

FOOD SECURITY –THE ROLE OF EXTENSION

Institution: - University of Liberia

Department: - Agriculture Extension

Course: - Food Security

Level: - Undergraduate students

Term: - 1 semester (year 1)

Credit Hours: - 3

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- **Learning Objectives**

At the end of the course students will be able to:

- Define what is food security and food insecurity
- Identify emerging challenges of food security
- Analyze the relationship among food security, the society, agriculture activities and the environment.
- create output of professional extension quality related to food security
- Understand the linkage between extension agents and the farmers in relation to food security.

OUTLINE

- **Introduction**
 - I. Definition
 - II. Importance
 - III. Background
- **Global effort towards improving food security**
 - I. United Nation (UN)
 - II. Food and Agriculture Organization
 - III. West Africa
- **The role of extension in improving food security in Liberia**
 - I. The Government

- II. NGOs
 - III. Teaching Institutions
 - IV. Extension Agents
 - V. Farmers
- **Factors affecting food security in Liberia**
 - I. Food unavailability
 - II. Poor roads network (poor market integration and high prices in remote areas)
 - III. Low education levels
 - IV. Poor sanitation
 - V. Rapid population growth
 - VI. Inadequate health system
 - VII. Lack of financial support to the agriculture sector
 - VIII. Land tenure system
 - IX. Climate change
 - **The level of food insecurity in Liberia**
 - **Measures in improving food security**
 - I. Good governance and policy reform (subsidies) to the agriculture sector
 - II. Access to relevant knowledge, information and training
 - III. Improving nutrition and health issues
 - IV. Open trade flows and effective markets
 - V. Expansion of employment/ work opportunity
 - VI. Good road network
 - VII. Provision of adequate training
 - **Reference Books**
 - **Evaluation**

Class room exercise-----Assignments, Oral questions, Test and Presentation.

Field practices-----field interview with the farmers (on the availability of food in 4 counties).

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Introduction

The course material “Food Security” for agriculture students has been prepared for students who are studying agriculture extension. This literature will help the students acquire an understanding of food security and the emerging challenges the country’s is being faced with. The course note will also enable students understands the role of extension in improving food security. The topics are intended to deepen the understanding of food security and foster an appreciation of the contributions of extension services in shaping the minds of society members.

Amongst the many reasons why an understanding of food security is important is the fact that agriculture production which is major factor to eradicating food insecurity in Liberia is still largely in the hands of farmers who rely mostly on traditional production techniques. Provide training and practical support to these farmers needs training in agricultural best practices to increase their productivity in a sustainable way. Agriculture students leaving the university will have adequate knowledge on the importance of improving food security and they will serve as extension agents to build farmers capacity in utilizing improve crop and animal production techniques.

IV. Definitions

Food security refers to the availability of food and one's access to it. It exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life.

Food insecurity exists when people do not have adequate physical, social or economic access to food.

Food Availability: Sufficient quantities of appropriate, necessary types of food from domestic production, commercial imports, or donors, are consistently available to individuals, are in reasonable proximity to them, or are within their reach.

Food Utilization: It is when food is properly used and many suitable techniques are employed for storage.

Undernourishment: It is the lack of sufficient calories in available food, in that one has little or no ability to move or work.

Malnourishment: is the lack of specific components of food such as proteins, vitamins or essential components. It is possible to have excess food and still suffer from malnourishment due to nutritional imbalance caused by a lack of specific dietary components.

