UNIVERSITY OF CAPE COAST

FARMERS' PERCEIVED IMPACT OF THE AGRICULTURAL SECTOR REHABILITATION PROJECT ON THEIR LIVELIHOODS IN CAREYSBURG AND TODEE DISTRICTS, LIBERIA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for degree in this university or elsewhere.

Candidate's Signature: ……..... Date: .....

Name: Woloba M. Sumo

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

The Agricultural Sector Rehabilitation Project (ASRP) is one of key rural development projects whose impact is yet to be understood. The purpose of the study was to determine farmers' perceived impact of the ASRP on their livelihoods in Careysburg and Todee districts, Liberia. The study sought to describe the socio-economic characteristics of farmers who participated in the project, ascertain the perceptions of beneficiaries on the relevance of the ASRP and examine the perceived levels of impact of the ASRP on the livelihoods of farmers. The study also sought to determine the socio-economic characteristics of farmers influencing their perception of the relevance and livelihood impact of the ASRP. Descriptive survey design was used for the study. One hundred and ninety farmers who were beneficiaries of the ASRP took part in the study. Both closed and open-ended questionnaire items were used to elicit responses from the farmers. The data collected from the questionnaires were analyzed using SPSS version 20. The study revealed that most of the ASRP beneficiaries had been small-scale(less than 0.5ha for rice and cassava) farmers for at least ten years. The majority (83%) felt the key components (inputs provision and training) were not relevant to their needs. However, the project was perceived to have had a moderate impact on the livelihoods of the farmers. The socio-economic characteristics of farmers accounted for 10.5% of the variations of farmers' perception of the relevance of the ASRP with alternative sources of income as the best predictors. Similarly, socio-economic characteristics accounted for 19.2% of the variations in beneficiary farmers' livelihoods impact of the project with production type as the best predictor.

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DEDICATION

To my wife and son, Mr. & Mrs. John Y. Sumo, Mr. John Mulbah and to the memory of my late mother, Ma-Jangar Sumo.

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LIST OF ACRONYMS

ASRP	-	Agricultural Sector Rehabilitation Project of Liberia
CAAS-Lib	-	Comprehensive Assessment of the Agricultural Sector-Liberia
CBOs	-	Community Based Organizations
CFSNS	-	Comprehensive Food Security and Nutritional Survey of Liberia
FOA	-	Food and Agricultural Organization of the United Nations
GDP	-	Gross Domestic Production
IBRD	-	International Bank for Reconstruction and Development
IDPs	-	Internally Displaced Persons
IFAD	-	International Fund for Agricultural Development
IFPRI	-	International Food Policy Research Institute
MOA	-	Ministry of Agriculture of Liberia
NEPAD	-	New Partnership for Africa's Development
NGOs	-	Non Governmental Organizations
NHPC	-	National Housing and Population Census of Liberia
OECD/DAC	-	Development Assistance Committee of the Economic Cooperation and Development
SLA	-	Sustainable Livelihood Approach
SPSS	-	Statistical Product and Service Solution
UN	-	United Nations
UNDP	-	United Nations Development Programme
WFP	-	World Food Programme of the United Nations

CHAPTER ONE

INTRODUCTION

Background to the Study

Agriculture is the world's most important industry. It provides us with all our food. Agriculture also supplies materials for two other basic needs-clothing and shelter. In addition, agriculture provides materials in making industrial products. About half the world's workers are employed in agriculture far more than in any other industry (The World Book Encyclopedia, 2001).

Agriculture creates most of the jobs in Africa. Aside from the North and Southern African countries, some oil-producing countries in the Gulf of Guinea, and notable exceptions such as Nigeria, Cote d'Ivoire and Cameroon, agriculture accounts for half or more of the working population (NEPAD, 2013).

The agricultural population in Africa stands at 530 million people, and is expected to exceed 580 million by 2020. The population relying on agriculture accounts for 48% of the total African population (almost 70% in East Africa). A special feature of African agriculture in comparison to the rest of the world over the last 30 years is that the sector has continued to absorb a large proportion of the working population; half of all new entrants to Africa's working population have turned to agriculture (NEPAD, 2013).

African economies have undergone tremendous change over the last 20 years. After the 1990s, which were generally characterised by low growth rates, African economies in the 2000s experienced strong, regular growth, with an average annual growth rate of 5.2%. However, the transition to more diversified economies is difficult to initiate. A significant proportion of growth occurring in the 2000s is linked to the rise in food prices and the volumes of mining and oil products exported by a few African countries, whose profits are not always equally and sustainably reinvested in economic diversification (NEPAD, 2013). African governments are increasingly concerned to bring about an agricultural revolution which will improve production. However, governments may facilitate, stimulate and promote growth of agriculture production; success must ultimately depend on the decisions of multitude of farm households making up the agricultural industry. In short, agricultural development must occur at the farm level.

In most of Africa, rural people make up the majority of the poor and disadvantaged. Many of the urban unemployed have recently migrated from their villages in the hope of improving their welfare. For this reason, increased crop and livestock production is needed to raise farm incomes, improve the level of living and reduce the rate of migration from rural areas.

In Liberia like most African countries, agriculture is the main occupation. Many families raise crops on small plots of land owned by their communities. Cassava, rice, sugar cane, and tropical fruits are the major food crops. Most Liberian farmers use old fashioned farming methods, and only a few have modern farming techniques. The farmers produce agricultural goods

mainly for their own families, and so there is little to sell. As a result, the country must import much of its food (The World Book Encyclopedia, 2001).

Liberia's agricultural sector is forest based and it is dominated by traditional subsistence farming systems mainly in the upland areas (Ministry of Agriculture [MOA], 2008). The farming system is characterised by high labour intensity, shifting cultivation, and low technologies and low productivity. Production of rice and vegetables occupy about 87% of cultivated land. Small acreages of tree crops are maintained for generating cash income. Commercial agricultural activities in Liberia are almost exclusively made up of plantation estates of rubber, oil palm, coffee and cocoa, the latter two are produced exclusively for export, with little value addition done for rubber and oil palm. Besides the plantation estates, very little private sector investment has taken place in the agricultural sector (MOA, 2008; Anyane, 1988).

The agricultural sector in Liberia is therefore a strategic industry which accounts for the employment of nearly 70% of the economically active population, and over 90% of total exports. It as well as makes significant contributions to the Gross Domestic Production (GDP) during and after the war, (about 52% in 2005). The value chains of the sector's commodities possess tremendous potential for improved access to food, remunerative employment, and improved livelihoods of the rural people. The agriculture sector has over the years, and increasingly during the recent past, significantly contributed to the Liberian economy. The contribution of agriculture (including fisheries) to GDP was around 10 percent in the late 1970s. During the war years, the sector provided the mainstay of the economy and the only

meaningful source of livelihood to a large segment of the population, including the displaced and conflict affected. Agriculture related imported products, of which food and life animals account for 37.6%, amounted to well over half of total imports in the post war period, second only to petroleum products.

The agricultural sector is proving itself valuable to recovery and development efforts, and central to peace building in Liberia. Resumption of farming activities has enhanced food security and assisted in sustaining resettlement of internally displaced persons (IDPs), returnees and conflict affected communities, as well as creating employment for women and youth. As a major source of growth in the country, investment in revitalizing the value chains of agricultural commodities will significantly improve access to food, generate sustainable, remunerative employment, and improve livelihoods of rural communities, thereby significantly contributing to the consolidation of peace, stability, economic recovery and development.

The sector is however, confronted with several challenges, mainly structural in nature (low capacities of farmers and institutions as well as damaged infrastructures). Increasing the productivity and incomes of Liberia's subsistence farmers may require the transformation of the agricultural sector by transforming them into commercial farmers through the adoption of new techniques and technologies, improving access to seeds, fertilizers, and other inputs, diversifying their enterprises and strengthening linkages to input and output markets (MOA, 2008).

Overall, the food security situation in Liberia remains weak. The latest report of the International Food Policy Research Institute (IFRI) categorizes

the food security situation as 'alarming' with a Global Hunger Index of 24.3; and that Liberia is highly vulnerable to global economic downturns (IFPRI, 2010). While the country is blessed with a climate favorable to agriculture, extensive biodiversity, and vast natural resources, decades of war and low economic and social investments have ravaged Liberia's productive assets (IFPRI, 2012). Liberia only produces about 40 percent of the rice it needs to feed its population, relying on expensive imports to cover the rest (FAO, 2014). The production of rice – the most important staple – fell by 76 percent between 1987 and 2005 (MOA, 2008; FAO, 2014). A comprehensive assessment of the agriculture sector of Liberia carried out by the Government in 2006 and 2007 revealed that about 81% percent of the population was either highly vulnerable or moderately vulnerable to food insecurity (MOA, 2008). Over a third of Liberian children were stunted, and almost 20 percent were underweight. This finding led to the development of the Agricultural Sector Rehabilitation Project (ASRP) in 2007 (MOA, 2008). The purpose of the ASRP was to support national transition efforts and lay foundations for achieving long term goals of self-sufficiency and competitiveness in food production, expansion of cash crop production, increased employment and incomes, and diversification of the production base.

The Agriculture Sector Rehabilitation Project covers 30 districts located in the four North West and four South-Eastern counties of Liberia. In North West Liberia (Grand cape Mount, Bomi, Montserrado and Grand Bassa Counties) these counties had substantial number of the poor small-scale rice and cassava farmers; the highest poverty levels (65 to 80%) in the country (IFAD, 2009). In Montserrado County, the Ministry of Agriculture in

partnership with Action Aid Liberia implemented the ASRP. The three-year project sought to support rural families improve their productive livelihood through the restoration of agricultural productive capacity. Beneficiaries were trained in agricultural best practices to assist them to maximize their productive capacity as they seek to be food secured.

Statement of the Problem

Agriculture is the major source of occupation for many families who raise crops on small plots of land owned by their communities. Since post-war period, the agricultural sector in Liberia has declined with now about 81% feared to be vulnerable to food insecurity. To address the problem in part, the government of Liberia through the Ministry of Agriculture introduced the ASRP to deal with the food insecurity problem through the restoration of agricultural productive capacity.

From 2010, the Ministry of Agriculture introduced a number of initiatives including the provision of agricultural inputs, training and adult literacy in two of the four districts (Careysburg and Todee) in Montserrado County. Since the first phase of the project in 2010 no empirical study has been conducted on the beneficiaries. Such research information is important for up-scaling the ASRP and for designing new and similar programmes. This information gap has been the basis for this research.

Objectives of the Study

The general objective of the study is to evaluate the perceived impact of the Agricultural Sector Rehabilitation Project on livelihoods of farmers in Careysburg and Todee Districts, Liberia.

The specific objectives of the study are to:

1. describe the socio-economic characteristics of farmers who participated in the project
2. ascertain the perception of beneficiary farmers on the relevance of the project in terms of its components
3. examine the level of impact of the ASRP on farmers' livelihood
4. determine the socio-economic characteristics of farmers influencing their perception of the relevance of the ASRP
5. determine the socio-economic characteristics of farmers influencing perception on livelihood impact of the ASRP

Research Questions

1. What are the socio-economic characteristics of farmers who participated in the ASRP in the study areas?
2. What are the perceptions of the farmers who participated in the ASRP in the selected areas on its relevance?
3. What are the perceived levels of impact of the ASRP on the livelihoods of farmers who participated in the ASRP in the study areas?
4. What are the socio-economic characteristics of farmers influencing their perception of the relevance of the ASRP?
5. What are the socio-economic characteristics of farmers influencing livelihood impact of the ASRP?

Research Variables

The independent variables in the study are the socio-economic characteristics of beneficiaries of the ASRP.

The dependent variables in the study are the relevance and the impact of the ASRP.

Hypothesis

1. $H_{0:}$ There are no relationships between the socio-economic characteristics of farmers and the perceived relevance of the ASRP.

$H_{1:}$ There are relationships between the socio-economic characteristics of farmers and the perceived relevance of the ASRP.

2. $H_{0:}$ There are no relationships between the socio-economic characteristics of farmers and the perceived impact of the ASRP.

$H_{1:}$ There are relationships between the socio-economic characteristics of farmers and the perceived impact of the ASRP.

Justification

The study seeks to evaluate the impact of the ASRP on the lives of beneficiary farmers and how the programme may be improved if the need be. The result of the study could contribute to assessing the cost benefit analysis of the programme to ascertain whether it is worth continuing.

Based on the crucial role information plays in the formulation and implementation of agricultural policies, results from the study could provide useful information to assist government in setting priorities and formulating policies concerning improvement and sustainability of the ASRP.

The outcome of the study with respect to the impact of the various components of the programme would serve as a useful guide to donor agencies and governments when planning programmes. The study will also add to the

body of knowledge so far as impact on livelihoods is concerned especially in the field of agriculture.

Delimitation

The study is confined to the perception of relevance of inputs and impact of the ASRP on livelihoods of farmers who participated in the project in the first year in Careysburg and Todee Districts, Montserrado County, Liberia.

Limitation of the Study

Resource constraints such as money and the time allotted for the study could allow the researcher to only use a cross-section of the first year beneficiaries of the ASRP in the study area.

Definition of Terms

The following are the operational definition of terms used in the study.

Financial capital: the capital base (cash, credit/debt, savings, and other economic assets, including basic infrastructure and production equipment and technologies) which are essential for the pursuit of any livelihood strategy.

Human capital: the skills, knowledge, ability to labor and good health and physical capability important for the successful pursuit of different livelihood strategies.

Impact: the extent to which farmers think the ASRP has better or retarded aspects of their livelihoods.

Livelihood: A livelihood comprises the capabilities, assets (stores, resources, claims, and access) and activities required for a means of living.

Natural capital: these include the physical environment and the natural resource stocks that can be controlled by the household and used to expand or enhance livelihoods. Natural assets include land, water, wildlife, biodiversity, and forests.

Perceived impact: one's judgment of the effect something has had on him or her.

Perception: the way farmers give meaning to their own way; their feelings or thinking about the ASRP.

Physical capital: include the physical economic infrastructure along with the household's productive and other assets that enable the household to pursue its livelihood. The physical economic infrastructure includes, among other things, roads, rail networks, communication facilities, ports, etc

Social capital: the social resources (networks, social claims, social relations, affiliations, associations) upon which people draw when pursuing different livelihood strategies requiring coordinated actions.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

This chapter reviewed literature relating to the study. The socio-economic characteristics of farmers, impact chain and indicators, and elements of typical impact evaluation were reviewed. Furthermore, this chapter reviewed literature on the criteria for evaluation of impact programmes, purpose for project and programmes evaluation, types of evaluation and sustainable livelihood framework. Other areas on which literature was reviewed included elements of sustainable livelihood framework, livelihood strategy, livelihood outcomes, and a conceptual framework.

Socio-economic Characteristics of Farmers

Socio-economic characteristics of farmers to be discussed are sex, age, marital status, household size, educational levels, income generating activities, farming experience, farm size, yields and prices of rice (paddy) and cassava.

Sex of respondents

Nelson (1981) stated that it is wrong to assume that an effective development for male will automatically turn into an effective programme for women as well. This implies that men and women have different needs and desires.

According to the MOA (2008), women in rural areas in Liberia produce most of the food, are largely responsible for household food security; they fetch wood and water, care for children and homes, and undertake transport and marketing activities of the family. They predominate in key segments of the value chains of key food and some cash crops, especially in production, primary processing, product development and marketing. Some women also serve as heads of their families and shoulder its corresponding responsibility.

In another survey conducted by the Comprehensive Food Security and Nutrition Survey (CFSNS), the proportion of food-crop growers is higher among female-dominated households (87 percent) than in male-dominated (81 percent) or gender-balanced households (86 percent) (MOA, WFP & VAM Food Security Analysis, 2010).

Age of respondents

The consequence of age on farm output has been examined at length by Rongoor, Huirne and Renkema (1998) where it is discovered that the weight of age on farm productivity is very diverse. Some studies have found that age has a positive effect on productivity (Kalirajan & Shand, 1985; Stefanou & Sexena, 1988). A study by Adubi (1992) reveals that age, in correlation with farming experience, has a significant influence on the decision-making process of farmers with respect to risk aversion, acceptance of improved agricultural technologies, and other production-related decisions.

Age has been found to establish how active and industrious the head of the household would be. Age has also been found to affect the rate of household taking up of innovations, which in turn affects household

productivity and livelihood improvement strategies (Dercon & Krishnan, 1996). Temudo (2004) emphasized that getting young people interested in agriculture is crucial for rural development because they are more innovative.

In a survey conducted by The Promoting Sustainable Agriculture in Borno State {PROSAB} in their project area in Nigeria, it was found that the predominance of active and productive heads of households in the project area has a direct bearing on (1) increased availability of able-bodied labor for primary production; (2) ease of adoption of innovations; and (3) reduction in the degree of risk aversion. All these have great potential for increasing agricultural productivity and production and, hence, for improving household livelihoods and reducing poverty (Amaza, Abdoulaye, Kwaghe & Tegbaru, 2009).

Marital status of farmers

The need to be married has been justified by Amaza *et al*. (2009) who argued that the significance of marital status on agricultural production can be explained in terms of the supply of agricultural family labor. It is expected that family labor would be more available where the household heads are married.

Household size

Amaza *et al*. (2009) reported the implication of household size in agriculture hinges on the fact that the accessibility of labor for farm production, the total area cultivated to different crop enterprises, the amount of farm produce kept for domestic consumption, and the marketable surplus are all determined by the size of the farm household. Household farms are based on family labour with an estimated average size of 1.5 ha according to 2001

Baseline Survey (FAO/WFP, 2006). Output is largely consumed by household members and consists of food crops (rice, roots, tubers, and legumes), small livestock (chickens, goats) and small plots of cash crops (coffee, cocoa).

Education level of farmers

The World Book Encyclopedia (2001) defines education as the process by which people acquire knowledge, skills, habits, values, or attributes. The word education is used to describe the results of educational process. Ideally, it says education should be used to help people develop an appreciation of their cultural heritage and live more satisfying lives. It should also enable people become more productive members of the society. Education involves both learning and teaching, sometimes people learn by teaching themselves. But they also learn with the help of others.

