AGRICULTURAL POLICY ANALYSIS PROJECT
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OKLAHOMA STATE UNIVERSITY

PROCEEDINGS OF THE LIBERIAN AGRICULTURAL POLICY SEMINAR 1985

Yekepa, Nimba County
Liberia

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Project Resource Report
Report B-23

Forward

The publication which follows is the product of a team effort by members of the Agricultural Policy Analysis Project at Oklahoma State University, the Liberian USAID Agricultural Sector Analysis Project, and the Division of Planning in the Liberian Ministry of Agriculture. This team effort began in the spring of 1984 when an agreement was reached between USAID Liberia and the Agricultural Policy Analysis Project at Oklahoma State to develop an Agricultural Policy Workshop for Liberia. Over the next year Dr. Luther Tweeten and Dr. James Trapp of Oklahoma State University, and the Agricultural Analysis Project, visited Liberia three times. During these visits they worked with Dr. Richard Edwards, coordinator of the Liberian Agricultural Sector Analysis Project, and selected staff members of the Division of Planning in the Liberian Ministry of Agriculture Their work during these visits focused on identification of key policy issues in Liberia and outlining methodological procedures for analyzing these issues. Emphasis in the analysis process was given to the use of quantitative modeling techniques and microcomputers.

In the Fall of 1984 three members of the Liberian Ministry of Agriculture's Division of Planning came to Oklahoma State University for six weeks (J. Boima Rogers, Joseph Musah, and Rudene Wilkins). They worked with Dr. Tweeten and Dr. Trapp, as well as other Oklahoma State University staff members in conducting analyses of the key Liberian agricultural policy issues previously identified. During this time they were also given intensive training on the use of microcomputers.

By January of 1985 a working team relationship had evolved between Dr. Tweeten, Dr. Trapp, Dr. Edwards and the staff of the Division of Planning. This team met and planned a Liberian Agricultural Policy Seminar to be held in March of that year. The publication which follows is the proceedings of that Seminar. Of the fourteen papers presented, five were the direct products of the team research efforts conducted by the Agricultural Policy Analysis Project personnel (Tweeten, Trapp, and Epplin) and Division of Planning personnel (Rogers, Musah, and Wilkins). These five papers constituted the initiating and "keynote" papers to what we believe was a very successful seminar.

REPUBLIC OF LIBERIA
MINISTRY OF AGRICULTURE
MONROVIA, LIBERIA

OFFICE OF THE MINISTER

1985

Friends of Liberian Agriculture:

I am pleased to approve for publication the Proceedings of the National Agricultural Policy Seminar held in Yekepa, Nimba County, March 26-29, 1985. The Ministry of Agriculture brought together a distinguished group of Liberians to present papers and to discuss in an open manner many of the critical issues affecting our agricultural development. I believe that the many people who are interested in our agricultural development but were unable to attend the meetings will find this Volume informative.

I wish to use this opportunity to express my sense of pride in the professional analysis and work done by Liberian agriculturalists. I believe this Volume represents analysis which is as good as or better than any previous work by any consultants. I am charging them with the responsibility to continue their work and to develop coherent plans for our agricultural development.

I congratulate the Seminar Committee on the excellent job they have done organizing and preparing for the Seminar. Their dedicated preparation is evident throughout this Volume. I would also like to thank USAID, especially Dr. Richard Edwards of their Agricultural Sector Analysis Project, for the support and assistance given the Ministry in this activity.

Let us build on this foundation of ideas a stronger and, more productive Liberia.

Sincerely,

S. Gblorzue Toweh
M I N I S T E R

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FOREWORD

The need for the understanding of the goals and objectives of the Ministry of Agriculture and the general direction of our agricultural development efforts is an over-riding concern of the Ministry, most especially the Department of Planning and Development. Hence, by the beginning of the 1984/85 fiscal year plans were made to undertake certain activities that would enhance the overall direction of the Ministry's functions.

It was in accordance with this plan that an Agricultural Policy Seminar was organized by the Agricultural Sector Analysis Section of the the Department; financial assistance was received from the United States Agency for International Development (USAID) and the United States Department of Agriculture (USDA) Resident Advisors, under the Agricultural Sector Analysis and Planning Project. We in this Department are deeply encouraged by the continuous efforts by USAID to assist us in upgrading and maintaining planning as well as participating in other activities in these development endeavors. We wish to register our thanks and appreciations for these invaluable efforts, believing that this is a proper expression of our partnership in progress.

It remains our hope and aspiration that the results of the deliberations during this Seminar would help the Department to update the policy document of the Ministry by the collection and incorporate the reactions, observations, and overall recommendations of the presenters and participants. Consequently, the Seminar Planning Committee selected as participants a cross-section of people involved in agricultural and other related decision-making positions. We believe the group who attended this working seminar represents most of the diverse interests in the Liberian agricultural community. We apologize to the many others whom we would have liked to have invited but could not because of space problems.

The Planning Committee is indebted to all of those who participated in one way or another in making the Seminar the success we believe it to have been. While space does not allow us to mention everyone, some must be mentioned. We are grateful for the support given throughout by the Minister of Agriculture; he continually emphasized the importance of the work to the Nation and used his office to assist towards that end. In a similar manner, Deputy Minister Mehn gave his continued valuable support to our efforts. We are very indebted to Professors Tweeten and Trapp and their colleagues at Oklahoma State University. These Professors and their

Agricultural Policy Project assisted us by giving three members of the Planning Bureau special training at their University, working with them in preparing some of the major papers of the Seminar, and giving of their time to participate in the work here in Liberia. And of utmost importance, gratitude must be expressed to Mrs. Celestine Johnson for the fine and dedicated work she did in the typing and preparation of the materials for the Seminar and this proceedings volume.

Finally, I wish to convey my personal thanks to my fellow members of the Seminar Committee for the unselfish contributions they made to this activity. They are Mrs. Marian Varfley, Mrs. Rudene Wilkins, Dr. J. Chris Toe, Mr. J. Boima Rogers, Mr. Joseph Musah, and Dr. Richard J. Edwards. Because they truly shared in doing the work, our job was enjoyable.

MacArthur M. Pay-Bayee
CHAIRMAN, SEMINAR COMMITTEE

SUMMARY OF THE FIRST DAY
TUESDAY, MARCH 26, 1985

The first session of the National Agricultural Policy Seminar began at 9:05 a.m. with INA Member Zoe Norman leading the participants in a prayer. This was followed by opening remarks by the Deputy Minister for Planning and Development of the Ministry of Agriculture, Mr. James Mehn. He stressed that the seminar was organized by his Department and sponsored by USAID under the auspices of the Agricultural Sector Analysis project so as to induce the interchange of expertise and views and introduce new ideas which could aid the MOA in formulating comprehensive agricultural policies and approaches. He acknowledged and welcomed the two Oklahoma professors who have spent a great deal of their time assisting with the further training of three MOA staff members. Minister Mehn noted the presence of representatives from government institutions, agricultural parastatals, the local farming community and donor agencies. He thanked them for responding to the MOA's call for their participation and wished them success in their deliberations.

In his remarks, the Operations Manager who deputized for LAMCO's General Manager welcomed everyone to LAMCO and invited the seminar participants to visit other parts of Yekepa prior to their departure from the area.

The keynote address was delivered by the then Minister of Agriculture, Major Joseph N. Boakai. He observed that the selection of Yekepa as the venue for this important seminar was not a coincidence. As the site for the mining of iron ore which is a non-renewable resource, the need for developing sound and efficient agricultural policies was self-evident and therefore could not be overemphasized. The Minister thanked USAID for the financial assistance to the hosting of the seminar and LAMCO for permitting the use of its facilities.

The MOA's head recalled a series of recent events which have impacted upon global and national agricultural performance. He stressed the need for complementary price and trade policies which would handle emerging output surpluses from the sector and reiterated his interest in, and concern for, the outcome of the seminar's deliberations.

For his part, the Superintendent of Nimba County, Col. J. Gonda Walkie, welcomed everyone to Nimba, wished the participants success in their discussions and promised them the full use of his good offices.

Prior to the 15 minutes break, Mr. MacArthur Pay-Bayee explained the seminar's procedures and enumerated the day's other events.

Following the break, Professor Luther Tweeten of Oklahoma State University (OSU) placed the seminar into its proper perspective. He noted that the papers to be presented in the early part of the seminar were the results of joint efforts between the MOA Department of Planning and Development and OSU Department of Agricultural Economics. The aim of the OSU team was to provide inputs for a Liberian agricultural policy but not to write it, according to Dr. Tweeten. He discussed some basic principles of economic development while noting the social and political dimensions of agricultural policy. Although these other factors are crucial to the implementation of a comprehensive agricultural policy, Dr. Tweteen's discussion was restricted to fundamental economic concepts applicable not only to agriculture, but to all other economic sectors. In his discussion of the elements of economic progress, Professor Tweeten mentioned the impacts which attitudes, natural resources, and institutions have on savings, investment, and efficiency. These in turn are major determinants of the rates of capital accumulation and economic growth and utility.

He emphasized that economic progress occurs by investing in those enterprises and sectors yielding the highest returns.

The general deliberations which followed this overall conference perspective cautioned against excessive reliance on economic criteria for investment decisions. The importance of the economic factors was acknowledged but the caution was not to ignore the culture for economic gain.

The next paper in the series dealt with a representative farm planning model. This was presented by Dr. Trapp of OSU and Mr. Joseph Musah of the MOA. Trapp discussed the considerations and assumptions which underlied the model. These included subsistence requirements, alternative enterprises, and an explanation of the Linear Programming technique used in the construction of the Planning Model. Musah explained how the data for the model was collected and explained the LP Model's construction. Some of the concerns raised by participants covered data accuracy, optimum enterprise combination, distinction of models by production systems, and foreign exchange generation capabilities of alternative crops. Specifically, participants were interested in knowing the sources and reliability of production cost estimates for rice and basis for the conclusion that tree crops should be emphasized in Liberian agriculture rather than rice production.

The second paper in the series of papers which was dedicated to the rice situation attempted to estimate the costs and

benefits of alternative rice policies. Boima Rogers of the MOA traced the history of rice price policies in Liberia while Dr. Tweeten of OSU explained the supply and demand framework used in estimating the impacts of imported rice policies. Mr. Rogers also enumerated additional policies for managing commercial imports of rice and the costs and benefits of these approaches while Dr. Tweeten presented options for in-country rice price support arrangements. Some of these included the termination of LPMC rice purchases and the maintenance of the current rice support program with some slight modifications.

The majority of questions engendered by Rogers and Tweeten's presentation can be summarized as follows: Has the current price support system resulted in increased rice production? Can we calculate the costs and benefits of alternative rice import options and if so, which is the best? Do we need a producer price subsidy program?

In the ensuing discussion, Mr. Francis Dunbar of LPMC clarified the role of PL-480 rice imports as a means for filling in gaps between domestic production plus other assistance programs and domestic consumption. He noted that LPMC has not determined unit costs of production which include the costs of storage, transportation, milling, and other pertinent variables. Apart from LPMC's current insolvency and marketing problems, Mr. Dunbar observed that auxilary activities undertaken by the corporation impose additional costs and are a drain on scarce financial and managerial resources.

Mr. Dunbar further noted that GOL's support to agriculture is necessary since the private sector is reluctant to invest in agriculture due to its high risks. Increased emphasis on privatization should therefore be tempered with the current realities of the Liberian situation.

When asked by Professor Tweeten whether he favored the privatization of rice purchases as opposed to other enterprises such as tree crops, Mr. Dunbar reiterated the need for the GOL to continue its assistance in the areas of research, extension, and training, among others.

Minister Boakai questioned Mr. Dunbar's explanation of the motives for the PL-480 rice imports. He (Minister Boakai) explained that the program currently facilitates GOL's budgetary assistance to agricultural development projects. He wanted to know why the quantity of rice consumed responds to changes in rice price if rice is considered an inferior good. The Minister expressed the need for the Ministry of Commerce to gather realistic import price figures for imported rice in light of the fact that some importers usually overestimate the CIF price of rice so as to reap abnormally high profits. He noted that the GOL should not continue to rely on PL-480 rice

imports as a permanent source of funds. He observed that LPMC has not bought paddy from farmers for several seasons. This is due to the fact that the IMF's demand that GOL increase the price of purchased paddy from 12 cents to 18 cents per pound has drained LPMC's financial resources. The Minister urged the need for increasing the flow of information among GOL agencies and for increased coordination of their activities. He gave an example whereby the Ministry of Commerce increases transportation costs without evaluating the effects of such policy changes on the marketing of agricultural produce. He wondered what could become of LPMC's milling and storage facilities if rice purchases were privatized?

Dr. Tweeten answered that such facilities could be used for holding rice stocks. Mr. Dunbar stressed the need for improvements in LPMC's data base so that policy manipulations like seasonal price adjustments could be undertaken. Minister Boakai then called for controls to ensure that products purchased from producers by LPMC are of highest quality.

The papers presented during the first day follow.

THE PURPOSE OF THE SEMINAR

James W. Mehn*

Mr. Superintendent, Members of the INA, Representative of LAMCO Management, International Organizations, and Educational Institutions, Managers of Agricultural Institutes and Agricultural Development Projects, Ladies and Gentlemen.

This seminar is organized by the Planning and Development Department of the Ministry of Agriculture under the auspices of the Agricultural Sector Analysis Project. This Project is financed by the USAID.

The purposes of this seminar are to induce the interchange of expertise, ideas, and experiences and to generate fresh, tried, and useful suggestions. It is our hope that recommendations emanating from this gathering will assist the Ministry of Agriculture in formulating effective agricultural policy guidelines for Liberia that are comprehensive in scope, long-run in perspective, and sectoral in nature and approach.

Accordingly, the topics for discussion will include the areas of agricultural marketing, input supply and credit, and land tenure. Additional topics will include research, training, and extension, strengths and weaknesses of agricultural parastatals, and agricultural investment strategies.

We at the Ministry of Agriculture do not pretend to have all of the answers to the agricultural sector's problems. We have therefore invited knowledgeable individuals with different institutional affiliations and professional backgrounds. Through the Agricultural Sector Analysis Project, we were able to hire the services of two distinguished Professors from the Oklahoma State University in the United States. These men have the expertise and experience. They have worked with many developing countries and have served as advisors to their own government on agricultural matters at the highest level.

We also have in our presence representatives for agricultural and rural development from USAID/Liberia. The FAO and UNDP Permanent Representatives in Liberia have also been invited. A consultant under World Bank sponsorship is also here with us.

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* Deputy Minister of Agriculture for Planning and Development.

But much closer to the problems which this sector experiences are the Liberian agriculture leaders whom we have invited from various government agencies including the Ministries of Planning and Economic Affairs; Commerce, Industry and Transportation; and Finance. The University of Liberia and the Cuttington University College are also represented at this seminar. Private farmers as well as representatives from our own agricultural institutions and projects including those in research, credit and the Agricultural Development Projects have been invited.

The importance and seriousness which we at the MOA attach to this seminar is manifested by the presence of our Minister himself, three of his four deputies, and almost all members of the senior staff and advisors of the Planning and Development Department of the MOA.

Very importantly, we are highly honored by the presence of Honourable Victor L. Yates, Chairman of the Committee on Agriculture of the INA and Ms. Zoe Norman, member of that august body.

Finally, let me say to all of you who have responded to our invitation that we are heartened and encouraged by your presence . We want to thank you heartily for responding so enthusiastically to our call.

KEY ISSUES FOR AGRICULTURAL POLICY MAKERS

Joseph N. Boakai*

It is my fervent honor and indeed a privilege as I respond to your kind invitation to present a keynote address to this very important and historic Agricultural Seminar. The selection of the venue was not a coincidence. On the one hand, the atmosphere is conducive for organized thinking and fruitful interchange as an underpinning consideration for this discussion. On the other hand, Yekepa represents a Mining Town embodied with a non-renewable resource. The impending awesome fate of this community should stimulate us as agriculturalists in seriously formulating meaningful policies. I would like to congratulate the organizers of the Seminar. A special recognition is also given to the United States Agency for International Development for its financial support to this endeavor. We wish all the participants a very successful outcome. I also wish to entreat you all to remain for the duration of the entire Seminar so that we get out of it what we put into it.

The overriding consideration of Agricultural Policies is the latitudinal dimension of the society that it affects. Its impact is felt by all participants of any economy, particularly those involved in the Agricultural sector. The farmers, public corporations, consumers, input suppliers, producers, the food distribution network, and Agricultural Development Projects are affected. Food is an important wage commodity in many economies, and has crucial implications for wages and employment policy, and ultimately for the non-farm sector. Similarly, it has implications with regard to balanced-of-payments; either it can drain foreign exchange reserves, or it can contribute to expanded foreign exchange earnings.

I would thus like to address myself now to four key issues to be considered when addressing the question of an Agricultural Policy.

1. THE RELATIONSHIP OF THE INTERNATIONAL ECONOMY TO DOMESTIC AGRICULTURAL POLICY

The condition of the international economy determines the production-possibility frontier, to a large extent, of the

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* Minister of Agriculture, Republic of Liberia.

domestic food and agricultural policy. It also determines the guidelines which are for the transformation of one resource into another and the rate at which one commodity can be substituted for another.

For the past two decades, tremendous changes have occured in the international economy which cannot be ignored. Ignoring these changes has caused the failure of many domestic food and agricultural policies in almost every country of the world. It is imperative, therefore, that these changes are observed with respect to Policy formulation.

Some of the paramount changes observed are as follows:

A. The FAO, World Bank, the EEC, other international agencies and collaborating countries and institutions have developed an International Food and Agriculture System. The development of market opportunities and food security have been two major results of this trend.

B. An integrated international capital market has been developed.

C. The emergence of a system of bloc-floating exchange rates, coupled with the integrated international capital market, has caused a link between the financial and commodity markets.

D. The interdependence of nations as regards the emphasis of comparative advantage has been underscored. Hence, domestic policies have become increasingly dependent upon the international situation.

2. TECHNOLOGY ADVANCEMENT AS A STIMULUS TO AGRICULTURAL DEVELOPMENT

The development and dissemination of new technology primarily induces expanded production of food. A useful approach of technology transfer would be to present it as a source of an inexpensive income stream that would be widely distributed within an economy, in favor of the poor and disadvantaged. Obviously, some of these income streams would benefit technological receptive producers. Some will benefit the suppliers of the modern inputs upon which the technology is based . Other beneficiaries, to a large extent, would be the consumers who will benefit from lower prices. If the country deals with a particular commodity for which the technology is relevant, as an import or export commodity, the entire economy benefits from the income stream.

3. THE EMPHASIS OF FOOD SECURITY AND AGRICULTURAL POLICY

The strive toward self-sufficiency in food production by the Government of Liberia is predicated upon the shortfall in food output and the instability and uncertainty of the international commodity market. The Government's primary objective is to satisfy the welfare of its population. Hence, it is with this background that direct policy manipulations have been set in motion.

A significant factor to mention here is the price policy. There must be complementary price and trade policy. Given the present situation of commodities, this complementarity is seen as very crucial. Pricing at the "reasonable" level is not the only solution to disposal and distribution of commodities. The channel through which they are disposed must also be designed to effectively handle any surpluses. As stated earlier, the international market becomes an outlet when the domestic market is saturated.

4. THE UNFORESEEN RESULTS OF POLICY

Developing nations faced with the 'Vicious Cycle" have experienced that policy formulation results in two important factors. Firstly, the unforeseen results of a policy are more important than the intended purpose. Secondly, the stated policies sometimes create a situation opposite to what was intended initially.

An example of the foregoing can be seen as follows: Government emphasizes the production of rice as a staple to ensure food security. The consequence is the voluminous production of rice which cannot be stored and marketed effeciently. At the same time, foreign exchange earnings are sacrificed.

Eventually, stocks of rice begin to spoil and the farmers take a tremendous loss. This is not the fault of the policy per se, but because of a combination of factors, including the international economy, these consequences are felt.

Another example: Government subsidizes the production of coffee and cocoa as important export commodities. The result is that when the commodities are finally sold, the world market prices would have been lowered significantly, causing a loss to Government. Hence, the desired effect of increased foreign exchange to the economy is defeated.

The list could be expanded, but I am sure you got the message that I am trying to get across. All aspects of a policy must be investigated before it is implemented. In closing, I would like to emphatically point out that the world economy today is extremely volatile. Currency movements, commodity movements,

capital movements and vacillating international policies are crucial areas of concern. The factors have caused an increased interdependence amongst nations. The developed countries now need the developing countries than ever before, and vice versa. In closing, let me remind you of the Dennis Healey's "Law of Holes". It says, if you are found in one, stop digging!

Fellow participants, I welcome you again and charge you to exercise your utmost expertise in your respective areas in making our deliberations fruitful.

Lastly, but most importantly, special thanks are due to the LAMCO management for providing their facilities for this seminar. We would like to register our appreciation as partners in development.

I THANK YOU

COMPONENTS OF AN OVERALL DEVELOPMENT POLICY FOR LIBERIAN AGRICULTURE

Luther Tweeten and Richard Edwards*

Introduction

Minister Boakai, in his keynote address, has very appropriately given the charge to this gathering of people concerned with Liberian agriculture. The purpose of this paper is to present some potential components of an overall development policy as viewed from the eyes of two independent, non-Liberian economists. The suggestions are intended to be a foundation for discussion and not answers. They are intended to be sound economically, but need input from a wide range of individuals with an understanding of agriculture and of the social, economic and political conditions of Liberia. Some of our discussion is an elaboration of points that the Minister has already mentioned. Much of what we say will be obvious to many of you, but we are presenting the observations to you as a springboard for dialogue at this Seminar.

Two major sources of Liberian national income and export earnings, iron ore and high-grade timber, are expected to be severely depleted by the year 2000. As this depletion occurs in the future, it will generate economic stress on the Liberian economy. Currently the export sector of the Liberian economy is under stress due to the value of the dollar in international exchange. A strong dollar constitutes a "tax" on exports and diminishes export opportunities in industries such as rubber in which Liberia has a comparative advantage. Meanwhile, population countinues to grow at least 3 percent annually and will double in 25 years if current trends continue.

Agriculture is the most important industry to the future of Liberia. Productivity and income in agriculture must progress for the Liberian economy to progress particularly given the bleak outlook for other sectors as noted above. On average,

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*Regents Professor, Oklahoma State University/Policy Analysis Project; and Agricultural Economist, Agricultural Sector Analysis Project, USDA/USAID/MOA, Liberia, respectively.

four out of every five people employed in Liberia are in agriculture[1]. Agriculture directly accounts for about one-third of Gross Domestic Product, although it accounts for perhaps double this share if service and other industries supported by agriculture are accounted for. A little over one-tenth of the employment in agriculture is in the monetized commercial sector which accounts for 44 percent of the agricultural output. The remaining 56 percent of agricultural output is produced by the 90 percent of total persons employed in agriculture who are in traditional agriculture. Most of those in traditional agriculture practice slash-and-burn, shifting cultivation largely for family subsistence. Their staple is rice.

The concessional or "enclave" economy is comprised largely of foreign-owned enterprises engaged in rubber and timber extraction and dominates the monetized, commercial agriculture. This sector has relatively high productivity. It needs minimal government assistance and services. The concessions have benefited from fairly low taxes and considerable freedom for profit repatriation. Concessions have in turn provided linkages to the Liberian economy, especially in generating foreign earnings -- much of which is received as payrolls by Liberian workers. These concessions now face stiff competition from foreign producers because of the high value of the dollar. The Liberian government will need to avoid measures that increase costs and in other ways diminish comparative advantage for concessions at a time when the dollar is unusually strong and export markets are weak.

In summary, the priority concern for the Government of Liberia and for the Ministry of Agriculture is to increase the productivity of the noncommercial sector of Liberian agriculture. Future economic and social progress of Liberia depends on success in that effort because the subsistence sector accounts for a large proportion of the people and resources of the nation. The commitment by the Government and the Ministry to agriculture, and especially smallholder agriculture, is both an opportunity and a challenge. Although agriculture offers the greatest promise for increasing future productivity and income in Liberia, that promise will not be realized unless public and private resources devoted to agriculture are used more efficiently than in the past. Unless agricultural policies are modified, Liberia is likely to experience a declining standard of living by the year 2000 and beyond.

