed to be used by the Agricultural Coordination Committee (ACC). All NGOs provided information regarding their activities to the ACC through the datasheet. A summary of the data revealed that in 2005 21 NGOs (9 international, 12 local) undertook crop (rice, roots and tubers, leaf vegetables) and fishery production activities involving 93 221 beneficiaries in the 15 counties. In 2006, more NGOs provided their activity reports to FAO. Twelve international and 14 local NGOs undertook crop and livestock (small ruminants and poultry) production activities involving 106 565 beneficiaries in the 15 counties of Liberia.

The UN Central Emergency Relief Fund (CERF) provided assistance to Liberia through FAO for an agriculture recovery programme. In 2006 FAO undertook a rice pest management project in 11 counties. Thirteen NGOs implemented the project with 19 200 beneficiaries (FAO-OSRO Report). Another CERF project involving distribution of seed rice to 81 900 farming families was implemented by 16 NGOs in the 15 counties of Liberia in 2007 (FAO-CERF Reports).

Annex 3 shows the number of programmes and their locations in the country for NGOs/CBOs that have applied for 2007 renewal of registration with MOA. Among the NGOs/CBOs registered with MOA five have no funded programmes, while the others have from one to four programmes funded. The NGOs/CBOs with programme funding are spread throughout 14 of the 15 counties of Liberia. They serve approximately 234 000 beneficiaries. If these projects are sustainable, they could have exponential effects and may lead to poverty reduction.

Data for cooperative societies are presented in Annex 4. According to the Cooperative Development Society (CDA) assessment data, 28 cooperative societies in four counties with a total membership of 14 991 are involved in crop production and produce marketing.

NGO/CBO missions, organizational structure, staffing, and logistical and financial support A review of articles of incorporation shows that all NGOs have a mission statement with specific objectives deriving from this statement. All INGOs have a well defined organizational structure and the minimum staff requirement of not fewer than three permanent staff in accordance with the draft NGO guidelines produced by MPEA. All INGOs have reliable sources of funding from donors such as USAID, OFDA, the EU, the EC, ECHO-Aid, DANIDA, UNDP, FAO, Irish AID and Swiss Development Corporation, etc. (Annex 2). Most local NGOs are implementing partners of INGOs, hence they have secured the bulk of their funding from these sources. It was also noted that all INGOs have the minimum logistical support required for their programmes. Other INGOs, such as Mercy Corps, are involved in building the capacities of their local implementing partners by assisting them to secure offices, opening bank accounts in the organization's name, and providing of minimal office equipment, e.g. computers with printers, and project vehicles where necessary (stated from personal experience of working with the NGO in 2002/2003).

Opportunities and mechanisms for participation of NGOs/CBOs at all stages of agricultural policy, decision-making and delivery of services In 1991, MOA established the Agricultural Coordination Committee (ACC). The objective of the ACC is to coordinate the activities of all NGOs/CBOs and donor agencies providing agricultural services to farmers in Liberia. The ACC holds monthly meetings in which all NGOs/CBOs participate, report their activities, share experiences and discuss issues relating to the sector. The monthly meetings are held at national level in Monrovia and at county level. These meetings are organized and chaired by officials of the MOA. The ACC has an Agricultural Policy Committee at the highest level, which includes heads of NGOs as well as the Minister of Agriculture as members. It also has a technical working group (TWG) of which NGOs are also members.

Through the ACC, the FAO from time to time has engaged NGOs/CBOs to implement several of its project activities nationwide.

Mechanisms for coordination and monitoring of NGO/CBO activities at national, county and community levels A technical working group (TWG) was established as a standing committee

of the ACC. The TWG is responsible for the monitoring and evaluation of all the activities of stakeholders in the agriculture sector. The membership of the TWG consists of MOA, FAO, USAID, EU/ECHO, ICRC, UNMIL Civil Affairs, LINNK and NGOs with the requisite background and expertise in specialized subject matter. The TWG is responsible for undertaking field assessment and monitoring, impact evaluation and annual appraisals of field activities of all agriculture service providers. In addition all NGOs/CBOs present reports on all project activities to the ACC monthly meetings at both national and county levels.