V. Background

The global community often uses the term “food security” to describe not only the availability of food, but the ability to purchase food. On September 14, 2010, the Food and Agriculture Organization of the United Nations (FAO) published its estimates concerning the number of people suffering from hunger in 2010: 925 million. This figure was below the 1,020 billion in 2009, but it was higher than the number reached before the 2008 global food crisis. The 2010 figure corresponded to 13.5% of the world population, while the 2015 objective (millennium development goal (MDG) number 1) was 8%. The FAO concluded that we were still far from achieving MDG 1 that is, halving the number of hungry people worldwide by 2015

In 2010, the regional distribution of people suffering from hunger was the following: 578 million in the Asia Pacific region; 239 million in sub-Saharan Africa; 53 million in Latin America and the Caribbean; 37 million in North Africa;

and 19 million in developed countries. Hunger weakens immune systems and stunts child development; half of all child deaths in the developing world are related to under-nutrition/food insecurity. Hungry families spend over half their income to buy the food they need to survive, with little to fall back on. Food often cannot travel from surplus to deficit regions within and across countries because of poor roads and barriers at the border and checkpoints along the way. Without enough food, adults struggle to work and children struggle to learn, making sustainable economic development difficult to achieve.

Ensuring global food security will only become more challenging in the future as demand for food is projected to increase by 50 percent over the next 20 years. Increased demand will come primarily from population and income growth in middle-income countries. Growth in agricultural productivity, already lagging globally, also faces increasing threats from climate change, scarce water supplies, and competition for energy resources from industry and urbanization. Because of climate change, rice yields are projected to fall more than 25 percent in most of the world's poorest countries. As a result, an additional 24 million children could suffer from under-nourishment. Without significant improvements in agriculture productivity, market access, post-harvest infrastructure, and rural incomes, the imbalances between food supply and demand will increase food scarcity, food price volatility, and food insecurity.

The World Food Summit (WFS) held in Rome in 1996 committed FAO Member States to the 2015 goal of reducing food insecurity by half. It is estimated that approximately 800 million people in developing countries - representing about 20 percent of their total population - and 34 million in developed countries, are chronically undernourished. To meet the target of having malnutrition in developing countries by 2015, this number needs to be cut by at least 20 million per year, more than twice as fast as the current reduction of about 8 million. With a growing world population, this situation may even worsen unless very determined and well-targeted actions are taken to improve food security.

- **Global effort towards improving food security**

IV. United Nation (UN)

The international community has engaged in a constructive dialogue aimed at finding sustainable global responses to safeguarding world food security and to guaranteeing vulnerable populations with adequate access to food. In April 2008

the UN Secretary General Ban Ki-moon established the High Level Task Force (HLTF) on the Global Food Security Crisis which produced a Comprehensive Framework for Action (CFA) representing a consensus view on how to respond to the global food crisis and invest in agriculture in a coherent and coordinated manner. At the FAO High level Conference on World Food Security in June 2008 in Rome, the international community adopted a Declaration on World Food Security through which it committed to establish short, medium and long term actions to eliminate hunger and to secure food for all

In response to the food crisis in 2008, countries have considerably augmented their commitments and aid assistance towards food security, agricultural and rural development, nutrition, markets and trade, and social protection. In the short-term, G8 Countries allocated additional resources to meet the urgent need of the people most affected by soaring food prices. Through medium-long term measures G8 Partners have invested resources to increase agricultural productivity and raise rural incomes. The short-term food assistance is mainly channelled through the World Food Programme and other multilateral organizations. Aside from the provision of food assistance, efforts have been paid by G8 Partners to promote agricultural production and productivity, improve access to markets and trade, agricultural research, budget support, safety nets measures, nutrition, investment and infrastructure. An example is represented by the European Commission Food Facility for € 1 billion funding as rapid response to soaring food prices in developing countries.