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[1] See Ministry of Planning and Economic Affairs, Second Four-Year National Socio-Economic Plan, 1980.

Creating a Climate for Growth in Agriculture

Agriculture does not develop in isolation. It requires a facilitative economic environment. Individuals and firms need the market price system or the public sector to turn pursuit of self-interest into pursuit of the public interest. Managerial and administrative talent to run public agencies is very scarce in Liberia. It follows that one appropriate development strategy would be to let the market guide and conduct economic activity to the extent possible. Public agencies and funds can then be reserved to perform those vital activities that the market performs very poorly or not at all.

Before turning to the role of the public sector directly serving agriculture, a short list is provided of activities indirectly related to agriculture but essential for the development of agriculture. The public sector plays a key role in each of the following.

(1) Basic education. Schooling in literacy and other basic skills has a high economic payoff in agriculture and other occupations.

(2) Primary health care. Sanitary water systems, immunization against diseases and special maternal and child nutrition programs can make people healthier and more productive. Family planning can slow population growth to place less strain on available land and other resources.

(3) Infrastructure. Significant advances in agriculture require low-cost transportation which in turn permits farmers to sell their output at profitable prices for purchase of improved inputs. Subsistence agriculture gives way to commercial agriculture and a higher standard of living with improved roads and bridges. In many areas the critical need is to maintain existing structures before investing in new structures.

(4) Efficient government. Markets work best and investment flourishes in an environment of stability and administrative efficiency. A stable government avoiding "crises" in the form of excessive expansion of money supply or large fiscal deficits, and encouraging open domestic and foreign trade generates private investment, economic growth and general prosperity.

Agricultural Development

A number of circumstances that we see as influencing policy for agriculture will be discussed next. The person/land ratio in Liberia is one of the most favorable in Africa. Rainfall is plentiful and fairly consistent from year to year. More than 95 percent of Liberian farms and food production is on upland

soils. However, soils are fragile and quickly lose fertility and structure when exposed to sun and rain.

Because of fragile soils and weed and insect problems, continuous annual cropping does not now appear to be economically or ecologically feasible. New crop varieties such as LAC 23 increase yields but not by the quantum amount necessary for a breakthrough to sustained economic growth.

No known technology permits continuous annual cropping of upland laterite soils at acceptable costs for inputs. Large-scale clearing of land by bulldozers followed by attempts at continuous annual cropping have done serious damage to soils that will take decades, perhaps centuries, to reverse.

A small portion of Liberia's land area is lowland, mostly scattered swamps and narrow valleys. Although swamp rice yields are higher than upland rice yields and shifting rotation need not be practiced, still the potential for increased national rice production is limited both absolutely and by better economic alternatives such as tree crops. Most farmers producing swamp rice diversify by also producing upland rice, thus making fuller use of labor and gaining greater security of output. Because of small and isolated occurance of swamps, and production as well as upland rice production is not suited for mechanization.

Because of high cost of capital relative to labor and problems with animal draft power, hand methods of production are emphasized. Output per worker is low. Animal draft power is not used, in part because of trypanosomiasis. The same "tryp" problem also precludes utilization of potentially abundant forage to produce livestock for dairy and red meat.

Labor is typically the most limiting resource in crop production although land increasingly will become a constraint. Efforts to mechanize crop production even with simple technologies such as replacing the knife with the sickle in harvesting rice have met with only limited success. Land-intensive enterprises will be favored as the labor-land ratio increases. Generally, economic incentives will encourage tree crops over rice as land becomes more scarce.

Large scale farms which account for a small portion of Liberia's farms are mostly in tree crops. Most were financed by development capital from nonfarm (sometimes foreign) sources, and most of the economies of size are gained through marketing and processing in large volume and in improved production management rather than through mechanization.

Input markets are not well developed, mainly because commercial fertilizers, pesticides and other purchased inputs are only

marginally profitable. While at some point the Government might be economically justified in subsidizing fertilizer and pesticides for a limited period to induce quick adoption of highly profitable and productive inputs, that point of profitability has not been reached for Liberia. However, financial assistance by GOL to encourage planting of improved rice varieties and improved seedlings of coffee, cocoa, rubber and palm may be economically justified over the long-run on a technological change and productivity. It is especially important to learn from special agricultural and rural development projects which have experimented with alternative ways to expand productivity.

Diversification is important because no one crop is likely to be consistently most profitable or suited for all soils and resource conditions. For example, excessive expansion of coffee production not only would bring production in excess of quotas but also would make the economy sensitive to fluctuation in world coffee prices. Export quotas, changing market conditions and differing suitability of soils to tree crops require planning and adjustments to new circumstances. Public agencies such as the Ministry can help producers make better decisions regarding choices of enterprises, practices and marketing.

For tree crops to have a favorable payoff to individual investors, rights to output from investments must be assured. As such, tenure and property right arrangements would need to be examined, and revised if necessary, to create a favorable investment climate.

Agricultural Research

We see one of the highest prioroties for Liberian agriculture as the need to strengthen agricultural research to raise farm productivity, output and income. We have heard many of you mention, and we would agree that specific priority research needs include:

(a) Development and/or adaptation of improved rice varieties.

(b) Development and/or adaptation of improved tree crop varieties.

(c) Development and/or adaptation of animal breeds, resistant to "tryp" or immunization of livestock to the tryp organism.

(d) Development of low-cost labor saving technology for production of rice and tree crops.

Some areas of Liberia are under sufficient population pressure so that bush rotations are being shortened with attendant reduction in yields. Technologies are needed to raise productivity, but large-scale land clearing for continuous cultivation, use of commercial fertilizers and pesticides, and mechanization are not economically or ecologically feasible at this time.

For agricultural development in Liberia to proceed, the large mass of subsistence farm families must be involved. Equity considerations suggest that these families should be not only a major source but a beneficiary of economic progress. The involvement requires increased productivity per person.

Greater productivity comes about from human and material capital formation through savings and investment in high-payoff activities. Lack of highly productive, high pay-off, new varieties and other technologies is a serious impediment to progress of agriculture in Liberia. Agricultural research has been found to be the highest payoff investment possible in many countries. Several years are required for research to go from inception to implementation. A successful agricultural research program requires continuity in the form of sustained commitment to excellence -- with adequate salaries to attract and hold the very best minds of the country. Support facilities must be adequate to provide a working environment conducive to attracting and holding able scientists.

Although Liberia does not have a comparative advantage in rice production, research and extension must continue to improve yields and efficiency of rice production, in part for food security and in part to free farm labor and other resources to produce higher-value tree crops. However, an increasing share of research and extension resources should focus on improving production and marketing of tree crops. Such policy builds on comparative advantage to increase income of producers and the country as a whole. Such emphasis is also consistent with an environmentally sound, sustainable agriculture in the lon run.

Extension

A central function of the MOA is to organize and operate an Extension Service supporting the development needs of agriculture at all levels but especially at the producer level. Research is of no value unless improved technology, practices and inputs are utilized on farms. That requires a strong extension program. (Of course, extension will have little value until it has something worthwhile to extend, hence research and extension cannot be separated). The immediate need in Liberia appears not to be for additional extension personnel but for upgrading expertize and effectiveness of existing personnel. That requires additional training, transportation and communication. Extension also

must have adequate and continuous funding for greater effectiveness. Personnel, as in research, must be selected and promoted based on performance. The administrative environment must be facilitative.

A continuing program of short courses and other educational efforts helps to ensure that extension personnel are up-to-date. As technological, managerial and marketing aspects of agricultural and rural development special projects are phased out, lessons learned from success and failures should be absorbed and utilized by the Extension Service.

Summary and Concluding Observations

We look forward with great pleasure to the next few days as you graple with the difficult questions about how best to guide the development of Liberian agriculture. Questions such as:

1) Should Liberia make the fullest use of its apparent comparative advantage in tree crops?

2) Should Liberia emphasize rice self-sufficiency or rice security?

3) What should be LPMC's role in rice marketing?

4) What kind of price policy should be pursued for rice?

5) How big a research program can the country afford?

6) What is the Extension Service's proper role in agricultural development?

7) Who should control Liberia's land?

The questions can go on forever, but the time has now arrived when we should take them a few at a time. You have an excellent group of resource people to help clarify the facts of the situation. We know that you will come out with many good recommendations. There will also be issues with no agreeable conclusions. While this will be true, the dialogue and attempt to find an answer is valuable and will lead to eventual answers. We feel honored to be allowed to participate even in a small way in this dialogue.

A REPRESENTATIVE FARM PLANNING MODEL FOR LIBERIA

Francis M. Epplin and Joseph G. Musah*

Representative farm planning mathematical programming models are useful tools by which agricultural resource allocation problems can be addressed and analyzed. In this paper we report on efforts to develop a mathematical programming model for a representative Liberian farm and present results of the model.

Resource Base of Representative Fram

The modeled resource constraints for the representative farm include labor by sex, land, family (internal) operating capital, and government credit restrictions. A farm family of three adults and four children is assumed to be able to provide 50 days of male labor and 50 days of female labor per month for agricultural production and marketing. Labor requirements for household production activities are not included in the model. In addition, labor activity is not adjusted for the impact of weather on days available for field work. Activities are included which permit the purchases of male labor for each month. Each unit of purchased male labor costs $2.50 per day.

Ten acres of land are available for the production of annual crops and tree crops. Land is not differentiated by quality. Thus an implicit assumption included in the model is that land availablility is not a major limitation or determinant of farm family production in the region.

The typical farm family is assumed to have an operating capital base of $170. An additional $1,000 can be borrowed from government sources at an annual interest rate of 15 percent. An unlimited quantity of operating capital can be borrowed from private sources at an annual interest rate of 30 percent.

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Family Subsistence Rquirements

Annual family consumption demands are included for rice (1,880 pounds), cassava (270 pounds), okra (96 pounds), pepper (128 pounds), bitter balls (96 pounds), sugar cane juice (20 gallons), and palm oil (24 gallons). The model is structured such that all of these demands with the exception of rice, must be met by production on the farm. Rice can be puchased off the farm at a price of $0.30 per pound. No additional family consumption requirements are included in the model. In addition, alternative uses of family resources are not included. For example, off-farm employment of labor and other resources is not considered.

Farm Production Activities

Production activities are included in the model for rice, okra, peppers, bitter balls, cassava, cocoa, coffee, sugar cane, rubber, cultivated palm, and indigenous palm. One activity is included for single cropped rice. In addition, rice can be produced by intercropping with okra, peppers, bitter balls, or cassava in the first year followed by a one year crop of sugar cane.

As noted, okra, pepper, bitter balls, cassava, and sugar cane can be produced in combination with rice. In addition, activities are included which will permit the production of these five crops independently.

Activities are also included for the production of cocoa, coffee, rubber, and cultivated palm. Annual resource requirements and production for these crops are averaged over the expected life of the plant. In other words, resource requirements for establishment, including brush cutting, burning, and clearing, are incorporated into the activities.

The indigenous palm activities include the collection of fruits from indigenous trees. Indigenous palm production activities are included for each month. Each activity requires one hour of male labor, and one hour female labor, and generates 2.5 gallons of palm oil.

Resource Requirements, Yields, and Prices

Crop yields and prices used in the model are included in Table 1. Table 2 includes estimates of the variable "cash" production costs, the labor requirements by month and the annual operating capital requirements for each of the production activities. These data were acquired from various sources by Mr. J.G. Musah.

Production and Sales Restriction

Sales of palm oil are restricted to seven gallons per year. In addition, off-farm sales of cassava are restricted to 81 pounds per year. These levels were based upon the assumption that neither of these commodities could be exported in commercial quantities.

Table 1. Estimated Yields (per acre) and Product Prices.

Activity	Yield	Price($)
Rice/	960 lbs.	.12/lb.
Okra	100 lbs.	.11/lb.
Rice/	960 lbs.	.12/lb.
Peppers	150 lbs.	.10/lb.
Rice/	960 lbs.	.12/lb.
Bitter Balls	100 lbs.	.10/lb.
Rice/	960 lbs.	.12/lb.
Cassava	3,000 lbs.	.05/lb.
Rice	1,100 lbs.	.12/lb.
Cassava	6,000 lbs.	.05/lb.
Cocoa	400 lbs.	.45/lb.
Coffee	450 lbs.	.55/lb.
Sugar Cane	80 gals.	5.00/gal.
Okra	800 lbs.	.11/lb.
Peppers	800 lbs.	.10/lb.
Bitter Balls	800 lbs.	.10/lb.
Rubber	985 gals.	.32/gal.
Rice/	480 lbs.	.12/lb.
Cassava/	1,500 lbs.	.05/lb.
Sugar Cane	40 gals.	5.00/gal.
Palm	5.5 tons.	30.00/ton

Table 2. Production Costs and Labor and Annual Operating Capital Requirements for the Production Activities Per Acre.

	Rice/ Okra	Rice/ Peppers	Rice/ Bitter Balls	Rice/ Cassava	Rice	Cassava	Cocoa	Coffee	Sugar Cane	Okra	Peppers	Bitter Balls	Rubber	Rice/ Cassava/ Sugar Cane	Palm
Production Cost ($)	57.50	57.50	57.50	57.50	45.61	8.65	21.11	22.10	144.58	3.85	4.01	3.41	62.00	101.04	27.00
Male Labor (days)															
JAN	6.00	6.00	6.00	6.00	3.00	:	1.36	1.36	:	:	:	:	5.05	3.0	:
FEB	8.00	8.00	8.00	6.00	:	8.00	.80	1.20	10.00	:	:	:	6.18	4.00	:
MAR	5.00	5.00	5.00	5.00	10.00	12.00	.44	.44	18.00	:	:	:	5.24	10.50	5.60
APR	11.00	11.00	11.00	11.00	4.00	5.00	2.00	2.04	20.00	:	:	:	5.16	12.00	.50
MAY	10.00	10.00	10.00	10.00	7.00	:	.80	.60	20.00	:	:	:	6.38	12.50	5.40
JUN	10.00	10.00	10.00	10.00	5.00	:	1.24	1.24	4.00	:	:	:	7.29	5.00	1.50
JUL	:	:	:	:	3.50	:	.56	.40	:	:	:	:	5.19	:	2.40
AUG	:	:	:	:	2.00	:	.68	.28	:	:	:	:	4.91	:	:
SEP	1.00	1.00	1.00	1.00	:	:	1.00	1.20	:	:	:	:	6.16	.50	1.50
OCT	2.00	2.00	2.00	2.00	:	:	.60	.52	:	:	:	:	4.91	1.00	1.00
NOV	2.00	2.00	2.00	2.00	2.00	:	1.04	1.60	:	:	:	:	8.41	1.00	5.50
DEC	:	:	:	:	5.00	2.00	.40	.28	3.00	:	:	:	5.19	1.50	:
Female Labor (days)															
JAN	2.00	2.00	2.00	2.00	7.00	:	:	:	:	7.50	7.50	7.50	:	1.00	:
FEB	:	:	:	:	5.00	:	:	:		:	:	:	:	:	:
APR	5.00	5.00	5.00	5.00	:	:	:	:	:	10.00	10.00	10.00	:	2.50	:
MAY	4.00	4.00	4.00	4.00	:	:	:	:	:	10.00	10.00	10.00	:	2.00	:
JUN	3.00	3.00	3.00	3.00	3.00	:	:	:	:	:	:	:	:	1.50	:
JUL	7.00	7.00	7.00	7.00	3.00	10.00	:	:	:	:	:	:	:	3.50	:
AUG	6.00	6.00	6.00	6.00	4.00	6.00	:	:	:	:	:	:	:	3.00	:
SEP	2.00	2.00	2.00	2.00	8.00	4.00	.60	:	:	8.00	8.00	8.00	:	1.00	:
OCT	8.00	8.00	8.00	8.00	4.00	:	.80	.20	:	20.00	20.00	20.00	:	4.00	:
NOV	6.00	6.00	6.00	6.00	6.00	:	.80	.80	:	:	:	:	:	3.00	:
DEC	6.00	6.00	6.00	6.00	10.00	:	.48	.20	:	:	:	:	:	3.00	:
Annual Operating Capital($)	28.75	28.75	28.75	28.75	26.60	6.40	10.55	11.05	10.31	0.96	2.00	0.85	22.00	19.53	

Mathematical Programming Model

The objective function of the model is to maximize annual returns to family labor, land, and family capital, subject to the family consumption demands. A pictorial description of the model is included in Table 3. It includes 46 rows and 60 real activities. The model includes 15 crop production activities and 12 activities for the production of oil from indigenous palm. Eleven selling activities permit off-farm sales of the commodities. Male labor purchase activities are included for each month. Two capital acquisition activities permit the borrowing of government or private operating capital. One activity is included to enable the purchase of rice to meet family demands in excess of production, and seven activities are included to facilitate the transfer of commodities from production activities to family demands.

A labor row is included for each month for both male and female labor. One row is included to constrain land use to ten acres. One constraint restricts annual operating capital use. Eleven transfer rows facilitate the transfer of commodities from the production activities to uses. Seven rows are included to force the model to meet the family consumption requirements for rice, okra, peppers, bitter balls, cassava, sugar cane juice, and palm oil.

Results of Base Model

Production levels for the optimal farm plan are included in Table 4. The plan generates a return to the family resources of $1,761. Production levels for rice (1.724 acres), sugar cane (0.25 acres), okra (0.12 acres), peppers (0.16 acres), and bitter balls (0.12 acres) are at the minimum quantities to fulfill family consumption requirements. Production of cassava (0.117 acres intercropped with rice) and palm oil (from indigenous palm) is restricted to the maximum permissable levels. Production in excess of 351 pounds of cassava and 31 gallons of palm oil is not permitted. The remaining acreage is planted to coffee and rubber. The optimal plan includes 2.582 acres of coffee and 5.044 acres of rubber.

A summary of labor and capital utilization is included in Table 5. All fifty days of male family labor are utilized in the months of April, May, and November. However, hired male labor is utilized in only the month of April and only 0.56 of one day is hired. The optimal plan indicates that if fifty days of female labor are available in each month (and the weather does not limit field days) for the farm production activities, female labor is not a constraining resource. In fact, during the month of September, female labor requirements peak at 21.88 days per month. Again we note that the model does not include any household labor requirements and does not have provisions for capturing the influence of weather on days available for field work.

Table 3. Pictorial Description of Liberian Farm Model

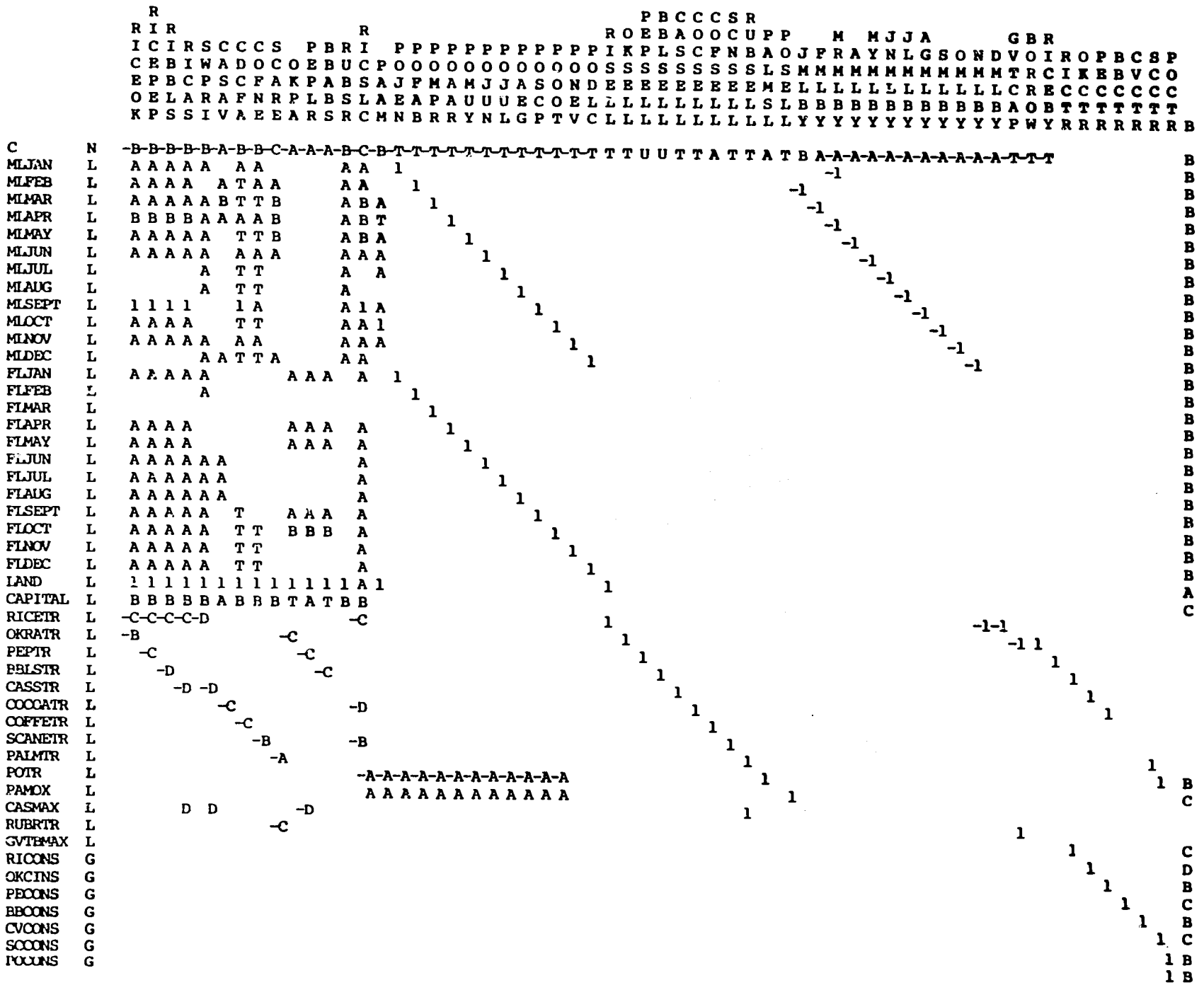

Table 4. Production Levels for Optimal Farm Plan.

Production Activity	Acres	Quantity Produced	Family Consumption	Sales
Swamp Rice	1.607	1880.000 lbs.	1880.00	
Coffee	2.582	1161.857 lbs.		1167.857
Sugar Cane	.133	10.64 gals.	10.64	
Okra	.12	.96 lbs.	96.00	
Pepper	.16	128.00 lbs.	128.00	
Bitter Balls	.12	96.00 lbs.	96.00	
Rubber	5.044	4968.451 lbs.		4968.451
Rice/	.117	112.32 lbs.	112.32	
Cassava-		351.00 lbs.	270.00	81.000
Sugar Cane	.117	9.36 gals.	9.36	
Palm Oil	Gallons			
April	17.022	17.022 gals.	10.022	7.000
September	13.978	13.978 gals	13.978	

Table 5. Labor and Capital Summary of Optimal Farm Plan

	Male Labor (Days) Used	Slack	Hired	Female Labor (Days) Used	Slack
January	34.51	15.51		14.48	35.52
February	36.53	13.46		8.03	41.97
March	48.49	1.51		0.00	50.00
April	50.00	0.00	0.56	11.39	38.61
May	50.00	0.00		4.47	45.53
June	49.71	0.29		5.17	44.83
July	32.84	17.16		5.64	44.36
August	28.70	21.30		7.13	42.87
September	39.88	10.12		21.88	28.12
October	26.34	23.66		15.88	34.12
November	50.00	0.00		12.41	37.59
December	35.69	14.31		17.29	32.71

(Household production labor is not included in the model.)