Education is an additional factor which is thought to influence the food security status of the household (Najafi, 2003). According to Najafi (2003), education attainment by household heads could lead to awareness of possible advantages of modernizing agriculture by means of technological inputs; enable them to read instructions on fertilizer packs and diversification of household incomes which in turn would enhance households' food supply.

Many studies have revealed that the level of education (years of schooling) helps farmers to use production information efficiently, as a more educated person acquires more information and, to that extent, is a better producer (Phillips, 1994; Yang, 1997). According to Amaza *et al*. (2009), the level of farmers' education is believed to influence the use of improved technology in agriculture and, hence, farm productivity. They further said that the level of education determines the level of opportunities available to

improve livelihood strategies, enhance food security, and reduce the level of poverty. It affects the level of exposure to new ideas and managerial capacity in production and the perception of the household members on how to adopt and integrate innovations into the household's survival strategies.

The MOA, WFP & VAM Food Security Analysis (2010) found out in a study conducted in Liberia that prevalence of food insecurity decreases as the educational attainment of the household head improves (see Figure 1)..

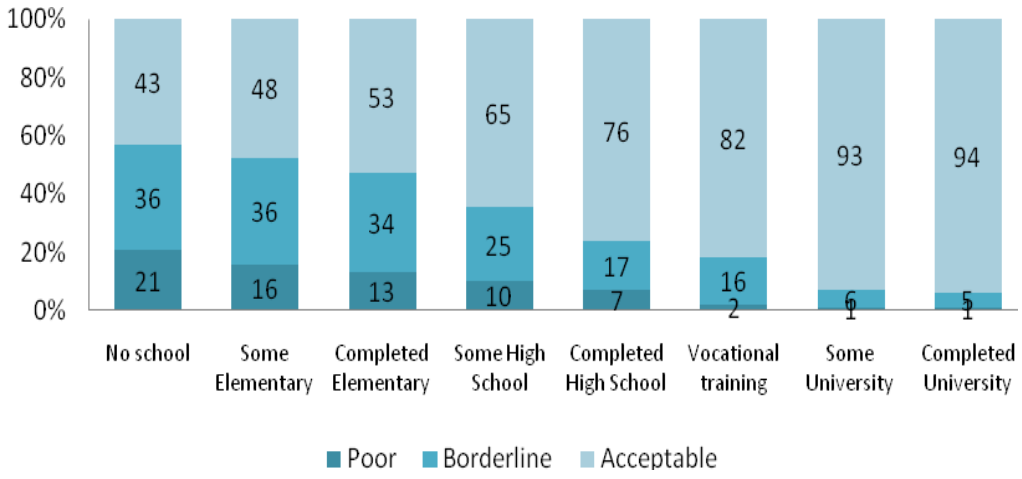

Figure 1: Education Status of Head of Household

Source**:** The MOA and WFP, VAM Food Security Analysis (2010)

Fifty-seven percent of households with below tolerable consumption levels are headed by someone with no schooling. Worse is that, households with poor food consumption tend to send fewer children to school irrespective of age and gender of the children.

In another survey conducted by the National Housing and Population Census of Liberia [NHPC] (2008), educational levels remain considerably low, with illiteracy rates reaching 53% at the national level, 41% among men and 65% among women. The majority of food-insecure households reside in rural areas, where long distances, poor infrastructure and low availability

result in schools being much more difficult to access. Net primary school enrolment is as low as 65%. Secondary school enrolment is even lower at 38%. Low school enrollment is especially high among food insecure households.

Alternative sources of income

According to Amaza *et al*. (2009), in sub-Saharan Africa, it is common for some farm household members to engage in other nonfarm occupations to complement their earnings from farming. A study by Herbert (1996) in Burundi also revealed that there is a tendency towards income diversification through extra-agricultural activities which complement farming. In this survey, different farming and non-farming occupations of household heads were identified.

Gardening is the main alternative source of livelihood in Liberia (MOA, WFP & VAM Food Security Analysis, 2010). A countrywide survey conducted in March/April 2006 and was representative for rural and semi-urban communities; in December 2006, the survey was repeated in Greater Monrovia. In the rural sample according to the report, the following livelihood profiles dominate: food crop producers (15%), palm oil seller/producer (14%), petty traders (12%), contract labourers (10%), rubber tappers (7%), charcoal producers (7%), hunters (5%), employees, fisher folks (4%), and skilled labour (3%). Fourteen percent rely on a combination of two income sources: palm oil and food crop producers (8%), and cash and food crop producers (6%) (MOA, WFP &VAM Food Security Analysis, 2010).

Years in farming (Farming experience)

Farming experience is an important factor influencing both the productivity and the production level in farming (Amaza *et al*., 2009). According to them, the effect of farming experience on productivity and production may be positive or negative. Normally, it would appear that up to a certain number of years, farming experience would have a positive effect; after that, the effect may become negative. The negative effect may be as a result of aging or unwillingness to change from old and familiar farm practices and techniques to those that are modern and improved.

Household farm size

Cramer and Jensen (1994) define land as all the productive attributes of the earth's surface, including space and the natural environment. According to the International Bank for Reconstruction and Development [IBRD] (2004), land is the main asset of agricultural households in developing countries and is the key determinant of household welfare. In traditional agriculture, land is considered as the most important factor of production (Amaza *et al*., 2009). This arises as a result of the low level of technology that accompanies agricultural production and other related problems of land tenure that are commonly found in the agriculture of developing economies. The commonest type of land tenure is individual ownership by inheritance from family or community. "Owned land" refers to land that was acquired through direct purchase or inheritance by the respective households. Duncan and Brants (2004) have reported that access to land determines the farmers' access to income generating activities as well as the farmers' access to food.

According to Cramer and Jensen (1994), land is that which we derive our food and fiber, space over which we transport people and goods, building materials, space for home sites for recreation and aesthetic purposes. They further said that land is everything you ordinarily see in viewing the earth's surface. But there is more than this to our concept of land. Land includes not just the soil itself, but all its physical characteristics and the natural environment that may influence the ability of the land to yield a product.

In many farming systems, Dinon, Aidan and Gibbon (2001) reported that a small minority of farmers occupy large areas of land which are often utilized only at relatively low intensities, while producers are confined to smallholdings which are increasingly less viable. To increase small farm competitiveness they say it is essential to increase the capacity of the smaller producers within farming systems, to respond adequately to trade liberalization and market development. They further added that a fundamental precondition for development is improved access to and control over land by poorer rural populations.

In general, there is no inherent problem in accessing land for farming in Liberia; although in some cases farmers may have to arrange for farmland through local authorities (FAO/WFP, 2006). Considering the link between emergency assistance of agricultural inputs and land ownership as central to any expectation that such assistance can support 'vulnerable groups', there is evidence of a satisfactory impact due to easy access to land at small holders level. However, the lack of access to production inputs have pushed a relatively high percentage of poor farmers to work as hired labourers with the richer farmers within the community (FAO/WFP, 2006).

Yield

In its global strategy to improve agricultural and rural statistics the World Bank (2010) considers crop area, crop production, and crop yield as three key variables that should be part of the minimum core data set that all countries should be able to provide. It identifies crop productivity, or crop yield, as one of the essential indicators for agricultural development. In essence, crop yield is defined as Crop yield = (amount of harvested product) / (crop area) and is normally expressed as kilograms (kg) or metric tons (mt) of product per hectare (ha). The estimation of crop yield thus involves both estimation of the crop area and estimation of the quantity of product obtained from that area (World Bank, 2010).

Liberia's rice yields when compared to those of surrounding countries, is one of the lowest in the region (MOA, WFP & VAM Food Security Analysis, 2010). In Ghana and Senegal, average paddy (unprocessed rice) yields are between 2.4 and 3.6 Mt/ha, much higher than the yield in Liberia. Liberia relies on extensive forms of cropping, such as 'slash and burn' in the uplands, which entail substantial environmental costs. All counties in Liberia are deficient in rice production compared to requirements. Counties that have witnessed substantial investment in agricultural production in the last three years, including Lofa and Bong are now able to meet at least three quarters of local requirements. In contrast, Montserrado (including Monrovia) meets only four percent of rice consumption requirements from local production. The post-harvest loss rate is also very high at 35-45%, for example, about 52,000 Mt of paddy rice harvested in 2006/2007 was lost due to poor pest

management and lower efficiencies in processing (MOA, WFP & VAM Food Security Analysis, 2010).

Price

Increasing demand of grains for food, feed and bio-energy, coupled with a slow growth in agricultural productivity, are likely to continue putting upward pressure on prices and generating more volatility (OECD-FAO, 2011). According to Galtier (2009), responses to price volatility can be grouped into those stabilizing prices and those reducing the effects of price instability.

Commodity price instability has a negative impact on economic growth, income distribution and the poor (IBRD, 2004). Low prices according to IBRD (2004), limit farmers' income and price volatility makes it difficult for farmers to plan production activities, allocate resources efficiently and obtain credit. For each type of reply, two possible interventions are possible: market-based and government-based ones. The grouping of these two dimensions (responses and interventions) gives rise to four different options to deal with price unsteadiness. Each option is more appropriate for different stages of development.

Access to Seeds, Tools and Support Gap

According to the FAO/WFP (2006), it is estimated that more than 50% of the farming population have not had access to seeds and tools provided by NGOs and UN agencies directly involved in the agriculture sector. However, those who did not receive assistance have relied on their limited capacity to get their seeds from different sources including purchase, loans and donations from relatives. The FAO/WFP (2006) further said a total

of 3,241 MT of rice seeds were distributed to 158, 566 beneficiary farmers with an average of 20 kg/ farmer. This quantity is only enough to plant 0.32 ha/ farmer. A few of the intervening agencies are providing both the basic inputs package complimented with the required monitoring technical backstopping. A large number of the agencies are providing only a segment of the package. There is also evidence that some intervening agencies' role ends with distributing the inputs to communities without further monitoring and follow-up.

Rice Production

Rice is the key staple in Liberia. It is grown by over two-thirds of the population—mostly in female-dominated households. Currently it is grown by over 74 percent of Liberians (Ministry of Gender and Development of Liberia [MOGD] & World Bank's Gender and Development Group [World Bank] (2010). As is common in most traditional farming systems in Sub-Saharan Africa, men and women share the tasks of staple food crop production**.** In Liberia, it is estimated that women contribute 36% of the total labour in rice and cassava production and men contribute 64%. Men provide most of the labour for clearing and preparing the land, while women do most of the weeding and harvesting of the crop (MOA, FAO, UN, World Bank & IFAD, 2007). Among female-headed households, 78 percent grow rice, while only 69 percent of male headed households do so (MOGD & World Bank, 2010).

There are basically two systems of rice cultivation: upland rice and swamp rice. The former dominates: data from the CFSNS (2006) indicate that 63% of households fully relied on upland rice techniques, while 17% opted for swampland; 21% used a mixture of both.

Upland rice cultivation is carried out purely under rain-fed conditions using shifting cultivation**,** with the rice planted on farms in the same year that fallow or forest vegetation is cleared. Seed is broadcast. The upland farm is a mixed cropping system that usually includes maize, cassava and banana/plantain as well as local vegetables (e.g. pepper and bitter balls). The productivity of the farm depends on the length of the fallow period, with significant declines in yield if the fallow periods drop below 8–10 years (Finck, 1973). The rice is panicle harvested with a knife and is usually head loaded into a special store, where it is stacked on the panicle and threshed only when it is to be eaten or sold. Farm size averages approximately 1.1 ha, and rice yields are between 0.5and 1.1 mt/ha (MOA, FAO, UN, World Bank & IFAD, 2007). A significant amount of production takes place in the uplands (World Bank, 2010).

Swamp rice is traditionally grown in inland valleys that have been cleared, usually using hand labour. The rice varieties are usually different from those grown on the uplands and the seed is usually transplanted. The swamps are extensively used for the production of rice in the rainy season and vegetables during the dry season. The rice is usually panicle harvested and stored in the same way as upland rice. Farm sizes are usually smaller and yields higher than on the uplands.

A key production-level issue is the great unused potential of producing in lowlands and swamps, where cultivation has proven to be more efficient and generates much higher yields. According to the World Bank (2010), one constraint is the low use of fertilizers in rice production; incentives for farmers to use it are minimal since rice production is done on subsistence basis; with

only 7% of rice production being sold on the market. It is further stated in the report that only 8-9% of households have enough marketable surpluses. In contrast, 68 percent of the households, evenly distributed between male- and female-dominated, consume some of what they produce, and 23 percent retain some seeds. Female headed households tend to have slightly more months of rice stock (5.2) than male headed households (4.6).

Another constraint faced by rice farmers according to the report, is the extremely low level of technical support received from public and private extension services. Meanwhile, the absence of support services by private institutions maybe understandable on economic grounds, public sector technical support should be available (World Bank, 2010). Absolutely it is essential for meaningful rice productivity gain in rice production. However, should yields increase and surplus becomes available, there are still problems of storage and inability to processing. Hence, addressing post-harvesting issues are also important if growth in the sector is to be sustainable.

Cassava Production

Cassava is the second most important food crop in the Liberia, with annual production estimated at 250,000 tons (MOA, FAO, UN, World Bank & IFAD, 2007). Crop area is around 0.5 ha, and yields are estimated to be between 6 and 10 mt/ha on upland farms. It is grown by a high proportion of rural households, but marketed by only a relatively small number of households. Cassava is grown by about 62 percent of the Liberian population. About 53 percent of self-supporting female-headed households produce the crop and more than 62 percent of households dominated by female adults do so. It is often planted as a follow-on crop after upland rice is harvested. Most

cassava (about 60 percent of households) is produced for own consumption (MOGD & World Bank, 2010). About 22 percent of households report selling fresh cassava, and 17 percent report selling processed cassava.

Among the most important constraints for women and cassava farming is the inadequate supply of tools for field, land preparation, and weed. These are crucial where male labor is scarce and difficult or impossible to hire. Field production practices, including the timing of field activities and planting techniques, are also important determinants of yield differentials. Despite the advantage of being storable in the ground for a long time, the lack of local demand for raw cassava is a serious constraint, as losses can still occur if harvest does not take place in a timely way. Provision of inadequate storage facilities before any processing is likely to lead to losses. Cassava has very high water content; it has a low value-to-weight profile, making transportation costs another serious constraint to accessing distant markets unless scale is achieved in production and marketing (World Bank, 2010).

Constraints Faced by Agricultural Producers

The constraints faced by women and men engaged in agricultural production affect household food and nutritional security and their ability to generate income. However, several key constraints to growth in agricultural production, particularly among women include: (1) inadequate access to production inputs and technology, (2) land and land tenure security, (3) labour resources, (4) extension education and services, (5) finance, and (6) cash-crop opportunities (World Bank, 2010). Widespread inadequate access to production inputs and technologies limits farmers' ability to increase productivity of all crops. Data from the CFSNS (2006) and MOGD & World

Bank, 2010) indicate that despite progress over the years, women are still disadvantaged in the ownership of agricultural tools (65 and 49 percent in 2006 and 75 and 72 percent in 2008) and use of productivity enhancing inputs (World Bank's Gender and Development Group & Ministry of Gender and Development of Liberia, 2010).

Marketing of Agricultural Produce

Most County capitals and some secondary urban centers have daily markets (FAO & WFP, 20O6). Women are mainly responsible for marketing so their time and energy is invested in this essential activity. Difficult access to markets, particularly in the rainy season, is a negative influence on production and income, as well as on the availability of foodstuffs. Producers have to bear the transportation cost to buyers' substations or sell to middle-men at lower prices at the farm gate. Poor infrastructure thus hinders production, limits the marketing network, and constrains people's access to agricultural goods and cash. People in Counties also bring agricultural products such as plantain, cassava, or chickens to their relatives in Monrovia and in return receive used clothes and some dry goods, or cash to buy the latter to resell at home. These rural traders return with dry goods (basic consumer necessities such as salt, soap, Maggi cubes, rice, batteries, sugar, onions, cloth, rubber slippers, kerosene and cigarettes to resell in their communities.

Small-scale wholesalers of agricultural products are primarily small-scale farmers themselves, the majority being women, residing in rural villages and towns (Aeschliman & Wesseh, 2007). They try to increase their income by buying neighbors' 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 sells on a wholesale basis. Difficult access to markets, particularly in the rainy season, is a negative influence on production and income, as well as on the availability of foodstuffs (MOA, WFP &VAM Food Security Analysis, 2010).

The Perception Process

Perception has been defined by The World Book Encyclopedia (2001) as the process by which we observe and find meaning in the objects, events and people around us. According to The World Book Encyclopedia (2001), perception involves the active process of working on sensory data to produce objects and events. This work involves many physical and psychological factors. Both physical and psychological factors influence perception. One of the physical factors is the structure of the human nervous system. Important psychological factors include our emotions, needs, expectations and learning.

Principles of Perception

There are a number of general principles that help us understand the process of perception such as closure, constancy, and perceptual context (The World Book Encyclopedia 2001).

Principle of Closure

The World Book Encyclopedia (2001) claim closure is the psychological tendency to perceive as complete and unified.

Principle of Constancy

The World Book Encyclopedia (2001) asserted that the principle of constancy states that we tend to perceive objects as constant in size, shape, colour and other qualities in spite of changes that occur in stimulation.

Perceptual Context

The World Book Encyclopedia (2001) further argues that an object or event depends in part on the surrounding conditions.

Categories of Impact Assessment

The term 'impact' means different things to different people. In discussing impact of any research and extension programme, one can identify two broad categories of interpretations (Anderson & Herdt, 1990). In the first category, some people look at direct output of the activity and call this an impact, for example, a variety, a breed, or a set of recommendations resulting from a research activity or a training activity conducted. The second goes beyond the direct product to study the effects of the product on the ultimate users, i.e. the so-called people level impact. The people level impact looks at how fit the program is within the overall research and development to discover facts that have practical and beneficial application to the society (Anderson & Herdt, 1990).

The people level impact assesses information about number of users and the degree of adoption of improved techniques and incremental effects of these techniques on production costs and output.