- **Food and Agriculture Organization**

To reduce food insecurity, the FAO initiated the Special Programme for Food Security (SPFS) in 1994. A special dimension of FAO's work, this programme was strengthened and its implementation accelerated after the 1996 World Food Summit (FAO 1996). In 2003, the SPFS was operating in over 70 countries (FAO 2003). SPFS began with a set number of objectives aimed at increasing production and small-scale water control, but has gradually expanded to embrace related rural development problems. In 2002, an independent external evaluation of the SPFS (FAO 2002A) made twentyfour recommendations to the programme¹⁰, which resulted in a number of actions taken by FAO (FAO 2002B). As a result, the programme widened its approach and embraced a number of more strategic concerns related to agricultural development

processes such as post-harvest management¹¹, development of small-scale processing facilities, and access to credit and supplies. SPFS currently consists of project initiatives. Among the various FAO and other international programmes aimed at assisting developing countries to reduce food insecurity, the SPFS began by supporting food security in Low-income Food Deficit Countries (LIFDCs), but as of 2003 the programme was operating projects in over 70 developing countries. In general, the programme sets out to help developing countries to:

- control water resources through micro schemes that protect from the vagaries of the weather (drought and flooding) that cause serious fluctuations in annual output levels;
- boost the crop, livestock and aquaculture productivity, including diversification and intensification of production by small farmers so that they can feed their families and secure a surplus to increase earnings;
- identify and find measures for responding to the socio-economic constraints on the production, marketing and processing of agricultural commodities;

V. West Africa

West Africa has an abundance of natural and human resources, yet remains one of the poorest regions in the world. Representing approximately 35 percent of the region's GDP and 60 percent of the active labor force, the agriculture sector is committed to achieving food security and broad-based economic growth in West Africa. Agricultural productivity is inhibited by under-developed linkages between farmers and markets, limited access to affordable and reliable high quality seeds and fertilizer, and lack of information on new agricultural technologies and best practices. As a result, the region has experienced some of the lowest per hectare crop yields in the world, and 13.5 percent of its population is undernourished. Despite these challenges, the West Africa region is working closely with regional institutions by harmonizing regional trade and agricultural policy, encourage investment in the sector, and providing farmers with access to better information and technology.

The West Africa Seed Program enhances the commercial seed industry and the Alliance for Seed Industry in West Africa. It aims to increase the availability of certified and drought resistant seeds for farmers from 12 percent to 25 percent of the total supply by 2017. It also seeks to increase private sector seed production and to improve cross-border seed trade.

Also, the West Africa Fertilizer Program, initiated in 2012, is improving fertilizer quality and availability for West African farmers. It works with the private and public sector to assist countries to adopt ECOWAS regional fertilizer regulations and increase the availability and demand for high quality fertilizer.

- **The role of extension in improving food security in Liberia**

VI. The Government

Government plays an important role in helping achieve food security, some of these roles are:

Enabling open markets

Trade plays a crucial role in ensuring food security by allowing agricultural commodities to move from places of surplus to places of deficit. Governments can help by: Supporting trade through an open, durable and rules-based trading system. Encouraging commodity exchanges. Ensuring government support for producers is consistent with World Trade Organization (WTO) rules (i.e., not product-specific or trade distorting). Completing a WTO trade round as soon as possible with meaningful commitments. Refraining from export and import bans

Supporting smallholder farmers

Governments, civil society, academia and the private sector must all work together toward solutions to help smallholder farmers fulfill their expanding role in feeding the hungry and fighting malnutrition: Provide training and practical support – Smallholder farmers need training in agricultural best practices and access to inputs, credit, storage and technology to increase their productivity in a sustainable way, which raises their own living standards and produces surpluses to help nourish others. Governments can help by: - Ensuring that agricultural extension or private services are available to train farmers in best agricultural practices and help

provide access to inputs, credit to facilitate harvest loans and appropriate technologies at the time of planting - Providing encouragement for training and education for women farmers in developing countries - Helping farmers invest cooperatively in collective crop storage and other infrastructure - Ensuring authorization and implementation of technology where it can improve the sustainability of crop production.