Capital Summary

Provided by family	Quantity($)	Rate
Borrowed from government	170.00	15%
Borrowed elsewhere	0	30$

The results of the model indicate that operating capital is not a severe limitation to agricultural production. All $170 of family capital is used. However, only $18.72 is borrowed from government sources. Since the cost of borrowing from private sources exceeds the cost of borrowing from the government, all of the requirement for borrowed capital is met from government sources

Sensitivity analyses for the results are included in Table 6. Ten acres of land are avaliable for crop production. The shadow price of land is estimated to be $219.49 per acre. This price is valid over a range from 8.4 to 10.7 acres. This finding indicates that the model may not adequately represent the situation. Land availablility was not assumed to be a major constraint to production.

Family demand requirements were included for seven commodities. Only two of the commodities (cassava and palm oil) would be produced on the farm if production had not been required. Thus production of five of the seven required commodities "penalizes" the value of the objective function. The income penalty associated with rice is $0.264 per pound and is valid over the range from 1,777 to 1,974 pounds. This finding suggests that if rice could be purchased off the farm at some price less than $0.26 per pound, the farm family would be better off purchasing rice and producing some other commodity. Of course, this is contingent upon the ability of the model to properly represent the situation.

Minimum okra production was set at 96 pounds. The income penalty of $0.279 per pound for okra is valid over the range from zero to 1,374 pounds. Similarly, income penalties for peppers ($0.28 per pound), bitter balls ($0.279 per pound), and sugar cane ($5.195 per gallon), range from zero to 1,406 pounds for peppers, zero to 1,374 pounds for bitter balls, and 18 to 26 gallons for sugar cane juice. Thus, the shadow prices for rice, okra, peppers, and bitter balls are more than double the farm gate market prices. The shadow price for sugar cane is only $5.195 per gallon compared with a farm gate market price of $5. The shadow price of cocoa is $0.165 per pound greater than the market price of $0.45 per per pound. And, the shadow price of cultivated palm is $18.99 per ton greater than the market price of $30 per ton.

Family comsumption requirements for cassava are set at 270 pounds. Off-farm sales are restricted to 81 pounds at $0.05 per pound. This restriction on off-farm sales penalizes the objective function $0.035 per pound over the range from 351 to 750 pounds.

Off-farm sales of indigenous palm oil are restricted to seven gallons at a farm gate market price of $4.00 per gallon. Family requirements are 24 gallons. Thus, production is

Table 6. Range Analysis for Selected Resources and Activities

Land	10 acres used	Shadow Price 219.49	Range 8.4 to 10.7
Family Requirements		Income Penalty	
Rice	1880 lbs.	.264	1777 to 1974
Okra	96 lbs.	.279	0 to 1374
Pepper	128 lbs.	.28	0 to 1406
Bitter Balls	6 lbs	.279	0 to 1374
Sugar Cane	20 gls.	5.195	18 to 26
Cassava	270 lbs.	0	
Palm Oil	24 gls.	0	

The income penalty is the cost per unit for the requirement. For example, the requirement to produce 96 lbs. of okra penalizes (cost) the value of the objective function by 96 times $0.279 or $26.784.

Items not Produced in Excess of Family Requirements

	Market Price	Shadow Price
Rice	.12/lb.	.264
Okra	.11/lb.	.279
Pepper	.10/lb.	.28
Bitter Balls	.10/lb.	.279
Sugar Cane	5/gal.	5.195
Cocoa	.45/lb.	.615
Cultivated Palm	30/ton	48.99

These shadow prices indicate the market price level that would increase the production of these items such that some could be produced for commercial sales.

Items Produced for Sale

Cassava	Sales restricted to 81 pounds. Production limited to 351 pounds. Income penalty is $0.035/lb. over the range from 351 to 750 lbs., at a market price of $0.05/lb.	
Palm Oil	Sales restricted to 7 gallons. Production limited to 31 gallons. Income penalty is $3.74/gal. over the range from 31 to 56 gals., at a market price of $4.00/gal. This production is from indigenous palm.	
Coffee	1161 lbs	1140 to 1206
	$0.55/lb.	0.538 to 0.576
Rubber	4968 gals.	4875 to 5016
	$0.32/gal.	0.308 to 0.325

restricted to 31 gallons. The income penalty associated with this restriction is $3.74 per gallons over the range from 31 to 56 gallons.

Results of Model with 25 days of Male and Female Labor per month

Experienced observers of typical Liberian farms contend that agricultural output is restricted by labor availability. The base model does not validate this contention. As noted, labor availability does not account for the influence of weather on available days for field work. To test the influence of a reduction in the number of available days, the model was solved with 25 (rather than 50) days of labor available from both sexes in each month. Table 7 includes a summary of labor use for the revised model. The 25 days of male labor is completely utilized in the months of January, March, April, May, and November. Additional male labor is hired in the months of March and April. The 25 days female labor are not totally utilized in any month.

Table 8 includes a summary of the optimal organization of the farm with 25 days of labor per month. Production levels for rice, sugar cane, okra, pepper, bitter balls, cassava, and indigenous palm oil are not different from those with 50 days of labor. When the labor availability is reduced, production of coffee increases by 4.4 acres and production of rubber decreases by 4.4 acres. Returns to the family resources decrease from $1,761 per year to $1,626 per year. The shadow price of rice increases from $0.264 to $0.281.

Results of Model with Unlimited Family Labor and Reservation Wage of $0.50 per day

In the previous two models, available family labor is utilized up to the point where the marginal value of labor is zero. In other words, family labor is assumed to be a fixed resource with a short run marginal cost of zero, and would be utilized as a "free" resource. However, an individual's utility function depends upon leisure as well as the goods derived from work. If the utility derived from leisure is positive, family members would prefer leisure to work at some reservation wage. If the returns from work are less than the reservation wage, family members would not work. A reservation wage of $0.50 per day was incorporated into the model for both male and female labor. Quantity of family labor was not restricted.

Labor utilization for the model is presented in Table 9. The option to purchase male labor is not included in the model. However, this does not influence the results which show that 27 days of male labor would be utilized in April. However, requirements are less than 25 days in all of the other months.

Table 7. Labor Summary of Optimal Farm Plan with 25 days of Male and Female Labor Per Month

	Male Labor (Days) Used	Slack	Hired	Female Labor (Days) Used	Slack
January	25.00	0.00		21.30	3.70
February	14.51	10.49		8.03	16.97
March	25.00	0.00	2.26	0.00	25.00
April	25.00	0.00	4.39	4.58	20.42
May	25.00	0.00		4.47	20.53
June	22.95	2.05		5.17	19.83
July	11.65	13.35		5.64	19.36
August	8.22	16.77		7.13	17.87
September	12.82	12.18		16.76	8.24
October	6.92	18.07		16.76	8.24
November	25.00	0.00		21.07	3.93
December	13.97	11.03		18.17	6.83

(Household production labor is not included in the model.)

Table 8. Production Levels for Optimal Farm Plan with 25 days of Male and Female Labor per month.

Production Activity	Acres	Quantity Produced	Family Consumption	sales
Swamp Rice	1.607	1880.000 lbs.	1880.00	
Coffee	7.005	3152.170 lbs.		3152.170
Sugar Cane	.133	10.64 gals.	10.64	
Okra	.12	96.00 lbs.	96.00	
Pepper	.16	128.00 lbs	128.00	
Bitter Balls	.12	96.00 lbs	96.00	
Rubber	0.621	611.879 lbs.		611.879
Rice/	.117	112.32 lbs.	112.32	
Cassava-		351.00 lbs.	270.00	81.000
Sugar Cane	.117	9.36 gals.	9.36	
Palm Oil	Gallons			
January	17.034	17.034 gals.	10.034	7.000
September	1.166	1.166 gals.	1.166	
November	12.800	12.800 gals.	12.800	

Table 9. Labor Summary for Optimal Farm Plan for Unlimited Family Labor with Reservation wage of $0.50 per day and 10 acres of land.

	Male Labor (Days) Used	Female Labor (Days) Used
January	15.89	14.48
February	23.82	20.43
March	24.27	0.00
April	27.45	4.58
May	21.41	4.47
June	19.19	5.17
July	8.67	5.64
August	5.35	7.13
September	9.27	16.29
October	4.20	16.89
November	15.65	16.44
December	10.92	18.30

(Household production labor is not included in the model.)

Maximum female labor requirements occur in February when 20 days are utilized.

Production levels for the cropping activities are included in Table 10. The results are almost identical with those of Table 8 which include results when no reservation wage is imposed on the family labor. The imposition of the reservation wage reduces the production of rubber from 0.62 to zero acres and increases the production of coffee by the same acreage. Rubber production is more labor intensive than coffee production, and is not economical with the reservation wage of $0.50 per day.

The model indicates that with a reservation wage, coffee is the most economical tree crop alternative. The market price of coffee is $0.55 per pound. The model results would not change if the price of coffee fell to $0.548 or rose to $0.593. If the price of coffee fell to $0.45 per pound, coffee production would drop only slightly from 7.63 to 7.09 acres. Interestingly, if the price of coffee declines to $0.45 per pound, rice production would decline and cultivated palm production would enter the optimal plan. If the coffee price were decreased to $0.40 per pound, cocoa (at $0.45 per pound) would replace coffee in the optimal farm plan, but rice production would still be less than that required for family consumption. If the price of coffee was $0.40 (compared to the original budgeted price of $0.55) and the price of cocoa was

$0.30 per pound (versus the original budgeted price of $0.45), coffee would still be the preferred crop and some of the rice consumption demand would be fulfilled with off-farm purchases at $0.30 per pound for rice.

Results of Model with Unlimited Land, Reservation Wage of $0.50 per day, and 25 days of Male and Female Labor per Month

In the three previous models land resources were restricted to ten acres. In this model the limit on land is lifted. In addition, male and female labor is restricted to 25 days each per month and the reservation wage is maintained at $0.50 per day. Labor utilization for the model is included in Table 11. All 25 days of male labor is utilized in the months of April, September, and November. Female labor is totally utilized only in the month of October.

Optimal cropping for the model is included in Table 12. The optimal farm plan requires 12.48 acres of land. Given the resources and limits on labor, additional land would not add to the income of the family. Virtually all of the rice required for family consumption is purchased from off-farm sources at $0.30 per pound. The 1.6 acres utilized in all three previous models for the production of rice is diverted to other crops. Coffee production is increased to 9.2 acres. However, the major difference between this model and the previous models is that 1.8 acres are allocated to the production of cultivated palm. In previous models cultivated palm was not included in the optimal farm plan.

Table 10. Production Levels for Optimal Farm plan with Unlimited Family Labor with Reservation Wage of $0.50 per day and 10 acres of land.

Production Activity	Acres	Quantity Produced	Family consumption	Sales
Swamp Rice	1.607	1880.00 lbs.	1880.00	
Coffee	7.626	3152.17 lbs.		3152.17
Sugar Cane	.133	10.64 gals.	10.64	
Okra	.12	96.00 lbs.	96.00	
Pepper	.16	128.00 lbs	128.00	
Bitter Balls	.12	96.00 lbs.	96.00	
Rice/	.117	112.32 lbs.	112.32	
Cassava-		351.00 lbs.	270.00	81.00
Sugar Cane	.117	9.36 gals.	9.36	
Palm Oil	Gallons			
January	31.0	31.00 gals.	24.00	7.00

Table 11. Labor Summary of Optimal Farm Plan with 25 days of Male and Female Labor Per Month with Reservation Wage of $0.50 per day and Unlimited Land.

	Male Labor (Days)	Female Labor (Days)
January	13.02	8.60
February	14.60	1.27
March	19.13	0.00
April	25.00	11.67
May	20.91	11.58
June	15.68	0.27
July	8.09	0.63
August	2.57	0.54
September	25.00	20.29
October	6.79	25.00
November	25.00	7.88
December	3.32	2.38

(Household production labor is not included in the model.)

Table 12. Production Levels for Optimal Farm Plan with 25 days of Male and Female Labor per month with Reservation Wage of $0.50 per day and Unlimited Land.

Production Activity	Acres	Quantity Produced	Family Consumption	Sales
Coffee	9.176	4129.03 lbs.		4129.03
Sugar Cane	.160	12.80 gals.	12.80	
Okra	.842	673.60 lbs.	96.00	577.60
Pepper	.16	128.00 lbs.	128.00	
Bitter Balls	.12	96.00 lbs.	96.00	
Rice/	.090	86.40 lbs.	86.40	
Cassava-		270.00 lbs.	270.00	
Sugar Cane	.090	7.20 gals.	7.20	
Cultivated Palm	1.843	10.14 tons		10.14
Palm Oil	Gallons			
February	3.165	3.17 gals.	3.17	
September	27.835	27.84	20.84	7.00
Rice Purchased	Pounds		1793.60	

Coffee production would be included in the optimal plan at the same level (9.2 acres) over a price range of $0.45 to $0.59 per pound. In other words, if land is not a limiting resource, and if family labor is restricted to 25 days each of male and female labor per month with a reservation wage of $0.50 per day, coffee would be a preferred activity even if the price fell to $0.45 per pound. (All other prices, yields, and input-output coefficients are assumed to be held constant.) On the other hand, the price of cocoa would have to be increased from the budgeted level of $0.45 per pound to $0.59 before production of cocoa would enter the optimal farm plan. Similarly, with labor limited, the price of rubber would have to increase from the budgeted level of $0.32 per pound to $0.72 before it would be a preferred alternative. Thus, the results of model indicate that production of coffee is preferred to production of cocoa or rubber. Again we note that these results are derived from the relationships incorporated in the coefficients of the model. Changes in relative prices, yields, and input-output coefficients may alter the results and the conclusions drawn from the analysis. The importance of verifying the technical coefficients, especially for coffee production, can not be overemphasized.

Conclusions

A mathematical programming model was constructed to represent a typical Liberian family farm based upon the available data. Production activities were included for rice, okra, pepper, bitter balls, cassava, cocoa, coffee, sugar cane, rubber, cultivated palm, and indigenous palm. Family consumption requirements were included for rice, okra, pepper, bitter balls, sugar cane, cassava, and palm oil. The model was structured to permit purchases of rice from off-farm sources. However, all other family requirements are forced to be fulfilled from on-farm production. Family resources in excess of those required to meet family consumption demands were permitted to be allocated to the production of crops for sale.

Four alternative resource combinations were considered. For all situations analyzed, the production of rice, pepper, bitter balls, and sugar cane juice in excess of family requirements is not economical. Production of cassava, and palm oil from indigenous palm, was restricted to levels considered to be appropriate for domestic consumption. If family labor is plentiful (50 days of male and female labor per month) and land is limited to 10 acres, the production of coffee and rubber is indicated. However, if family labor is restricted to 25 days per month from each of the sexes, and a reservation wage of $0.50 per day is imposed, coffee production expands and rubber production ceases.

If land is not a limiting resource, the optimal farm plan would include more than 9 acres of coffee and almost 2 acres of cultivated palm. Most of the family rice requirements would be purchased from off-farm sources. The major conclusion to be drawn from the modelling effort is that production of tree crops, especially coffee, offer more potential for improving the economic well being of Liberian farm families, than rice production.

All results are contingent upon the reliability and validity of the data used in the model. In addition, the family decision makers are assumed to be risk neutral and to possess the technical skills necessary to produce the alternative crops. It is suggested that the coefficients in the model be refined by farm management workers in Liberia as additional information becomes available.

COSTS, BENEFITS AND INCOME REDISTRIBUTION FROM LIBERIAN RICE POLICIES

Luther Tweeten and J. Boima Rogers*

This paper estimates the contribution of rice policies to the level and distribution of income among producers, consumers, and the public sector. The results show that rice market policies transferred income from consumers to producers and to the public sector. Losses to consumers more than offset gains to producers and the public sector, however. Thus, rice market interventions reduced total income in Liberia.

This and other papers in this series suggest agricultural policy alternatives that would accomplish objectivies of income redistribution and rice price stabilization while adding to income of Liberia.

These alternatives can help in formulating an overall Liberian agricultural policy.

Redistribution and Social Costs

Based on analysis in the Appendix, the redistribution of income among sectors and the net social cost of Liberian rice policy in 1982, 1983 and 1984 is shown in Table 1. Net social cost is the value of goods and services sacrificed by inefficient use of resources.

Compared to a well-functioning market, rice policies in 1983 increased farmers' income by $1,023,410 and commerical rice importers' income by $618,910. loss to consumers was $5,195,180. Net loss to the private sector was $3,552,870 because consumers sacrificed more than producers and commerical importers gained.

Gains to rice producers cost the Government of Liberia (GOL) $1,516,160 in 1983. In addition, costs of marketing, waste and spoilage in excess of those expected in a well-functioning market totaled $2,020,510 to the Government. Ignoring the value to the GOL of PL 480 counterpart funds, the Government gained $4,388,450 from consumers through prices held above world price levels in 1983.

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Public sector gains from consumers more than offset public sector losses. Hence, the GOL gained an estimated $852,090 from rice market intervention policies in 1983 (Table 1). Overall public sector gains fell short of private sector losses. The sum of private and public sector gains and losses was negative.

The net social cost of rice market policies was $2,700,780 in lost value of goods and services (national income) that could have been forthcomimg in the absence of the Government rice market policy. National income loss was less in 1984 than in 1982 and 1983 mainly because country rice support activity was curtailed in 1984.

One objective of Liberian rice policy was to transfer income to producers. A "pure" income transfer would shift income to producers from comsumers or others at no resource cost or lost output. In fact, scarce resources are used in transferring income. Transfer of income away fron Liberian rice consumers was relatively efficient; less than 10 cents of real income was lost from consumption per dollar transferred (see row 17C, Appendix Table 1). This high transfer efficiency compares favorably with other well managed income transfer programs in world perspective.

On the other hand, the efficiency of tranferring income to Liberian producers was very low. National income was reduced over $1.80 in 1982, 1983 and 1984 to add $1.00 to producers income. The high real cost of the transfer came from three principal sources:

1) Foregone output of tree crops and other high-value products because producers were encouraged by price supports to use their limited resources to produce rice.

2) Spoilage of country paddy rice stocks accumulated by price supports but not processed because of limited milling capacity.

3) Administrative and other personnel and transportation costs incurred by LPMC in excess of those required by the private market to process the same volume of rice.

Intrinsic benefits of income redistribution and of price stability are not accounted for in Table 1. That is, even if total real output of Liberia were unchanged, income transfers from high income to low income people and greater income stability may make people of Liberia better off on the whole. These benfits must be balanced against the costs shown. At issue is whether rice policies could be changed to reduce social costs and achieve income redistribution and stability ojectives at lower cost.

Table 1. Gains and Losses to Private Sector, Public Sector and Society from Liberian Rice Market Interventions in 1982, 1983 and 1984.

Item	1982	1983	1984
Private Sector		- Thousand Dollars -	
+ Gain to producers	595.35	1,023.41	186.69
+ Gain to commercial importers	629.25	618.91	545.67
- Loss to consumers	4,481.94	5,195.18	7,658.67
= Net loss to private sector	3,257.34	3,552.87	6,922.30
Public Sector			
+ Policy transfer from consumers to GOL	3,711.45	4,388.45	6,724.73
- Policy transfer to producers	882.00	1,516.16	203,13
- Excess cost of country marketing	291.04	389.27	374.71
- Value lost from country waste	529.20	1,044.29	361.62
- Spoilage and waste, Monrovia	629.25	586.65	604.50
= Net gain to public sector	1,379.96	852.09	5,180.77
Society			
Net cost of public intervention to society (Excess of private cost over public gain)	1,877.38	2,700.78	1,741.54

Source: See Appendix Table 1.

Policy Changes to Increase Efficiency

We first examine policies to benefit local rice producers, then examine policies regarding imports of rice for urban consumption.

In-country supports

Several policy changes discussed below could substantially reduce the social cost of rice policies. One alternative to reduce the real cost of the country rice policy would be to terminate Liberian Produce Marketing Corporation (LPMC) country rice supports and allow the private market to transport, mill and market country rice . There appear to be sufficient numbers of private buyers to create market competition, restrain market costs, and promote efficiency. However, the market would function more efficiently if the government would provide timely estimates of market prices and ensure that scales of buyers are properly calibrated. Country rice prices could be supported indirectly if deemed desirable by a variable levy on foreign imports. LPMC might continue its milling activities for a fee and might hold buffer stocks to stabilize rice prices and supplies. It would buy and sell at market prices to roll over stocks so as to maintain stocks at desired levels. LPMC would use a first in - first out (FIFO) rather than a last in -first out (LIFO) inventory policy to minimize spoilage.

This market oriented overall policy would free substantial government resources to upgrade research and extension resources encouraging efficient tree crop production and marketing. The additional tree crop production would in time raise producers' incomes to more than offset any loss of income from rice.

A second general alternative is to retain country rice price supports but with modifications to reduce Government costs to a level that will allow supports to be sustained without interruption. Addition to milling capacity at country collection points will allow LPMC to market more milled rice from in-country purchases. Milling capacity currently being installed will remove the need to store paddy for long periods with attendant spoilage.

Some producers use LPMC as a storage and milling agent by selling to LPMC at harvest and then buying back clean rice as needed during the year. The attractiveness of this option is apparent. Assuming a milling conversion rate of 55 percent for a producer, 12 cents per pound paddy rice received on average by farmers selling to LPMC is equivalent to 22 cents per pound clean rice.

By buying back clean rice as needed from LPMC stocks during the year for 24 cents per pound (2 cents over the selling price), the producer saves costs of storage facilities, interest, spoilage and milling. Meanwhile, costs of transportation, storage, spoilage and milling to LPMC were at least 12 cents per pound in 1982. Producers would perform these functions at much lower cost because they have lower labor and transportation costs. Hence, net social costs would be reduced and real national income increased by reducing incentives for producers to sell and buy back from LPMC. Lack of ability to control borders means that some LPMC procurement costs accrue as benefits to rice producers in neighboring countries. The high cost of the operation to LPMC has caused funds to support prices to run short periodically so that purchases are intermittently terminated. This adds instability to rice markets.

If producer price supports are maintained, several changes could make them more workable.

1) One option to reduce LPMC costs would be to lower the in-country support price by several cents per pound at the three LPMC buying stations. The lower support price could have less unfavorable impact if producers are allowed to sell directly to LPMC.

2) Seasonally adjust support prices. If producers can store rice more cheaply than can LPMC, they should be encouraged to do so by LPMC providing lower support prices at harvest and raising support prices according to storage costs as the season progresses beyond harvest.

3) Adjust support prices for quality. If the same support price is paid on all purchases by LPMC, producers have strong incentives to deliver lower quality rice to LPMC and sell commercially their higher quality rice.

4) Pay no premium for transportation. Transportation allowances attempting to provide the same local support price for all locations encourage production and marketing by producers so distant from markets that large transportation costs are incurred. If local prices are allowed to differ by transport costs, more rice will be produced nearer markets so that resource costs to produce and market rice will be as low as possible. Furthermore, there is evidence that transportation allowances are misused. Buyers provided transportation allowances for purchase of rice from distant points instead purchase nearer LPMC stations and pocket the allowance. It follows that the termination of transportation allowances would not necessarily reduce producers' incomes by the amount of the allowance

-- much of the loss would be absorbed by lower profits to middlemen who obtain supplies from producers for delivery to LPMC.

Economic analysis suggests that local rice has the characteristics of a "non-traded good" for Liberia. The costs of clean rice imported at Monrovia plus transportation costs to rural locations is approximately 25 cents per pound. Locally produced rice is available at a much lower cost, hence it does not pay to import rice into producing areas except in some localities from bordering countries. The opportunity cost (foregone earnings from tree crops) of producing and marketing locally produced rice in major urban areas of Liberia is well above the cost of importing rice, hence it does not pay to produce rice in Liberia for coastal urban markets. Thus the most efficient, low-cost policy for Liberia is to continue to import rice for urban consumption.

Based on studies of comparative advantage in production, it is more profitable and efficient to produce tree crops for export rather than to produce rice for commercial urban markets. But for food security and other valid reasons, Liberian farmers will continue to produce rice for subsistence home consumption. Rice will continue to be produced in large quantities in Liberia and the Government of Liberia should continue strong policies of research and extension to improve rice production and marketing through agricultural extension and research. Rice storage and a rice security reserve fund financed from levies on commercial imports can be used to ensure stable rice supplies and prices. But as indicated earlier, Government costs of market interventions to support producer prices are now very large relative to benefits received. A lower rice support price and reduction of marketing costs and taxes on tree crop exports could substantially increase incomes to producers. Because tree crops damage the soil less and provide more income per acre (including fallow) than cultivated crops, greater emphasis on tree crops is also consistent with an environmentally sound and sustainable agriculture.