Anadajaysekeram *et al*. (2008) classified impact assessment into three categories:

1. Outputs
2. Immediate outcome/impact and
3. Ultimate outcome (impact)

Output refers to the results of program activities, i.e. goods and services produced by the set of collaborative activities. Immediate impact refers to the benefits and changes resulting from the application of the output. Ultimate impact refers to the measurable effects of the outputs and outcomes on the well-being of the ultimate beneficiaries of the research and development efforts, namely the poor, the food-and nutrition-insecure, and the environment (Anadajaysekeram *et al*. (2008).

Impact Chain

The typical impact chain starts from the set of inputs and activities of a project/program to the most highly aggregated development results such as poverty reduction, food security, and environmental protection. This chain also specifies all the main intermediate steps: the activities of a project, the output, the use that others make of this outputs, the direct as well as possible indirect effects, and the implications of the use of these outputs on the ultimate beneficiaries-society (see Figure 1) Anadajaysekeram *et al*. (2008).

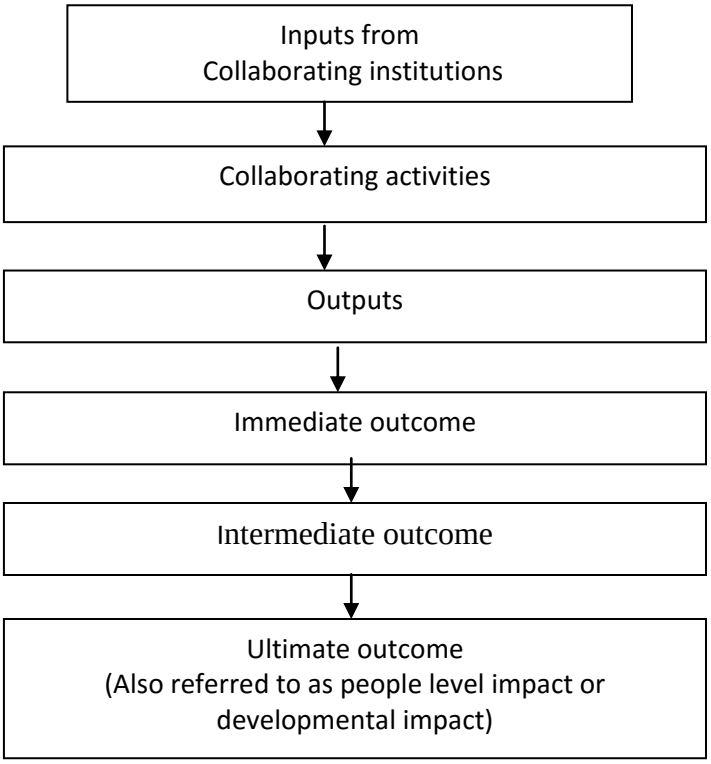

Figure 2: Impact Chain

Source: Anadajaysekeram *et al*. (2008)

The output, outcome, and impact are generally sequentially produced over a period of time and become more difficult to articulate, measure, and attribute as one moves from output to impact.

Outputs

This refers to the results of the programme activities, example goods and services produced by the set of collaborative activities. In the case of training activities, the outputs may be trained individuals with acquired skills, a set of training materials and or trained trainers.

Immediate outcome

This refers to the first level effect of the outputs. That is the observed or documented behavioural changes in those directly affected by the programme.

Intermediate outcome

This refers to the benefits and changes resulting from the application of the output. In the case of training, what are the effects in the performance of the individual and or institution as a result of the applications of the skills acquired?

In order to bring about an outcome, the programme has to change people's behaviour. By trying to identify and then document the changes in attitudes, knowledge, perceptions and decisions taken by programme target groups, which logically link to the outcomes being observed. By doing this, we can often acquire a good understanding of the actual impact that the programme has (Anadajaysekeram *et al*., 2008).

Ultimate outcome (Impact)

Impact refers to measurable effects of the outputs and outcomes on the well-being of the ultimate beneficiaries of the of the research and development efforts, namely the poor, the food-and nutrition-insecure and the environment (Anadajaysekeram *et al*., 2008).

Impact Indicators

Swanson and Rajalahti (2010) explained that the overall purpose of impact indicators is to determine whether specific improvement in the

extension system (1) had a significant and positive impact on different crop, livestock, and other enterprises; (2) helped increase farm household income and rural employment; and (3) improved rural livelihoods among different socioeconomic and gender groups within rural communities. So that project impact can accurately be assessed and the resulting findings provide essential insights into how future extension projects should be prepared in making other improvements to the overall agricultural innovation system, they recommended these impact indicators to carry out a comprehensive evaluation of project impacts as:

1. Increase in Agricultural Productivity across Different Crop, Livestock, and Fishery Systems and by Different Categories of Farmers.
2. Changes in Crop and/or Livestock Diversification and Increase in crop and Livestock Intensification
3. Changes in Farmer Skills, Knowledge, and Attitudes.
4. Impact on farm Household Income
5. Impact on off-Farm Rural Employment
6. Impact on Rural Livelihoods
7. Growth and Sustainability of Producer Groups, Farmer association, and Rural Youth
8. Use of More Sustainable Natural Resources Management Practices
9. Sustainability of a More Decentralized, Farmer-Led, Market- driven Extension System

Elements of Typical Impact Evaluations

The use and methodology of impact evaluation is not new. The common techniques have been used since the 1960's and 1970's many of

which were pioneered in the evaluation of United States government public policy programs. Full program evaluations have evolved to include several elements, or related study components. Impact evaluations often consist of the following components: process study, impact assessment and cost benefit (Blomquist, 2003). Process study, this analysis examines the operations and processes that make up the particular program under study. It is not an examination of impacts on participants. Impact assessment examines impacts on participants, and requires survey data and econometric methods to isolate the effects. The techniques used vary from random assignment to simple reflexive assessments, and represent the heart of an impact evaluation.

Cost-benefit assessment according to Blomquist (2003) calculates the costs of program operation and compares them with the benefits to determine its net value. According to him, two versions can be conducted. Cost-effectiveness analysis estimates inputs in monetary terms and outcomes in non-monetary quantitative terms. He states that Cost-benefit analysis estimates both inputs and outputs in monetary terms.

Criteria for Evaluating Impact Programmes

Five evaluation criteria from the Development Assistance Committee of the Economic Cooperation and Development (OECD/DAC) have provided the basis for international development evaluation since 1991. They have been the most prominent and widely adopted criteria used for aid evaluation by most bilateral and multilateral donor agencies, as well as international nongovernmental organizations (Chianca, 2008). However, critiques of the quality of development aid evaluation are still abundant. The five criteria to

evaluate development interventions according to (Chianca, 2008) include relevance, effectiveness, efficiency, impact, and sustainability.

The five DAC evaluation criteria are based on the conception that evaluation is an assessment "to determine the relevance and fulfillment of objectives, developmental efficiency, effectiveness, impact and sustainability" of efforts supported by aid agencies.

Relevance**:** The extent to which the aid activity is suited to the priorities and policies of the target group, recipient and donor. Effectiveness measures the extent to which an aid activity attains its objectives. Efficiency measures the outputs—qualitative and quantitative— in relation to the inputs. It is an economic term which signifies that the aid uses the least costly resources possible in order to achieve the desired. Sustainability is concerned with measuring whether the benefits of an activity are likely to continue after donor funding has been withdrawn. Impact-the positive and negative changes produced by a development intervention, directly or indirectly, intended or unintended.

On the other hand, IFAD (2003) provided that three main evaluation criteria (consistent with international practice) provide the basis on which project achievements and impacts are to be assessed. According to IFAD (2003), the three domains considered are:

(1) Performance of the Project

(2) Impact of the Project on Rural Poverty and

(3) Performance of the Partners

Each main criterion is divided into a number of elements (or sub-criteria). The assessment of each criterion requires a somewhat different

approach. The Performance of the Project is assessed through three criteria: relevance of the objectives, effectiveness and efficiency.

Under Impact on Rural Poverty six "domains of impact" have been defined systematically to cover the main factors which affect rural poverty. The six domains consider the impacts on:

1. Physical and Financial Assets
2. Human Assets
3. Social Capital and Empowerment
4. Food Security
5. The Environment, and
6. Institutions, Policies and the Regulatory Framework

The Performance of the partners requires separate assessments of the performance of the primary partners in the project: the cooperating institution, the government agencies responsible for implementing the project, the NGOs/CBOs involved in project implementation and the project co-financiers. These criteria address how well donor and its partners identified, prepared and supervised the project, and the contribution each made to project success during implementation.

Purpose of Project and Programmes Evaluations

Evaluations need to be included in project document as it contributes to secure the optimal quality and impact of development interventions (Austrian Development Cooperation, 2009). According to the Austrian Development Cooperation (2009), evaluation helps managers of projects and programs to manage and improve their implementation. The purpose of evaluations according to them is:

1. Learning from experience: With the assistance of evaluations, successes and failures can be interpreted. Based on those experiences, both current and future projects and programs can be improved.

2. Transparency: Evaluations illustrate the responsible utilization of the resources and justify the results and their effects vis-à-vis the contractor, the partners, the target groups in the recipient country and the tax payers.

3. Deepening understanding: Evaluation is a tool for deepening knowledge and understanding of the assumptions, options and limits of development cooperation. Evaluations are intended to contribute to a comprehensive discussion and reflection about development cooperation.

4. Improved communication: An evaluation is intended to foster communication and understanding within and between the groups (Austrian Development Cooperation, 2009).

According to Farley, Lucas, Molyneaux and Penn (2012), impact evaluations serve two key purposes – accountability and learning. According to them, accountability compares costs and impacts on final outcomes such as income and poverty that are attributed to investments. They further asserted that learning tests development hypotheses and explores how well or poorly a particular development approach works. Again, they maintain learning relates to better understanding the causal chains expected to link investments to income changes. For example, trained farmers should: 1) learn why improved soil management practices increase yields; 2) adopt these practices; 3) improve their yields; 4) increase farm income; and 5) ultimately raise their household incomes. Learning requires understanding how and why these

causal linkages do or don't happen and is essential to testing the assumptions behind program design.

Types of Evaluations

Evaluations are often categorized according to when they occur in the project cycle and their purpose (Anadajaysekeramet *et al*., 2008). Some of the common types of evaluations according to them are: Ex ant evaluation, On-going evaluations, ex post evaluation, and impact evaluation. They noted that ex ant evaluation is a research planning process which includes a comprehensive analysis of the potential impact of alternative activities before implementation. On-going evaluations according to them are conducted throughout the technology development and transfer process is more useful for management than ex ant and ex post assessments. Monitoring is fundamental to on-going evaluation.

Furthermore, they also assert that ex post evaluation or final evaluation assesses the project's performance, quality, and relevance immediately after the project completion and attempts to measure the effectiveness and efficiency of a completed activity.

Impact evaluation is a form of ex post evaluation. Impact evaluation attempts to determine the extent to which technology and development transfer program have contributed to larger development goals such as increase in farm production, or improved food security and poverty alleviation.

Impact evaluation focuses on the larger organizational and social context of a programme. However, assessment of learning focuses on what and how learners learn and how educators have helped or hindered the process

of learning (Kusek & Rist, 2004). According to them, Programme impact refers to positive and negative, primary and secondary or long term effects produced by development intervention either directly or indirectly, intended or unintended.

Germanov, Meijer-Irons and Carver (2004) classified impact assessment into two. They named the as donor-led and practitioner-led.

A donor-led programme or project according to Germanov, Meijer-Irons and Carver (2004) is examined from the prospective of the lender. Outcome of a donor-led impact assessment are often shared with the donor's funders, which are usually government agencies or foundations. Prospect funding decisions are often made based on this assessment.

In a practitioner-led impact assessment, focus is placed on how well projects fits into existing work patterns as well as build on knowledge and experience and produce results that can be easily used by management.

Donor-led impact assessment methods can be thought of as needing to "prove impact," while practitioner-led impact assessment is meant to "improve practice" of an organization.

Impact Assessment of Programmes

Bamberger, Blackden, Fert and Manoukim (2001) explained that evaluation in the poverty reduction approach situation refers especially to impact evaluation. An impact evaluation assesses the changes in individual's well being that can be contributed to a particular programme or strategy. Evaluation is the process of judging the worth or values of an ongoing or completed intervention (Kusek & Rist, 2004). The decision is formed by comparing evidence as "what the programme is" with criteria as "what the

programme should be". According to them, the aim of the evaluation is to establish the relevance, effectiveness, efficiency, impact and sustainability.

Evaluation is a management tool used by researchers and managers to improve institutional performance and organsitional technology and to gain support for the research process (Omoto, 2004). According to Omoto (2004), evaluation is judging, appraising, or determining the worth or quality of research in term of relevance, effectiveness, efficiency and impact so as to incorporate lessons learned in decision making process.

According to Germanov *et al.* (2004), there are two basic types of evaluation: formative and summative. Formative evaluation is a tool used from the beginning to the end of a project. A formative evaluation is conducted at several points in the cycle of a project and is used to continually "form" or modify the project to make sure that its program activities match program goals and the overall mission. A summative evaluation assesses the project's success. This type of evaluation takes place after the project is up and running, in order to judge its impact.

Summative evaluation according to Germanov *et al*. (2004), is dedicated to assessing the project's impact or success. Naturally, a summative evaluation takes place after the project cycle has been concluded and when it is possible that the impact of the project has been realized. It answers these basic questions:

1. Was the project successful? What were its strengths and weaknesses?
2. Did the participants benefit from the project? If so, how and in what ways?
3. What project components were most effective?

4. Were the results worth the costs?
5. Can the project be replicated in other locations?

Definite impacts that may be looked for include health, nutrition, reproduction, child schooling, income, and employment. In addition, practitioners may want to know if microfinance had any impact on poverty, women, empowerment, and domestic violence.

Baker (2000) argued that impact evaluation is intended to determine whether the programme had the desired effects on individuals, households and institutions and whether the effects are due to the intervention of the programme. Baker further stated that impact evaluation answers questions like:

1. How did the programme affect the beneficiaries?
2. Were improvements a direct result of the programme?
3. Could programme design be modified to improve impact?
4. Were cost justified?

Sustainable Livelihood Approaches

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks maintain or enhance its capabilities and assets, while not undermining the natural resource base (Scoones, 1998). According to Krantz (2001), there are three insights into poverty which underpin this new approach. The first is the realization that while economic growth may be essential for poverty

reduction, there is not an automatic relationship between the two since it all depends on the capabilities of the poor to take advantage of expanding economic opportunities. Secondly, there is the realization that poverty — as conceived by the poor themselves — is not just a question of low income, but also includes other dimensions such as bad health, illiteracy, lack of social services, as well as a state of vulnerability and feelings of powerlessness in general. Finally, it is now recognized that the poor themselves often know their situation and needs best and must therefore be involved in the design of policies and project intended to better their lot (Krantz, 2001).

The core concepts of the Sustainable Livelihood Approach (SLA) represent its strengths. Above all, it places the main focus on the poor people themselves by involving them in all the planning processes and by respecting their opinions (GLOPP, 2008). The poor people themselves define their strength, potentials and goals. This is done by adapting a holistic view to encompass all the aspects of poor people's livelihoods, and by considering that they are dynamic. It focuses explicitly on short and long-term changes and allows the pointing out of the various processes that permanently influence one another. By directly linking problem causes, for example, political programs at a government level, with their effects on individuals, the SLA connects the macro and micro level (GLOPP, 2008).

In addition, the SLA does not contradict other current development approaches, it rather tries to combine and take advantage of their strengths. It relies on participation and pays special attention to gender specific or ecological specific issues. A livelihood analysis therefore applies a broad range of conventional methods and instruments, for example, from

Participatory Poverty Assessment (PPA), Participatory Rural Appraisal (PRA) and Good Governance Assessment techniques" (Kollmair & Gamper, 2002). Thus, the SLA provides a clear and practical perspective on how to reduce poverty and has generated (if used effectively) a good way of integrating the four pillars of development (economic, social, institutional and environmental).

Elements of Sustainable Rural Livelihood Framework

As the livelihoods approach is concerned first and foremost with people, it seeks to gain an accurate and realistic understanding of people's strengths (here called "assets" or "capitals"). It is crucial to analyze how people endeavor to convert these strengths into positive livelihood outcomes. The approach is founded on a belief that people require a range of assets to achieve positive livelihood outcomes. The Sustainable Livelihood Framework identifies five types of assets or capitals upon which livelihoods are built, namely natural capital, physical capital, financial capital human capital and social capital (GLOPP, 2008).

Natural capital

Natural capital is the term used for natural resource stock form which resource flows and services (e.g. soil, water, air, genetic resources, etc.) useful for livelihoods are derived (GLOPP, 2008; Kumari, 2008). There is a wide variation in the resources that make up the natural capital, from tangible public goods such as the atmosphere and biodiversity to visible assets used directly for production. Clearly natural capital is important to those who derive all or portion of their livelihoods form activities based on natural capital (such as

farming, fishing, gathering in the forest and mineral extraction). Natural capital includes land, trees, and wildlife. The productivity of these resources may be degraded or improved by human management (Kumari, 2008).

Physical capital

Physical capital is created by economic production (Kumari, 2008). This includes infrastructure such as roads, irrigation works, transport, buildings, sanitation, communications, health clinic (GLOPP, 2008; Kumari, 2008).

Financial capital

Financial capital – the capital base (cash, credit/debt, savings, and other economic assets, including basic infrastructure and production equipment and technologies) which are essential for the pursuit of any livelihood strategy (GLOPP, 2008).

Human capital

Human capital represents the skills, knowledge, ability to labour and good health and physical capability that together enable people to pursue different livelihood strategies and achieve their livelihood objectives (GLOPP, 2008; Kumari, 2008). At the household level human capital is a factor of the amount and quality of labour available. This varies according to household size, skill levels, leadership potential, and health status. Human capital (knowledge, and labour or the ability to command labour) is required in order to make use of any of the four other types of capital. It is therefore necessary

though not sufficient on its own for the achievement of livelihood outcomes (Kumari, 2008).