Currently, MOA is setting up a monitoring and evaluation unit in the Department of Planning. Its mandate and strategies are being finalized.

4. PROPOSED STRATEGIES FOR MAXIMIZING THE CONTRIBUTION OF NGOS/CBOS TO AGRICULTURE DEVELOPMENT AND POVERTY REDUCTION

The NGOs/CBOs have strengths in resource mobilization and project management as well as community mobilization. The creation of an enabling environment by GOL, including duty free privileges, sustained peace and security, is necessary to allow NGO/CBO activities to continue from the transitional period to development.

The programme content and coverage of NGOs/CBOs covers all counties of Liberia. These activities can be considered as provision of agriculture extension services to the farming populace. Thus, a pluralistic extension policy is being suggested. This is so because an effective extension system does not currently exist. The MOA cannot adequately perform its developmental role until its extension network in postwar Liberia is revitalized and restructured under a "new policy". The MOA acknowledges that donors, NGOs/CBOs (44 INGOs, 112 LNGOs) and other providers of extension services are crucial to the delivery of extension services to the diverse farming community in the country. At the same time the Ministry also acknowledges that these alternative providers of extension services are no substitute for public extension services in the country. For continuity and sustainability, especially when the alternative providers cease to function, it is prudent to establish a "***pluralistic extension policy" that recognizes the complimentary roles of both the Government and non-governmental agencies that are involved in extension service delivery.***

At present INGOs and some local NGOs have adequate logistical facilities and the ability to raise funds, hence their activities are spread nationwide. Their impacts and sustainability are minimal in some areas, however. Thus, a strategy should be developed for extension delivery services to be localized or specialized for all stakeholders. The MOA is in the process of collecting detailed information on all agricultural NGOs/CBOs to include strengths and weaknesses of existing internal and external structures, programme content and national coverage, and institutional capacity with regard to staff strength, logistical and financial support, etc. These data can be used to categorize NGOs/CBOs with respect to types of service delivery. In addition, a self-assessment of all NGOs/CBOs is recommended. Because Liberia is in transition from recovery to development, funds for development do not come as smoothly as those for emergency relief. Thus NGOs/CBOs should strategically position themselves in a particular area of operation. As observed earlier an NGO may operate in three or four non-contiguous counties. This requires considerable resources to set up offices and meet other logistical needs.

Therefore, MOA should organize a one-day workshop for all agricultural NGOs/CBOs as well as the MOA extension service to allow them to undertake a self-assessment exercise, i.e. a personal "X-ray" that will define the strengths and weaknesses of each stakeholder. They should jointly develop strategies to localize activities for certain extension service providers in a clan, district or single county. Additionally, other service providers should be allowed to provide specialized service over a wider coverage area e.g. more than one county. That is, specialized NGOs such as Veterinaires sans Frontières could be allowed to work in a wider coverage area if their resources permit.

Mapping of extension service delivery nationwide is being advanced The need for all stakeholders to be aware of who is doing what, where and for how long will go a long way towards maximizing the contribution of each stakeholder to the provision of agriculture services to farmers. This will enable each new service provider quickly to identify gaps and position itself without overlapping of functions. Discussion of the mapping exercise should commence at the monthly ACC meeting both at national and county level. Placement of NGO/CBO names and activities on a map of Liberia must be undertaken only when there is a consensus by all stakeholders on the principles of "specialization" vs "localization". Donor-driven NGOs/CBOs should be localized, i.e. they must operate only within one county. However, NGOs/CBOs with specialized skills, such as veterinary service provision, fabrication of agriculture tools, plantain and banana production, root and tuber production, etc. should be allowed to spread their technologies nationally as far as their resources permit.