Greater reliance on the private sector to market locally produced rice coupled with a smaller marketing role for the public sector can reduce marketing costs and save scarce Government resources for much needed investment in schooling, roads, extension and research. Such investments will have less spillover to benefit bordering countries than does the current local rice support policy.

Import Policies

Private commercial importers have profited from current government rice import policies as noted in the calculations in Table 1. Commercial imports at prices below Government support levels for sale in competition with LPMC frequently erode LPMC

sales from PL-480 imports and build LPMC stocks to levels causing spoilage.

Several options need to be considered to control commercial rice imports:

1) Tighter import licensing regulations to restrict commercial imports at levels that do not erode LPMC sales. Such licenses could be auctioned to the highest bidder.

2) Strict enforcement of procedures to collect variable levies on imported rice. A $1 per hundredweight duty seems to be currently enforced but the variable levy is not. A study of how the European Economic Community and how other developing countries have successfully collected the variable levy would be instructive. Lessons learned could be implemented in Liberia. One option would be to charge commercial importers a variable levy not based on commercial import invoices as is done currently but on the basis of the lowest quoted price at U.S. or Thailand ports adjusted to Liberian grade imports and accounting for shipping and handling costs.

3) Another option would be to turn over all importing to commercial firms. LPMC would only be responsible for holding and managing rice storage stocks which would be released if rice prices rise to prescribed levels. A levy might be imposed on all imports to support prices to producers and earn foreign exchange. The levy could be variable, rising when world prices fall and falling when world prices rise to maintain a more stable price to Liberian consumers. The world market would provide the major buffer stock, but local stocks might be held by LPMC to provide additional security. The GOL would need to work out arrangements for private firms to import and market PL-480 supplies. Proceeds above negotiated marketing costs would be turned over to the Government.

4) Another option would be for LPMC to import all rice. Sales by LPMC of imported stocks to commercial distributors would in essence collect the variable levy. This option would strain LPMC managerial capacity, potentially creating problems of mismanagement.

Enforcing a variable levy on rice imports would help to keep Liberian rice prices relatively stable, provide modest price incentives to producers and transfer some income from higher income consumers to lower income producers. The currently high value of the dollar constitutes an import subsidy which justifies an offsetting import tax to achieve an appropriate

balance between imports and domestic production. The support price must not be held substantially above world prices, however, or high costs will be imposed on Liberian consumers. Also, rice prices held well above world price levels would require a costly targeted food assistance program for the needy if the well-being of low income consumers is of concern.

Approximately half of marketed rice consumption in 1983 was from PL-480 imports which provide counterpart funds used to support essential and productive Government services such as agricultural research and extension. Because rice imports from neighboring countries cannot be controlled at the border, a high support price would invite sufficient commercial imports to undermine PL-480 rice marketing and cut off an important and low-cost source of funding for public services to agriculture. PL-480 imports may be jeopardized if stocks are allowed to spoil or if sales are used to finance country rice supports.

In summary, the variable levy should be designed to:

1) stabilize domestic rice prices;

2) provide an insurance stabilization fund (to be set aside for imports if world rice supplies are short and import prices rise);

3) provide modest economic incentives for domestic producers; and

4) transfer some income from higher income urban consumers to lower income producers.

If inflation drives world rice prices above locally established market prices for extended periods, it would be unwise for the Government of Liberia to persistently subsidize rice consumption. Transitory world rice increases due to temporarily short world supplies of rice need not be passed to Liberia consumers because one goal of price policy is to assure adequate supplies at reasonably stable prices. But a more permanent price increase due to inflation or other sources should be passed to consumers because the GOL cannot afford the large Treasury drain of permanently subsidizing consumers. Under such circumstances, an appropriate policy may be to raise the Government-established wholesale rice price say one cent per pound per quarter until domestic prices are raised to the level of world rice prices. This policy would avoid sharp price changes disliked by consumers, and would avoid depleting either LPMC rice stocks or the Treasury. Rice prices set too low to consumers or too high to producers may actually contribute to instability because they cannot be sustained by the Government's limited revenues. When revenues are stretched too far, sharp policy changes must occur which are unsettling to producers and consumers alike.

Conclusions

Liberian agricultural and food policies are under stress. Troublesome issues include high social costs (inefficiency) from policies to increase rice output and raise farm income. A second major problem in disarray in rice import policies. A number of options were presented to improve these policies.

The goal of self-sufficiency in rice production shows a commendable commitment of GOL to serve the needs of farmers and consumers. However, self-sufficiency is unattainable with current policies and Government resources in the foreseeable future. The goal of self-sufficiency should not deter the Government from immediate attention to a policy that increases producers' efficiency and income, reduces Government treasury outlays and maintains food security.

The highest form of food self-sufficiency is food-security. This issue is discussed in another paper by Trapp, Rogers and Wilkins; only a few points are mentioned here. Liberia will increase food security by helping producers to increase income by shifting to crops offering highest returns and in other ways using resources most efficiently. This can best be accomplished by modifying policies to permit tree crops to be marketed as efficiently as possible without export taxes. A modest variable levy on rice imports could be maintained to encourage local production and to provide an insurance fund for purchasing rice in an emergency from accumulated variable levies. Some buffer rice stocks could be maintained by LPMC for food security.

Current country rice price support policies reduce national income. Instead, Liberia's very limited funds to improve agriculture could be used where investment benefits exceed costs and thereby add to national income. Producers will continue to produce rice for local needs. But several high-payoff activities can produce benefits in excess of costs, can target benefits to Liberians and avoid spillout to neighboring countries. Potential productive investments to improve agriculture include:

1) General and vocational schooling of youth in agriculture.

2) Research to develop or adapt from other countries improved farming practices and inputs such as seed varieties. Efforts need to be directed not only at rice but also at tree crops, fruits, vegetables and livestock.

3) Provide modest subsidies to speed early adoption of improved farm inputs such as higher-yielding seed varieties -- the Smallholder Rice Seed Development Project is an example.

4) Roads and bridges.

5) Sanitary water systems, health and family planning clinics.

6) Local credit unions or clubs mobilizing savings and encouraging investment in high-payoff activities in rural communities.

7) Extension activities, including upgrading of capabilities and transportation for extension personnel. Extension personnel can assist farmers not only in improving efficiency of rice production but also in expanding output of tree crops such as coffee, cocoa, palm oil and rubber which have higher payoffs for commercial markets.

APPENDIX

Appendix Table 1 and Appendix Figure 1 show estimated gains and losses from Government market interventions in the Liberian rice economy in 1982, 1983 and 1984. Analysis at the producer level (P) is expressed in paddy rice. Analysis at the consumer level (C) is expressed in milled clean rice. Although much effort went into obtaining data, some of the estimates are not highly reliable.

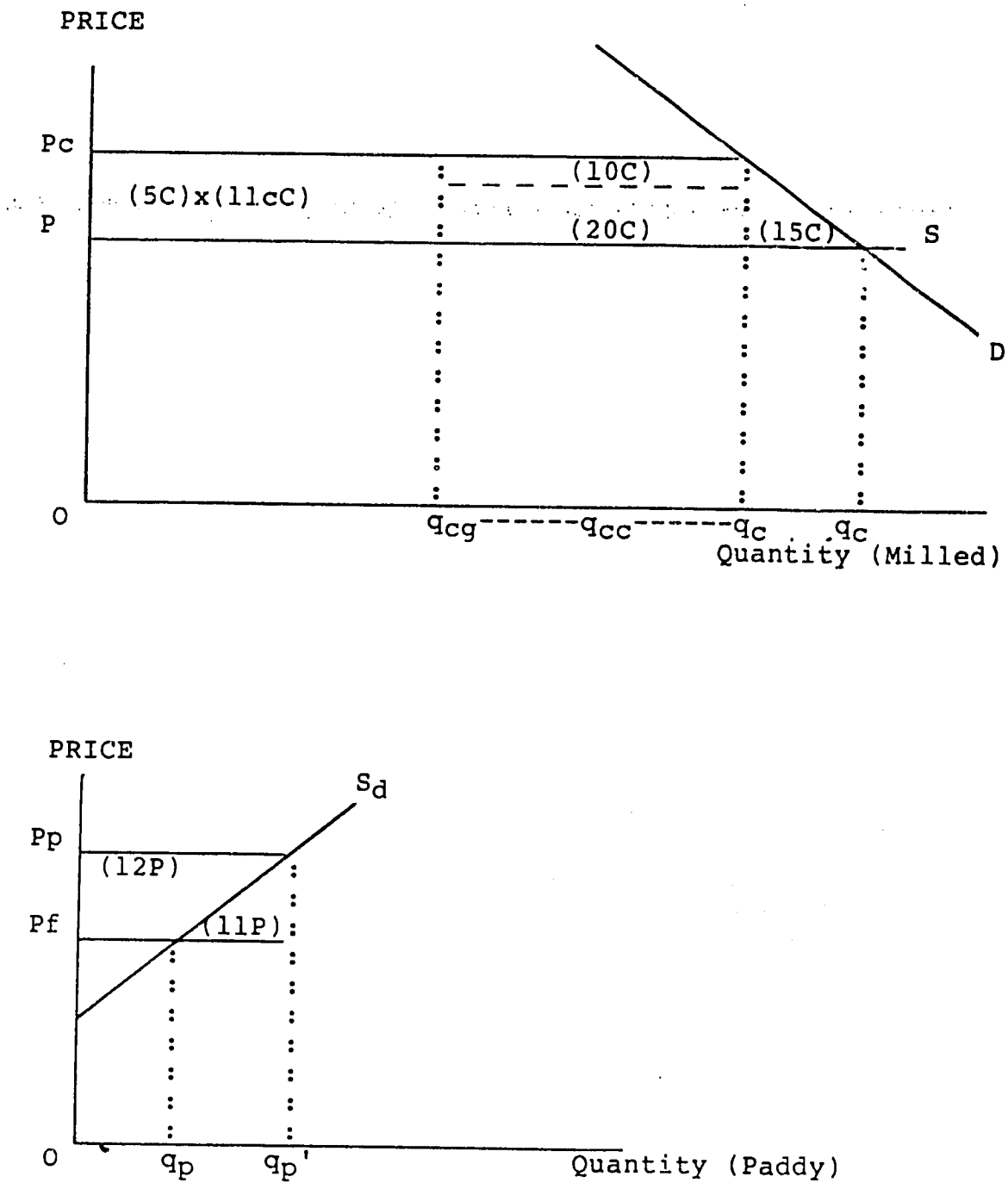
First consider impacts on producers as estimated in the first panel (P) in Appendix Table 1 and the lower panel of Appendix Figure 1. The official support price at the county receiving stations was 18 cents per pound paddy, but at the farm level was approximately 12 cents per pound p_p. The effective support price was lower in 1984 because the official support price could not be sustained for lack of funds. In the absence of supports, farm price was estimated to be p_f = 8 cents per pound, hence the effective proportional subsidy was 50 percent in 1982 and 1983 as shown in row (8P). The support price generated a market surplus quantity $q'_p - q_p$. The subsidy of $(p_p - p_f)(q'_p - q_p)$ to producers was partially offset by additional production costs as shown in row (11P).

Only the market surplus is assumed to be effective by rice price support in the above calculations. Approximately the same additional quantity is produced in row (10P) if it is assumed that total rice supply elasticity is .1 and all Liberian rice production, even in remote areas for subsistence use, is effectively raised in price by 25 percent.

Mainly because of limited milling capacity, the Liberian Produce Marketing Corporation (LPMC) was only able to market a portion of paddy acquisitions as noted in row (14P). An estimated half of the unmarketed quantity was lost as waste at a value shown in row (19P). In addition, marketing costs were estimated to exceed competitive marketing costs. The excess resource cost for marketing is shown in row (17P). The sum of the lost value from three sources (production value lost, excess marketing cost, and spoilage) is shown in row (20P). The loss of well over $1 in goods and services to transfer $1 of income to producers as shown in row (21P) indicates very low efficiency in transferring income to producers.

Effects of Government rice policy on market consumers (C) are shown in the second panel in Appendix Table 1 and the upper panel of Appendix Figure 1. The Liberian price was supported above the cif world price level p as shown in row (5C), reducing consumption from q_c to qc' as shown in Figure 1. Of this consumption, q_{cc} =qc' - q_{cg} was imported commercially and q_{cg} was from LPMC in-country and PL-480 acquisition as shown in row (11C) of Appendix Table 1. The loss to consumers from the consumption tax was (16C). The Government received part of the tax directly and (10C) of the tax indirectly from a duty on commercial imports. Commercial importers gained (20C) of the tax as economic rent, hence consumers lost (15C) not gained by Government or commercial importers. In addition, social costs roughly estimated in (19C) were incurred due to above normal spoilage of LPMC stocks.

The distribution of gains and losses from market intervention is summarized in the final panel of Appendix Table 1. Gains to producers and commercial importers were offset by losses to consumers so that the private sector incurred a net loss of over $3 million each year. The public sector gained because transfers from consumers more than offset losses from price supports to producers, excessive marketing costs, and spoilage and waste. The net loss to society was over $2 million in 1983 because losses to the private sector exceeded gains to the public sector. The social cost must be balanced against unaccounted for benefits of rice policies such as stability of rice prices, public employment and political support. Net costs and benefits of PL-480 counterpart funds are not included in the calculations.



Appendix Figure 1. Graphic Illustration of Liberian Rice Policy Intervention.

Appendix Table 1. Gains and Losses from Government Policies, Liberian Rice Economy.

Item	Notation	Units	1982	1983	1984
		Producers (Farm Level) P			
(1) Domestic production sold to LPMC	q'_p	1,000 mt paddy	10.00	17.19	9.25
(2) Guaranteed producer price	p_g	$/mt (18c/lb.)	396.90	396.90	396.90
(3) Effective producer price	p_p	$/mt	264.60	264.60	198.36
(4) Producer receipts (1)x(3)	$q'_p p_p$	$1,000	2,646.00	4,548.47	1,834.83
(5) Normal market price, farm level	p_f	$/mt (8c/lb.)	176.40	176.40	176.40
(6) Producer subsidy (3)-(5)	$p_p - p_f$	$/mt	88.20	88.20	21.96
(7) Policy transfer to producers (1)x(6)	$q'_p(p_p - p_f)$	$1,000	882.00	1516.16	203.13
(8) Proportional subsidy (6/5)x100	$(p_p - p_f)/p_f$	Percent	50.00	50.00	12.45
(9) Direct price elasticity of market surplus		Percent	1.30	1.30	1.30
(10) Quantity generated by production subsidy (1)x(8)x(9)/100	$q'_p - q_p$	1,000 mt	6.50	11.17	1.50
(11) Production value loss .5(6)x(10)	$.5(p_p - p_f)(q'_p - q_p)$	1,000	286.65	492.75	16.44
(12) Gain to producers (addition to producers surplus) (7)-(11)		$1,000	595.35	1,023.41	186.69
(13) Production value loss per unit of gain to producers (11)/(12)		$	.48	.48	.09
(14) LPMC quantity sold from local production		1,000 mt	4.00	5.35	5.15
(15) LPMC marketing cost of local production sold		$/mt	205.06	205.06	205.06
(16) Normal marketing cost for competitive sector		$/mt	132.30	132.30	132.30
(17) Excess resource cost of marketing (15-16)x(14)		$1,000	291.04	389.27	374.71
(18) LPMC purchases less sales (1)-(14)		1,000 mt	6.00	11.84	4.10
(19) Value lost from waste .5(5)x(18) (assume half loss)		$1,000	529.20	1,044.29	361.62
(20) Sum of social costs (11)+(17)+(19)		$1,000	1,106.89	1,926.31	752.77
(21) Social cost per unit gain to producers (20)/(12)		$	1.86	1.88	4.03

Appendix Table 1 (Continued).

Item	Notation	Units	1982	1983	1984
		Producers (Farm Level) P			
(1) Total quantity marketed and consumed	q'_c	1,000 mt	95.40	102.40	102.40
(2) Support price, wholesale	p_c	$/mt	465.00	440.00	474.00
(3) Consumption cost (1)x(2)	$q'_c p_c$	$1,000	44,361.00	45,056.00	48,537.60
(4) Computed cif world wholesale price	p	$/mt	419.50	391.10	403.00
(5) Consumption tax (2)-(4)	p_c-p	$/mt	45.50	48.90	71.00
(6) Policy tax on consumers (1)x(5)	$q'_c(p_c-p)$	$1,000	4,340.70	5,007.36	7,270.40
(7) Proportional tax (5/4)x100	$(p_c-p)/p$	Percent	10.85	12.50	17.62
(8) Commercial importers	q_{cc}	1,000 mt	50.00	55.00	55.00
(9) Prescribed import margin .03(4)		$/mt	12.59	11.73	12.09
(10) Planned commercial tax revenue (5-9)x(8)		$1,000	1,645.75	2,044.18	3,240.05
(11) LPMC a) PL-480		1,000 mt	43.00	45.00	46.00
b) In-country purchases		1,000 mt	2.40	2.94	2.68
c) Total	q_{cg}	1,000 mt	45.40	47.94	49.08
(12) Policy tax transfer to GOL (5)x(11c)+(10)		$1,000	3,711.45	4,388.45	6,724.73
(13) Direct price elasticity of demand		Percent	-.60	-.60	-.60
(14) Consumption lost by tax (1x7x13)/-100	$q_c-q'_c$	1,000 mt	6.21	7.68	10.82
(15) Consumption value loss .5x(5)x(14)	$.5(p_c-p)(q_c-q'_c)$	$1,000	141.24	187.82	384.27
(16) Loss to consumers (6)+(15)		$1,000	4,481.94	5,195.18	7,654.67
(17) Consumption value lost per unit of tax (15)/(12)		$	.04	.04	.06
(18) Spoilage and waste above normal		1,000 mt	1.50	1.50	1.50
(19) Cost of spoilage (4)x(18)		$1,000	629.25	586.65	604.50
(20) Gain to commercial importers (6)-(12)		$1,000	629.25	618.19	545.67

Appendix Table 1 (Continued).

Society Gains and Losses from Market Intervention[a/]

Private Sector	Source	Units	1982	1983	1984
+ Gain to producers	(12P)	$1,000	595.35	1,023.41	186.69
- Loss to consumers	(16C)	$1,000	4,481.94	5,195.18	7,654.67
+ Gain to commercial importers	(20C)	$1,000	629.25	618.91	545.67
Net		$1,000	-3,257.34	-3,552.87	-6,922.30
Public Sector					
- Policy transfer to producers	(7P)	$1,000	882.00	1,516.16	203.13
- Excess cost of country marketing	(17P)	$1,000	291.04	389.27	374.71
- Value lost from country waste	(19P)	$1,000	529.20	1,044.29	361.62
+ Policy transfer from consumers to GOL	(12C)	$1,000	3,711.45	4,388.45	5,724.73
- Spoilage and waste	(13C)	$1,000	629.25	586.65	604.50
Net		$1,000	1,379.96	852.09	5,180.77
Net cost of public intervention to society (Loss to private sector less gain to public sector)		$1,000	1,877.38	2,700.78	1,741.54

[a/]Omitted from analysis:
a) Net cost and benefits of PL-480 imports -- could be established as separate account.
b) The subsistence rice production--consumption sector.

LIBERIAN RICE IMPORT POLICY IN RETROSPECT

J. Boima Rogers*

Introduction

Agricultural policies are usually responses to trade patterns which policy makers perceive as uneconomical or politically unaceptable. Policies are therefore adopted to stimulate agricultural exports, or substitute local output or imports that policy makers regard as potentially viable. The objective is therefore to change the patterns of trade to allow the country comcerned to maximize returns from trade given its comparative advantage or for food security. Such measures as are adopted also result, either in an explicit policy or shock, in redistributing incomes and changing taste patterns of the public. Many countries, including Liberia have recognized the poverty of the rural farming population relative to that of the urban nonfarming population. In getting ahead with the policy of increased substitution of local rice for imported rice, it has frequently been accepted that urban consumers would pay above free market prices to allow Government to accumulate funds for subsidizing local production.

1920-1971

Liberian import rice policy was partly formulated even before the first rice imports started rolling in 1946. In agreements with concessions, starting with that with Firestone Rubber Corporation in 1920, the Government of Liberia (GOL) waived its rights to limit rice imports or collect future taxes that may be needed by such corporations to feed their workers. The Open Door Policy initiated by President Tubman which ushered in foreign investments and a new group of non-rice growing agricultural population meant that the traditional rice production and marketing system could not meet up to these new trends. The rapid growth in the economy during and after the second world war through to the early 1970s, when GDP increased by 10% per annum, opened Liberia to the world and rice imports.

In 1963, President Tubman, partly as a result of balance of payment problems, initiated the first agricultural development program. In Operation Priority Number One, he outlined a

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program that would, among other things, attempt to achieve self-sufficiency and increase agricultural production. It, however, proved that the GOL was not fully committed to supporting the program through adequate resources or maintaining a coherent, ongoing policy and the greatest impact of this exercise was to orientate the government to an interventionist agricultural policy within the background of a free and open economy. The Crash Program for Agricultural Development (CPAD) launched in 1968 included the goal of "nearly self-sufficiency in the production of food crops and particularly rice." The Rice Committee was created to regulate rice imports. Initially, import rights were given to a company to import paddy and to mill it into white rice. High spoilage and deterioration in the quality (odor) of such rice resulted in quick termination of this arrangement. A biding system was implemented in which competitive bids would be accepted from any prospective importer. The creation of the Rice Committee was about the most tangible result in the CPAD and ensured GOL's effective control of imports.

1971-1980

The Tolbert regime in 1971 initiated a new national economic policy in which self-sufficiency in rice continued to be a policy goal. GOL's committment, however, was this time accompanied by rapidly increased budgetary outlays, which increased from $2.6 million (4% of total budget) in 1971 to $29.5 million (9.3% of total budget) in 1979/80.

During this period, GOL had accepted the fact that to pursue its objective of self-sufficiency in rice, policies had to be enacted that had more than rhetoric value. It needed payments to farmers in the form of imput and output subsidies which the hard pressed GOL treasury found hard to absorb. It was also accepted that pricing policy should attempt to dampen the frequently volative world market price through a variable levy system which would be inversely proportional to world market price (cif) Liberia. The variable levy assumed a base cif price and allowances made for distribution costs. The difference between cif price plus distribution costs and the wholesale price was paid into the general agricultural development fund. The fund was used for general agricultural development of tree crops and rice as well as stabilizing prices received by farmers. This fund grew rapidly attaining a value of $5 million per annum by 1977, a third of the GOL agricultural outlay that time. However, as world prices rose in the period 1978-1981, GOL policy represented a subsidy which went against GOL's policy of getting predominantly urban consumers of imported rice to subsidize local production. This pricing policy, together with budgetary constraints, forced the Government to reevaluate the base cif price in its calculation of final retail price. The inevitable increase in the sale price of imported rice in 1979 also turned out to be politically explosive.

In addition to these policies GOL eliminated imports of parboiled rice in a bid to wean the rice buying public from the taste of American parboiled rice which had been the predominant type of import since rice importation started. It was felt that this policy would familiarize Liberian rice purchasers with white non-parboiled rice which the Liberian Produce Marketing Corporation (LPMC) produced and local producers provided for sale. It was also believed that the exclusive use of white rice, which stores for a much shorter time than parboiled rice, would eliminate or minimize the activities of speculators.

Towards the close of the 1970s, GOL became increasingly concerned about the low level of participation of Liberians in key industries. This concern was evidenced by many GOL pronouncements culminating in Executive Ordinance No. 2 (1980). This ordinance went on to formulate an explicit policy goal of income transfer from the foreign enclave to Liberian nationals. Liberians without adequate capital formation were to be assisted by LPMC, or other more financially qualified nationals, through consortium arrangements. The document further maintained the price of $20 per bag of 100 lb. U.S parboiled, 50% maximum brokens.