Social capital

There is much debate about what exactly is meant by the term 'social capital'. In this context, it is taken to mean the social resources upon which people are drawn in pursuit of their livelihood objectives. These are developed through:

1. Networks and connections, either vertical (patron/client) or horizontal (between two individuals who share interests) that increased peoples' trust and ability to wider institutions such as membership or more formalized political or civic groups.
2. Membership of more formalized groups which often entails adherence to mutually agreed or commonly accepted values, norms and sanctions; and relationships of trust reciprocity and exchanges that facilitate cooperation reduce transaction costs and may provide the basis for formal safety nets among the poor.

Social capital composes of assets such as right or claims that are derived from membership of a group. This includes ability to call on friends or kin for help in times of need, support from trade or professional associations, and political claims on chiefs or politicians to provide assistance (GLOPP, 2008; Kumari, 2008).

Livelihood Strategy

Livelihood strategies comprise the range and combination of activities and choices that people make/undertake in order to achieve their livelihood goals. It should be understood as a dynamic process in which people combine activities to meet their various needs at different times. Different members of a household might live and work at different places, temporarily or permanent (Gloop, 2008). Livelihood strategy examines how people use their assets to derive a livelihood (Ruedin, 2007). Different livelihood strategies according to Ruedin (2007), may include agricultural intensification, diversification or migration. Examples of livelihood strategies include:

1. employment
2. farming, fishing, hunting
3. begging
4. trading
5. run a business
6. study, go to university
7. developing and fostering networks
8. saving money in a bank.

People engage in a diverse range of activities, and several members in a single household may have different strategies in a variety of geographical locations including urban and rural.

The range of options available to people for making a living, are partly determined by their access to different assets. Other factors such as policy, and stability of markets affect the livelihood strategies available to people. For

example, the seasonal fluctuation in crop prices influences the types of crops people can grow profitably, thus limiting their livelihood options.

Livelihood strategies are direct dependent on asset status and policies, institutions and processes. Hence that poor people compete and that the livelihood strategy of one household might have an impact (positive or negative) on the livelihood strategy of another household (Reudin, 2007).

Livelihood Outcomes

Livelihood outcomes are the achievements or outputs of livelihood strategies, such as more income, increased well-being, reduced vulnerability, improved food security and a more sustainable use of natural resources (Gloop, 2008). When thinking about livelihood outcomes, the aims of a particular group as well as the extent to which these are already being achieved has to be understood. Ruedin (2007) linked livelihoods outcomes to the goals to which people aspire. If people's livelihood goals are achieved they then become outcomes, and are the results of their livelihood strategies. They represent the inverse of poverty. People have a wide range of goals that are not necessarily related to only income.

Goals change and develop over time. Younger people have different aspirations from older people. Outcomes may influence assets; for example, if a person achieves greater knowledge and skills, this will increase their human assets. This may in turn increase the range of strategies available to them to make a living, as they may now be able to obtain higher paid work (Ruedin, 2007).

Conceptual Framework

To determine the perceived impact of the Agricultural Sector Rehabilitation Project, the study considered the effects of provision of inputs- both material (cutlasses, hoes, files, shovels, boots, seed rice, cassava cuttings, chickens goats and sheep) and training on the livelihoods of beneficiary farmers (Figure 3).

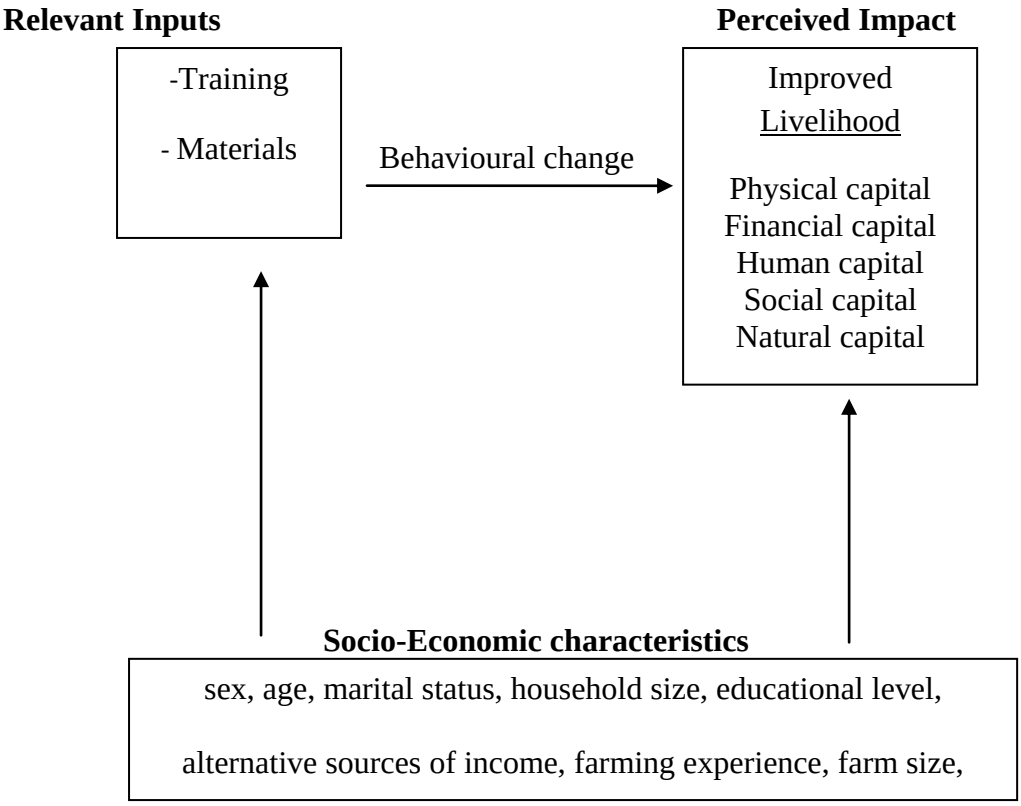

Figure 3: Conceptual Framework for the Determination of the Perceived Impact of the ASRP in Careysburg and Todee Liberia

Source: Adopted from: (Dercon & Krishnan, 1996; Amaza *et al*., 2009; Najafi, 2003; IBRD, 2004).

From literature (Najafi, 2003), it is expected that provision of relevant inputs should bring about a behavioural change which eventually should lead to improvement in the livelihoods in terms of physical, financial, human, social and natural capitals.

Relevant inputs are those things which people need to improve upon their livelihoods. The relevant inputs in the framework include training to provide relevant information on good agricultural practices and material resources (example cutlasses, hoes, files, shovels, boots, seed rice, cassava cuttings, chickens goats and sheep) to support production. The inputs (training and materials) a person receives are expected to bring a behavioural change that should lead to change in his/her livelihood (Amaza *et al*., 2009; Najafi, 2003).

From literature, there are other factors other than inputs (materials and training) that could impact livelihood (Dercon & Krishnan, 1996; Amaza *et al*., 2009; Najafi, 2003; IBRD, 2004). Socio-economic factors such as sex, age, marital status, household size, and educational level, income generating activities, farming experience, farm size and price have been found to influence livelihoods of farmers (Amaza *et al*., 2009). Amaza *et al*. (2009) found that in sub-Saharan Africa, it is common for some farm household members to engage in other nonfarm occupations to complement their earnings from farming.

CHAPTER THREE

METHODOLOGY

This chapter describes the methods and procedures used to collect and analyse data for evaluating farmers' perceived impact of the ASRP in Careysburg and Todee districts in Liberia. Sections of this chapter include the research design, population, sample size and sampling procedure, instrumentation, data collection, data processing and data analysis.

Study Area

Montserrado County is located in the northwestern part of Liberia and is the smallest of the fifteen counties of Liberia in terms of land area occupied. Montserrado County has an area of 737 square miles (1,886.72 square kilometers). Montserrado County is a potentially influential county, being home to the country's capital. The County is home to approximately 1.5 million people, corresponding to almost half of Liberia's entire population; about 70% reside in the capital (Ministries of Planning and Economic Affairs and Internal Affairs, 2008). The national household average consists of 6 persons. According to the CFSNS (2006), Montserrado County's average household size was 6 persons which is the same as that of the national household size of 6. The overall national mean age of household heads is 40 years, with 8% of households headed by 60 years of age or older. The dependency ratio is 1.4 (MOA, IFAD, World Bank & FAO, 2007).

Liberia is one of few countries in which the poverty rate of female-headed households is lower than male-headed households. According to UNDP (2001), the proportion below the poverty line was 79% for male-headed households compared with 68%for female-headed households. One reason according to the UNDP (2001) is that female heads of households work in the informal non-farm sector where incomes are relatively high, as well as receiving inheritance from husbands and close relatives, and higher levels of education.

Created in 1847 at the foundation of the country, Montserrado County is the oldest in Liberia. Located on the coast in the northwestern third of Liberia, Montserrado County is bordered by three counties. The Atlantic Ocean makes up the county's southern border, while Bomi County lies on the western border. Bong County is to the north and Margibi County to the east (Republic of Liberia, 2008).

Careysburg and Todee districts are two of the four districts of Montserrado County (see Figure 4). Careysburg is home to 96,003 people while 56,364 people live in Todee district. The major occupations of the people are farming of vegetables, rice and cassava, while charcoal burning and fishing feature. Yet these agricultural activities are overwhelmingly subsistence-level, and the County still has great potential to increase production once farmers have access to capital for tools, pesticides, seeds, and other inputs. Private rubber plantation exist offering tapping as a source of livelihood for some of the locals (Republic of Liberia, 2008).

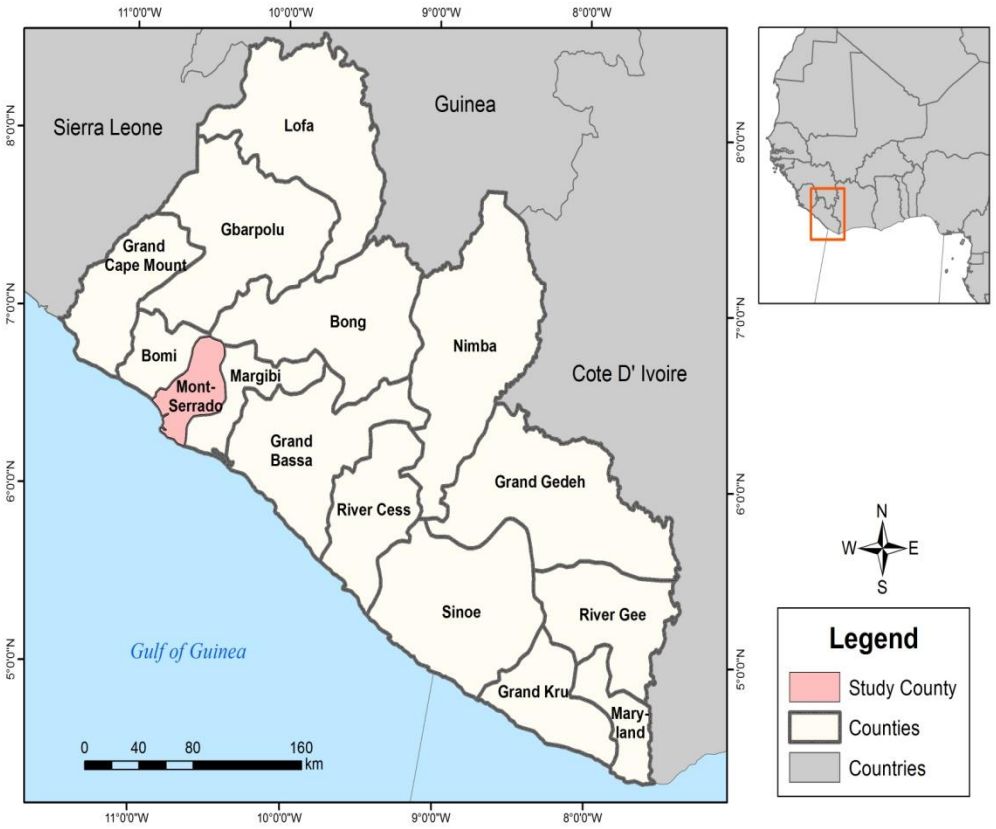

Figure 4: Map of Liberia showing the Study County

Source: www.un.org/Depts/cartographic/map/profile/Liberia.pdf

The districts like the rest of the country have a tropical climate with two seasons, rainy and dry. The rainy season covers May to November, while the dry season is between December and February. The average temperature is between 21 and 36 degrees Celsius. Annual rainfall is about 75 inches (1905 millimetres) (Republic of Liberia, 2008 - 2012).

The deplorable state of the roads and bridges in Todee district make majority of the district inaccessible, particularly during the rainy season. The district lacks adequate access to basic social services such as safe drinking water, sanitation and health facilities, and high schools. Paved roads run through some parts of the Careysburg district, but many areas are inaccessible due to the bad roads, particularly during the rainy season. Education is crucial

for the development of the County. Most deprived in Montserrado County is Todee District, where there are no high schools. The situation deprives a majority of the region from development, makes accessing health care and education a strenuous task, and limits essential business and farm commerce. This, in turn, leads to the underutilization of resources in the region.

This deprives the region of development since the access of higher education has a negative effect on employment opportunities. Parents who make efforts in sending their children to rural high schools suffer additional financial burdens, while children from families who cannot afford the additional fees often suffer from early pregnancies and additional strenuous labour. Only about 42 percent of the people in Montserrado County have access to agricultural land, and out of these, only 16 percent of households surveyed by the Comprehensive Food Security and Nutritional survey produced rice the national staple (Table 1).

Table 1: Agricultural Constraints of the Study Area

Constraints	Percent
Lack of access of tools	59
Lack of access of seeds	53
Lack of access of arable land	42
Lack of access of cash	25
Lack of access of fertilizer and pestilence	19
Lack of access of labour	14
Birds attack	11
Groundhog attack	8
Households engaged in other activities	5
Returned late for planting	1
Plant disease/insect attack	1
Lack of access to training	1

Source: CFSNS, 2006.

Farmers in the County complain they have rarely benefited from Ministry of Agriculture extension services, even as MOA staff is assigned to their districts. As shown in Table 1, the inability of farmers in the County to produce enough food for household consumption can be attributed to a host of problems, especially those related to access to capital for inputs (Republic of Liberia, 2008 - 2012).

Research Design

According to Gay (1992), a research designs indicates the basic structure of the study, the nature of these hypothesis and the variables involved in the study. The study used a descriptive survey design to evaluate farmers' perceived impact of the ASRP on their livelihoods. It involves collecting data through questionnaires. The descriptive survey is concerned with relationships that exist, the direction of the relationships that exist, opinions that are held, and evidenence or trends that are developing among the variables. Survey according to Sarantakos (2005); Fraenkel and Wallen (2002), is methods of data collection in which information is gathered through oral or written questionnaire and could be structured, more informal, or a mixture of approaches. Whatever the tools used to collect the data, it is essential to maintain consistency throughout the exercise to avoid error (Sarantakos, (2005); Fraenkel & Wallen, 2002). This study is used a descriptive survey design based on its methods of gathering information through the use of questionnaires and interviews which are characteristics of descriptive survey.

Study Population

The target population of the study consisted of all farmers (340) in Careysburg and Todee districts, Montserrado County, Liberia that benefited from the ASRP in the first year (2010) of the project.

Sample Size and Sampling procedure

Sampling involves the process of selecting a portion of the population to represent the entire population (Amedahe, 2004). According to Sarantakos (2005), a sample consists of a carefully selected unit that comprises the population. Many researchers use different ways to determine the sample size based on a given confidence level of precision required (Israel, 1992). The general notion held by researchers is that the larger the sample size, the smaller the sampling errors. Best and Khan (1998) assert that sample size depend on the nature of the population, the data to be gathered, the type of analysis to be conducted and funds available for the study. Due to constraints of resources and time, it was extremely difficult to cover the entire population.

For this, a cross-section of the population was sampled based on the Krejcie and Morgan table for determining sample size from a given population. In the table, for a population of 340 people the sample size should be 181 (Krejcie & Morgan, 1970). A total of 190 persons were selected for the survey through proportional sampling and rounding of decimals to obtain whole numbers. For a farmer to be selected for the survey, a combination of proportional stratified sampling and lottery techniques were used with the aid of the sample frame of farmers that benefited from the project in the first year. In stratified sampling the population was first divided based on the town/community farmers hailed from. The Number of farmers taken from

each town/community was in the proportion in which they appear in the population. Thereafter, a representative sample was obtained by randomly sampling the desired number from each group and bulking the selected units.

To form part of the sample for the study from each town/community, the lottery technique was employed. The names of beneficiary farmers were written on pieces of paper, folded and put into a box. The pieces of papers were shuffled in the box after which the required number of respondents from each town/community was picked. Table 2 shows the number of farmers from each communities/towns and the number of respondents sampled.

Table 2: Population and Sample Size used for the Study

Town/community	District	Total number of farmers	Sample size
Karto	Todee	100	54
Zannah	Todee	69	37
Koon	Todee	28	15
Pleemu	Todee	23	13
Clean	Todee	19	11
Sunkey	Todee	19	11
Geyan	Todee	17	10
Bensonville	Careysburg	15	8
Goba	Todee	14	8
Bulu	Careysburg	12	7
Saackie	Todee	10	6
Tata	Careysburg	8	5
Gbotoe	Todee	4	3
Yankolor	Careysburg	2	2
Total		**340**	**190**

Source: Field Data, 2014

Data Collection Instrumentation

A structured interview schedule was used to collect data from the sampled farmers. This is because farmers who are the main target of the study are generally uneducated, and cannot articulate and read English language well. The researcher also felt that interviewing is a very useful method due to its value for openness, qualitative nature and its guiding mode (Sarantakos, 2005). The interview schedule was divided into three parts. The variables and how they were measured were based on the objectives of the study are:

Part 1 Appendix A: This part sought information on the socio-economic characteristics of farmers who benefited from the project. Respondents were asked to provide background information such as sex, age, marital status educational level, income generating activities, years in farming, farming land size, yields, prices of planting materials and source(s) of planting materials.