It has been observed in the past that most projects are developed by identifying the needs of beneficiaries without their involvement and are brought to them for implementation. **A**gricultural services to farmers have been supply driven – a top-down approach. Although this may have its own advantages the results in Liberia have not shown a "quantum leap" in agricultural production and the vast majority of the farmers remain poor. The thinking is that agriculture service providers should reverse gear and work with farmers within communities in a participatory manner to jointly determine their needs for farming. This approach will be demand driven and when the farmers' needs are provided, agriculture productivity is more likely to make the "quantum leap". In addition, clan groups have close relationships and have trust in one another. Thus, planning of extension services (projects) should begin at the grass roots, e.g. clan/community level.

In 1998 FAO and MOA began the process of setting up grass roots agricultural organizations at the clan level in the counties. The group was named the Clan Agriculture Development Association – CARDA for in short. In several counties a CARDA was set up at the clan level. The administrative structure of a particular CARDA was decided by the communities making up the clan, based on their developmental needs. The CARDA system takes into consideration the holistic development approach while using agriculture as a driving force. All agriculture service providers were asked to work within a particular CARDA system to help build the capacity of the organization to become sustainable. Lack of support and the continued civil unrest destroyed the vision.

A compressive assessment of the cooperative societies in Liberia has been done by the Cooperative Development Authority (CDA). According to the Deputy Registrar of CDA (H. Wennie) the cooperative societies have began to rejuvenate and they need capacity building (training, logistical support, etc). However the capacity of the CDA itself needs to be increased. Currently they are operating in a temporary location with minimal levels of staffing and logistics capability.

5. CONCLUSIONS

The strengths of existing internal and external structures of NGOs/CBOs are their ability to secure funding and gather information, the high quality of their staff, considerable logistical support, efficient internal control systems (INGOs) and community mobilization (local NGOs).

Their main weakness is their reluctance to work through local NGOs. Perhaps this is due to a lack of confidence in the financial accountability, timely reporting, and internal control systems of the latter. Many INGOs spend considerale sums of money on logistics, international staff and consultancies, etc. Many do not build the capacities of local NGOs. While the local NGOs may have poor internal control systems, many also lack offices, logistic support, the ability to source funding and qualified staff.

The author reviewed the content and national coverage of the programmes of NGOs/CBOs and found that most NGOs/CBOs had defined programmes and funding sources for 2007. All the INGOs and implementing partners with support from numerous donors have ongoing programme activities covering all of the 15 counties of Liberia. About 0.5 million lives have been touched positively by these interventions.

The opportunities and mechanisms for participation of NGOs/CBOs at all stages of agricultural policy, decision-making and delivery of services were assessed. It was discovered that the ACC, which was established in 1991, holds monthly meetings for all agricultural stakeholders. It is through this medium that views are exchanged, experiences are shared and issues affecting the agriculture sector are discussed.

The efficiency of the mechanisms for coordination and monitoring of NGO/CBO activities at national, county and community levels were also assessed. A TWG has been established as a standing committee of the ACC. The TWG, of which some NGOs/CBOs are members, is responsible for the monitoring and evaluation of all the activities of stakeholders in the agriculture sector. The TWG undertakes field assessment and monitoring, impact evaluation and annual appraisals of field activities of all agriculture service providers. In addition, all NGOs/CBOs present reports on all project activities to the ACC monthly meetings at both national and county levels.

Proposed strategies for maximizing the contribution of NGOs/CBOs to agriculture development and poverty reduction were advanced and include *inter alia:*

- establishment of a pluralistic extension policy;
- extension delivery should be localized or specialized for all stakeholders;
- extension service delivery nationwide should be mapped out;
- extension services should be planned from the grass root, i.e. clan/community, level.

Finally, it can be noted that working with NGOs as implementing partners ensures rapid service delivery to farmers in the counties, using their existing relationships with community organizations and available logistics with support from donors.

6. RECOMMENDATIONS

Based on the cursory evaluation of NGOs/CBOs and the proposition of suitable strategies for maximizing their contributions to agriculture development and poverty reduction the following recommendations are made.