The Committee was also mandated to "monitor importation and distribution of rice" within the country and "insure against bottlenecks" in the supply of rice to all Liberians.

During this period, the Minister of Commerce replaced the Minister of Agriculture as Chairman of the Rice Committee, thereby separating rice development programs from the imported rice market.

Post April 12, 1980

After the coup of 1980, rice policy changed significantly. Rice had been an explosive issue in the proceeding year and it had been felt by large sections of the population that rice prices had not been properly managed. The new regime was parodoxically faced with the conflicting facts of increasing world market prices in 1980-1981 and of populist expectations of reduced rice prices. Given the world wide economic recession which had just started setting in and grossly reduced government revenue intakes, the GOL was hard pressed to maintain the rice price at $20.00/100lb. bag. The situation had changed from the mid-70s of surplus reserves, to GOL subsidy of mainly urban consumers of imported rice.

These issues resulted in GOL adopting a "Statement of Policy on the importation of rice" in 1981. This document liberalized the Liberian market for imported rice, making the availability of rice the main issue. The emphasis was more on financial and physical capability of firms rather than the previous emphasis on income transfers.

Specifications were made regarding financial, organizational and warehouse capacities of importers and a new higher price of $24.00/bag retail to be charged. Qualitative standards were liberalized to allow 'any quality of rice so long as it did not exceed 65% of brokens', to be imported with a specification that qualities presented to the Rice Committee were the same that docked in at port. The Committee established a bench mark cif price and margins for importers and wholesalers. Based on those calculations, a payment to the Rice Stabilization Account of $1.00/100lb. bag was to be made by importers, half of which was to be deposited at the time the permit was granted to an importer and the balance at the time of arrival. This document also specified a new higher price for paddy which was at 18 cts/lb., 50% higher than the old former LPMC quoted price. It was inferred that in the case of rice prices going below the benchmark price, additional revenues equal to the difference between the new cif price and the previous cif bench mark price were also to be deposited in the Rice Stabilization Account.

During this period, starting from 1980, the U.S. government implemented the PL-480 program. This program provided rice to GOL on a long-term, soft loan basis with revenues to be utilized for financing various development projects. LPMC continued its mandate of procuring, milling and distributing polished rice from local sources under this program. At the same time, rice was allowed to be imported by commercial importers and concessions. Imports by all groups were to be monitored by the Rice Committee to ensure an adequate supply. In the ensuing years starting from 1983, uncontrolled imports and greatly increased intake of local paddy resulted in acute storage problems. These problems have continued intermittently as world prices have plummeted and without proper mechanism for collecting the variable levy on imports. Private importers have found it profitable to import vast quantities with the hope of reaping huge economic rents in the face of the inflated GOL administered price. The administrative mechanism which replaced the tender system has therefore proven to be rigid with regards to the dynamic marketing system.

Concluding Remarks

In the final analysis, we can delineate three phases of rice import policy.

The first phase starts with the implementation of the first concession agreements in the 1920s when the GOL waived its rights on certain types of imports in terms of volume imported and future tax schemes. This phase continued to a point whereby the GOL instituted an interventionist agricultural policy in which self-sufficiency was first mentioned. The Rice Committee, the official institution regulating imports of rice was established in an atmosphere of minimum government involvement. This episode witnessed the first stirrings of

hostile reaction of the business community to controls, resulting in shortages of rice in 1968 as GOL attempted to calculate marketing costs to institute a ceiling price for imports. By the end of the period, 1971, it had been more or less established that an assertive GOL policy on rice imports was here to stay.

The advent of the Tolbert regime ushered in a new mood of optimism regarding rice production and rural development in general. During this period, despite significantly increased GOL budgeting outlays, rice imports continued to increase at an unrelenting pace averaging 8.8% annually for the period 1971-1980. Although this rather poor production response to relatively high GOL budgetary transfers can be blamed on deficiencies in the planning and implementations of programs, there were factors outside GOL's control. Demographic factors like the rapidly increasing rate of urbanization, sluggish farm population growth, at 2.4%, less than the national rate of 3.3% and possibly changing tastes in favor of parboiled rice contributed to this. It can therefore be said that, whereas the first phase witnessed the orientation of GOL, the 2nd phase tried out various schemes and GOL committed itself on paper and in its budget. An attempt was made at analyses of problems and measures were implemented to affect those problems.

In post April 12, 1980, an administrative system for regulating stocks, prices and margins has operated in the background of a volatile domestic and international background. Although world prices went down considerably after 1981, the GOL support price stayed at $24.00 a bag retail. The increased revenues that were supposed to have been generated by reduced cif prices and deposited into the Rice Stabilization Fund never materialized. The variable levy degenerated into an excise tax and private importers obtained windfall profits while still underselling LPMC and clearing stocks at high frequencies. LPMC in the face of an ambiguous domestic rice policy absorbed the extra tax of $1.00/bag and even some of the proceeds of PL-480.

The long storage period of imported and local rice at LPMC warehouses has resulted in large storage losses in the last two years that completely negate any gains of GOL programs. Finally, the goal of self-sufficiency in rice as affected by output subsidy has collapsed in the last 6 months as LPMC in the face of liquidity problems has terminated buying of local rice.

Prospcts for the Future

GOL's rice import policy needs to be revamped and new procedures introduced.

To start with, the GOL needs to review and implement policies and goals. These ploicies can be conceptualized as:

1) Economic efficiency - to obtain rice as cheaply as possible to the consumers.

2) Social - it is perceived here that the social welfare function may deviate from (1), but policies here tend to increase political stability and can be classified as:

   a) Increased substitution - Increased substitution of local rice for imports as a way of utilizing capacity, and reducing reliance on external sources.

   b) Stockholding for food security - GOL is committed to ensure the availability of three months supply of rice at any moment in time to avert any major supply problems.

   c) Income distribution - GOL has maintained that as an equity goal, relatively high income urban dwellers would be taxed to subsidize the local rice program which would benefit the relatively economically underpriviledged rice producers.

GOL's performance given these expressed goals has not been as successful as desired. Rigid rice prices together with lack of an effective mechanism to collect the variable levy in the last two to three years has meant that rice has been delivered to consumers at high prices relative to declining world market prices. Unduly high LPMC marketing costs for local paddy and PL-480 has meant that a large part of the huge subsidy supposedly disbursed to producers has been absorbed by the administration of the rice program. In effect, therefore, the relatively high price of rice has resulted in income transfers to rice importers and other high income groups. Income transfers to producers have been only a fraction of total output subsidy. Finally, import substitution has had a miniscule effect on total rice marketed and consumed, about 1.6% of total rice consumed in 1983.

The following measures if adopted could affect GOL expressed objectives:

1) Improve the procedures of the Rice Committee by adopting procedures formulated by the Technical Sub-committee of the Rice Committee in 1983, entitled: Guidelines for the Rice Committee.

2) Reinstitute the tender system whereby the best bid by any importer would be accepted. This would effectively wipe out economic rents of importers. In the case

of possible collusion by private operators, GOL would set a reserve price based on world market prices, freight and handling costs, and LPMC would be contracted to import said amount.

3) Create a data base that will monitor stocks, flows freight, charges and prices of rice in the domestic and world markets. Such data should be regularly disseminated to Rice Committee members and other relevant policy makers.

4) Regularly review the price of imported rice sold by small amounts, preceeded by promotional campaigns to allow market conditions to be disseminated to consumers.

Appendix I. Rice Production and Imports 1965-1984

	Production[1]	Imports	Degree of Self-Sufficiency
	Mt.	Mt.	Percent
1965	*	33	*
1966	*	46	*
1967	*	34	*
1968	*	46	*
1969	*	28	*
1970	*	49	*
1971	*	54	*
1972	*	42	*
1973	*	46	*
1974	149	35	80.9
1975	137	31	81.6
1976	147	38	79.4
1977	151	56	72.9
1978	147	87	62.8
1979	*	88	*
1980	*	86	*
1981	161	88	64.6
1982	171	86	66.5
1983	174	86	66.9
1984	174	101	63.3

1 Milling yield assumed to be 60 percent.
* Not available.
Source: Statistics Division, Ministry of Agriculture.

Appendix II. Prices of Selected Types of Rice and Income in Liberia, 1976-1984

Year	Unit Cost of U.S. Rice cif Liberia[a]	U.S. #5, Parboiled cif Liberia[b]	Thai 5's fob Bangkok	Retail Prices by bag	Retail Prices by cup	GDP Per Capita	Retail Prices 1980 by cup	Per Capita GDP 1971
	($/lb)	($/lb)	CURRENT VALUES ($/lb.)	($/lb)	($/lb)	($)	CONSTANT VALUES ($/lb)	($)
1976	.16	.14	.16	.20	.24	344	.35	216
1977	.16	.16	.16	.22	.26	370	.36	207
1978	.17	.18	.18	.22	.29	379	.37	208
1979	.16	.19	.15	.22	.30	420	.34	211
1980	.17	.21	.18	.22/.20[c]	.30	425	.30	194
1981	.22	.24	.21	.20	.30	393	.28	179
1982	.20	.17	.13	.20/.24[d]	.34	387	.30	194
1983	.21	.18	.13	.24	.30	351	.26	154
1984	na	.18	.12	.24/.23[e]	na	na	na	na

Sources: Ministry of Planning and Economic Affairs; Liberian Produce Marketing Corporation.

a. Calculated from Ministry of Planning and Economic Affairs, Foreign Trade Statistics. Prices represent unit cost of U.S. imports in 100 lb. bags.

b. Only 1980, 1981 and 1984 data on fob prices and shipping costs for U.S. #5 rice were available. The price series in Appendix 2 is generated from data on shipping costs and fob prices for U.S. #2 rice. Relative fob prices of U.S. #5 and U.S. #2 were assumed constant, and a World Bank index of freight rates was used to project backwards ocean freight and insurance costs. Calculated values were found to equal actual values for 1980 and 1981, lending support to the verity of this method.

c. Price change in April.

d. Price change in August.

e. Price change in October.

SUMMARY OF THE SECOND DAY
WEDNESDAY, MARCH 27, 1985

The morning session of the second day of the seminar was a continuation of discussions pertaining to the Liberian rice situation. This time, participants listened to Professor Trapp of OSU, Mr. J. Boima Rogers and Mrs. Rudene Wilkins of the MOA present a comparative analysis of food security versus rice self-sufficiency and the associated policy implications of these alternative objectives.

In answer to a question concerning the extent to which changes in Liberian rice policies have influenced variations in the prices and quantaties of imported rice over time, one of the presenters explained that the changes in domestic policies have had little or no impact on these fluctuations. The hope was expressed that revenues from domestic exports would be adequate to finance food and other imports. But such an optimistic view was buttressed by that fact that Liberia may not be able to increase her exports to the point where world prices for said exports could be influenced significantly. For example, short term benefits from our attempts to increase tree crops exports may not amount to much given the time it takes to establish new trees and other countries increasing their tree crop production and exports.

The participants noted that rice self-sufficiency and food security have to be balanced whether tree crops exports are increased or not. This is because some of the international markets for specific tree crops are controlled. The case of coffee was cited. In such light, Liberia's ability to increase the volume of coffee exports will depend on her ability to extract a larger quota from a world body.

Questions were also raised about the most efficient policies that ought to be pursued if Liberia is desirous of increasing her rice production to the self-sufficiency level as well as the scale of local rice production necessary to assure that such an enterprise yields economic returns that serve as an incentive. Several shortcomings with respect to the presenters' analysis were brought to the attention of the participants. These included failure to analyze the overall issue of food security versus food self-sufficiency and ignorance of local rice policy changes. The latter criticism was made in view of the fact that the history of rice policy changes discussed by the presenters pertained only to imported

rice. The need for a fuller discussion of local rice production issues was therefore suggested.

In addition to constraints mentioned by the presenters, some seminar participants stressed the need for additional and more relevant data. For example, the figures currently available do not indicate how much locally produced rice is available in the country, but is only the facts and data that an effective policy can be built on.

In conclusion, the participants cautioned policy makers to remember that Liberia cannot always rely on imports. Food security means that what the people want or need will always be available. That Liberia will always have access to stable international rice markets can not be taken for granted since countries like Nigeria, which were not major consumers of rice, are now prominent in foreign rice markets. In addition, rural to urban migration has risen over the years. This is why policy makers need to stress research and extension for increased rice production by insuring that more profitable investments are made in both upland and swamp rice. When these factors are combined with Liberia's currently uncontrolled currency, the need for redefining the roles of agricultural parastatals becomes warranted. For example, what whould LPMC's present and future roles be with respect to rice production, rice marketing, etc?

Input Supply Issues

Problems and difficulties confronting the efficient delivery of agricultural inputs, as well as the past and current arrangements for the supply of said inputs, were dealt with in a paper delivered by Mr. Arthur Gedeo of CARI and Mr. Jerry Mason of BCADP. They defined the categories of agricultural inputs such as materials and factor services. They limited their presentation to a historical review of institutional arrangements for input supply in Liberia and the constraints which deter the timeliness and availability of such farm inputs. The lack of a clearly defined public policy for the supply of farm inputs was stressed by the presenters. Recommendations for improving current arrangements were also made.

The discussion which followed this presentation focused on several factors. One of these was the nature of the appropriate institutional arrangements necessary for efficient input delivery. The quality and recommended rates of input application as well as farmer awareness of input availability and extension assistance were also deliberated.

It was noted that input supply and application must be undertaken at the right time and place and in the correct amounts. Thus, there is a need to establish a linkage or

relationship between the input supply agency proposed by the presented and the already existing national extension system. Some participants felt that a new agency may not be required for the supply of needed inputs to farmers. Since the ACDB already gives credit for the purchase of these inputs by farmers, ACDB could establish an input supply subsidiary that could ascertain that what is needed is available in a timely fashion.

This suggestion that a public or para-public institution be established was rationalized by the fact that private concerns have not exhibited any appreciable interest in investing in the agricultural sector. Therefore, the GOL has always taken the role of investor in the agricultural sector through the formation of corporations and the establishment of projects. the development of a viable agricultural sector therefore hinges on the existence of an efficient input supply system. This is why a sound and concrete policy for the timely delivery of agricultural inputs is crucial.

The proposition that ACDB should set up an input supply subsidiary did not go unchallenged. It was felt that ACDB should only provide credit or funds for such an effort, since LPMC is already established and equipped to distribute such inputs. At the time of establishing the ADPs, it would have been economical and less tasking if LPMC had been made the sole supplier of inputs while the projects distribute them. The MOA division concerned with quality control ought to be strengthened to the point that it is able to assure the delivery of only high quality farm inputs to farmers. The extension agents employed by the MOA and the projects could aid in the distribution of inputs as well as the education of farmers as to their appropriate use. CARI's role in these input arrangements would be to conduct research inorder to determine the appropriate rates of input application conducive to Liberian conditions.

But for any input supply agency to be of use to farmers, there is a need for decentralizing its distribution functions. Farmers living far from some centralized point of distribution will be at a disadvantage due to higher effective cost per input. This and similar problems have to be resolved if a central input supply agency is to be effective.

The question of what farmers do with inputs after they have been delivered was another source of concern. The case of fertilizer application was cited. One project manager urged that policy makers should not be overly ambitious in recommending said input for several reasons. For example, the application of fertilizer to upland rice is a costly undertaking except where the resulting yields are adequately high. Upland rice farmers would otherwise find it difficult to see the benefits of fertilizer application unlike those dealing

with swamp rice. Thus, the need for caution could not be overemphasized. Differences among crop requirements should also be kept in mind. For example, cocoa requires a year or two of fertilizer treatment while coffee requires it on an almost annual basis.

In addition to the above statement, it was brought to the attention of the participants that some of the recommended rates of input application (such as fertilizer) from institutions such as the World Bank have been inappropriate for Liberian ecological conditions. One project manager informed the participants that his project had already abandoned the fertilizer requirements recommended by the World Bank based on the experience of farmers in his project area.

As to why farmers are not yet aware of the benefits of high yielding rice varieties such as LAC-23, the participants were informed that while farmers in project areas have been educated and are therefore aware of these, those residing outside project areas are not. The current task of extension therefore calls for the dissemination of such critical information to those farmers not covered by projects.

It was additionally suggested that the setting of the rates of application should be a function of CARI. CARI could also help with quality control since it already had adequate laboratory facilities. This role of CARI with respect to quality control was viewed by others as a long run objective. In the short run, quality control functions ought to remain within the MOA establishment.

Other problems which confront efficient input delivery were discussed. Among these were a reliable road net work and efficient marketing outlets. The need to properly assess the terms of loans before the GOL accepts them, the need to encourage the sharing of information and resources among ADPs, output quality controls, etc., were also urged.

The papers presented the second day follow.

LIBERIAN RICE POLICY: RICE SELF-SUFFICIENCY VERSUS RICE SECURITY

James N. Trapp, J. Boima Rogers, and Rudene Wilkins*

Overview

Rice is the focal point of Liberian agriculture. It is the major crop of traditional agricultural producers and is the main staple of the Liberian diet. Despite rice being the major product of traditional Liberian agriculture, the country is not currently self-sufficient in rice. Approximately one-third of all rice consumed in the country in 1983 and 1984 was imported. Liberia's agricultural sector in total, however, is self-sufficient in the sense that it has a positive net balance of trade. Major agricultural exports include rubber, forest products, palm products, coffee, and cocoa.

The achievement of rice self-sufficiency in Liberia must be viewed as a long-term effort. Its achievement in the next few years is not possible without drastic policy actions. The policy alternatives considered in this paper for short-term achievement of rice self-sufficiency all proved to either be extremely costly or result in large food cost escalations, or both. Until Liberia achieves rice self-sufficiency there exists a strong need for "rice security". Rice shortages and rice price instability can generate considerable social and political hardships for the country of Liberia given the importance of rice in the Liberian diet and economy. This paper has examined policies which can be immediately undertaken by Liberia to achieve "rice security " within a year. Rice security, as defined here, means that adequate rice reserves would be held by the government to guarantee that demand for rice could be filled in any foreseeable future production and price situation. In the rice security program described within this paper a rice reserve stock program is presented which would quarantee adequate rice supplies in 99 out of 100 years. Even in the year when reserves were not adequate, the shortfall amounts to less than 10 percent of normal cousumption.

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The rice reserve stock/security program proposed and analyzed in this paper is envisioned to be conducted by the Liberian Produce Marketing Corporation (LPMC) as an added responsibility to its current coffee, cocoa and rice price support operations. The program in essence relies on the world market to serve as the main form of rice reserves, but gives Liberia the guaranteed financial security to always be able to buy the rice it needs on the world market. The program is envisioned to operate as follows. LPMC would maintain a specified level of rice stocks. The stocks would be purchased with surplus revenue during years of positive cash flows. Rice import tax levels and coffee and cocoa processing profit margins required to finance these purchases are estimated in the analysis. The estimates made indicate that current profit margins on coffee and cocoa plus a rice import tax of three to five cents per pound would be adequate to finance the program. As long as c.i.f. rice import prices plus any import taxes remained below Monrovian wholesale rice prices, no reserve stocks would need to be used. Under such circumstances adequate profit incentives would exist to cause commerical rice importers to import adequate rice supplies. However, when world rice prices rise to the extent that c.i.f. prices plus taxes exceed Monrovia wholesale rice prices, commerical imports will cease and rice shortages will occur. Under such circumstances and with the rice security program, stored rice stocks would be used to subsidize rice imports. The objective of the subsidy is to make rice importation profitable and hence create the incentive for commerical importers to import sufficient rice to fullfill the existing demand. For example, if c.i.f. price plus any import tax was 10 percent above the Monrovia wholesale rice price, importers would be given one pound of reserve rice for each ten pounds of rice imported, thus effectively reducing the import cost per pound by 10 percent and generating a normal profit situation for importers. In subsequent years when world rice prices declined, subsidies would not be needed and reserve stocks could be rebuilt.

The same type of reserve/import subsidy program could also be conducted using a cash reserve rather than a rice reserve. Such a program has the adavantage of being cheaper since no storage cost exists; in fact, interest can be earned on the reserve fund. However, a cash reserve has the disadvantage of being more subject to political intervention to use the cash reserve fund to meet other governmental financial obligations in times of budget crises.

Analysis of the above reserve stock rice security program leads to the conclusion that Liberia can obtain rice security with approximately $20 to $25 million of cash reserves or 45 to 50 thousand tons of rice reserves, depending on the rice import tax rate assessed and the rice support price maintained. Excluding administrative cost and initial funding of $20 to $25 million, the annual average cost of a cash reserve security

system would be roughly $50 thousand per year. Annual net costs for a rice stock security system would be higher, at about $3.7 million per year. Both the cash and stock security programs were estimated to be capable of being more than self-supporting. In fact the cash reserve security program, given the LPMC policies assumed, would have a profit or excess cash flow of about $10 million per year which could be returned to the government. The rice stock reserves form of the program would return an average of about $5 million per year to the government.

The magnitude of the cash or rice reserves required to operate the security program can be reduced in several ways. First, the higher the import tax the lower the reserve needed. Higher import taxes generate more year to year liquidity in the LPMC budget and hence increase its ability to deal with shortfalls out of current operating capital. In addition, larger annual net revenue flows allow reserves to be built back faster, thus leaving reserves at vulnerable low levels for less time. Secondly, lowering the paddy rice support price reduces the amount of reserves needed. The current paddy rice support and milling activities of LPMC operate at a net loss. Reducing the support price cuts losses in this program by reducing the prices paid for marketed surplus rice and by reducing the typical amount of marketed surplus to be purchased. Reducing the support price for rice increases LPMC's net income and reduces the volatility of LPMC's net income. Both of these effects help reduces the amount of cash or stock reserves necessary to provide rice security.

Over the past several years Liberia has annually received 40 to 50 thousand tons of United States PL-480 rice imports. The rice security programs discussed to this point have not considered the use of PL-480 stocks or funds to assist the rice security funds, with the exception that import taxes are assumed to be collected on PL-480 rice imports. However, the magnitude of PL-480 rice imports to Liberia are strikingly similar in size to the magnitude of rice reserve stocks estimated to be needed for a rice security program. If PL-480 imports and/or the funds raised from their sale were to be given first priority for use in the rice security program, the size of rice stock or cash reserves needed for the security program would be reduced to nearly zero. Assuming 45 thousand tons of PL-480 rice was given first priority for use in the rice security program, estimates made in this study indicated only two to three thousand tons of rice stock reserves or about $1 million of cash reserves would be needed. Net annual costs of the rice security program under such a system would be less than $50 thousand per year for cash reserve and about $400 thousand for a stock reserve program. Hence, nearly all funds from the PL-480 program would over time continue to be passed on to other activities, but in a rather volatile manner. LPMC's average net income, including income from the sale of

PL-480 rice, would be about $21 million per year, but with a standard deviation of approximately $8 million per year. Hence, PL-480 funds could be expected to be passed on to the government with about the same volatility.

The alternatives presented in this paper for achieving rice security appear to be obtainable by the government of Liberia within one to two years. Furthermore, their costs are reasonable and much less than those associated with obtaining rice self-sufficiency. While rice security may not be as socially and politically attractive as rice self-sufficiency, it appears to be a good low-cost, short-run substitute for rice self-sufficiency.

Liberian Rice Policy: Rice Self-Sufficiency Versus Rice Security

Introduction

Rice is the focal point of Liberian agriculture. It is the major crop of traditional agricultural producers and is the main staple of the Liberian diet. Despite rice being the major product of traditional Liberian agriculture, the country is not currently self-sufficient in rice. Approximately one-third of all rice consumed in the country in 1983 and 1984 was imported. Liberia's agircultural sector in total, however, is self-sufficient in the sense that it has a positive net balance of trade. Major agricultural exports include rubber, forest products, palm products, coffee, and cocoa.