Part 2 Appendix B: It solicited information on beneficiary farmers' perception of the relevance of the ASRP in terms of its components. The respondents were asked to indicate

1. First whether or not they benefited from the ASRP; and
2. The relevance of the ASRP on a five point likert-type scale ranging from 1=very irrelevant (VIR), 2=irrelevant (IR), 3=moderately relevant (MR), 4=relevant (R), and 5=very relevant (VR).

Part 3 Appendix C: This part sought to establish the level of impact of the ASRP on farmers' livelihoods, with respect to the livelihood capitals, a five point likert-type scale ranging from 1= strongly disagree (SD), 2=disagree (D), 3=moderately disagree (MA), 4=agree (A), and 5=strongly agree (SA) was used to measure the impact.

Validation and Pre-testing of Instrument

The content validity of the instrument was ensured by supervisors at the Department of Agricultural Economics and Extension of the University of Cape Coast. They scrutinized the interview schedule to determine if the content domains were based on the objectives of the study.

Pre-testing

Pre-testing of the instrument was done to determine internal consistency of the instrument in Diamond Creek, Low Cost Village and Kollieman communities in Careysburg District, Montserrado County. The communities were selected because they also benefited from the ASRP in 2012. The pre-test was conducted on October 2, 2014 and involved twenty farmers.

The data collected from the pre-test was entered into Statistical Product and Service Solution (SPSS) version 20 to determine the internal consistency of all likert-type scales. The two main subscales relevance and livelihood capitals had Cronbach's alpha coefficient of -1.098 and 0.7 respectively indicating that the instrument was not reliable. This is because scales with Cronbach's alpha coefficient of 0.7 or more are considered to be reliable (Pallant, 2001). Therefore, the instrument was restructured to strengthen the instrument; for example options of items on the relevance of the ASRP were increased from 15 to 21. The scale on which relevance was measured was also reduced from a six point Likert scale to five-point scale. For the livelihoods capitals scale, the items were also increased. For example, items under financial capital were increased from 7 to 10, physical capital from 9 to 11, human capital from 5 to 8, social capital from 8 to 11, and natural capital from

3 to 5 respectively. In all, items under the livelihood capitals were increased from 32 to 45.

Following changes to the research instrument, it was administered to thirty (30) former beneficiaries of the ASRP to determine internal consistency of the instrument. The instrument was administered in Karto town to first year (2010) beneficiaries of the project not selected for the main survey. The Cronbach's alpha coefficient for the affected sub-scales relevance and the livelihood capitals improved to 0.909 and 0.868 respectively indicating that the instrument was reliable. This is because scales with Cronbach's alpha coefficient of 0.7 or more are considered reliable (Pallant, 2001).Table 3 shows the reliability coefficient of the two main subscales. The final interview schedule was developed for data collection.

Table 3: Reliability Coefficient of the Research Instrument

Subscale	Item	Cronbach's alpha 1	Cronbach's alpha 2
Relevance	15	-1.098	0.909
Livelihood capitals	32	0.7	0.868

(n=20 for Cronbach alpha 1, n=30 Cronbach alpha 2)

Source: Field Data, 2014

Data Collection

Three enumerators were trained on how to administer the instrument. The training encompassed the meaning and interpretation of each item on the interview schedule. The validated and pre-tested structured interview schedule was translated in into simple 'Liberian English' to the respondents and their responses were ticked or written on the schedule. The data was collected

between November 3, 2014 to November 28, 2014 and all 190 targeted for the study were interviewed. There was 100% response rate.

Data Analysis

With the help of Statistical Package and Service Solutions (SPSS version 20.0), frequencies, percentages, means, standard deviations, Kendall co-efficient of concordance, Friedman test of mean rank and multiple regression were used to analyse the data. The analytical techniques used to analyse each of the specific objectives are as follows:

Objective 1: Descriptive statistics such as frequencies, percentages, and cumulative percentages were computed from the responses to describe the socio-economic characteristics of respondents.

Objective 2: To ascertain the perception of beneficiary farmers on the relevance of the project in terms of its components**,** frequencies, percentages, standard deviations and means were used. Kendall co-efficient of concordance was used to determine the consistency in the levels of agreement in agreeing on the relevance of the project's components on a five point likert-type scale ranging from 1=very irrelevant (VIR), 2=irrelevant (IR), 3=moderately irrelevant (MR), 4=relevant (R) and 5=very relevant (VR).

Objective 3: Frequencies and percentages were used to examine the level of impact of the ASRP on farmers' livelihood on a five point Likert-type scale ranging from 1=strongly disagree (SD), 2=disagree, 3=moderately agree (MA), 4=agree (A) and 5= strongly agree (SA) to measure their level of impact. The Friedman test of mean ranking was used to rank the livelihood capitals.

Objective 4: To determine the socio-economic characteristics of farmers influencing their perception of the relevance of the ASRP, a Multiple regression model of $Y = a + \beta_i x_i + \varepsilon$ was used. Where,

Y = perceived relevance of the ASRP

a = constant or the intercept which describes the mean response value when all predictor variables are set at zero

β_i = parameters of the independent variables (x_i). These variables are presented in the Tables 4.

ε = error term

Table 4: Variables and Scale Measurement of the Socio-economic Characteristics of Farmers influencing their Perception of the Relevance of the ASRP

Variable	Measurement of variables
Household size	Ratio level
Educational level	Ordinal level
Alternative source of income	Ratio level
Years in farming/farming experience	Ratio level (in years)
Total agricultural land	Ratio level (in years)
Production type	Dummy (1= rice only or cassava only, 2 = both rice and cassava)

Source: Field Data, 2014

Objective 5: To determine the socio-economic characteristics of farmers influencing their perception on the livelihood impact of the ASRP, a Multiple regression model of $Y = a + \beta_i x_i + \varepsilon$ was used. Where,

Y = perceived relevance of the ASRP

a = constant or the intercept which describes the mean response value when all predictor variables are set at zero.

β_i = parameters of the independent variables (x_i). These variables are presented in the Tables 5.

ε = error term

Table 5: Variables and Scale Measurement of the Socio-economic Characteristics of Farmers influencing their Perception on Livelihood Impact of the ASRP

Variables	Measurement
Household size	Ratio level
Educational level	Ordinal level
Alternative source of income	Ratio level
Years in farming/farming experience	Ratio level (in years)
Total agricultural land	Ratio level (in hectares)
Production type	Dummy (1= rice only or cassava only, 2 = both rice and cassava)
Age	Ratio level (in years)

Source: Field Data, 2014

The analytical techniques used to analyse each of the specific objectives are summerised in Table 6.

Table 6: Summary of Statistical Tools used for the Study

Specific objective	Statistical tool(s) used for analysis
1. Describe the socio-economic characteristics of farmers who participated in the project	Frequencies, percentages and cumulative percentages
2. Ascertain the perception of beneficiaries on the relevance of the project in terms of its components	Frequencies, percentages, standard deviations and Kendall coefficient of concordance for ranks (w)

Table 6: Cont'd

3. Examine the level of impact of the ASRP on farmers' livelihoods	Frequencies, Friedman test of mean ranking
4. Determine the socio-economic factors underlying farmers' perception of the relevance of the ASRP	Multiple regression
5. Determine the socio-economic factors underlying farmers' livelihood impact of the ASRP	Multiple regression

Source: Field Survey Data, 2014

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

The rationale for this study was to evaluate the perceived impact of the Agricultural Sector Rehabilitation Project on the livelihoods of farmers in Careysburg and Todee Districts, Liberia. Specifically, the study focused on describing the socio-economic characteristics of farmers who are beneficiaries, ascertain the perception of beneficiary farmers on the relevance of the project in terms of its components, and examine the level of impact of the ASRP on farmers' livelihood with respect to Natural, Physical, Financial, Human and Social capitals. The study further evaluated the socio-economic determinants of beneficiary farmers' perception of the relevance of the Agricultural Sector Rehabilitation Project and the socio-economic determinants of beneficiary farmers' livelihood impact of the ASRP.

Socio-economic Characteristics of Respondents

Socio-economic characteristics of respondents are described in terms of sex, age, marital status, household size, educational levels, income generating activities, farming experience, farm size, yields and prices of rice (paddy) and cassava.

Distribution of household heads by sex

Table 7 summarises the frequency distribution of the sex of 190 respondents. The results showed that the majority (58.9%) of the respondents were females with 41.1% males.

Table 7: Sex of Household Heads

Sex	Frequency	Percent	Cumulative Percent
Male	78	41.1	41.1
Female	112	58.9	100.0
Total	**190**	**100**	

Source: Field Data, 2014.

The findings in Table 7 revealed that more than half of the farmers sampled are females confirming the findings of the Ministry of Agriculture (MOA, 2008). According to the MOA (2008), women in rural areas in Liberia produce most of the food and are largely responsible for household food security. Women fetch wood and water, care for children and homes, and undertake transport and marketing activities of the family. Women predominate in key segments of the value chains of key food and some cash crops, especially in production, primary processing, product development and marketing. Some women also serve as heads of their families and shoulder the corresponding responsibility.

The result of the study gives an indication that females are venturing into a male dominated sector. Similarly, the finding supports the MOGD & World Bank, 2010) report which suggests that the proportion of food-crop growers is higher among female- dominated households (87 percent) than in male-dominated (81 percent) or gender-balanced households (86 percent).

Distribution of household heads by age

Age has been found to determine how active and productive the head of the household would be. The age of a farmer may affect the kind of task they do and consequently their productivity. Age is one of the major constraints to increase production and older people are less able to perform heavy task such as clearing and felling of trees which requires physical strength. Age has also been found to affect the rate of household adoption of innovations, which in turn, affects household productivity and livelihood improvement strategies (Dercon & Krishnan 1996). Table 8 shows the distribution of respondents by age ranges. The result shows that 34.7% of respondents were between 30 years to 39 years. The mean age was 45 years. The standard deviation value was 13.00.

Table 8: Age of Household Heads

Age range	Frequency	Percent	Cumulative Percent
20-29	16	8.4	8.4
30-39	66	34.7	43.2
40-49	44	23.2	66.3
50-59	36	18.9	85.3
≥60	28	14.7	100.0
Total	**190**	**100.0**	

Mean = 44.91 SD = 13.00, Min. = 24 max. = 83

Source: Field Data, 2014.

Findings from Table 8 show that 34.7% of the respondents were between 30 years to 49 years. Only 33.l6% of the respondents were about fifty years and above. In all, 66.3% of the respondents were below the age of fifty

and are therefore said to be in their economically active age group and could play important roles in the agricultural production.

The mean age (45 years) of household heads in the study area is higher than that at the national level. The overall mean age of household heads is 40 years with 8% of household of households headed by 60 years of age or older (MOA, IFAD, World Bank & FAO, 2007).

It could be said that these farmers have high welfare needs as they are in their reproductive age group. The presence of more middle-aged people into farming holds a lot of potential for the industry. Therefore, introduction of agricultural technologies are likely to be adopted by those farmers. There is also an indication of the existence of potential labour force that can be tapped for development. There is a need for government to provide incentives and programmes that meet the needs of its farmers. Most of their agriculture is done manually; this explains why few aged farmers (33.6%) are still found working in the area.

Temudo (2004) emphasized that getting young people interested in agriculture is crucial for rural development because they are more innovative. It could also be said that these farmers have high needs as they are in their reproductive age group.

Household heads' Marital Status

Table 9 shows distribution of the marital status of the respondents. The results show that the majority (68.4%) of the respondents were married. They may have a lot of responsibilities. Few (6.3%) were either separated or divorced. About 11.6% were widowed. Agricultural programmes are likely to

compete after their matrimonial duties. Therefore, programmes need to be planned taking into consideration gender development as marriage.

Table 9: Marital Status of Household Heads

Marital status	Frequency	Percent
Single	26	13.7
Married	130	68.4
Separated	9	4.7
Divorced	3	1.6
Widowed	22	11.6
Total	**190**	**100.0**

(n=190)

Source: Field Data, 2014.

The result implies that having a partner to provide labour for the farm may be advantageous in a labour intensive enterprise like farming. It could also mean farmers who are single will have to meet the entire labour requirements by themselves, or depend on hired labour in the wake of shortage and high labour cost. It is expected that family labour would be more available where the household heads are married (Amaza *et al*., 2009).

Household sizes

The results in Table 10 show that about 38.9% of the respondents had household size between 7 to 9 people; with only 7% of the respondents having household size between 1 to 3 people. Fewer (1.6%) of the respondents had household size of 16 t0 18 people. As their farming is done manually one can see why more than 92.6% of the household heads had household size of more than three persons.

Table 10: Household Size

Range	Frequency	Percent	Cumulative percent
1-3	14	7.4	7.4
4-6	54	28.4	35.8
7-9	74	38.9	74.7
10-12	38	20.0	94.7
13-15	7	3.7	98.4
16-18	3	1.6	100.0
Total	**190**	**100.0**	

2014 Minimum =1, Maximum =15, Mean =6.12

Source: Field Data, 2014

The mean household size in the study area consists of 6.12 persons above the national household average but consistent with that of the County. The national household average consists of 5.6 persons with 6.4 persons per household for Montserrado County (MOA, IFAD, World Bank & FAO, 2007). Higher household size could offer farmers access to farming labour. Amaze et al. (2009); FAO/WFP (2006) asserted the implication of household size in agriculture hinges on the fact that the accessibility of labour for farm production, the total area cultivated to different crop enterprises, the amount of farm produce kept for domestic consumption, and the marketable surplus are all determined by the size of the farm household. If this assertion is true, the respondents may have ready access to labour in consonance with the report of the CFSNS (2006) that only 14% of household in the study area lack access to labour.

Household heads' level of education

About half (50.8) of the respondents have had no formal education (Table 11). Of the half who had some education, the highest was Senior High school (10.1%). Most of them had primary education (28.0%), followed by

junior high education (11.1%). From the findings it can be said that the majority (78%) of the farmers have no formal education or only primary education.

Table 11: Distribution of Household Heads by Level of Education

Level	Frequency	Percent
No formal education	96	50.8
Primary education	53	28.0
Junior high school	21	11.1
Senior high school	19	10.1
Total	**189**	**100.0**

Source: Field Data, 2014.

The illiteracy rate of the study area may be attributed to inadequate schools in the district. Parents who make efforts in sending their children to remote school suffer additional financial burdens, while children from families who cannot afford the additional fees often suffer from early pregnancies and additional strenuous labour (Republic of Liberia, 2008 - 2012). The study shows that farmers who benefitted from the ASRP in the first year had low level of formal education. This might affect their levels of understanding issues. Farmers' educational level to some extent determines the kind of task they can undertake in any programme and therefore the type and level of participation of technology introduce to them and its adoption.

The finding in Table 11 is consistent with the submission of the (NHPC, 2008) which suggests that educational levels remain considerably low, with illiteracy rates reaching 53% at the national level, 41% among men and 65% among women. According to the NHPC (2008), the majority of

food-insecure households reside in rural areas, where long distances, poor infrastructure and low availability result in schools being much more difficult to access. Net primary school enrolment is as low as 65%. Secondary school enrolment is even lower at 38%. Low school enrollment is especially high among food insecure households. As a result, the majority of the farmers having little or no education, production information may not be used efficiently as many studies(Phillips, 1994; Yang; 1997) have revealed that the level of education (years of schooling) helps farmers to use production information efficiently. According to them, as an educated person acquires more information, the better producer he becomes.

Alternative sources of income

The result revealed that most of the respondents combined or engaged in two or three activities to uphold their livelihoods (Table 12). In sub-Saharan Africa, it is common for some farm household members to engage in other nonfarm occupations to complement their earnings from farming (Amaza *et al.*, 2009). As practised in many rural areas in Liberia, the households in the project area had highly diversified income-generating activities.

Table 12: Alternative Sources of Income of Household Heads

Alternative Sources	Frequency	Percent
Charcoal burning	69	36.3
Gardening	108	56.8
Rubber tapping	41	21.6
Petty trade	41	21.6
Palm oil processing	28	14.7
Others	26	13.7

n=190

Source**:** Field Data, 2014

The majority (56.8%) of the sampled beneficiaries are engaged in gardening apart from rice and cassava farming as the main alternative source of income for their households. Charcoal burning was also found to be the second major (36.3%) source of income generating activity for most beneficiaries. Both rubber tapping and petty trade were the third major (21.6%) activity bringing income to households. Palm oil processing and other activities accounted for 14.7 and 13.7% respectively.

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

Gardening as the main alternative source of livelihood is similar with finding of the (MOA, WFP & VAM Food Security Analysis, 2010). Charcoal burning, rubber tapping, petty trade and palm oil production are not consistent. In the rural sample according to CFSNS (2006), the following livelihood profiles dominate: food crop producers (15%), palm oil seller/producer (14%), petty traders (12%), contract labourers (10%), rubber tappers (7%), charcoal producers (7%), hunters (5%), employees, fisher folks (4%), and skilled labourers (3%). Fourteen percent rely on a combination of two income sources: palm oil and food crop producers (8%), and cash and food crop producers (6%) (MOA, WFP, VAM Food Security Analysis, (2010).

Farming experience of household heads (years)

More than half (101) of the respondents have been farmers for more than ten years (Table 13). Approximately 55.2% of the respondents have more years of experience as farmers.

Table 13: Farming Experience of Household Heads (years)

Years	Frequency	Percent	Cumulative Percent
≤10	82	44.8	44.8
11-20	40	21.9	66.7
21-30	31	16.9	83.6
31-40	19	10.4	94.0
41-50	9	4.9	98.9
51 and above	2	1.1	100.0
Total	**183**	**100.0**	

Range = 53.85, Mode = 5 years & 10 years

Source: Field Data, 2014.

The probable reason of more years of experience in farming could be most people take the occupation early having been borne into a family making their living through farming. Another reason could be borne into a family without the financial power to send offspring to school.

Farming experience is an important factor determining both the productivity and the production level in farming (Amaza *et al*., 2009). There is the general notion that the longer the number of years an individual has been in a particular activity, the more experienced him/her becomes. The experience of the beneficiary farmers is a store which could be tapped to enhance the transfer and adoption of agricultural technologies in the study area. Farming experience of household heads in the project area varied widely.

Household heads total agricultural land

Household heads total land for agricultural production in the study area are presented in Table 14. Total land for agricultural production in this study refers to the land area that was actually used for crop production during the survey year.