- The NGO/CBOs with donor support provide an immense contribution nationwide to the reduction of food insecurity and hence to poverty reduction; thus an enabling environment via duty free privileges and security should be provided to encourage them to remain operational in the country.
- The MOA national extension programme needs to be reviewed for better coordination.
- A pluralistic extension policy must be put in place to involve all stakeholders.
- Extension delivery should be localized or specialized for all stakeholders to avoid wastage of scarce resources.
- Extension service delivery should be mapped nationwide to avoid duplication of services and to provide a clear route of entry for newcomers.
- Extension services should be planned from the grass root, i.e. clan/community, level to take advantage of the close relationships and trust among clan and community members.
- All cooperatives should be revitalized and their capacity built, including the CDA.
- The need to encourage INGOs to remain in the country and work in partnership is necessary because working with NGOs as implementing partners ensures rapid service delivery to farmers in the counties, via their existing relationships with community organizations and their available logistics with support from donors.

ANNEX 1

Requirements for accreditation of agricultural NGOs

In order to obtain accreditation for operation in the agricultural sector, the following requirements must be submitted by all NGOs/CBOs to the Department of Planning and Development, Ministry of Agriculture, 5th Street, in Monrovia (Liberia).

1. Name of Organization
2. Date of Establishment
3. Head Office
4. One copy of Articles of Incorporation form the Ministry of Foreign Affairs
5. A copy of Certificate of Accreditation from the Ministry of Planning and Economic Affairs
6. Proposed agricultural program(s)/project(s) detailing:
   a) Title of project
   b) Aims and objectives
      - Date of commencement
      - Date of completion
   c) Targeted beneficiaries/population
   d) Location of operation
      - County
      - District
      - Towns/village
      - Population

   e) Source of support/funding
      - Organization name
      - Full address
      - Email address
      - Telephone number(s)
      - Post office box number
      - Contact person
   f) Resume of technical/support staff:
      - Expatriate:
        - Name: _____
        - Qualification: _____ Year_____
      - Local
        - Name: _____
        - Qualification: _____ Year _____
7. Implementing partner (any)
   a) Partner's name _____
   b) Organization _____
   c) Year _____