Reliance upon the world market to provide one-third of the major staple food grain of the Liberian diet has troubled the Liberian government. For over a decade the Liberian government has had the stated objective of making Liberia self-sufficient in rice. To this end several policy actions have been taken. Most notably, rice production has been subsidized; retail prices have been controlled and generally set at a level above the world market; rice imports are taxed; agricultural research and extension efforts have been financed to identify and provide high yielding rice varieties to producers; government programs have helped facilitate expanded swamp rice production systems; and marketing of rice has been facilitated with the construction of government supported rice collection centers and mills in the rice producing areas.

United States Aid programs have also had an influence on Liberia's rice policy. Approximately one-half of Liberia's rice imports in 1983 were through the PL-480 food aid program.

Purpose

The purpose of this paper is to analyze selected policy alternatives for coping with the problem of non-self-sufficiency in rice production in Liberia. To do this two analytical models will be employed together with Liberian agricultural data for the past thirty years. The models used include the Liberian Agricultural Policy Analysis Model (LAPA), and a Monte Carlo Trade Simulator (MCTS). Both of these models are operable on micro computers and can be operated without the aid of a programmer.

The LAPA model is an econometric model of the Liberian agricultural sector. It consists of supply and demand equations for nine categories of agricultural commodities including rice, cassava, palm oil, vegetables, spices, coffee, cocoa, meat and other crops. The model also considers imports and exports for these commodities. Consumption of the commodities modeled is broken into rural and urban categories. The core of the model is a set of three elasticity matrices, one each for rural demand, urban demand, and supply. These matrices, when coupled with a base set of prices and quantities, can be used to estimate the impact of any price or quantity change upon the supply and demand of all other commodities represented in the model. The model is particularly designed to estimate the impact of changes in rice prices at the farm level and retail level.

The MCTS model is a simulation model designed to estimate the amount of variation in the net trade balance for rice, coffee, and cocoa. The three commodities comprise the major portion of agricultural product trade for Liberia's traditional agricultural sector. Furthermore, trade in these commodities is conducted by the Liberian Produce Marketing Corporation (LPMC). Therefore, trade of these commodities should be readily controllable through government policy. The MCTS model is capable of determining the net trade balance and expected variation in the trade balance under alternative price conditions and production levels for the three commodities. The major use of the MCTS model here will be to explore the level of financial or stock reserves required to assure adequate rice supplied under alternative world market conditions and Liberian agricultural policies.

The approach taken in this paper will be to first explore selected alternative rice support prices and taxation policies that could lead to self-sufficiency in rice production. Secondly the trade stability implications of these policies will be explored. As an alternative to rice self-sufficiency and/or as a contingency plan until self-sufficiency is achieved, the requirements for obtaining assured adequate rice supplies through trade and stock or financial reserves will be explored. Such a plan would in essence achieve "rice security" rather than rice self-sufficiency.

The Impact of Alternative Crop Taxes and Subsidies

The government policy of Liberia is currently to tax the export of tree crops and subsidize the production of rice. The ultimate objective of these and other policies is to make Liberia self-sufficient in rice. In 1983 Liberia consumed an estimated 253.6 thousand metric tons of rice. Imports made up 86.5 thousand metric tons of this consumption, or approximately 34 percent of all rice consumed. Commercial imports of rice amounted to only 34 thousand tons, or about 13 percent of total consumption. United States AID imports totaled to approximately 40 thousand metric tons. The remaining 12.5 thousand tons of rice imports were by concessions.

Policies to Achieve Rice Self-Sufficiency

Perhaps the first question to be asked is how much subsidization of rice production would be required to achieve self-sufficiency. Raising rice prices in general has a two-edged effect, it encourages production and discourages consumption. In 1983 paddy rice prices received by producers were set at 18 cents per pound when delivered to LPMC sites by licensed buyers, while retail prices for cleaned rice were set at 24 cents per pound. In contrast the world price for comparable quality cleaned rice was approximately 17 cents per pound.

Increased subsidization of rice production does not in itself appear to be a feasible way to achieve self-sufficiency in rice production. Although the LAPA model is not specifically designed to estimate the impact of large, long-run policy change, it is capable of giving an approximate estimate of the producer response to changes in the price they receive for rice. The model indicates that doubling the rice price received by farmers to 36 cents per pound paddy would only bring about 20 thousand metric tons of additional rice production. This increase would be at the expense of reduced cassava, vegetable, coffee, and cocoa production. Additional problems associated with raising producer prices would be the development of dependency upon neighboring country rice imports. Without strict control of the borders, rice would be imported from neighboring countries and sold by producers in Liberia as Liberian rice. Indeed, this likely already is the case to some degree with the current price support program and free trade policy.

Raising the retail price of rice and thus economically rationing rice is another alternative to assist in obtaining self-sufficiency. However, this alternative has obvious serious political and humanitarian problems. Rice is the dominate food in most Liberian diets. Raising its price would create substantial financial pressures for many consumers. For investigative sake the LAPA model can be used to estimate the

approximate magnitude of increase in retail prices that would result in rice consumption begin rationed back to self-sufficiency levels. The estimate obtained is that rice prices would have to increase to about 28 or 29 cents per pound to eliminate commercial rice imports, i.e., to reduce consumption by approximately 34 thousand metric tons. Rationing rice consumption enough also to eliminate AID rice imports would require raising the retail price of rice to approximately 38 cents per pound.

Neither of the preceding price policy alternatives (producer price subsidies or consumer price escalation) appear feasible. A third alternative for achieving rice self-sufficiency is to improve rice yields. To achieve rice self-sufficiency through improved yields would require a percentage increase in yield roughly equal to the percentage of rice consumption that is imported, i.e., 13 percent to eliminate commercial imports, and 34 percent to eliminate all imports. This assumes constant rice acreage. Most likely rice acreage would decrease as yields rose if economic incentives were not offered to motivate production beyond rural self sufficiency. Current tests being conducted with improved varieties of rice appear to be capable of generating a 13 percent yield increase, but not a 34 percent increase.

All of the above analysis has not factored in the need to increase rice supplies by at least the population growth rate in order to maintain the current level of self-sufficiency in rice production. As the need for rice increases with population growth, rice acreage must expand if yields do not increase. Expansion of rice acreage will likely reduce yield due to poorer quality of land being used and/or the fallow period for land being shortened. The above analysis also does not address the need for at least some reserves of rice to protect against variations in production due to weather, disease, and insect problems.

Taken individually it appears impossible to rely upon producer subsidies, retail price rationing, or yield improvement to achieve rice self-sufficiency. Combined together these three elements may provide a workable method of achieving rice self-sufficiency. First assume that improvements in rice yields will exceed the population growth rate by 5 percent per year. Secondly, assume retail prices can be raised by no more than 2 cents. In this case the LAPA model indicates producer price incentives would have to be raised to 24 cents per pound to eliminate the need for commercial imports. To eliminate the need for AID imports, producer prices would have to more than double. Such an increase in producer prices appears impossible to undertake.

An alternative combination policy approach to take may be to start by setting paddy rice prices at twice the current

official LPMC price for paddy rice, i.e., at 36 cents per pound. Again assume rice yield improvement exceeds population growth by 5 percent. The LAPA model estimates that in this case a retail price of 25 cents would eliminate the need for commercial imports, and a retail price of 32 cents would eliminate the need for AID imports also.

None of the above alternatives for achieving rice self-sufficiency appear particularly desirable. Raising producer prices through subsidies would be extremely costly and would jeopardize the production of other crops. It also would likely lead to imports from neighboring countries which enjoy free trade relation with Liberia. Raising the retail price of rice effectively rations rice, but basically defeats the fundamental purpose of having a self-sufficiency program. Rice supplies would not be ample to fulfill dietary needs without extreme financial difficulty for many Liberians. The alternative of improving yield by more than 5 percent a year is attractive, but likely not realistic. Yield improvement is a slow and unpredictable process which is not without its limits.

Alternatives to Rice Self-Sufficiency

Undoubtedly there are more creative ways to work toward achieving rice self sufficiency than those discussed in the previous section. The LAPA model could also be used to consider numerous other combination of the type reviewed above. However, the task of achieving rice self-sufficiency under any approach will likely not be easy. The alternative to self-sufficiency in rice is reliance on the world market for imports of rice and the development of a "rice security" program. Relying on the world market for a major portion of one's staple food supply has some undersirable traits. Foremost may be the insecurity such reliance creates if international instability and political relations should shut-off normal world trade channels. Secondly, the need arises to have adequate export flows to maintain foreign exchange balances with which to purchase imports. Thirdly, normal variation in the world price of rice is substantial and could create wide variations in the export revenue or financial reserves needed to finance required rice imports.

There are likely other adverse affects to be alleviated by self-sufficiency, but the focus of this analysis is upon the export revenue requirements and trade instability generated by reliance upon rice imports. The elimination of these factors as a problem with trade reliance would likely reduce the need for self-sufficiency. The question to be raised here is can the objective of making rice import reliance socially and politically tolerable be achieved at a lower cost than rice self-sufficiency? Additionally, what steps, if any, can be taken immediately to provide rice security to the citizens of Liberia while the objective of rice self-sufficiency is being sought?

The focus of the analysis will be upon trade in rice, coffee, and cocoa. The trade of all three of these commodities is currently under the control of LPMC. Hence, government policy for these three commodities can readily be administered through this agency to deal with the problem of rice trade instability.

To begin with, this analysis will attempt to quantify the past and expected future volatility of export revenue for coffee and cocoa, and import costs for rice. Of prime importance here is the volatility of the net balance of trade for these products. Can LPMC be operated in a manner such that the export revenue from coffee and cocoa can be reliably expected to cover the import costs of rice under any foreseeable world market conditions and Liberian production conditions? This question will be addressed in the remaining portions of this paper.

Estimation of the Sources of Variation in the Net Trade Balance

Variation in the net trade balance for rice, coffee, and cocoa is derived primarily from variation in export/import prices for these three commodities and variation in the quantities of the commodities traded. To accurately estimate the sources of variation in the trade balance for these three commodities, estimates must first be made of the expected variance in each commodity's price and traded quantity. In addition, any correlation in the variation of the prices or traded quantities of rice, coffee, and cocoa should be considered. For example, it is logical to expect that the variation in quantities of coffee and cocoa available for export might be correlated. Both crops are tree crops and are produced in close proximity to each other. Hence, growing conditions would likely be similar for both crops.

The variances and covariances used in this study were estimated from Liberian export/import data and price data available in the "Liberian Statistical Handbook" for the years 1954 to 1976. To determine the variance and covariance of quantities of rice, coffee, and cocoa traded, the export/import quantities for these commodities were first regressed against time and their own price. This removed variation due to price response and trend growth. The variation that remains is largely due to unexpected year to year changes in factors such as weather, disease, etc. The equations obtained are as follows where the values in parenthesis below the parameters are t-values.

1) Coffee Exports = -36,838 - 42.211*Pcf + 711.214*T
   R^2 = .59 (-.37) (5.14)

2) Cocoa Exports = -15,025 + 36.419*Pco + 269.205*T
   R^2 = .85 (1.95) (9.42)

3) Rice Imports = -285,256 - 387.61*Pr + 5,984.64*T
R^2 = .83 (-2.88) (8.36)

Where

Pcf = price of coffee (cents/lb.)
Pco = price of cocoa (cents/lb.)
Pr = price of rice (cents/lb.)
T = a time trend variable 1958=58

All export and import quantities are in thousands of pounds. The price variable parameter in the coffee equation was not statistically significant, nor did it have the expected sign. Because of this the above coffee export equation was not used. Instead, a simple time trend equation for coffee exports was used. The estimated coffee time trend equation appears as follows:

4) Coffee Exports = - 37,242 + 697.785*T
R^2 = .59 (5.34)

The variance/covariance matrix for the residuals of equations 2), 3), and 4) appears below. A quick examination of the matrix in Table 1 indicates that coffee export quantities are much more volatile than cocoa exports and rice imports. This does not appear to be due to a different equation form being used for coffee, but is due to actual greater volatility in the coffee export data series. The standard deviations of coffee exports, cocoa exports, and rice imports as a percent of their mean values (i.e., coefficients of variation) are 52.5, 25.5, and 20.7 percent respectively. Observation of the variance/covariance matrix also shows that all three quantity series have positive covariances.

Table 1. Export/Import Quantity Variance/Covariance Matrix 1954 - 1976 (Variance due to trend price removed).

	Coffee	Cocoa	Rice
	----------thousands of pounds----------		
Coffee	13,760,055	398,099	24,663,521
Cocoa		583,608	647,018
Rice			180,829,962

A variance/covariance matrix similar to that reported in Table 1 was also estimated for rice, coffee, and cocoa prices. The price series used were also from the "Liberian Statisticsl Handbook" for the years 1954 to 1976. Before calculating the variance/covariance relationships between the price series, each series was "detrended" with a time trend equation. This removed all variation due to general inflation and other trended variation. The variance/covariance matrix obtained from the detrended price data is reported below.

Table 2. Export/Import Price Variance/ Covariance Matrix 1956-1976 (Variance due to trend removed).

	Coffee	Cocoa	Rice
	----------cents per pound----------		
Coffee	55.477	48.219	10.114
Cocoa		88.432	16.152
Rice			5.254

The price volatility of all three commodities is approximately the same in terms of the standard deviation as a percent of the average price. The standard deviations of coffee, cocoa, and rice prices as a percent of their mean values (i.e. coefficients of variation) are 25.01, 36.68, and 30.42 percent respectively. All covariances between the price series are positive implying all three price series tend to randomly vary above or below their long-run trends together.

Simulation of the Variation of the Net Trade Balance

Given estimates of the variance/covariance matrices for price and quantity variation in rice, coffee, and cocoa trade, the variation of the net balance of trade for these three commodities can be simulated. In addition, the simulation procedure can be used to examine the effect of changing trade levels or price volatility for any of the three commodities, thus allowing analysis of the impact of policies designed to change any of these factors.

Simulation of the variation in the balance of trade is achieved by using a random number generator and procedure for correlating random events. The random event correlation procedure is used to simulate the covariances present between

the price and quantity series. The procedure used is described by Clements, et al., and Naylor et al. Nearly all computers have the capability of generating a series of uniformly distributed random numbers between zero and one. This series can then be transformed into any distribution desired by using either the density function or cumulative distribution for the desired distribution (see (Naylor, et al.). It was assumed here that the distributions in question followed a normal distribution with means and variances equal to those estimated from the data series available from 1954 to 1976.

To estimate the variation in the net trade balance for Liberian rice, coffee, and cocoa, a procedure known as Monte Carlo Simulation was used. This procedure consists of repeatedly generating sets of random import/export prices and quantities and then calculating the trade balance implied by them and saving the results. After a large number of such calculations have been made the mean, variance, and minimum and maximum value of the simulated net trade balance values are calculated. The calculated values represent estimates of the expected volatility of the net trade balance.

The advantage of this approach is that complex interactions between the data series generating the variable in question can be separated and considered. Such interactions would be nearly impossible to quantify and solve for mathematically.

The sequence of steps employed in the Monte Carlo Simulation used here is as follows:

a) Random, but correlated prices for rice, coffee, and cocoa are generated.

b) The prices generated are used in conjunction with equations 2), 3), and 4) to generate expected import/export quantities of rice, coffee, and cocoa.

c) Random, but correlated, variations in the expected quantities of rice, coffee, and cocoa are calculated and added to the expected export values for rice, coffee, and cocoa.

d) The net trade balance implied by the price and quantities simulated is calculated.

e) Steps a) through d) are repeated for one hundred or more times with the results of each simulation saved. The mean, variances, minimum, and maximum values of the data series generated are then calculated and summarized.

The procedures for steps a) through c) are further explained in Clement, et al., and Naylor, et al.

Simulation Results and Assumptions for 1983 Conditions

The first simulation to be considered was that of the current (1983) situation. The assumed 1983 situation is summarized in Table 3. Reviewing Table 3 the quantities and prices assumed are relatively self explanatory with the exception perhaps of the Marketed Surplus figure. Marketed Surplus is assumed to be the difference between production and rural consumption. All rice falling in the Marketed Surplus category is assumed to be purchased by LPMC for 18 cents per pound of paddy or approximately 29.5 cents per pound cleaned, assuming a conversion rate of .61 (.61 is the average of the reported range of conversion rates from .55 to .67).

Table 3. Summary of Assumption for the 1983 Simulation.

	Quantities and Prices		
	Cleaned Rice (100 tons)	Price (cents/lb.)	Expected Value (million $)
Coffee Exports	10.0	1.060	23.36
Cocoa Exports	10.0	.760	17.19
Rice Imports	86.5	.167	31.84
Expected Rice Production	167.3	---	---
Expected Rice Consumption	253.8	.240	134.25
Expected Rural Rice Consumption	154.7	.240	81.83
Expected Rice Marketed Surplus	12.6	.295	8.18

Taxes and LPMC Costs and Policies

LPMC Profit Margin on Coffee and Cocoa of 10 Percent
Rice Import Tax - One Cent Per Pound
LPMC Rice Processing and Storage Cost - 9 to 12 cents/lb.
LPMC Cleaned/Paddy Conversion Rate - .55 to .67 percent
LPMC Sells All Cleaned Rice at Wholesale for 22 cents/lb.

	Expected Value (million $)
Expected LPMC Net Revenue from Coffee	2.33
Expected LPMC Net Revenue from Cocoa	1.72
Expected LPMC Rice Tax Collection	1.88
Expected LPMC Rice Processing and Storage Cost	2.96
Expected LPMC Rice Purchase Costs	8.19
Expected LPMC Rice Sales (22 cents/lb.)	6.11
Expected LPMC Net Revenue	.89

The assumption made concerning LPMC's operating cost and policies are listed in the second part of Table 3. LPMC is assumed to price its purchases of coffee and cocoa such that a 10 percent profit can be made. It was assumed that the tax collection rate on rice was one cent per pound for all rice imported. Processing and storage costs for rice purchased by LPMC are difficult to determine and have not been reported in any literature reviewed. Hence, an estimated cost of 9 to 12 cents per pound was assumed and the average of that range, 10.5 cents, was generally used. Likewise, the milling efficiency for LPMC milling of rice was also assumed to be the average of .55 and .67. LPMC was assumed to sell all cleaned rice at a wholesale price of .2 cents per pound.

Given the listed assumption about costs and prices, LPMC's revenues and costs from its coffee, cocoa, and rice activities can be estimated. This has been done in the lower portion of Table 3. With these assumed values and conditions, LPMC is expected to have an average net revenue of $890 thousand on its coffee, cocoa, and rice activities.

Table 3 reflects the expected values for 1983. These expected values can be used in conjunction with the Monte Carlo Trade Simulation model to determine the variance of the trade balance and the variance of LPMC's net revenue balance. In doing this the Monte Carlo Trade model is used to generate random values for world coffee, cocoa, and rice prices as well as random values for the quantities of Liberian coffee and cocoa exported and rice imported to Liberia. Domestic prices are assumed to be controlled and non-random. Domestic consumption is also assumed to be known and non-random. Because consumption is assumed to be known, Liberian rice production can be defined by identity as consumption minus imports. Since imports are random, use of this identity results in random production values. This in turn yields random values for marketed surplus which is defined as production minus rural consumption. In some cases the values generated for marketed surplus may become negative because of the smallness of the production value generated, i.e. in about one out of ten cases. In such cases the model assumes marketed surplus to be equal to zero. This implies that some of the rice imports are used to fulfill rural consumption.

The results of the Monte Carlo Trade Simulation for 1983 conditions are presented in Tables 4 and 5. Table 4 presents the Trade Balance estimates. Coffee and cocoa export revenues were expected to be $40,301 thousand. The simulated average export revenue of $40,028 thousand was calculated from 500 simulation runs. The closeness of the simulated average to the expected value varifies the correctness of the simulation process. The standard deviation of the simulated average

export revenues was $117,239 thousand, or 43 percent of the average value. The maximum export revenue earned was nearly three times the average export revenue while the minimum export revenue value was about 12 percent of the average. Hence, considerable export revenue volatility is indicated to exist.

Import cost volatility was slightly less than export revenue volatility. The standard deviation of rice import cost was only 40 percent of the average simulated value. The maximum rice import cost was also about triple the average value.

Given the volatility of both imports and exports, it is logical to expect considerable volatility in the trade balance itself. This is the case. The standard deviation of the trade balance is 150 percent of the simulated average trade balance. The maximum trade balance in the 500 simulation made was five times greater than the average trade balance. Likewise, the minimum trade balance was a deficit balance of $38,689 thousand.

Table 4. Simulated 1983 Rice, Coffee, and Cocoa Trade Balance and Variation.

Exports (Coffee and Cocoa - $1,000)	
Expected Revenue	40,301
Simulated Average Revenue	40,028
Standard Deviation of Revenue	17,239
Maximum Revenue	114,705
Maximum Revenue	4,859
Imports (Rice - $1,000)	
Expected Cost	31,467
Simulated Average Cost	31,004
Standard Deviation of Cost	12,335
Maximum Cost	84,404
Minimum Cost	3,887
Trade Balance ($1,000)	
Expected Balance	8,834
Simulated Average Balance	9,024
Standard Deviation of Balance	13,755
Maximum Balance	49,401
Minimum Balance	-38,689

Table 5 presents the expected and estimated variance results for LPMC's net income. The expected net income is the same as that reported in the bottom line of Table 3 and reflects the fact that the conditions assumed in Table 3 are correctly modeled. The result for the simulated average net revenue for the assumed 1983 conditions indicates that in an average year LPMC will have a negative net revenue flow of $-1,167 thousand with a rather large standard deviation of $7,462 thousand. In 49 out of a hundred cases LPMC will have negative net revenue flows.

The simulated average LPMC net revenue is considerably lower than the expected net revenue. This deserves some explanation. The discrepancy comes from the procedure for dealing with simulated negative marketed surpluses of rice and the fact that LPMC loses approximately 18 cents per pound of market surplus rice purchased. This loss in essence amounts to a subsidy for Liberian rice producers. This loss or subsidy is calculated as follows. LPMC purchases paddy rice for 18 cents per pound. This converts to a cleaned rice price of 29.5 cents per pound assuming a 61 percent conversion rate from paddy to cleaned rice. When a 10.5 cent per pound milling and storage charge is added, the cost of cleaned Liberian rice to the LPMC is approximately 40 cents per pound. This rice is assumed to be sold at a wholesale price of 22 cents per pound. This is a loss of 28 cents per pound. The expected volume of market surplus rice purchased by LPMC is 12.6 tons. However, the distribution for the expected volume of marketed surpluses is skewed such that the simulated average is greater than the expected or most frequent value. The skewedness of the distribution results because negative marketed surplus values are not allowed. They are converted to zero values. Thus, the average loss encountered by LPMC in purchasing and processing marketed surplus rice is larger than the expected value reported in Table 3. This in turn causes LPMC's net revenues to be less than expected.

Table 5. Simulated 1983 LPMC Net Revenue

	Value ($1,000)
Expected Net Revenue	890
Stimulated Average Net Revenue	-1,167
Standard Deviation of Net Revenue	7,462
Largest Single Deficit	77,499
Number of Deficits Per 100 Years	49

Policy Adjustments and Buffer Stock Requirements for Rice Security Through Trade

While the 1983 situation yielded a favorable trade balance, it did not yield a favorable LPMC net revenue situation. The financial hardships of LPMC during 1984 reflect and confirm the conditions simulated here. In this section policy adjustments will be considered which would make LPMC self supporting. In addition, LPMC will also be charged with the additional responsibility of assuring rice supplies are adequate to meet demand under all foreseeable market conditions. Buffer stocks in the form of cash reserves or rice stocks that insure LPMC's financial independence in maintaining its current programs and the rice security program, even in unfavorable years, will be estimated.

Two alternative buffer or reserve options will be considered as methods of obtaining rice security. One option will consider holding rice stock reserves, while the other will consider holding cash reserves. The physical holding of rice reserves has the advantage of holding one's reserves as "in-kind reserves." Such reserves are not as vulnerable to political pressure to be used elsewhere, regardless of their purpose, in times of budgetary pressure. The cash reserve system on the other hand has the advantage of being considerably cheaper to operate since no storage costs are encountered.