Table 14: Household Head total Land for Agricultural Production

Land (hectare)	Frequency	Percent	Cumulative percent
<0.5	85	48.3	48.3
0.5-0.9	62	35.2	83.5
1.0-1.4	16	9.1	92.6
1.5-1.9	7	4.0	96.6
2.0-2.4	3	1.7	98.3
2.5-2.9	2	1.1	99.4
3.0-3.4	1	.6	100.0
Total	**176**	**100.0**	

Source: Field Data, 2014.

Table 14 depicts that 48.3% of the respondents have less than 0.5 hectares of land for agricultural production. Respondents with total agricultural land area of 1.0 to 1.9ha constituted 13.1% while those of total agricultural land of 2.0 to 2.9ha accounted for 2.8%. Only 0.6% of the respondents had total agricultural land of 3.0ha and more.

Farm land sizes being small may be due to methods of land acquirement in the study. From the finding it can be said that getting arable land in the study area is a problem thus decreasing livelihood strategies of farmers as most of their activities are attached to the land.

It can be said that farmers in the Careysburg and Todee districts will continue to lack income generating activities and food as asserted by Duncan

and Brants (2004). According to Duncan and Brants (2004), access to land determines the farmers' access to income generating activities as well as access to food. The finding support the Comprehensive Food Security and Nutrition Survey, (CFSNS, 2006) that 42% of the farmers in the study area lack arable land.

Household heads farm sizes for rice production

In traditional agriculture, land is considered to be the most important factor for production. Table 15 shows distribution of land for rice production in the study area.

Table 15: Household Head Farm Size for Rice Production

Area (hectare)	Frequency	Percent	Cumulative percent
<0.5	118	76.6	76.6
0.5-0.9	22	14.3	90.9
1.0-1.4	7	4.5	95.5
1.5-1.9	4	2.6	98.1
2.0-2.4	3	1.9	100.0
Total	**153**	**100.0**	

Source: Field Data, 2014.

The majority of the respondents had farm land holdings of less than 0.5ha. Of the 190 respondents, 76.6% had land holding less than 0.5ha for cultivation with only 9% of the respondents having farm land holdings of 1.0 to 2.4ha.

The farm sizes are small probably due to the lack of arable land in the study area. This may negatively affect the adoption of farming technologies since land size has been found to have positive relationship with adoption.

With the major occupation of the people of Careysburg and Todee districts being farming, it can be concluded that having access to food and income will always be a major problem because of the lack of access to land for farming. The finding that 75% of the farmers cultivate less than 0.5ha of land confirms the submission of CFSNS (2006) that 42% of farmers lack arable land in the study area. Similarly, Dinon, Gulliver, & Gibbon (2001) reported that in many farming systems, a small minority of farmers occupy large areas of land which are often utilized only at relatively low intensities while producers are confined to small holdings. According to Dinon, Gulliver, and Gibbon (2001), a fundamental precondition for development is improved access to and control over land by poorer rural population.

The lack of arable land as reported by the CFSNS (2006) may deny farmers in the study means of getting food and generating income as asserted by Duncan and Brants (2004). According them, the access to land determines the farmers' access to income generating activities as well as the farmers' access to food.

Household heads farm sizes for cassava production

Table 16 depicts findings on the size of land cultivated by respondents for production of cassava. The majority (79.2%) of respondents cultivate less than 0.5 hectare of land for cassava production. About 6.6% of respondents cultivated between 1.0 to 1.9ha of land for cassava production while only 3.0% of the respondents cultivated 2ha and more for cassava production. It could be the size of land cultivated for cassava production is small because most of the farmers are subsistence farmers. Most cassava (about 60 percent of households) is produced for own consumption (World

Bank, 2006). About 22 percent of the sampled households reported selling fresh cassava, and 17 percent reported selling processed cassava (World Bank, 2006).

Table 16: Household Head Farm Size for Cassava Production

Land Area (hectare)	Frequency	Percent	Cumulative percent
<0.5	133	79.2	79.2
0.5-0.9	19	11.3	90.5
1.0-1.4	9	5.4	95.8
1.5-1.9	2	1.2	97.0
2.0-2.4	5	3.0	100.0
Total	**168**	**100.0**	

Source: Field Data, 2014.

Household heads rice yields

Table 17 shows that 96.2% of the respondents gathered less than 50 bags (in 50kg bag) of rice (paddy) from their harvests. About 4% (3.9%) of the respondents received more than 50 bags of paddy from their fields. The yields are low probably as a result of small land size and farming practices. Liberia's rice yield when compared to that of surrounding countries is one of the lowest in the region. Yields are between 0.5 and 1.1mt/ha (MOA, FAO, UN, World Bank & IFAD, 2007). Low yields could also be as a result of short fallow period.

Table 17: Household Head Rice yield Levels

Rice yield (in 50 kg bag)	Frequency	Percent	Cumulative Percent
1-10	67	43.8	43.8
11-20	42	27.5	71.2
21-30	20	13.1	84.3
31-40	9	5.9	90.2
41-50	9	5.9	96.1
51 and above	6	3.9	100.0
Total	**153**	**100.0**	

Source: Field Data, 2014.

The findings in Table 17 support report of the Ministry of Agriculture Annual Crop Assessment 2009 (MOA, 2010), that all counties in Liberia are deficient in rice production compared to requirements. The report further revealed that Montserrado County meets 4% of rice consumption requirements from local production.

Household heads cassava yield levels

Table 18 shows that of the respondents who planted cassava, only 8.6% received 50 bags or more. About thirty-two percent recorded 1 to 10 bags of cassava while 59.2% received 11 to 50 bags.

Table 18: Household Head Cassava yield Levels

Cassava yield (in 50kg bag)	Frequency	Percent	Cumulative Percent
1-10	52	32.1	32.1
11-20	54	33.3	65.4
21-30	24	14.8	80.2
31-40	14	8.6	88.9
41-50	4	2.5	91.4
51 and above	14	8.6	100.0
Total	**162**	**100.0**	

Source: Field Data, 2014

Farmers themselves have identified a number of constraints on output, of which many relate to the lack and/or cost of inputs as well as losses from pests. Animal pests are a major constraint – 'groundhog attacks', referring to various types of bush animals who eat crops standing in the field (CFSNS, 2006).

The low yields of cassava in the study area may be as a result of constraints faced by cassava farmers especially women (World Bank (2010). The most binding constraints for women and cassava farming are the lack of adequate tools for field clearing, land preparation, and weeding. The report further emphasized that where male labour is scarce and difficult or impossible to hire, field production practices, including the timing of field activities and planting techniques were also important determinants of yield differentials (World Bank, 2010).

Price of paddy

As contained in the Table 19, the price of paddy varies among household heads for rice stuck in a 50kg bag. It was established that 52.1% of households sold a bag of paddy between US$5.00 to US$25.00. About 47.9% of the household heads sold a bag of rice for US$26.00 and above.

Table 19: Price of Rice (paddy)

Price (US$ per bag)	Frequency	Percent	Cumulative Percent
≤5	5	3.6	3.6
6-10	21	15.0	18.6
11-15	7	5.0	23.6
16-20	30	21.4	45.0
21-25	10	7.1	52.1
26-30	16	11.4	63.6

Table 19: Cont'd

31-35	19	13.6	77.1
≥36-40	32	22.9	100.0
Total	**140**	**100.0**	

Source: Field Data, 2014

The variations in the price of rice paddy maybe due to the time of the year the commodity is sold. In Liberia, the prices of agricultural goods rise during the rainy season when roads become inaccessible to production sites. The increase in the price of locally grown rice can be attributed to the fact that the Country's rice yields when compare to those of surrounding countries, is one of the lowest in the region (MOA, WFP &VAM Food Security Analysis, 2010).The increasing demand of grains for food, feed and bio-energy, coupled with a slow growth in agricultural productivity, are likely to continue putting upward pressure on prices and generate more volatility (OECD-FAO, 2011).

Price of cassava

The majority (72.9%) of the households sold a bag of cassava for about US$5.00. About 25.6% of households sold a bag of cassava for US$6.00 to US$20.00. Only a small percentage of households (1.4%) sold a bag of cassava for more than US$20.00 (Table 20).

Table 20: Price of Cassava

Price of cassava (US$)	Frequency	Percent	Cumulative Percent
≤5	102	72.9	72.9
6-10	30	21.4	94.3
11-15	3	2.1	96.4
16-20	3	2.1	98.6
21-25	2	1.4	100.0
Total	**140**	**100.0**	

Source: Field Data, 2014

According to the World Bank (2010), cassava is grown by a high proportion of rural households, but marketed by only a relatively small number. Most cassava is produced for own consumption. The above could be the reason why cassava is sold at such a price.

Quantity of paddy sold by household heads

As contained in Table 21, the majority (63.2%) of the respondents who planted rice sold between 1 to 5 bags of rice (paddy). Only 8.9% of the farmers were able to sell more than 10 bags of paddy rice from their harvest.

Table 21: Quantity of Paddy sold by Household Head

Quantity of Cassava sold (in 50kg bag)	**Frequency**	**Percent**	**Cumulative percent**
≤5	43	63.2	63.2
6-10	19	27.9	91.2
11-15	5	7.4	98.5
16-20	1	1.5	100.0
Total	**68**	**100.0**	

Source: Field Data, 2014

Given that most rice produced is for subsistence purposes it is not surprising that very little domestic production finds itself on the open market. The findings show why Liberia is heavily dependent on imports for its staple food (rice) consumption. According to the World Bank (2010), one constraint is the under-use of fertilizers in rice production; incentives for farmers to use it are minimal because they are subsistence- orientated, not market-oriented—only about 7 percent of household production is sold, and the proportion of households that sell is only around 8.9 percent (9.3 percent in male-dominated households and 8.4 percent in female-dominated households).

Small-scale wholesalers of agricultural products are primarily small-scale farmers themselves, the majority being women, residing in rural villages and towns (Aeschliman & Wesseh, 2007). They try to increase their income by buying neighbors' 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 sells on a wholesale basis. Difficult access to markets, particularly in the rainy season, is a negative influence on production and income, as well as on the availability of foodstuffs (MOA, WFP, VAM Food Security Analysis, 2010).

Quantity of cassava sold by household

The majority (67.7%) of the households sold between 1 to 10 bags of cassava from their harvest. About 29.1% sold 20 to 50 bags (Table 22). Only 3.1% of the households sold above fifty bags of cassava.

Table 22: Quantity of Cassava sold by Household Head

Quantity of cassava (in 50 kg bag)	**Frequency**	**Percent**	**Cumulative Percent**
1-10	86	67.7	67.7
11-20	22	17.3	85.0
21-30	9	7.1	92.1
31-40	2	1.6	93.7
41-50	4	3.1	96.9
51 and above	4	3.1	100.0
Total	**127**	**100.0**	

Source: Field Data, 2014

Cassava is the second most important food crop in the Liberia, (MOA, FAO, UN, World Bank & IFAD, 2007). It is grown by a high proportion of rural households, but marketed by only a relatively small number. Cassava is grown by about 62 percent of the population. The findings in Table 22 support the MOGD and World Bank, (2010) report that only about 22 percent of households report selling fresh cassava and 17 percent report selling processed cassava.

Household heads main source of paddy

Table 23 contains findings on households' main source of paddy in the study area. The table shows that 40.5% of households get their paddy planting for from friends at no cost to them. About 5.2% of the households still depend on government/NGO for paddy rice to plant while 15.7% of households get their paddy for planting from their farms.

Table 23: Household Head Main Source of Paddy for Planting

Source of rice	Frequency	Percent	Cumulative Percent
Farmer's own seeds	24	15.7	15.7
Bought the seeds	59	38.6	54.2
Family/ friend	62	40.5	94.8
Government/NGO	8	5.2	100.0
Total	**153**	**100.0**	

Source: Field data, 2014

The finding in Table 23 is consistent with the Crop and Food Security Assessment report for Liberia (FAO/WFP, 2006). According to report, it is estimated that more than 50% of the farming population has not had access to seeds and tools provided by NGOs and UN agencies directly involved in the

agricultural sector. However, those who did not receive assistance have relied on their limited capacity to get their seeds from different sources including purchase, loans and donations from relatives.

Household heads main source of cassava cuttings

Table 24 presents findings on households' main source of cassava cuttings for planting. Around 41.5% of the households get cassava cuttings for planting from their own fields. About 14.2% of households are buying cuttings needed for planting while 13.6% still rely on government and or NGO for cassava cuttings for planting.

Table 24: Household Head Main Source of Cassava Cuttings

Source of cassava cutting	Frequency	Percent	Cumulative Percent
Farmer's own cuttings	70	41.4	41.4
Bought the cuttings	24	14.2	55.6
Family/friends	52	30.8	86.4
Government/NGO	23	13.6	100.0
Total	**169**	**100.0**	

Source: Field data, 2014

The findings in Table 24 confirm the finding of the United Nations Food and Agriculture Organization and the World Food Program Crop and Food Security Assessment report for Liberia (FAO & WFP, 2006) which estimated that more than 50% of the farming population have not had access to seeds and tools provided by NGOs and UN agencies directly involved in the agriculture sector. However, those who did not receive assistance have relied on their limited capacity to get their seeds from different sources including purchase, loans and donations from relatives.

Farmers' Perception of the Relevance of the Project

This objective sought to ascertain the perception of the beneficiary farmers on the relevance of the project in terms of its components. Tables 25 present farmers' perception of the relevance of the ASRP.

Table 25: Kendall's Coefficient of Concordance for Ranks (w)

Item (Inputs and Training)	Mean Rank	Ranked Position
Seed rice for planting	13.76	1
Cassava cuttings for planting	13.68	2
Training on rice production	13.11	3
Training on how to plant in line	13.11	4
Planting at some distance	12.58	5
Teaching farmers how to read and write	12.55	6
Training on cassava production	12.34	7
Training farmers how to plant cassava cuttings on mounds and ridges	12.00	8
Hoe(s) to farmers	11.84	9
Training on how to make mounds and ridges for planting cassava	11.71	10
Cutlass to farmers	11.63	11
The way Facilitators trained or helped other farmers	11.00	12
Training farmers on how to Planting rice in swamp (low lands)	10.55	13
Telling farmers the reason they should plant in swamp (low lands)	10.11	14
The way Facilitators were trained	10.11	15
Visits to other farmer's farm by Facilitator after training programs	10.00	16
Files to farmers	9.32	17
Chickens to farmers	9.13	18
Teach farmers about their rights	9.05	19

Table 25: Cont'd

Test Statistics	
N	19
Kendall's W	.169
Chi-Square	64.390
Df	20
Asymp. Sig	.000

Source: Field Data, 2014

The Kendall's Coefficient of Concordance for ranks (w) was run to calculate agreements between the respondents as they rank components of the project to determine its relevance (Appendix D). From the results, planting materials – paddy rice and cassava cuttings ranked first and second respectively as the most relevant of the components of the ASRP. Trainings on rice production and planting in line were third and fourth respectively. This was followed by planting at some distance, teaching farmers how to read and write, training on cassava production and training farmers how to plant cassava cuttings on mounds and ridges. Inputs (hoes to farmers) and training on how to make mounds and ridges for planting cassava ranked ninth and respectively. From the findings, it can be said that farmers in the study area lack sufficient planting materials and basic knowledge in the production of their staples.

The lack of access to planting materials (seeds) as established in the findings supports the submission of the CFSNS (2006) which pointed out that 53% of the farmers in the study area lack access to seeds. The need for trainings in the various aspects of production of the country's staples as ranked high by farmers contradicts the CFSNS (2006) report that only 1% of farmers in the study area lack training. Similarly, the results in Table 25 support the

submission of the (FOA/WFP, 2006) assessment report in which it is estimated that more than 50% of the farming population has not had access to seeds and tools provide by NGOs and UN agencies directly involved in agriculture.

The Kendall result shows that the components (Training and Inputs) had little effect in determining the relevance of the project. As depicted in the Kendall's W role of the Test statistics, about 17% (16.9%) of the respondents agreed with the ranking provided in Table 25. Though low, their levels of agreement is significant. Hence any effort to improve the components of the project should take into consideration these levels of relevance ranked. The Asymp. Sig value of .000 in the Test statistics signifies the test was significant.

Impact of the ASRP on Farmers' Livelihoods

This objective sought to assess the perceived impact of the ASRP on farmers' livelihoods. The Farmers were asked to indicate their opinions of their livelihoods after accessing the ASRP. Tables 26 to 30 present the results.

Financial Capital

The results show that respondents 'moderately agree' that the ASRP improved the financial capital of their livelihood ($\bar{X}_W$ =2.62; Table 26). The mean ranged from 3.22 to 1.32. The aspects of the respondents' financial capital which saw some improvement as a result *f* the ASRP's intervention were: 1. Increased income levels, 2. Ability to pay child/ children school fees and 3. Acquire of money to farming. Other aspects of their financial capital considered 'moderately improved' were saving of earnings from the sale of

farm produce, getting people to work on their farms and joining of 'susu'. Respondents considered their inability to acquire credit from financial institutions ($\bar{X}$ = 1.75) and getting insurance ($\bar{X}$ = 132) as the aspects of their livelihoods least impacted by the ASRP's intervention.