ANNEX 2A

List of international NGOs in the agriculture sector

Names of NGO	Abbreviations	Address in Monrovia
1. Action Aid Liberia	AAL	Mega Cpd, Randall Street
2. Action Contre La Faim	ACF	Mamba Point, Monrovia, Liberia
3. Adventist Development and Relief Agency	ADRA	Old CID Road, Mamba Point
4. African Concern International	AFCON	17th Street, Sinkor, Monrovia
5. AFRICARE	AFRICARE	98 Sekou Toure Avenue, Monrovia
6. Agri System UK	ASUK	c/o EU Office, Monrovia
7. American Refugee Committee	ARC	Atlantic House, Tubman Blvd., Monrovia
8. Cap Anamur	GED	Bong Mines Hospital
9. Caritas International	CARITAS-I	National Catholic Secratariat
10. Catholic Relief Services	CRS	19th Street Sinkor, Monrovia
11. CHF International	CHF	Old Road Junction, Congo Town
12. Christian Aid Ministries	CAM	15th Street, Sinkor
13. Christian Children's Fund	CCF	18th Street, Sinkor
14. Concern	CONCERN	VP Rord, Sinkor
15. Concern Worldwide	CONCERN/W	VP Rord, Sinkor
16. Conservation International	CIL	Atlantic House
17. Cooperative and Human Development Foundation	COHDEFI	Captan Building, Broad Street
18. Danish Refugee Council	DRC	Mamba Point, Monrovia
19. Diakonie Emergency AID	DEA	Congo Town, Monrovia
20. Emergency Response Fund	ERF	Mamba Point, Monrovia, Liberia
21. Environmental Foundation for Africa	EFA	18th Street, Sinkor
22. Equip Liberia	EQUIP	Tubman Blvd., Sinkor
23. Fauna and Flora International	FFI	Dennis Compound, Mamba Point
24. Finnish Refugee Council	FRC	Dennis Compound, Mamba Point
25. Geomar International	GEOMAR	Camp Johnson Road
26. German Agro Action	GAA	18th Street, Sinkor
27. German Technical Corporation	GTZ	Mamba Point
28. International Committee of the Red Cross	ICRC	Bushrod Island, Monrovia
29. International Rescue Committee	IRC	Congo Town
30. Liberia Community Infrastructure Program	LCIP	U.N. Drive & Randall Street
31. Lutheran World Federation/World Service	LWF/WS	Lutheran Church Compound
32. Mercy Corps	MC	Newport Street
33. Norwegian Refugee Council	NRC	Randall Street
34. OXFAM-GB	OXFAM-GB	UNICEF Compound
35. Peace Winds Japan	PWJ	Tubman Blvd., Congo Town
36. PMU Interlife	PMU Liberia	12 Houses Road, Paynesville
37. Premiere Urgence	PU	21st Street, Sinkor
38. Samaritan's Purse	SP	9th Street, Sinkor
39. Save the Children Fund – UK	SC-UK	Mamba Point, Monrovia, Liberia
40. Solidarites Aide Humanitaire D'urgence	SOLIDARITES	12th Street, Sinkor
41. TEARFUND	TEARFUND	ELWA Compound
42. Trocaire	TROCAIRE	Corina Hotel, Sinkor
43. Visions in Action	VIA	Monrovia, Liberia
44. World Vision Liberia	WVL	Mamba Point, Coconut Plantation
45. ZOA Refugee Care Netherlands	ZOA	3rd Street Sinkor, Monrovia

ANNEX 2B

List of local NGOs/CBOs that are involved in the agriculture sector

NAME OF NGO/CBO	Abbreviations	County
1. Action for Community and Human Development	ACOHD,INC	Montserrado
2. Action for Greater Harvest	AGRHA	Montserrado
3. Agriculture Relief Services Inc	ARS	Nimba
4. Assistance for All	AFAL	
5. Beekeepers and Agiculturist Association	BEEKAA	Montserrado
6. Bettie Agriculture & Development Union	BADU	Montserrado
7. Blebo Disabled and Handicapped Assistance Program	BLEDISHAP	
8. Blumu Agriculture, Education and Development Projects Inc.	BAEDP	Montserrado
9. Boewein Agricultural Development Productivity INC	BADEP INC	
10. BUCCOBAC	BUCCOBAC	Grand Bassa
11. Caritas Cape Palmas	CARITAS	Cape Palmas
12. Caritas Gbarnga	CARITAS	Bong
13. Caritas Liberia	CARITAS	Montserrado
14. CATALYST	CATALYST	
15. Center for Socio-Economic Empowerment & Environmental Protection	CESEEP	
16. Christ Foundation - SEAMA	CFS	
17. Christian Humanitarian Service	CHS	
18. Community Caring Association	COCASS	
19. Community Development Program	CDP	Cape Mount
20. Community Humanitarian Assistance Program	CHAP	
21. Community Reconstruction Resettlement & Agriculture Program	CORRAP Inc.	Cape Mount
22. Community Rehabilitation Association for Agriculture & Development	CRAAD	
23. Community Sustainable Development Program	CSDP	
24.Community Union for Productivity	CUP	Nimba
25. Community Union for Sustainable Development	CUSD	Nimba
26. Engineering Agricultural Reconstruction Education & Health Services Incoperated	EAREHS INC.	
27. Faimaba Fisheries Development Cooperative, INC.	FFDC	
28. Farmers Against Hunger	FAH, Inc.	Montserrado
29.Farmers Associated to Conserve the Environment	FACE	
30. Fassama (Kpakonu) Development Assoc. INC	FAKPADA,INC	
31. Foundation for African Development Aid	FADA	Montserrado
32. Foundation for African Development Aid	ADA	Montserrado
33. Gbartoh Agriculture Development Program	GADP	
34. Gbor-Kwado Development Association	GKDA	
35. Global Community Agriculture Env. Action Group	GCAEAG	Montserrado
36. Good Samaritan Fellowship International	GSFI	Montserrado
37. Grace land International Inc.	GLI	Bomi
38. Grand Bassa Agriculture Group	G-BAG	Gradn Bassa
39. Grassroots Democracy Inc	GDI	Nimba
40. Grassroots Development Program	GROPS	
41. Helping Hand in Liberia Inc.	HHL	Nimba
42. Hope International Mission	HIM	Montserrado
43. Human Development Foundation	HDF	Cape Mount