Specifically, a cash buffer reserve system would operate as follows. A specified cash reserve level would be maintained by LPMC at all times to the best of LPMC's financial ability. This reserve fund is assumed to earn 10 percent interest income per year. Any earnings by LPMC from interest, rice import taxes, and coffee and cocoa processing in excess of those needed to maintain the specified cash reserve and carry on their other activities would be paid to the government. When LPMC experienced shortfalls in the cash flows needed to carry on any of its programs, including the rice security program, the shortfalls would be covered by the cash reserve fund.

The rice security import program is envisioned to work as follows. As long as Monrovian c.i.f. rice import prices, plus any taxes charged, are below Monrovian wholesale rice prices, it is assumed that commercial rice imports will flow in and fill the gap between domestic production and demand. Should world rice prices rise and cause the c.i.f. rice price plus any taxes to exceed the Monrovian wholesale price, no profits would remain for importers, hence, rice importation would cease and a rice shortage would occur. In such a case, LPMC would intervene and pay a subsidy to commercial importers equal to the difference between the c.i.f. price plus any taxes and the wholesale price, thus maintaining a normal profit incentive to import rice.

A rice stock reserve program would operate in a similar manner to the cash reserve program, except subsidy payments would be made in terms of rice, not cash. For example, if c.i.f. prices plus taxes were 10 percent above the wholesale price, importers would be given one pound of LPMC reserve rice for each ten pounds of rice imported, thus effectively reducing their import cost by 10 percent. Likewise, if additional funds were needed to carry out any other LPMC functions, rice reserves could be sold at the wholesale price to generate the required funds. It is assumed in this analysis that a rice stock program would encounter storage costs equal to 20 percent of the value of rice in storage.

The objective of the two alternative rice reserve programs outlined above is to achieve rice security through trade. If adequate cash or rice reserves are held, LPMC should never experience any financial liquidity problems. Hence, LPMC should always be able to adequately subsidize commercial imports to a degree that they will import rice to fill the existing demand. The following sections of this paper will report the results of analyses conducted to determine the level of cash or rice reserves needed to maintain LPMC's financial liquidity and the alternative import tax rates and paddy rice support prices needed to guarantee this liquidity.

"Full" Rice Tax Collection

The first policy alternative to be considered is that of "full" rice tax collection. In principle the government of Liberia should be able to charge a tax equal to the difference between the c.i.f. Monrovia rice import price and the Monrovia wholesale price for rice. Such a tax should continue to generate imports because of the profits which can be generated by wholesaling rice. In practice collecting this tax has been difficult to achieve due to the problem of determining the Monrovia c.i.f. rice import price. As a result only a one cent per pound fixed tax has been effectively collected. Several alternative taxation policies and methods appear worthy of consideration. These are as follows:

1) Use a formula based variable levy tax. Monrovia c.i.f. rice import price would be estimated using either Houston, Texas, USA rice prices plus shipping costs, or Bangkok, Thailand rice prices plus shipping cost, whichever is lower. The tax would then be based on the difference between this calculated price and the Monrovia wholesale price, less any margin desired to be given the importer above the profit from wholesaling of rice. The tax could be adjusted continuously as prices changed in Houston or Bangkok, or more practically seasonally or monthly. In the event that Monrovia c.i.f. rice import prices ever exceed the Monrovia wholesale price, a subsidy would be paid with this system to maintain an incentive to import rice and to prevent the wholesale price from rising.

2) LPMC could act as a monopoly agent for rice importation. Thus, LPMC would obtain profits (or losses) equal to the difference between the import price and the Monrovia wholesale price for rice.

3) Import licenses for specified quantities of rice imported within a specified time period could be auctioned to the highest bidder. If a competitive import marketing system exists this should generate nearly as much revenue as a tax equal to the difference between the import price and the Monrovia wholesale price. Again, with this system, if the wholesale price of rice ever rose above the import price, licenses would have to be auctioned for the lowest subsidy to import a specified quantity of rice within a specified time period.

4) Establish a flat tax equal to approximately 70 percent of the expected long-term difference between the import price for rice and the Monrovia wholesale price for rice. Since the standard deviation in world rice prices is about 30 percent of the detrended rice price, this should result in a profit margin for importers about 84 percent of the time. Under the 1983 price conditions this procedure would have established about a 3.5 to 4 cent tax. This would have more than tripled the rice import tax actually collected in 1983 if imports remained at the same level.

Assuming that the "full" difference between the Monrovia wholesale price for rice and the import price for rice can be collected using a variable levy, the Monte Carlo Trade Simulator was again used to ascertain LPMC's net revenue position. In addition to estimating the expected LPMC net revenue and the variance of this revenue, the Monte Carlo model was expanded to estimate the degree of financial "self-sufficiency" given to LPMC by alternative levels of buffer stocks or cash reserves. This model was also expanded to consider the costs encountered in conducting the rice security program. Price policies and buffer stock programs that would make LPMC relatively self-supporting in this effort are considered. For this analysis all rice imports into Liberia were assumed to be commercial imports. PL-480 imports were no longer relied upon. The first policy set to be considered was a continuation of the 1983 and 1984 policies except that it is now assumed that a tax system will be developed that will allow the full difference between the rice import price and Monrovia wholesale price to be collected. Table 6 reports the results of the simulations for alternative stock levels.

Table 6 presents results for holding either cash reserves or rice buffer stocks. The rice buffer stock levels considered are those stock levels that could have been purchased with the

cash reserves reported in each column, i.e, $5 million would purchase 13.58 thousand tons of rice at a price of .167 cents per pound. All values in the rice buffer stock portion of Table 6 are reported in terms of rice quantities, except excess cash flows. The revenues and costs reported in terms of rice quantities are determined by converting the reported dollar values into the quantity of rice with an equivalent value at the rice price stimulated that year. Since the rice price is random the conversion rate of dollars to rice is not the same from year to year.

Table 6. LPMC Net Revenue Conditions With Alternative Stock Levels and Maximum Import Taxes

Alternative Cash Reserves (Million $)					
Cash Reserves	5.0	10.0	15.0	20.0	25.0
Simulated Rev. from Coffee, Cocoa, Rice Taxes and Interest on Reserves	14.1	15.5	14.9	15.4	15.9
Domestic Rice Program Costs	6.2	6.2	6.2	6.2	6.2
Interest Income	.3	.8	1.2	1.7	2.2
Simulated Average LPMC Net Revenue	7.8	8.2	8.7	9.2	9.7
Standard Deviation of Net Revenue	12.0	12.1	12.2	12.3	12.3
Average Excess Cash Flow	6.5	7.4	8.3	8.9	9.6
Largest Cummulative Deficit	41.9	36.4	30.9	24.9	19.4
Number of Deficits Per 100 Years	26	16	9	3	1
Alternative Rice Stock Reserves (1,000 tons) (All values except excess funds are in terms of rice quantities)					
Stock Reserves	13.6	27.2	40.8	54.3	67.9
Revenue from Coffee, Cocoa, and Rice Taxes	46.9	46.9	46.9	46.9	46.9
Domestic Rice Program Costs	18.5	18.5	18.5	18.5	18.5
Storage Cost	2.0	4.5	7.0	9.8	12.5
Simulated Average LPMC Net Stocks	26.4	24.4	21.4	18.7	16.0
Standard Deviation of Net Stocks	42.1	41.7	41.5	41.4	41.2
Average Excess Cash Flow	6.5	7.4	5.5	4.8	4.1
Largest Cummulative Stock Deficit	119.3	111.7	100.8	95.3	90.7
Number of Stock Deficits Per 100 Years	20	12	7	3	2

A quick review of the figures in Table 6 indicates that charging a "full" tax equal to the difference between the rice import price and the Monrovia wholesale rice price results in a net overall profit to LPMC of approximately $8 to $10 million per year with a standard deviation of about $12 million per year. This compares favorably to the negative net revenue flow reported in Table 5 when only a one cent per pound tax was simulated.

While some of the figures in Table 6 are self-explanatory, others deserve some definition and discussion. Excess cash flows are assumed to occur in any year when LPMC has a positive net revenue, has no outstanding debts, and holds the specified level of cash or stock reserves. The first priority of LPMC profits is assumed to be that of rebuilding any cash reserve or buffer stock reserves that may have been depleted in previous years. Once this is achieved any debts to the government or other institutions must be paid. Cash remaining after this period is termed "excess cash." Excess cash would likely be turned over to the government. Hence, excess cash flow is a cumulative concept and takes into account the payment of any deficits temporarily covered by the government or other institutions. The values under "Largest Cummulative Deficit" and "Number of Deficits Per 100 Years" give some idea of the frequency and magnitude of revenue shortfalls by LPMC and hence, a measure of LPMC's potential reliability as an institutional method for achieving rice self-sufficiency through trade.

Reviewing the alternative cash/stock reserve levels in Table 6 reveals that a reserve level in excess of $20 million or 55 thousand tons of rice are needed to provide a reasonable degree of stability to LPMC's financial independence. This is true despite the relative high average profitability level of LPMC. Of course, if LPMC were allowed to retain all excess cash funds it would soon become quite independent under conditions assumed for developing Table 6. But the purpose of LPMC, or any other government agency formed to conduct the tasks assumed here, is not to be profitable, but to provide a set of services to the people of Liberia at a reasonable cost.

Full Rice Tax and Low Producer Support Prices

An alternative policy to follow in achieving self-sufficiency in rice through trade is to reduce the subsidy given to domestic rice producers and use these funds, if necessary, to help insure the ability to import adequate supplies of rice. Such a policy would increase rather than decrease Liberia's dependence upon the world market. Additional rice imports would be needed. Also the resources no longer drawn to rice production would likely be diverted in part to coffee and cocoa production. In turn, exports of coffee and cocoa would increase. The question to be answered here is, however, would

savings rendered from the reduction in subsidization cost more than offset the negative effects of the increased reliance on trade? The Liberian Agricultural Policy Analysis model and Monte Carlo Trade Simulator were used to address this question.

The subsidy reduction considered here was to reduce the rice price paid by LPMC at its collection points from 18 cents to 15 cents per pound. This would reduce LPMC's cost of producing cleaned Liberian rice to approximately 35 cents per pound and cut the loss on each pound of excess market rice from 18 cents to 13 cents, i.e., 35 cents minus the wholesale price of 22 cents. Lowering the producer price for paddy rice would also reduce the expected production and the expected amount of excess market rice. This, of course, would raise the need for imports. Table 7 shows the new expected quantities and LPMC costs and revenues with a 15 cent paddy rice price.

Table 7. Expected Market and LPMC Conditions With a 15 Cent Paddy Rice Price and Full Rice Import Tax.

	Quantity and Prices		
	Cleaned Rice (1,000 tons)	Price (cents/lb.	Expected Value (million $)
Coffee Exports	10.1	1.060	23.64
Cocoa Exports	10.3	.780	17.88
Rice Imports	86.5	.167	31.84
Expected Rice Production	164.5	---	---
Expected Rice Consumption	253.8	.240	134.25
Expected Rural Rice Consumption	154.7	.240	81.83
Expected Rice Marketed Surplus	9.8	.246	5.31

LPMC Cost and Revenues

	Expected Value
Expected LPMC Net Revenue from Coffee	2.36
Expected LPMC Net Revenue from Cocoa	1.79
Expected LPMC Rice Tax Collection	10.10
Expected LPMC Rice Processing and Storage Cost	2.27
Expected LPMC Rice Purchase Costs	5.31
Expected LPMC Rice Sales (22 cents/lb.)	4.75
Expected LPMC Net Revenue	11.42

With a 15 cent producer rice price versus an 18 cent producer rice price, rice production is expected to drop from 167.3 thousand tons to 164.5 thousand tons. Total consumption and rural consumption are assumed to remain unchanged since consumer prices have not been altered. hence, marketed surplus will drop by the same amount as production from 12.6 thousand tons to 9.8 thousand tons. Rice imports rose to 89.3 thousand tons from 86.5 thousand tons to cover this drop in production and marketed surplus. Coffee exports increased from 10 thousand tons to 10.1 thousand tons. Cocoa exports rose from 10 thousand tons to 10.3 thousand tons.

The above change in production subsidy costs greatly improves LPMC's net revenue situation compared to the 1983 situation, and moderately improves it compared to the "full tax/high subsidy" case considered in the preceding section. Coffee and cocoa revenues increase slightly. Rice tax collection increases to $10.1 million, due to an increase in rice imports of 2.8 thousand tons. Expected LPMC rice processing costs and storage cost are cut by nearly a fourth due to a 22 percent drop in expected rice market surpluses. LPMC rice purchase costs are cut by 35 percent, or $1.54 million due to 22 percent less rice being bought at a 17 percent lower price. Hence, overall expected net revenue increases to $11.42 million versus the 1983 expected net revenue of $.89 million and the high subsidy policy expected net revenue of $9.11 million. As previously pointed out, however, the simulated average LPMC net revenues will not be as high as the expected net revenues due to the manner in which negative marketed surpluses are treated. The simulation results for the "low subsidy/full tax" case are presented in Table 8.

The results presented in Table 8 indicate that reducing the subsidy paid to rice producers will reduce the cash or stock reserve LPMC must hold and increase the average excess revenue flow returned to the government. With the assumed reduction in the rice production subsidy level, only two-thirds as much reserve cash or rice stocks have to be held to achieve the same approximate assurance of financial soundness of LPMC, i.e., only about $15-20 million of cash reserves are needed with reduced subsidies, versus $25 million without reduced subsidies.

First Priority Use of PL-480 Stocks

The previous cash/rice reserve analyses ignored the presence of PL-480 rice imports. It was assumed that funds from the PL-480 program were used elsewhere. Import taxes were assumed, however, to be collected on PL-480 imports. This analysis will assume that funds earned from PL-480 rice imports will be given first priority for use in the rice security program. If not needed for the program, they will be passed on as has normally been done.

Table 8. LPMC Net Revenue Conditions with Alternative Stock Levels, Maximum Import Taxes, and 15 Cent Paddy Rice Price

Alternative Cash Reserves (Million $)				
Cash Reserves	5.0	10.0	15.0	20.0
Simulated Revenue from Coffee, Cocoa, Rice Taxes and Interest on Reserves	14.8	15.2	15.7	16.2
Domestic Rice Program Costs	3.8	3.8	3.8	3.8
Interest Income	.4	.9	1.4	1.9
Simulated Avg. LPMC Net Revenue	11.0	11.4	11.9	12.4
Standard Deviation on Net Revenue	11.0	11.1	11.1	11.1
Average Excess Cash Flow	10.5	11.3	11.9	12.4
Largest Cummulative Deficit	21.0	61.1	10.6	5.1
Number of Stock Deficits Per 100 Years	11	5	2	1
Alternative Rice Stock Reserves (1,000 tons) (All values except excess funds are in terms of rice quantities)				
Stock Reserves	13.6	27.1	40.8	54.3
Simulated Revenue from Coffee, Cocoa, and Rice Taxes	49.1	49.1	49.1	49.1
Domestic Rice Program Costs	11.3	11.3	11.3	11.3
Storage Cost	2.4	2.4	2.4	2.4
Simulated Avg. LPMC Net Stocks	35.4	32.6	29.7	26.6
Standard Deviation of Net Stocks	42.7	42.6	42.7	7.2
Average Excess Cash Flow	9.7	9.0	8.1	7.2
Largest Cummulative Deficit	61.9	49.8	38.9	28.1
Number of Stock Deficits Per 100 Years	10	3	1	1

Basing part of the funding for the rice security program on PL-480 program revenue may be questionable in that PL-480 rice imports are subject to change as U.S. policy changes. Use of the PL-480 imports to initially fund the program does, however, seem reasonable. In the event that PL-480 import levels change in the future the program could be quickly phased into the self-supporting mode described in the previous sections. As will be seen in this analysis, the use of PL-480 funds virtually eliminates the need for any sizeable cash or rice reserve.

The analysis conducted here assumes that 45 thousand tons of PL-480 rice will be received annually. Observation of Tables 6 and 8 indicates that this is roughly enough rice to fill the rice reserve requirements, if a 15 cent paddy support price is

paid, but not enough if an 18 cent paddy rice support price is paid. However, these analyses do not permit the use of PL-480 funds to immediately fill any shortages in reserves. Allowing LPMC to claim PL-480 funds as income and pass them on to the government as excess cash flows when possible gives LPMC much more liquidity. This in turn would be hypothesized to reduce the reserves needed. Table 9 presents analyses where all PL-480 funds are assumed to be given first priority for use by LPMC. The table also assumes one other policy change from the previous analyses. Rice taxes are now considered to be only 66 percent of the spread between c.i.f. prices and Monrovia wholesale prices. It is believed such a tax would allow more than adequate incentive to remain for importers to import rice. It also may be more reflective of the "effective" tax rate that could be collected with a 100 percent import tax rate, given administrative cost and "slippage." A paddy rice support price of 18 cents per pound is assumed in Table 9.

In observing Table 9, we see that including PL-480 revenues as part of LPMC's revenues nearly doubles LPMC's gross revenues per year compared to those reported in Tables 6 and 8, i.e., from $14 to $16 million to about $28 million per year. Gross income from PL-480 rice imports valued at world prices runs approximately $16 million per year. LPMC's net revenue is also approximately doubled, thus giving them greater liquidity to deal with any short-term cash flow problems. Tables 6 and 8 indicated that combined cash reserves and net incomes of $27 to $37 million provided adequate funds for rice security. Table 9 indicates that with annual net revenues of approximately $27 million, only about $1 million of cash reserves are needed for fulfilling rice demand in 99 out of 100 years. A cash reserve of $5 million coupled with an average annual net income of $27.75 million would result in no rice shortages at all in 100 years.

Annual costs for a $1 million cash reserve fund, as reflected by the difference between average net income and average excess cash flow, is estimated to be $51 thousand. Cost for an equivalent rice stock reserve would be about $405 thousand. Hence, nearly all $16 million of income typically derived from PL-480 import sales would, on the average, be passed on to the government for other uses. However, its transfer would likely be very erratic. The standard deviation of LPMC's net income is approximately $8 million per year. The standard deviation of excess cash flows can be expected to be almost equally volatile.

Table 9. LPMC Net Revenue Conditions and Rice Security Conditions When PL-480 Imports Have First Priority Use in the Rice Security Program.

Alternative Cash Reserves (Million $)			
Cash Reserve	0.0	1.0	5.0
Simulated Revenue from Coffee, Cocoa, Rice, Taxes, PL-480 Imports and Interest on Reserves	27.3	27.4	27.8
Domestic Rice Program Costs	6.2	6.2	6.2
Interest Income	0.0	.1	.5
Simulated Avg. LPMC Net Revenue	21.0	21.1	21.1
Standard Deviation of New Revenue	8.0	8.2	8.2
Average Excess Cash Flow	21.1	21.1	21.5
Largest Cummulative Deficit	12.3	11.3	7.3
Number of Cash Deficits Per 100 Years	2	1	0

Alternative Rice Stock Reserves (1,000 tons) (All values except excess funds are in terms of rice quantities)			
Stock Reserves	0.0	2.7	13.6
Simulated Revenue from Coffee, Cocoa, Rice Import Taxes, and PL-480 Imports	80.1	80.1	80.1
Domestic Rice Program Cost	18.5	18.5	18.5
Storage Rice Program Cost	0.0	0.5	2.7
Simulated Average LPMC Net Stocks	61.6	61.1	58.9
Standard Deviation of Net Stocks	32.5	32.5	32.5
Average Excess Cash Flow	21.0	20.7	19.9
Largest Cummulative Stock Deficit	45.1	42.3	31.5
Number of Stock Shortage Per 100 Years	2	1	1

Conclusion

Liberia is currently not self-sufficient in rice. Alternatives for achieving rice self-sufficiency appear costly and/or require a long period to achieve. In light of this, this paper has considered the feasibility of the alternative of achieving assured adequate rice supplies through trade. Pricing, taxation, and buffer stock policies for operating a marketing organization that would assure ample rice supplies and have the financial stability to reliably achieve this objective were hypothesized and tested. It is concluded that Liberia can achieve a high degree of confidence of having adequate and stable rice supplies through trade with only minor changes in its current agricultural policies. The program devised could either incorporate the use of PL-480 rice imports or stand on its own.

The analysis found that insured adequate rice supplies through trade is aided by higher rice import taxes and lower producer rice support prices, if the savings from lower producer support prices are used in the rice import program. Further analysis to determine the exact level of import tax and producer price level to achieve the goal of insured rice supplies through trade is needed. At this point it appears that reducing the rice price paid to farmers by 3 to 6 cents while collecting a rice import tax of 2 to 3 cents per pound would allow financial stability of a marketing organization designed to assure adequate rice supplies. It is even feasible that the above subsidy and tax policy would permit some reduction in consumer rice prices in Liberia.

References

Clement, Alvin, Harry P. Mapp, and Vernon Eidman. A Procedure for Correlating Events in Farm Simulation Models, Technical Bulletin T-131, Agricultural Experiment Station, Oklahoma State University, Stillwater, August 1971.

Naylor, Thomas H., Joseph L. Balintfy, Donald S. Burdick, and Kong Cho. Computer Simulation Techniques, John Wiley and Sons, New York, April 1968.

Appendix

Coffee, Cocoa, Rice Volatility

The following graphs illustrate the price and quantity trend of 3 commodities; coffee, cocoa and rice represented over a period of time, 1954-1981, 27 years. The intent is to address the question, "How volatile can we expect coffee and cocoa revenue and the import cost of rice to be in the future," as discussed under the section "Alternatives to Rice Self-sufficiency". The preliminary step to observe, among other parameters, is the actual prices and quantities of these commodities over a 25, or more, year period. The more the number of years are the more accurate a trend line could be predicted after regressing the price or quantity against time. One also must observe the expected variance in each commodity's price and traded quantity and the possibility of any correlation in the variation of these prices or quantities.

There are six (6) graphs, two for each commodity. The first graph on each commodity shows export/import quantities . Time is measured on the x-axis (years) and quantity in thousand metric tons on the y-axis. The second graph shows export or import prices: it has time on the x-axis but price in dollars ($) per pound (lb.) on the y-axis. The actual quantity or price movement is sporadically dispersed around the trend line estimated by the simple regression model, i.e., $y = a + bx$.