Table 26: Impact of the ASRP on Financial Capital as Perceived Respondents

Item	Level of Agreement (%)					Mean	Std. Dev.
	SA	A	MA	D	SD		
ASRP increase my income levels	21.1	28.4	15.8	21.1	13.7	3.2	1.36
ASRP helped me pay my child/children school fees.	26.3	17.9	17.9	23.2	14.7	3.18	1.43
ASRP helped me acquire money to do my farming.	19.6	19.6	14.8	31.2	14.8	2.98	1.38
ASRP helped me save the earnings from farm produce.	18.4	20.5	17.4	27.4	16.3	2.97	1.37
ASRP helped me pay people to work on my farm.	22.1	15.3	14.2	30.5	17.9	2.93	1.44

Table 27: Cont'd

ASRP helped me to join "susu" group.	19.0	19.6	7.9	27.5	25.9	2.78	1.49
ASRP helped me decrease my debt levels.	8.4	21.6	14.2	26.8	28.9	2.54	1.33
ASRP helped me receive credit from other people or "susu".	12.1	16.8	10.5	32.6	27.9	2.53	1.37
ASRP helped me acquire credit from financial institutions.	3.7	8.0	4.8	26.6	56.9	1.75	1.10
ASRP helped me get insurance	0.5	0.5	1.6	25.4	72.0	1.32	.59
Weighted mean						2.62	0.90

Scale: Strongly Agree (SA) =5, Agree (A) = 4, Moderately Agree = 3, Disagree (D) = 2, Strongly Disagree (SD) =1
n = 190
Source: Field Survey Data, 2014**.**

The CFSNS (2006) reported that 53% of farmers in the study area lack seeds (planting materials) and 1% lack training. It could be that the seed rice, cassava cuttings and training provide the farmers may have led to increased yield or surpluses enabling the farmers to sell the additional to generate income. The ASRP prioritised training in improved methods of planting rice

and cassava since the two are the Country's staple food and provision of inputs as a means of restoring farmers livelihoods after years of civil conflict.

The inability of farmers to acquire credits from financial institutions could be that organized access to credit is not yet available to the majority of the population. Informal savings clubs have always played a vital role at the community level where cash can be borrowed with an interest rate of around 25%. Such borrowing is the normal route for entrepreneurs to enter into petty trading (Republic of Liberia, 2008 - 2012).

Physical Capital

From the results the farmers 'disagree' that their physical capital had improved as a result of the ASRP in the study area ($\bar{X}_W$ =2.30; see Table 27). Even though their overall physical capital was not improved, they 'moderately agree' of having planting materials ($\bar{X}$ =3.82), farm tools (3.01) and electronic materials ($\bar{X}$ =2.69) as a result of participating in the ASRP. The standard deviation shows respondents differed in their views on impact on their physical capital.

Table 27: Impact of the ASRP on Physical Capital as Perceived by Respondents

Item	Levels of Agreements (%)					Mean	Std. dev.
	SA	A	MA	D	SD		
ASRP helped with planting materials.	25.8	28.4	10.5	18.9	16.3	3.28	1.45
ASRP helped me buy my own farm tools.	21.6	21.1	13.2	24.7	19.5	3.01	1.45

Table 27: Cont'd

ASRP helped me buy electronic materials (cell phone, radio).	15.8	21.1	8.9	25.3	28.9	2.69	1.47
ASRP helped me sell my farm produce in the market.	7.9	15.8	10.5	37.9	27.9	2.38	1.26
ASRP helped us have physical markets around for the sale of my farm produce	5.8	12.7	11.6	35.4	34.4	2.20	1.21
ASRP helped me build a house.	5.3	12.2	5.8	41.3	35.4	2.11	1.17
ASRP helped me to have access to vehicles for to transport my produce to the market for sale	1.1	15.9	10.6	33.3	39.2	2.06	1.11
ASRP helped me rent a house from the proceeds of my produce	5.8	8.9	2.6	44.2	38.4	1.99	1.14

Table 27: Cont'd

ASRP helped me have access to agro-chemicals	2.6	11.1	5.8	38.4	42.1	1.94	1.08
ASRP helped me have access to good roads.	1.1	6.9	11.1	36.5	44.4	1.84	.95
ASRP helped me buy agro-chemicals	3.2	7.9	4.2	36.3	48.4	1.81	1.05
Weighted mean						2.30	0.75

n=190. Scale: Strongly Agree (SA) =5, Agree (A) = 4, Moderately Agree = 3, Disagree (D) = 2, Strongly Disagree (SD) =1

Source: Field Data, 2014**.**

According to CFSNS (2006), about 53% of the farmers in the study area lack access to seeds (planting materials), while 5% lacking access to basic farm tools. No wonder why they considered the planting materials and farming tools as improvement to their physical capital. The ASRP sought to support rural families improve their productive livelihood through the restoration of agricultural productive capacity. By this, the participants were provided planting materials.

The aspect of the farmers' physical capital least improved based on the results were access to good roads (mean = 1.84) and agro-chemicals (mean = 1.81). Road network in Liberia has always been a problem. The situation deprives a majority of the region from development, makes accessing health

care and education a strenuous task, and limits essential business and farm commerce (Ministry of Planning and economic Affairs and Internal Affairs, 2008). This, in turn, leads to the underutilization of resources in the region.

Human capital

The results in Table 28 show that the ASRP 'moderately' improve the human capital of farmers who participated in the project ($\bar{X}_W$ = 2.93; see Table 28). The mean ranged from 4.00 (knowledge in cassava production) to 1.85 (enjoy free health care services). The respondent generally 'agreed' that their knowledge in cassava production has been improved as a result of the ASRP's intervention ($\bar{X}$ = 4.00). The respondents also 'moderately agreed' that their knowledge in rice production ($\bar{X}$ = 3.28), access to labour ($\bar{X}$ =3.17), and their physical ability to undertake farming activities ($\bar{X}$ =3.17) have all improved as a result of the ASRP in the study area. Table 26 also shows that as a result of the ASRP's intervention in the study area, respondents' ability to pay for labour ($\bar{X}$ =2.98 and access to private extension service ($\bar{X}$ = 2.63) have 'moderately' been improved.

Table 28: Impact of the ASRP on Human Capital as Perceived by Respondents

Item	Levels of Agreements (%)					Mean	Std. Dev.
	SA	A	MA	D	SD		
ASRP gave me knowledge in cassava production.	42.6	36.8	3.7	11.6	5.3	4.00	1.19
ASRP gave me knowledge in rice production.	26.3	31.6	5.3	17.4	19.5	3.28	1.50

Table 28: Cont'd

ASRP helped me have access to labour.	20.6	23.3	18.0	28.6	9.5	3.17	1.314
ASRP helped me be physically fit to undertake my farming activities	23.7	30.0	8.9	13.7	23.7	3.16	1.52
ASRP helped me pay for labour.	20.0	16.3	20.5	28.4	14.7	2.98	1.36
ASRP helped me have access to private extension services.	20.0	6.3	13.2	37.9	22.6	2.63	1.42
ASRP helped me have access to Public Ext. service.	13.8	9.5	9.0	34.4	33.3	2.36	1.39
ASRP helped me enjoy free health care services.	2.6	10.5	5.8	31.1	50.0	1.85	1.09
Weighted mean						2.93	0.92

Scale: Strongly Agree (SA) =5, Agree (A) = 4, Moderately Agree = 3, Disagree (D) = 2, Strongly Disagree (SD) =1
n =190
Source: Field Survey Data, 2014

The 'moderate' improvement in the human capital of the respondents may be as result of training of participants which the ASRP prioritised. Training which was to support rural families improve their livelihood through agricultural productive capacity. Every group, Community/Town had a

facilitator trained in improved methods of planting rice and cassava. This facilitator in return trained members of his group, Community/ town. The standard deviations show respondents varied in their views on impact on their human capital.

Social capital

The means in Table 29 show that respondents generally perceived that the livelihood impact of the programme on the various categories of their social capital as we as the impact on social capital as a whole was 'moderate' ($\bar{X}_W$ =2.86). The exceptions were support from political parties ($\bar{X}$ = 2.13) and NGOs/government ($\bar{X}$ = 1.28) where respondents 'disagree' and 'strongly disagree' respectively.

Table 29: Impact of the ASRP on Social Capital as Perceived by Respondents

Item	Levels of Agreement (%)					Mean	Std. Dev.
	SA	A	MA	D	SD		
ASRP gave me the ability to feed my family members.	36.0	33.3	12.7	9.0	9.0	3.78	1.27
ASRP helped me to support community activities.	19.6	36.0	21.7	15.9	6.9	3.46	1.17
ASRP helped me to support family members	23.1	29.0	19.9	18.8	9.1	3.38	1.28

Table 29: Cont'd

ASRP helped me belong to a Farmers' group.	18.0	37.0	10.1	20.6	14.3	3.24	1.35
ASRP helped me get help from farmers' group members.	11.1	30.7	16.9	22.8	18.5	2.93	1.31
ASRP helped me get support from my family members.	17.0	22.9	13.8	28.7	17.6	2.93	1.38
ASRP helped to trust the members of my farmer group	11.6	29.6	15.9	22.8	20.1	2.90	1.34
ASRP helped to trust the members of my farmer group	11.6	29.6	15.9	22.8	20.1	2.90	1.34
ASRP helped me support farmers' group members	9.6	24.5	20.7	25.5	19.7	2.79	1.28
ASRP helped me receive support from farmers' group members	8.0	23.5	18.2	27.3	3.0	2.66	1.28

Table 29: Cont'd

ASRP helped me get support from NGO/Government	7.4	14.8	10.1	18.5	49.2	2.13	1.36
ASRP helped me receive support from political parties.			1.6	25.0	73.4	1.28	0.49
Weighted mean						2.86	0.81

Scale: Strongly Agree (SA) =5, Agree (A) = 4, Moderately Agree = 3, Disagree (D) = 2, Strongly Disagree (SD) =1
n = 190

Source: Field Survey Data, 2014

The standard deviations (mostly more than 1) indicate that respondents differed in their views on impact on their social capital. The farmers were more in agreement in their views on support from political parties.

Natural Capital

Table 30 shows mean impact of the ASRP on natural capital as perceived by beneficiaries.

Table 30: Impact of the ASRP on Natural Capital as Perceived by Respondents

Item	**Levels of Agreements (%)**					**Mean**	**Std. Dev**
	SA	**A**	**MA**	**D**	**SD**		
ASRP helped me have access to better planting materials.	24.9	29.1	22.2	14.8	9.0	3.46	1.26

Table 30: Cont'd

ASRP helped increase yield per acre.	17.5	30.2	28.0	13.2	11.1	3.30	1.22
ASRP helped me have access to land for farming.	12.2	33.9	6.9	28.0	19.0	2.92	1.37
ASRP helped me owned land for farming.	11.2	13.3	4.8	34.0	36.7	2.28	1.37
Weighted mean						2.99	0.90

Scale**:** Strongly Agree (SA) =5, Agree (A) = 4, Moderately Agree = 3, Disagree (D) = 2, Strongly Disagree (SD) =1
n= 190
Source: Field Data, 2014

The mean in Table 30 shows that respondents generally perceived that the level of impact of the programme on various aspects of their natural capital to be 'moderate' ($\bar{X}_W$ = 2.99). The results in the table show that every aspect of respondents' natural capital of their livelihoods was improved. The only exception was ASRP helped me to own land for farming ($\bar{X}$ = 2.28). The standard deviation (0.9) show farmers differed in their views on impact on their natural capital.

Ranking of the Livelihood Capitals

Table 31 shows the mean ranks of the five (5) main facets of farmers' livelihood examined in the study. The results show that impact on natural capital ($\bar{X}_{W=}$ 3.56) of ASRP participants was most impacted by the

intervention of the project. Human capital ($\bar{X}_W$ = 3.41) and social capital ($\bar{X}_W$ =3.35) 'moderately' impact the livelihoods of project beneficiaries. Physical capital ($\bar{X}_W$ = 1.96) was the least of the livelihood capitals of ASRP participants improved as a result of the project's intervention. High impact on natural capital seems to imply that farmers are likely to use profit from their farms to buy inputs that would help them sustain their farms then to use it advancing other aspects of livelihood. Livelihood was generally moderate but not as high as they anticipated in terms of livelihood measured.

Table 31: Friedman Test of Mean Ranking Table

Variable	**Mean Rank**	**Ranked Position**
Natural capital	3.58	1
Human capital	3.41	2
Social capital	3.35	3
Financial capital	2.69	4
Physical capital	1.96	5
Weighted mean	2.99	
Test Statistics[a]		
N	168	
Chi-Square	1839.668	
Df	44	
Asymp. Sig.	.000	
a. Friedman Test		

n = 190. Scale: Strongly Agree (SA) =5, Agree (A) = 4, Moderately Agree = 3, Disagree (D) = 2, Strongly Disagree (SD) =1N = 190
Source: Field Data, 2014

The ranking of natural capital as the first among the livelihood capitals can be attributed to the fact that the ASRP provide farmers with quality planting materials. The high quality planting materials thus contributed to

increased yields per acre. Increase in farmers' yields lead to the farmers having enough for his/her family and to sell. The income generated from the sales contributes to farmers maintaining or having access to land for cultivation.

Human capital ranked second among the livelihoods capitals that impacted the beneficiaries most. This can attributed to knowledge/training on cassava and rice production. Cassava and rice are the staple food of Liberian. Any attempt to help farmers to gain more knowledge or improve their livelihoods on the basis of these two crops will be welcome by farmers. Access to labour also had impact on the beneficiaries. In order to plant cassava cuttings or rice using the methods introduced by the ASRP, labour had to be provided. Mounds and ridges making to plant cassava on needed people. Human capital also impacted on the physical ability of farmers. In order to get the most of the planting methods thought farmers, they had to be fit physically in applying/using the planting methods.

The third ranked livelihood capital was social capital. This can be credited to the fact that the ASRP provided farmers with high yielding planting materials that increased their yields thus giving farmers the ability to feed their families. The high yielding planting materials which translated into increased yields for farmers meant that they could sell some of their produce. This gave the farmers extra cash which they used to support other obligations such as supporting other family members and their community. Social capital also impacted farmers by helping them belong to farmers' group. Every twenty farmers were considered a distinct group with its own leadership. The groupings helped built trust among group members and support one another.

From the findings, financial capital ranked fourth among the livelihood capitals that impacted farmers' livelihoods most. This is ascribed to the fact that farmers had their income levels increased from the sale of their produce as there was increased in yields. The increased yield can be credited to high quality planting materials and planting methods taught by the ASRP. As a result of increased in their income levels, farmers were able to pay school fees for their children, do their farming, and save some money from their sales.

Physical capital ranked least among the livelihood capitals that impacted the livelihoods of farmers. For physical capitals, farmers could only boast of the ability to buy and own farm tools and having planting materials as a result of the ASRP's intervention. These are essential for farmers to be able to farm as one must have the basic tools and planting materials needed. Having quality planting materials available to farmers was one of the major problems that the ASRP sought to eliminate after years civil war. Having access to agro chemicals was something the ASRP did not encourage for fear that the farmers may not be able to them after the project ends.

The overall impact of the ASRP on the livelihoods of farmers in the study area was perceived as 'moderate' ($\bar{X}_W$ = 2.99). The significant value-0.000 (in the Asymp. Sig. role of Table 29) which is well below 0.05, indicates that the test is significant.

Socio-economic Characteristics of Farmers Influencing their Perception of the Relevance of the ASRP

Socio-economic characteristics can influence farmers' perception of the relevance of project components and impact, though the variance may be

small. Regression analysis was run to evaluate the socio-economic characteristics of farmers' perception of the relevance of the ASRP. Table 32 presents multiple regression on the Socio-economic characteristics of farmers influencing their relevance of the ASRP.

Table 32: Multiple Regression of Selected Socio-economic Characteristics of Farmers influencing their Perception of the Relevance of the ASRP

Explanatory Variables	**Unstandardized Coefficients**		**t**	**Sig.**
	B	**Std. Error**		
(Constant)	4.195	.168	24.912	.000
Household size	.012	.012	.999	.319
Educational level of respondent	.051	.036	1.399	.164
Alternative sources of income	-.129	.043	-3.009	.003
Years in farming	-.003	.003	-1.088	.278
Total land size	-.062	.033	-1.846	.006
Production type	.139	.075	1.853	.066
R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	
.324[a]	.105	.071	.45031	

n=190,

Source: Field Survey Data, 2014

Regression equation (from the unstandardized Beta coefficient)

$Y = 4.195 + 0.012X_1 + 0.051X_2 – 0.129X_3 – 0.003X_4 – 0.062X_5 + 0.139X_6$

If B=0 then Y= 4.195

Relevance of ASRP = 4.195 + 0.012Household size + 0.051educational level – 0.129alternative sources of income – 0.003years in farming – 0.062total land size +0.139production type.

The results in Table 32 indicate that six (6) significant independent variables were entered with the relevance of the ASRP as the dependent

variable. The independent variables were household size, educational level of respondent, alternative sources of income, years in farming, total land size, and the production type. From the results in Table 32, it was observed that the six independent variables accounted for 10.5% (refer to the R Square column in Table 32). There might be many factors that can explain this variation, but the model can explain approximately 10.5% of it. This means that 89.5% of the variation in Socio-economic determinants of beneficiary farmers' perception of the relevance of the ASRP cannot be explained by the socio-economic determinants. Therefore, there must be other variables that have an influence also.

From the results in Table 32, it was observed that alternative sources of income are the overall best predictor of the independent variables entered (see Sig column of Table 30). Though considered the overall best predictor, the 'B' value (see Unstandardized Coefficients column of Table 32) shows that the ASRP beneficiaries were engaged in a number of other actives to meet their livelihoods.

This finding has an important implication for farm production decisions by the households. The dependence of farm families on farming as the predominant occupation may have a positive or negative effect on agricultural production, depending on the availability and allocation of household resources. In a situation where farm families have capital constraints due to low income from farming, there is likely to be heavy reliance on family labor and low input technology to carry out farming operations. Consequently, in the event of crop failure or low yields from

crops, farm families are likely to be faced with the problem of food insecurity arising from unavailability or limited access to sufficient food.

According to Amaza *et al*. (2009), in sub-Saharan Africa, it is common for some farm household members to engage in other nonfarm occupations to complement their earnings from farming. A study by Herbert (1996) in Burundi also revealed that there is a tendency towards income diversification through extra-agricultural activities which complement farming.

Socio-economic Characteristics of Farmers Influencing their Perception on Livelihood Impact of the ASRP

Regression analysis was run to determine the socio-economic characteristics of farmers' livelihood impact of the ASRP. In all seven significant independent variables were entered with livelihood impact from the ASRP as the dependent variable. The independent variables were household size, educational level of respondent, alternative sources of income, years in farming, total land size, production type and age of respondent. The Dependent variable was the livelihood impact from the ASRP. Table 33 summarizes the result of the regression computed for the socio-economic determinants of beneficiary farmers' livelihood impact of the ASRP.