Establish revenue certainty

Smallholder farmers often are forced to sell at harvest when they are cash flow destitute and have limited access to real credit. Selling at depressed prices creates a cycle of discouraging further production in future years. Farmers in developing countries need reliable markets to sell their crops each season and an adequate price to compensate them for their efforts and provide incentive to continue production the following year. Governments can help by: - Establishing and maintaining good agricultural policies that include revenue assurance programs, such as guaranteed prices that may require supplemental payments in difficult years. Working with the private sector to support producer associations or price pooling cooperatives, which give farmers improved access to markets and greater leverage in pricing their products - Providing revenue safety nets themselves - Encouraging the private sector to provide price assurances through their contracts with farmers

Manage risk

Farmers need access to crop insurance and other risk management tools so they can rebound from crop failures or other growing season fluctuations. Governments can help by: - Instituting regulatory frameworks that uphold market price discovery systems in a transparent way - Providing regulatory frameworks that give farmers access to risk management tools, such as properly regulated futures markets - Stimulating the provision of crop insurance either through government-funded programs or through incentives for the private sector to provide such programs

VII. NGOs

Agriculture projects by non-governmental organizations are helping Liberia achieve food security in terms of improving commercial marketing and food processing, strengthen Liberian organizations that support business and farming, developing skills of agriculture-related workforce, launching a Market

Development Fund to build Liberian capacity without compromising market development. Developed and provide extension manuals and brochures used by farmers and also help train women in areas of food processing and preservation skills to enable them establish their own businesses.

VIII. Extension Agents

Extension and outreach strategies are carried out by extension agents to build farmers capacity in utilizing improve crop and animal production techniques.

Also, helps in designing innovative pathways for disseminating research results and innovations to farmers and industry.

- **Factors affecting food security in Liberia**

X. Food unavailability

Although agricultural production has increased in recent years yields are still well below the regional average and the post-harvest loss rate very high. Most farmers operate at subsistence level on small family plots growing rice, cassava, pepper, bitter balls, greens, aubergines, okra, pulses and corn.

Currently Liberia barely produces a third of the rice it needs to feed its population, relying on expensive imports to cover the rest. This leaves Liberians exceedingly vulnerable to high food prices and fluctuations in global markets.

Cassava being the country's second stable crop, its production is still not given due consideration in terms of policy or investment. A national cassava policy to increase production and diversify cassava by-products into commercial sectors will be helpful. It is equally important to also invest in marketing the by-products of cassava. For focus on cassava flour with micro nutrients and soya proteins can help address chronic hunger and stunting.

Although the country has an estimated 2 million hectares of pastureland, the livestock sector accounts for only 14% of agricultural GDP. Liberia depends on imports of livestock products to satisfy domestic demand, with the survey showing that only 43% of households own any livestock. Although the coastline and extensive coastal shelf have abundant fish resources, fishing is mainly a subsistence

activity. The sector lacks equipment and storage/preservation facilities and technical know-how regarding aqua-culture hence only a small percentage of households derive their main livelihood source from this activity.

If Liberia is to reduce the high dependency on food imports, it must address the many constraints that are affecting the agricultural sector. More than half of rural households have no access to credit from any source, meaning these crop producers are unable to invest in the inputs required to increase their yields. Expansion of the microcredit sector may service to stimulate expansions in production and trade in rural areas, whilst increasing formal sources of credit may also achieve the same impact.

XI. Poor roads network (poor market integration and high prices in remote areas)

Liberia's road network fell into a state of almost complete disrepair during the conflict and is yet to recover. This makes access to remote areas extremely difficult during the rainy season. As a result, market integration between rural and urban areas remains weak. Expensive markets and those with more volatile prices tend to be those that have poor road transport links and are therefore poorly integrated with the rest of the country. The SE region (River Gee, Maryland and Grand Kru) has the poorest road network and tends to be the most food insecure.

XII. Low education levels

A large majority of Liberia's young population missed out on gaining basic education. They therefore have neither the requisite education, nor the technical and entrepreneurial skills to obtain gainful employment in either the private or public sectors. There is an established link between a lack of education and poverty, poor health, malnutrition and food insecurity. Education is key to supporting overall food security. Higher education can provide a greater opportunity to increase incomes, support enhanced health status, hygiene practices and basic nutrition awareness that all have a bearing on the consequent nutritional status of individuals. Those with no education or just with primary education are more likely to have unacceptable food consumption than those with higher levels of education. Overall 30% of Liberians have never ended school (24% of men and 36% of women), creating a huge illiteracy gap within the system.