NAME OF NGO/CBO	Abbreviations	County
44. Human Development Program	HDP	
45. IMANI House Inc.	IHI	Montserrado
46. Integrated Rural Development Organization	IRDO	Montserrado
47. International Colleges and Universities Bureau Inc.	ICUB	Montserrado
48. Karmon Agriculture Development Initiative	KADI	Nimba
49. Kpain-Kpain-Gbo	KKG	Montserrado
50. KRUDF	KRUDF	
51. Kweatornor Development and Relief Organization	KDRO	Bong
52. Liberia After War Volunteer	LAWVI	
53. Liberia Agro Systems	LAS	Grand Gedeh
54. Liberia Environment Care Organization	LECO	Bong
55. Liberia Initiative for Development Services	LIDS	
56. Liberia Islamic Union for Reconstruction and Development	LIURD	Montserrado
57. Liberia Local Cash Crops Farmers Association & Development Inc.	LIFARADE	Nimba
58. Liberia National Farmers Union	LINFU	Montserrado
59. Liberia NGOs Network	LINNK	Montserado
60. Liberia Productivity Agency	LIBPA	
61. Liberia Reconstruction Aid Workers Society	LRAWS	
62. Lofa Educational and Agricultural Foundation	LEAF	Lofa
63. Lutheran Development Services	LDS	
64. Mano River Relief Services	MARS	Cape Mount
65. Model for Reconstruction and Social Development	MORESODEV	
66. Modern Agriculture and Reconstruction	MORA	
67. Movement for the Promotion of Agriculture & Rural Development	MPARD INC	
68. Multi-Agrisystem Promoters	MAP	
69. National Foundation Against Poverty and Disease	NAFPD	
70. National Resettlement and Development Organization	NRDCO	
71. National Women's Commission of Liberia	NAWOCOL	Montserrado
72. North West Development Association	NWDA	
73. Organization for the Development of Agriculture and Farmers Related Association	ODAFARA	Montserrado
74. Permanent Liberian African for Citizen Empowerment	PLACE	
75. Professional Agricultural Consultancy Expertise Services of Liberia	PACESL	Montserrado
76. Project Bomi Inc.	PBI	Bomi
77. Project New Outlook	PNO	Margibi
78. Project Rebuild Liberia	PREBLIB	Montserrado
79. Promoters for Reconstruction and Development	PRED	
80. Rural Agriculture & Community Development Promoters INC.	RACDP	
81. Rural Assistance and Development Organization*	RADO	
82. Rural Communities Development Promoters, INC	RUCODEP	
83. Rural Community Oriented Services, INC.	RUCOS, INC.	
84. Rural Empowerment Foundation	REFOUND	Bong
85. Sinoe Relief and Development Assistance Program	SIRDAP	Sinoe
86. Skills International Inc.	SKILLS	
87. South-Eastern Agricultural Relief Agency	SARA	
88. Sustainable Agriculture Services Union	SASU	Montserrado
89. Sustainable Development Institute	SDI	
90. Sustainable Development Promoters	SDP	Montserrado