Table 33: Multiple Regression of Selected Socio-economic Characteristics of Farmers influencing their Perception of Livelihood Impact of the ASRP

Explanatory Variables	Unstandardized Coefficients		T	Sig.
	B	Std. Error		
(Constant)	2.846	.303	9.397	.000
Household size	.017	.017	.990	.324
Educational level of respondent	.061	.052	1.177	.241
Alternative sources of income	-.107	.061	-1.753	.082
Years in farming	-.009	.006	-1.362	.175
Total land size	-.087	.048	-1.822	.070
Production type	.388	.107	3.624	.000
Age of respondent	-.009	.006	-1.398	.164

R	R Square	Adjusted R Square	Std. Error of Estimate
.438[a]	.192	.156	.64000

n=190

Source: Field Survey Data, 2014

The regression equation (from the unstandardized Beta coefficient)

$Y = 2.846 + 0.017X_1 + 0.061X_2 – 0.107X_3 – 0.009X_4 – 0.087X_5 + 0.388X_6 – 0.009X_7$

If B=0 then Y= 2.846

Livelihood impact from the ASRP= 2.846 + 0.017household size + 0.061educational level of respondent – 0.107alternative sources of income – 0.009years in farming – 0.087total land size + 0.388production type – 0.009age of respondent.

The results in Table 33 indicate that the ASRP accounted for 19.2% (see R square column of Table 33) of the variations in beneficiary farmers'

livelihoods impact of the project. In other words, if we are trying to explain the impact of the ASRP, we look at the variation in the various socio-economic characteristics. There might be many factors that can explain this variation, but the model can explain approximately 19.2% of it. This means that 80.8% of the variation in Socio-economic determinants of beneficiary farmers' livelihood impact of the ASRP cannot be explained by the socio-economic determinants. Therefore, there must be other variables that have an influence also. The unexplained variations in the socio-economic determinants of beneficiary farmers' livelihood impact of the ASRP can be attributed to possible variables not included in the study.

From the results in Table 33, it was observed that production type is the overall single best predictor of the independent variables entered.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents the summary, conclusions and recommendations of the study. Areas for further research are also suggested in this chapter.

Summary

The agricultural sector in Liberia is a strategic industry which accounts for employment of nearly 70% of the economically active population, and over 90% of total exports (MOA, 2008). The ASRP is one of the policy interventions by government to address the issue of food insecurity.

The purpose of the study was to evaluate farmers' perceived impact of the Agricultural Sector Rehabilitation project on their livelihoods in Careysburg and Todee districts, Liberia. The study sought to describe the socio-economic characteristics of farmers who participated in the project, ascertain the perceptions of beneficiaries on the relevance of the ASRP and examine the perceived levels of impact of the ASRP on the livelihoods of farmers. The study also sought to determine the socio-economic characteristics of farmers influencing their perception of the relevance of the ASRP and the socio-economic characteristics of farmers influencing their perception on livelihood impact of the ASRP.

Descriptive research design was used for the study. One hundred and ninety farmers who benefitted from the project took part in the study. Both

closed and open-ended questionnaire items were used to elicit responses from the farmers. The data collected from the questionnaires were analyzed using SPSS version 20 software. The summary of the major findings based on the specific objectives of the study are given in the following paragraphs.

With regard to the description of socio-economic characteristics of the farmers, the study revealed that most of the farmers were females between 30 to 49 years old who were mostly married. A greater portion of the ASRP participants had household size of more than three people and had little or no formal education. It was also revealed that majority of the farmers were engaged in gardening apart from rice and cassava farming which were their main source of income. Most of the respondents were small-scale farmers for at least ten years with farm size less than 0.5ha in both rice and cassava cultivation. Average paddy rice yields of farmers were about 4.08mt/ha while average cassava yield was 1.04mt/ha. The study also revealed that most of the farmers (84.3% rice farmers and 59.6% cassava farmers) were still dependent on others sources for their planting materials.

Result of the study on farmers' perception of the relevance of ASRP revealed that a greater percentage (83%) felt the key components (inputs provision and training) were not relevant to their needs. Only 17% of the respondents felt the components of the ASRP were relevant to their needs. The components seen as most relevant by respondents to their needs were paddy rice for planting ($\bar{X}$ = 13.76), cassava cuttings for planting ($\bar{X}$ = 13.68), training on rice production ($\bar{X}$ = 13.11), training on how to plant in line ($\bar{X}$ = 13.11) and planting at some distance ($\bar{X}$ = 12.58). The least ranked of the components considered relevant to farmers needs were teaching farmers on

their rights ($\bar{X}$ = 9. 05), chickens to farmers ($\bar{X}$ = 9.13) and files to farmers ($\bar{X}$ = 9.32).

In terms of the levels of impact of the ASRP on farmers' livelihoods, the study revealed that the ASRP 'moderately' (X_w = 2.99) improved the livelihood of those who participated in the ASRP. Of the livelihood capitals of farmers most impacted by the ASRP's intervention was natural capital ($\bar{X}$ = 3.58). This can be credited to quality planting materials provided the farmers. Human ($\bar{X}$ = 3.41) and social ($\bar{X}$ = 3.35) capitals were second and third respectively. Knowledge or training in cassava and rice production contributed a lot to the aspect of human capital. Physical capital was the least of the livelihood capitals improved by the ASRP's intervention ($\bar{X}$ = 1.96).
The study found out that the socio-economic factors of farmers accounted for 10.5% of the variations of farmers' perception of the relevance of the ASRP. Alternative sources of income were observed to be the overall best predictor of the farmers' perception of the relevance of the ASRP.

In finding out the socio-economic characteristics of farmers' livelihoods influencing their perception on the impact of the ASRP, the study revealed that the ASRP accounted for 19.2% of the variations in beneficiary farmers' livelihoods impact of the project. Production type (planting both rice and cassava) of farmers was the overall best predictor of farmers' perception on livelihood impact of the ASRP.

Conclusions

Based on the findings of the study, it can be concluded that:

1. The farmers, who participated in the ASRP in the study area, were mainly subsistence, smallholder producers operating on less than 0.5ha for rice and cassava. The yields of farmers who participated in the ASRP were low (for rice and cassava).
2. The farmers had low educational levels and large household sizes and did not solely depend on rice and cassava cultivation for their livelihood.
3. Most (83%) farmers engaged in the ASRP saw the components of the ASRP not to be relevant. However, they were of the view that seed rice (paddy) for planting ($\bar{X}$ = 13.76), cassava cuttings for planting ($\bar{X}$ = 13.68), training on rice production ($\bar{X}$ = 13.11), training on how to plant in line ($\bar{X}$ = 13.11) and planting at some distance ($\bar{X}$ = 12.58) were the most relevant components of the ASRP.
4. The ASRP's interventions in the study area 'moderately' ($\bar{X}_w$= 2.99) impacted the livelihoods of farmers who participated in the programme. Natural capital ($\bar{X}$ = 3.58) of the livelihood capitals of farmers was most impacted by the ASRP's intervention. Of the farmers' livelihood capital, physical capital was least impacted as a result of the ASRP's involvement in the study area ($\bar{X}$ = 2.30).
5. Other income generating activities of farmers increase the relevance of the ASRP.
6. Farmers' production type (planting both rice and cassava) increase their perception of the impact of the ASRP.

Recommendations

Based on the conclusions of the study, the following are recommended to improve the ASRP.

1. That the ASRP increase farmers' access to improved planting materials and methods of planting to increase their yields.
2. That adult literacy programmes be intensified to help improve the literacy levels of farmers.
3. That the ASRP intensify sensitization of farmers on the components of the project by holding town hall meetings with stakeholders.
4. That the ASRP pay more attention to improving the physical capital of farmers' livelihood by facilitating access to land for farming.
5. That the ASRP encourage farmers to engage into other income generating activities.
6. The ASRP should encourage farmers to plant rice and cassava by providing both paddy and cassava cuttings.

Suggestions for Further Research

Due to the significance of agriculture to the Liberian economy, the following suggestions are made for further research to improve the knowledge provided by this study.

1. Further studies on farmers' perception of the relevance of the components of the ASRP should be conducted.

2. Further studies should be conducted to help explain other factors influencing farmers' perception of the relevance of the ASRP since the model could account for only 19.2% of the variance.
3. Further studies should be conducted to help explain other factors influencing farmers' perception on livelihood impact of the ASRP.

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APPENDICES

APPENDIX A

QUESTIONNAIRE FOR ASRP FIRST YEAR BENEFICIARIES

Structured Interview for first year beneficiaries of the Agricultural Sector Rehabilitation Project (ASRP) in Careysburg and Todee Districts, Montserrado County

Dear Respondent,

You have been selected to participate in the study which aims at determining the impact of the Agricultural Sector Rehabilitation Project (ASRP) on the livelihoods of farmers in your area. The research is being conducted as part of a Master of Philosophy (M.Phil.) Study at the University of Cape Coast. All information you give will be treated strictly as confidential. The information will be analyzed and used for the purpose for which it is collected. Your co-operation is highly needed and will be greatly appreciated.

Thanks for your willingness to participate.

PART I

SOCIO-ECONOMIC CHARACTERISTICS OF BENEFICIARY FARMERS

Please provide answers which best describe your situation. Tick (√) in the boxes or write on the space provided below

DATE: _____

1. Town/community_____

2. Sex of respondent: (a) Male ( ), b. Female ( )

3. Age of respondent in years.....

4. Marital status of respondent: a. Single ( ) b. Married ( )

c. Separated ( )

d. Divorced ( ) e. Widowed ( )

5. Number of dependent(s) in respondent's household_____

6. Educational level of respondent (a) No formal education ( ) (b) Primary school ( ),

(c) Junior high school ( ) (d) Senior high school ( ) (e) University ( )

7. Apart from rice and cassava farming give three other things that bring income to your household i_____ ii_____ iii_____

8. How many years have you been in farming? _____

9. What was your land size for rice production last season? _____ha

10. What was your land size for cassava production for last season? _____ha

11. What is the total land size for agricultural production? _____ha

12. What was your yield (in 50kg bag) for rice for last season? _____

13. What is the price of seed rice in 50kg bag? _____

14. How many bags of seed rice (in 50 kg bag) did you sell from your last season harvest? _____

15. What was your yield (in 50kg bag) for cassava for last season? _____

16. What is the price of cassava in 50kg bag? _____

17. How many bags (in 50kg bag) of cassava did you sell from your last season farm? _____

18. Main source of seed rice for planting?

a. Farmers own seeds ( ) b. Bought the seeds ( ) specify _____

c. Family/friends ( ) d. Government/NGO ( )

19. Main source of cassava cuttings for planting?

a. Farmers own cuttings ( ) b. Bought the cuttings ( ) specify _____

c. Family/friends ( ) d. Government/NGO ( )

APPENDIX B

ASCERTAIN BENEFICIARY FARMERS' PERCEPTION ON THE RELEVANCE OF THE PROJECT IN TERM OF ITS COMPONENTS

Please indicate first whether or not you benefitted the following under listed items provided by the ASRP by ticking (√) YES or NO. If YES please indicate the extent to which the following under listed items provided by the ASRP were relevant to you by ticking in the space to the right of the statement using the following ratings:

Very Relevant (VR) =5 Relevant (R) =4 Moderately Relevant (MR) =3

Irrelevant (IR) =2 Very Irrelevant (VIR) =1

	Items	**Response**		**Extent of Relevance**				
		Yes	**No**	**5 VR**	**4 R**	**3 MR**	**2 IR**	**1 VIR**
1	Seed rice for planting							
2	Cassava cuttings for planting							
3	Cutlass to farmers							
4	Hoe(s) to farmers							
5	Files to farmers							
6	Chickens to farmers							
7	Sheep or goat to farmers							
8	Training on rice production							
9	Training on cassava production							

10	Training on how to make mounds and ridges for planting cassava							
11	Visits to other farmer's farm by Facilitator after training programs							
12	Training farmers how to plant cassava cuttings on mounds or ridges							
13	Telling farmers the reason they should plant in swamp (low lands)							
14	Training farmers on how to Planting rice in swamp (low lands)							
15	Training on how to planting in line							
16	Planting at some distance							
17	The way Facilitators were trained							
18	The way Facilitators trained or help other farmers							
19	Training on how to take care of their chickens							

20	Teaching farmers how to read and write							
21	Teaching farmers about their rights							

APPENDIX C

PERCEIVED IMPACT OF THE AGRICULTURAL SECTOR REHABILITATION PROJECT ON FARMERS LIVELIHOODS

Please indicate the extent to which the following under listed aspects of your livelihood have been improved as a result of the ASRP by ticking under the number to the right of the statement using the following ratings:

Strongly Agree (SA) =5, Agree (A) = 4 Moderately Agree (MA) =3, Disagree (D) =2 Strongly Disagree (SD) = 1

	Financial capital	**Level of Agreement**				
		5 SA	**4 A**	**3 MA**	**2 D**	**1 SD**
1	ASRP increase my income levels					
2	ASRP helped me decrease my debt levels.					
3	ASRP helped me receive credit from other people or “susu”.					
4	ASRP helped me to join “susu” group.					
5	ASRP helped me acquire credit from financial institutions.					
6	ASRP helped me save the earnings from farm produce.					
7	ASRP helped me get insurance.					
8	ASRP helped me pay my child/children school fees.					
9	ASRP helped me acquire money to do my					

	farming.					
10	ASRP helped me pay people to work on my farm.					
	Physical capital	**5 SA**	**4 A**	**3 MA**	**2 D**	**1 SD**
1	ASRP helped me build a house.					
2	ASRP helped me rent a house from the proceeds of my produce.					
3	ASRP helped me buy electronic materials (cell phone, radio).					
4	ASRP helped me buy my own farm tools.					
5	ASRP helped me to have access to vehicles for to transport my produce to the market for sale.					
6	ASRP helped with planting materials.					
7	ASRP helped me sell my farm produce in the market.					
8	ASRP helped me have access to agro-chemicals.					
9	ASRP helped me buy agro-chemicals.					
10	ASRP helped me have access to good roads.					
11	ASRP helped us have physical markets around for the sale of my farm produce.					

	Human capital	**5 SA**	**4 A**	**3 MA**	**2 D**	**1 SD**
1	ASRP gave me knowledge in rice production.					
2	ASRP gave me knowledge in cassava production.					
3	ASRP helped me have access to labour.					
4	ASRP helped me pay for labour.					
5	ASRP helped me have access to Public Ext. service.					
6	ASRP helped me have access to private extension services.					
7	ASRP helped me enjoy free health care services.					
8	ASRP helped me be physically fit to undertake my farming activities.					
	Social capital	**5 SA**	**4 A**	**3 MA**	**2 D**	**1 SD**
1	ASRP helped me belong to a Farmers' group.					
2	ASRP helped me get help from farmers' group members.					
3	ASRP helped me support farmers' group members.					
4	ASRP helped me receive support from					

	farmers' group members.					
5	ASRP helped me get support from my family members.					
6	ASRP helped me to support community activities.					
7	ASRP helped me to support family members					
8	ASRP helped to trust the members of my farmer group.					
9	ASRP helped me receive support from political parties.					
10	ASRP helped me get support from NGO/Government					
11	ASRP gave me the ability to feed my family members					
	Natural capital	**5 SA**	**4 A**	**3 MA**	**2 D**	**1 SD**
1	ASRP helped me have access to land for farming.					
2	ASRP helped me owned land for farming.					
3	ASRP helped increase yield per acre.					
4	ASRP helped me have access to better planting materials.					
5	ASRP helped have access to water bodies/ rain for farming.					

APPENDIX D

FARMERS' PERCEPTION OF THE RELEVANCE OF THE ASRP

Item	N	Extent of Agreement (%)					Mean	Std. Dev
		VR	R	MR	IR	VIR		
Seed rice for planting	110	53.6	38.2	6.4	1.8		4.4364	.69767
Cassava cuttings for planting	155	55.5	36.8	6.5	0.6	0.6	4.4581	.70470
Cutlass to farmers	150	52.7	38.0	8.0	0.7	0.7	.4133	.72526
Hoe(s) to farmers	138	52.9	37.0	9.4	0.7		4.4203	.69210
Files to farmers	78	43.6	33.3	17.9	1.3	3.8	4.1154	1.00622
Chickens to farmers	162	34.0	38.9	19.1	4.9	3.1	3.9568	1.00526
Sheep or goat to farmers	55	14.5	21.8	34.5	21.8	7.3	3.1455	1.14533
Training on rice production	12	35.7	3.6	.8		.9	.2321	69726
Training on cassava production	59	.4	.2	2	6	6	4.3208	. 70550
Training on how to make mounds and ridges for planting								

cassava	59	.7	.3	3.8	.6	.6	4.2767	77060
Visits to other farmer's farm by Facilitator after training programs	53	5.5	4.4	6.1	.0	.0	3.8954	.87482
Training farmers how to plant cassava cuttings on mounds or ridges	58	3.7	6.8	.6	.6	.3	4.3101	.74784
Telling farmers the reason they should plant in swamp (low lands)	21	3.0	9.7	6.5		.8	4.2397	.78554
Training farmers on how to Planting rice in swamp (low lands)	14	43.9	7.7	7.5		.9	4.2368	.80158
Training on how to planting in line	149	6.2	9.0	2.8	.3	.7	4.1879	.75667
Planting at some distance	50	2.0	2.0	4.0	.2		4.1400	.72380
The way Facilitators were trained	50	2.7	2.0	8.7	.3	.3	3.7933	.89964
The way Facilitators trained								.

or help other farmers	49	2.1	9.6	9.5	.4	.3	3.7383	93285
Training on how to take care of their chickens	14	2.6	9.7	2.1	.1	.5	4.1560	. 96572
Teaching farmers how to read and write	22	0.8	9.3	.6	.8	.4	4.2541	1.07996
Teach farmers about their rights	16	44.8	88.8	.0	.9	.4	4.1466	1.04052

Source: Field Survey Data, 2014. Very Relevant (VR) =5, Relevant (R) = 4, Moderately Relevant (MR) = 3, Irrelevant (IR) = 2, Very Irrelevant (VIR) =1