XIII. Poor sanitation

Poor sanitation and a lack of safe drinking water contribute toward a higher prevalence of disease which in turn is an underlying cause of malnutrition as a result of the body's inability to effectively absorb nutrients from food. Just 13% of rural households have access to improved sanitation compared with 52% in urban areas, whilst just over half of rural households enjoy improved water sources compared with 77% of urban. In some areas a lack of improved water sources results in sanitation being even worse.

In River Cess for example (the second most food insecure county) only 20% of households have access to improved water sources and a deplorable 4% improved to improved sanitation. In terms of access to toilets, Bomi, Grand Cape Mount and Grand Kru counties all fair badly, with more than 90% having no option but to defecate in the bush. These are the most food insecure counties in Liberia.

XIV. Rapid population growth

Migration to the capital is continuing at a fast pace due to widespread poverty, income disparities, and a lack of access to health and educational facilities, food and employment opportunities in rural areas. It is steadily stripping the countryside of the farming entrepreneurs and workers that it desperately needs to increase agricultural production and strengthen national food security.

More than a fifth of rural households (22%) have at least one member that has migrated – 41% in Grand Bassa, 32% in Grand Gedeh, 31% in Lofa, 44% in Sinoe counties. This growing migration puts increased stress on urban infrastructure including housing, water supply, electricity and transportation, raising unemployment rates in urban areas. Furthermore, only half of remittances are transferred in cash, indicating that migrants are finding it difficult to earn sufficient money to save and send money back to their families.

XV. Inadequate health system

Insufficient or inappropriate caring and hygiene practices, poor Infant and Young Child Feeding (IYCF) practices, use of unsafe water, inadequacy or absence of sanitation systems and inadequate access to maternal and child health services can all lead to ill-health. This in turn affects a person's ability to absorb the required nutrients from available foods, leading to malnutrition. In turn, malnourished

people are more likely to get sick and have a lower resistance to disease. As stated above, poor food consumption and food insecurity are not the sole drivers of malnutrition.

Illness of a household member was the main difficulty that household's men having experienced in the six month run-up to the survey. On average 26% of households said they had been affected by this constraint, rising to 43% in Bomi, 41% in Nimba and 34% in Bong and Montserrado counties respectively. Early breast feeding is initiated by only half of mothers while the exclusive breast feeding rate is very low at 47%. Minimum diet diversity is extremely low at 28% for children of 6-23 months with female children consuming a less diverse diet than male. Minimum meal frequency is low at 35% for children of 6-23 months.

XVI. Lack of financial support to the agriculture sector

Inadequate financial support constrains the ability of small producers and agro-industries to invest in productivity and expand operations. The government and non-governmental organizations needs to support rural microfinance, community savings groups, innovative insurance mechanisms to reduce the risk of agricultural finance, weather-indexed insurance, and finance sector reforms that result in greater lending and growth.

XVII. Climate change

Climate change is one of the many causes affecting food security, and as such can impact agriculture prospects. The Environmental Protection Agency (EPA) of Liberia underscores IPCC predictions and states that the key climatic hazards Liberia faces are coastal flooding and sea level rise. Liberia's EPA adds that apart from migration, coastal flooding can result in loss of life, crops, livestock, and damage to infrastructure and settlements.

Recent assessment report of the Intergovernmental Panel on Climate Change (IPCC) indicates that the agriculture sector could be greatly affected by the impacts of CC than any other sectors. Agriculture plays an interesting environmental role; it is both a casualty of, and contributing factor to climate change. For instance, CC impacts such as changes in temperature, rising sea levels, erratic rainfall patterns, etc. would have negative results on agricultural productivity, and affect food (crop yields and livestock) production. These could exacerbate food insecurity and poor quality of life, thus aggravating poverty.