NAME OF NGO/CBO	Abbreviations	County
91. Sustainable Livelihood Promoters Program	SLPP	Cape Mount
92. Sustinable Development Institute	SDI	
93. Technocrats United for Reconstruction and Development*	TECURD	Bomi
94. True Love International	TLI	
95. Uncle Sam's Development & Agriculture Corporation	USDAC	
96. Union Farm Services	UFS	
97. Union for Rural Farmers Association Inc.	URFA	Nimba
98. United Liberia Inland Church Agency for Relief& Development, INC.	ULICARD	
99. United Methodist Church Agriculture Program	UMCAP	Montserrado
100. United Methodist Committee of Relief	UMCOR	Montserrado
101. Voinjama District Women Organization for Peace and Development	VODWOPEDE	Lofa
102. Vulnerable Welfare Foundation of Liberia	V_WELFOL	
103. War Affected Women in Liberia	WAWL	Montserrado
104. Women & Children Development Organization	WOCHIDO	Montserrado
105. Women and Children Development Organization	WACDO	Montserrado
106. Women and Children Rehabilitation Resource Center Inc.	WOCHIRRC	
107. Young Men's Christian Association	YMCA	Montserrado
108. Youth Aid Education Health Care and Development	YAEHD	
109. Zao Development Council*	ZADC	Montserrado
110. Zoe-Geh Development Council INC	ZOGEDCO	Nimba
111. Zorzor District Women Care, Inc.	ZODWOCA	Lofa
112. Zwedru Multi-lateral High School	ZMHS	Grand Gedeh

Source: FAO Liberia, July 2007 (blank spaces indicate lack of information in database).

ANNEX 3

Contribution of NGOs/CBOs to agriculture development and poverty reduction in Liberia

N°	NGOs/CBOs	Date of establishment	No. of projects (2006/07)	No. of beneficiaries	Funding source	National coverage counties	N° of staff m.
1.	ACF	-	1	11 700	ECHO	Lofa	3
2.	ADRA	1991	3	47 199	DANIDA/ADRA UK, etc.	Lofa & Nimba	3
3.	COMFORT	2003	1	-	Africare-Liberia	Nimba	3
4.	DRC	1998	2	13 339	ECHO,	Nimba, River Gee, Grand Kru	3
5.	GCEC	2005	1	500	European private donors	Nimba	3
6.	Imani House	1986	2	9 500	FAO	Bomi & Bassa	3
7.	LAS	2000	-	-	-	Grand Gedeh, Sinoe, River Gee	3
8.	FWF/WS	1990	4	9 522	LWF H/Quarter, Geneva	Mont., Maryland, Bong, Lofa	3
9.	MercyCorps	2002	1	30-50 000	USAID	Mont., Bong, Margibi, Bassa	3
10.	NEWFAD	1993	-	-	-	-	3
11.	RIGDCO	2006	-	-	-	River Gee	3
12.	SAPRO	2006	-	-	-	Bong	3
13.	Samaritan Purse	2003	3	7 850	SP-USA, USAID, OFDA	Cape Mount, Gpapolu, Lofa, Bong	3
14.	SLPP	2003	-	-	-	Cape Mount	3
15.	TEARFUND	2004	3	44 541	Irish Aid Swiss Dev. Corp. ECHO, Canada	Bomi. Sinoe, Nimba	3
16.	TECURD	1997	1	40 500	LCIP	Grand Gedeh, Bomi,. Cape Mount	3
17.	WOCHIDO	1997	1	1 000	SA&D	Montserrado	3

ANNEX 4

List of active production and marketing cooperative societies in selected counties

N°	Name of active cooperative society	Area of operation	Membership	Activities	Date of registration
		BONG COUNTY			
1.	Pulukpeh Farmers Coop Soc.	Raymond Town Bong County	500	Oil-palm, prod. rice, lowland, rubber	12 February 1975
2.	Fuamah Dist. Farmers Coop. Soc.	Bong Mines Bong County	600	Lowland vegetable production	6 February 2002
3.	Kukatonno Farmers Coop. Soc.	Palala City Bong County	100	Lowland rice vegetable products	16 December 2004
4.	Konkpoya Farmers Coop. Soc.	Belefanai Town Bong County	150	Rice, sugar cane produce marketing	14 October1997
		LOFA COUNTY			
1.	Intofawor Farmers Coop. Soc.	Foya Airfield Lofa County	800	Oil-palm & prod. marketing	19 April 1971
2.	Voinjama Dist. Farmers Coop.	Voinjama City Lofa County	2 500	Produce marketing	31 August 1972
3.	Gbandi Farmers Coop. Soc.	Kolba City Lofa County	850	Produce marketing	31 August 1972
		NIMBA COUNTY			
1.	Dokodan Farmers Coop. Soc.	Gbedin Town, Nimba	2 500	Paddy field veg. production	12 February 1975
2.	Vanco Agri. Multi-purpose Cooperative Soc.	Tunukpuyee Town, Lao Clan	65	Lowland rice, vegetable product.	31 December 1996
3.	Zoyah Farmers Coop. Soc.	Kamplay City Nimba	500	Produce marketing	22 October 2002
4.	Substainable Agri. Dev. Coop.	Tappita City Dist Nimba	300	Seed multiplication thru swamp dev., tree crops	16 August 2002
5.	Sroh Kwado Multi-purpose Coop.	Gbei Vonwea Town, Gbehley Dist.	325	Cash crops production market.	15 May1998
6.	Boe & Quella Multi-purPose Coop.	Zuatuo Town, Tappita	66	Cash crop production	4 October 2000
7.	Buu-Yoa United Lib. Farmers Coop	Gbloulay Zoe-geh Dist	81	Cash crops marketing	19 July 2005
8.	Nyao Multi-purpose Coop. Soc.	Nyao Wee Clan, Saclepea Mah Dist.	55	Lowland rice, vegetable prod.	29 May 2002
9.	Nequopi Kwodo Multi-purpose Coop. Soc.	Forhlay Town	155	Cash crops production market.	27 June 2005
10.	Gbehley Farmers Coop. Soc.	Karnplay City	289	Cash crops	
11.	Kpodo Farmers Cooperative Society	Zahglay Town Nimba County	865	Paddy rice, cash crops and marketing	July 2001

N°	Name of active cooperative society	Area of operation	Membership	Activities	Date of registration
12.	Beo Sehgren Cooperative Society	Beo Yodar Town Nimba County	460	Cash and food crops marketing	25 February 1988
13.	Zodo Farmers Cooperative Society	Kpaiplay Town Nimba County	436	Cash and food crops marketing	20 July 2001
14.	Nyor Kalokakou Cooperative Society	Nyor Chiefdom Nimba County	245	Cash crops and marketing	28 November 1980
15.	Nimba Kwaplah Cooperative Society	Bonglay Town Nimba County	209	Cash crops and Marketing	6 October 2005
16.	Wala-laakeh Farmers Cooperative Society	Yekepa Town Nimba County	296	Produce marketing	28 October 1977
17.	Douplay Warperley Multipurpose Cooperative Society	Douplay Town Nimba County	375	Low & upland farming and production of citrus fruit	16 November 2005
		GRAND GEDEH COUNTY			
1.	Work & See Farmers Cooperative Society	Zwedru City Grand Gedeh County	600	Lowland & vegetable production	20 September 1974
2.	Amenu Farmers Cooperative	Zleh Town Grand Gedeh County	750	Oil-palm, lowland & vegetable production	28 November 1972
3.	Konobo District Farmers Cooperative Society	Zieh Town	650	Oil-palm, cash crop production	6 August 1980
4.	Marylan Farmers Cooperative Society	Harper City Maryland County	269	Rubber and cash crops	26 April 1978

Sources: Cooperative Development Agency Assessment Report, 2007.
Central Emergency Relief Funds (CERF) – FAO, Final report, August 2007.
FAO, CERF – Project Report, May 2007.
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