Some tertiary impacts of these changes on agriculture include, increased air temperatures and changes in seasonality which affects the timing of plant flowering, plant–pollinator and pest–predator relationships, especially those involving migratory birds and the overwintering of insect pests. Higher daytime and night time temperatures disrupt and accelerate plant maturation during critical stages of flowering and grain-filling and disrupt plant night time respiration, all of which contribute to significant yield declines that will erase any positive effects on photosynthesis from higher concentrations of atmospheric CO₂. Rising sea levels will inundate low-lying coastal areas and islands, causing increased saltwater intrusion in coastal river and groundwater systems, eventually displacing up to 10% of the world’s population – those living within 10 meters of sea level.

Sector	Impacts
Agriculture	<ul style="list-style-type: none"> • Shortening of maturity period • Expanding crop diseases • Crop failure
Livestock	<ul style="list-style-type: none"> • Change in livestock feed availability and quality • Effects on animal health, growth and reproduction • Impacts on forage crops quality and quantity • Change in distribution of diseases • Change in income and prices • Contracting pastoral zones in many parts of the country
Forests	<ul style="list-style-type: none"> • Expansion of tropical dry forests • Loss of indigenous species/expansion of toxic weeds • Desertification
Water Resources	<ul style="list-style-type: none"> • Decrease in river run-off • Decrease in energy production • Flood and drought impacts

• **The level of food insecurity in Liberia**

On an average Liberians spend 53% of their income on food. The survey data indicates that 37% spend a very high share and 40% spend a high share on food. The chronic food insecurity situation in Liberia means that it is more revealing to measure food security through combining the food consumption score and the

share of expenditure on food at the household level. Households that spend a high proportion of their income on food are highly vulnerable to food insecurity because they have no buffer to protect them when prices rise. This is a peculiar issue in Liberia for two reasons: at a national level Liberia is highly dependent on food imports and is therefore vulnerable to global food price variations, and at the household level Liberians are highly reliant on purchasing rather than producing their own food.

Once again these national figures obscure a much more serious county level prevalence of food insecurity as figure 6 shows. The situation is most severe in Bomi, RiverCess and Grand Kru where 55%, 45% and 46% of households are food insecure respectively. Lofa and Margibi counties have the highest levels of moderate food insecurity at 41%, meaning that these households are highly vulnerable to becoming food insecure if there is a change in their situation or food prices rise.

- **Measures in improving food security**

VIII. Good governance and policy reform (subsidies) to the agriculture sector

This involves provision of subsidies on agricultural commodities and inputs that are exacerbating the developing food crisis, and shifting to sustainable food systems and food energy efficiency by governmental institutions.

IX. Access to relevant knowledge, information and training

The delivery of knowledge to farmers, referred to as “extension services,” must be demand-driven, cost-effective, and also address the needs of women producers. Agriculture stakeholders should invest in strengthening the effectiveness and coverage of a range of public and private extension service delivery systems to farmers.

X. Good road network

Good feeder roads can facilitate farmers’ access to markets and stimulate the local economy.

XI. Open trade flows and effective markets

Increased trade and improved market access can be achieved by improving infrastructure and reducing trade barriers. However, this does not imply a completely free market approach, as price regulation and government subsidies are crucial safety nets and investments in production. Increased market access must also incorporate a reduction of armed conflict and corruption, which has a major impact on trade and food security. To decrease the risk of highly volatile prices, price regulation on commodities and larger cereal stocks should be created to buffer the tight markets of food commodities and the subsequent risks of speculation in markets. This includes reorganizing the food market infrastructure and institutions to regulate food prices and provide food safety nets aimed at alleviating the impacts of rising food prices and food shortage, including both direct and indirect transfers, such as a global fund to support micro-finance to boost small-scale farmer productivity.

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