The equations obtained were as follows:

Coffee:

Price	$y = 2.03 + .04x$
Quantity	$y = 18.48 + 0.34x$

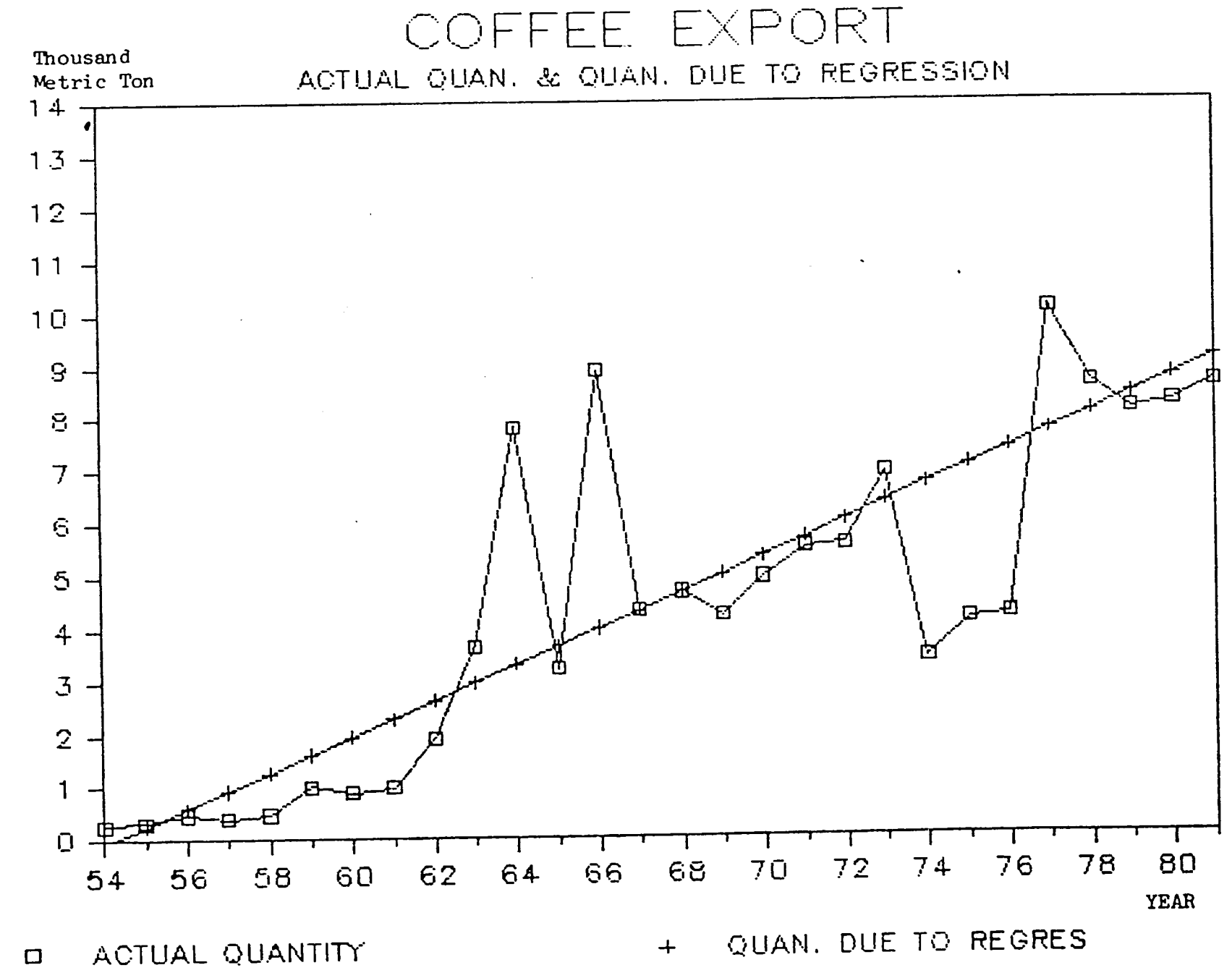
Cocoa:

Price	$y = 2.2 + .04x$
Quantity	$y = 8.2 + .15x$

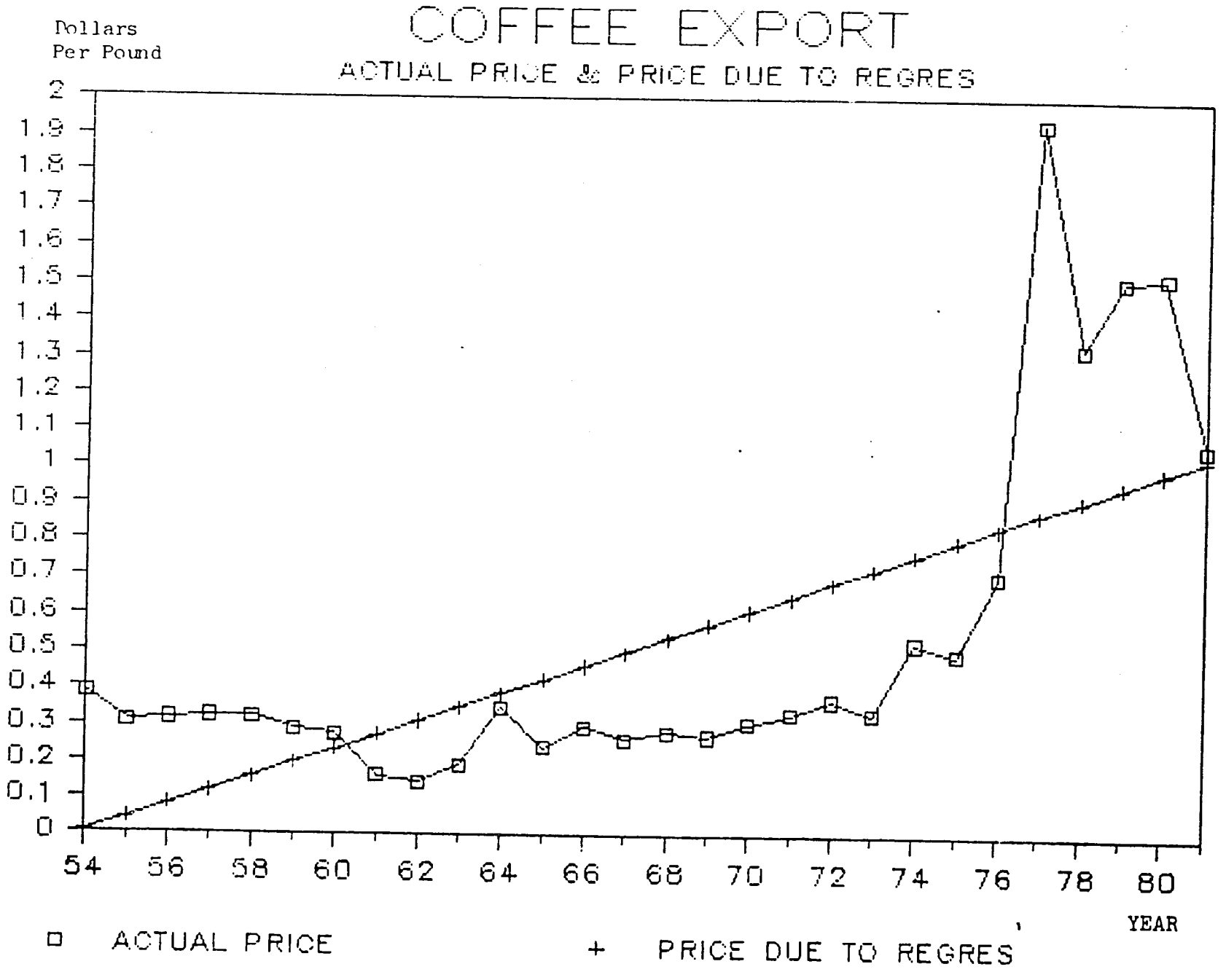
Rice:

Price	$y = 0.61 + 005x$
Quantity	$y = 116.7 + 2.31x$

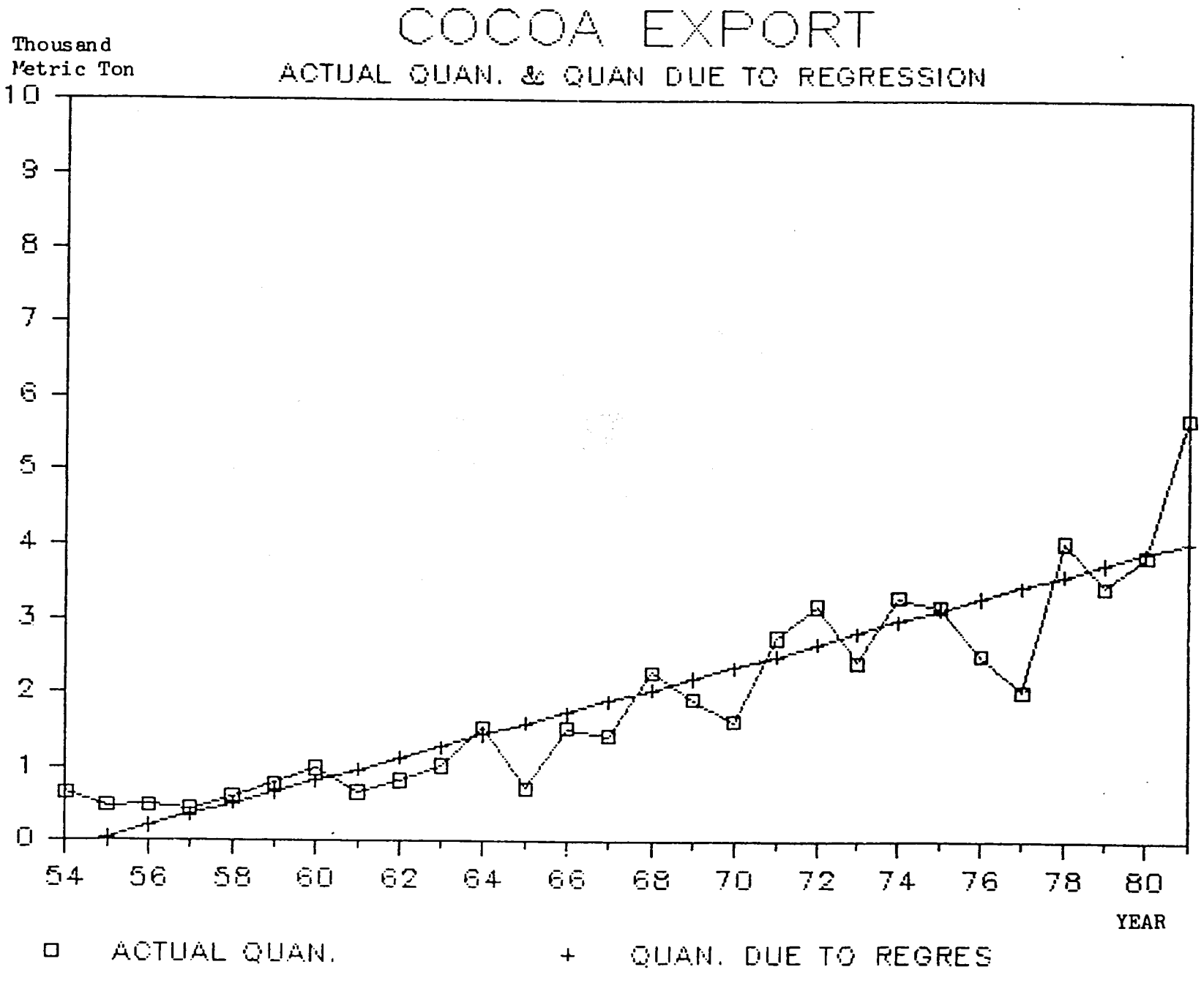
The trend line is due to the combination of several forces, which could be economic or sociological; therefore, it is only one of the many tools in an analysis in predicting or forecasting. By measuring the vertical distance on the graph between the actual price or quantity and that of the trend line for each given year and squaring, the variance and standard deviation around trend line was estimated, as elaborated in the text.



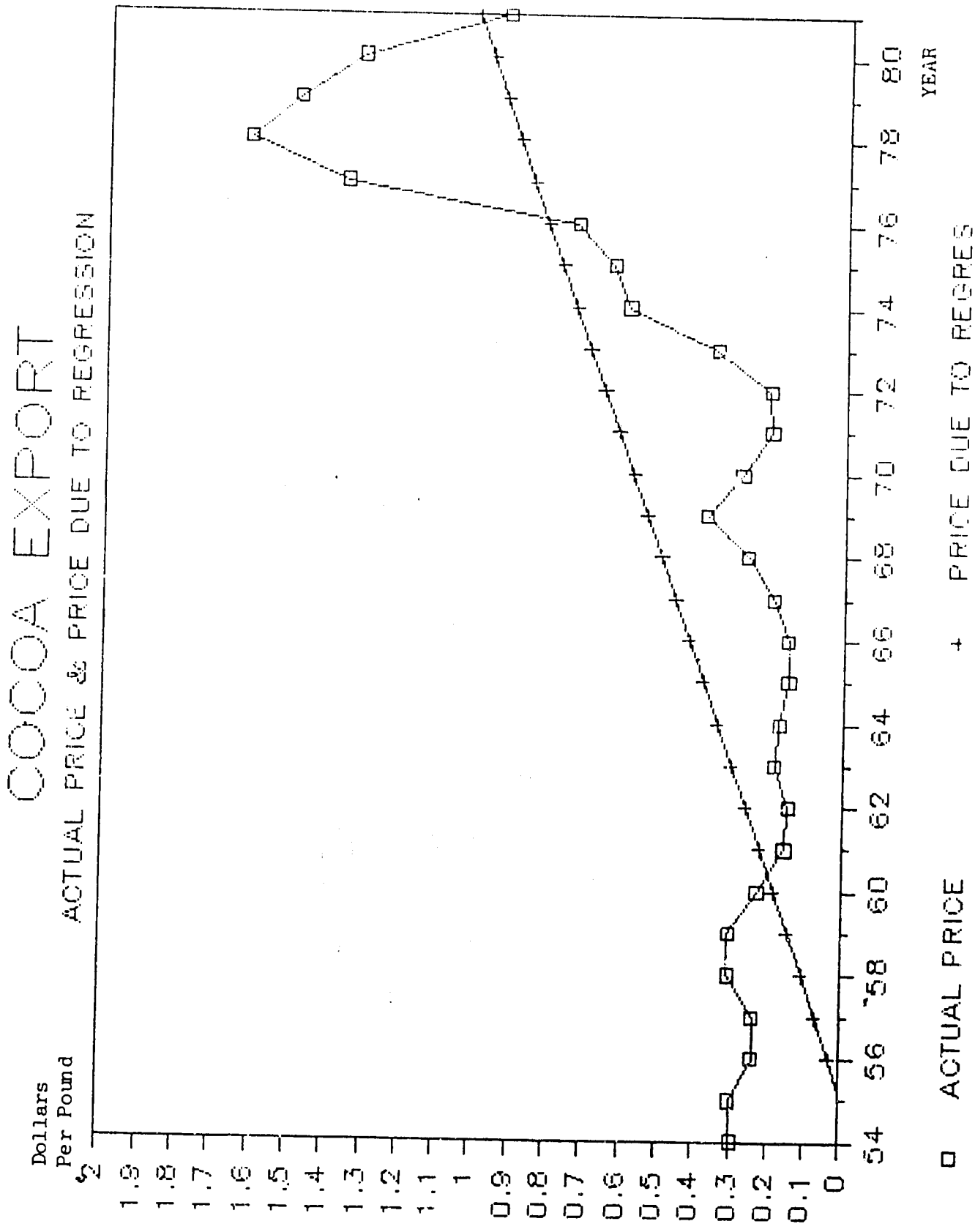
Appendix Figure 1. The Actual and Estimated Quantity of Coffee Exported from Liberia, 1954 - 1981.



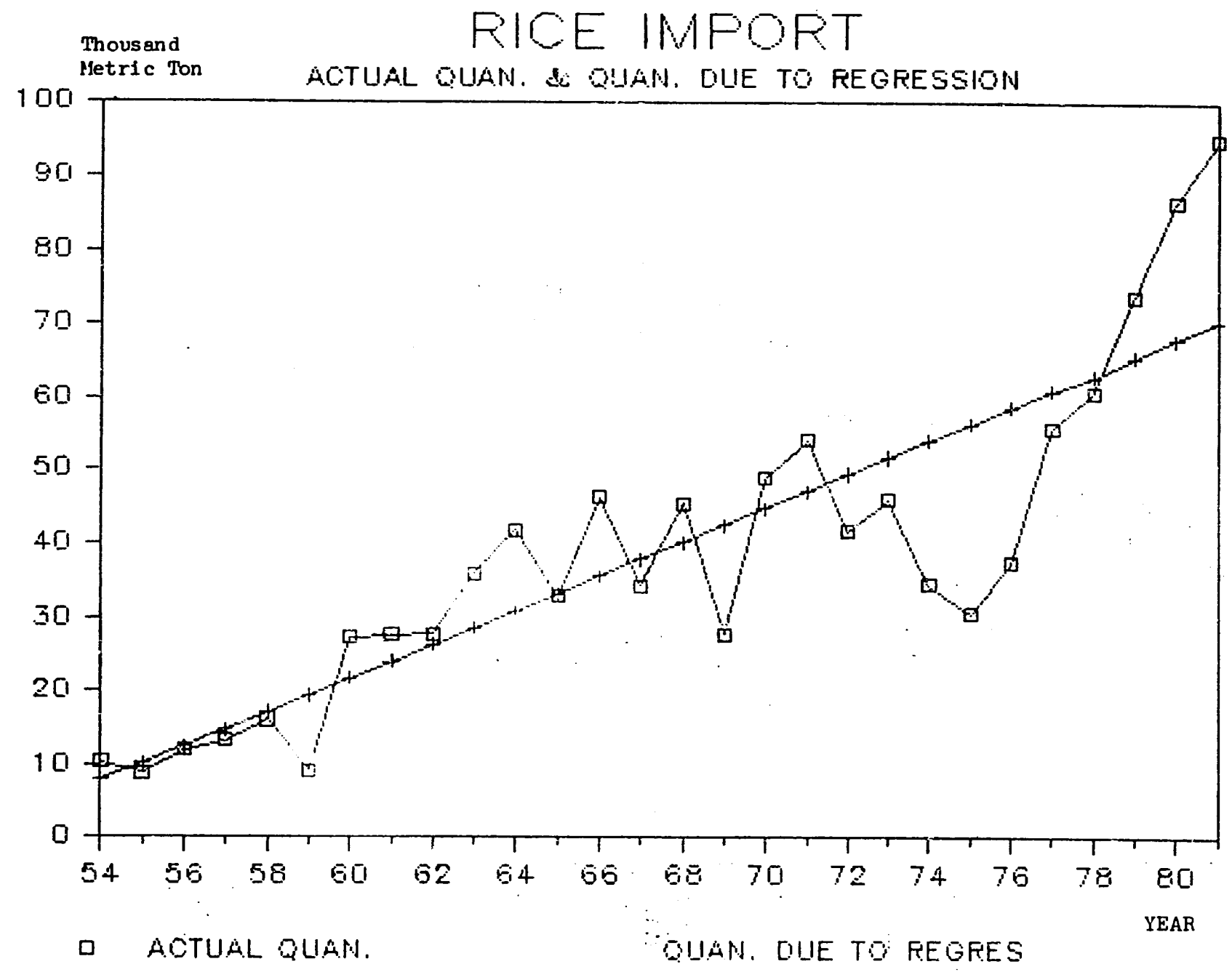
Appendix Figure 2. The Actual and Estimated Price Received for Coffee Exported from Liberia, 1954 - 1981.



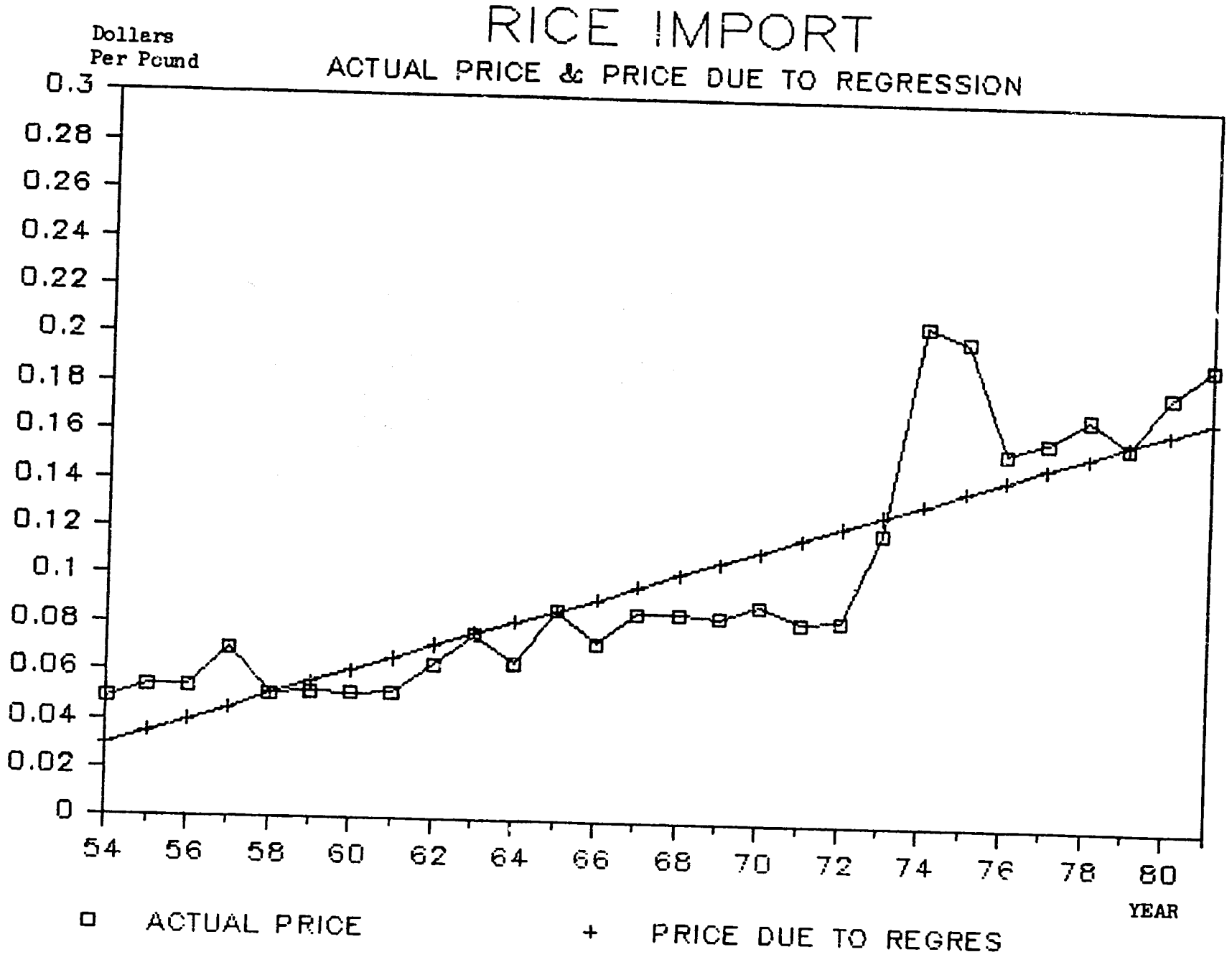
Appendix Figure 3. The Actual and Estimated Quantity of Cocoa Exported from Liberia, 1954 - 1981.



Appendix Figure 4. The Actual and Estimated Price Received for Cocoa Exported from Liberia, 1954 - 1981.



Appendix Figure 5. The Actual and Estimated Quantity of Rice Imported into Liberia, 1954 - 1981.



Appendix Figure 6. The Actual and Estimated Price of Rice Imported into Liberia, 1954 - 1981.

AGRICULTURAL INPUT SUPPLY AND DELIVERY SYSTEM

Arthur S. Gedeo and Jerry B. Mason*

Introduction

Farmers use three major resources in their operations: land, their own management and labor, and inputs originating from off the farm. These latter, called "purchased inputs", are supplied by what is known as the input sector. This sector supplies the agricultural production system with materials; labor services and capital needed to produce. In particular, the input sector is a source of technological innovations, improved methods and practices that affect agricultural productivity. When we as planners or policy-makers review the agricultural sector in terms of finding ways and means to improve the system and increase production, there is a tendency to overlook the "crucial role" of the input sector. It is often assumed that farm inputs will be available, affordable by farmers and that farmers are aware of their superior qualities and will be willing to purchase and apply them without considering the supply and delivery system. This, may be one of the major causes of the poor performance or failure of our attempts through different projects to increase food and agricultural production in Liberia.

Farm inputs play a very important role in the production process. In general terms, the producton of a particular crop by a farm household depends greatly on the inputs and services employed and the way they are utilized. According to Miller (Ref. 5, pp 1-2) a major differentiation between traditional and developed agriculture is the kind and amount of capital used by farmers in the production process. As a given agriculture becomes modernized, the farmer combines his labor with more capital in the form of simple machines, improved seeds, fertilizer, herbicides and pesticides. This results in an increase in the amount the farmer is able to produce, both per unit of labor input and per unit of land. The increase in the ability of the farmer to produce more by combining more capital inputs with his labor is fundamental to economic and agricultural development.

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The Liberian agriculture has traditionally been greatly dependent on land, labor and "nature" as major sources of inputs. These traditional sources have not been able to make any significant improvement in the Liberian agricultural development efforts. "Low yield, which are associated with the traditional farming methods, adversely affect returns to both land and labor. The available technology also limits farm size which results in the underutilization of family labour and low income..... Substantial increases in productivity and income will require technological improvements that will permit farm families to increase both yields and farm size" (Ref. 1, p 3). This will also require the introduction of the use of some basic inputs into the production process beyond the present levels.

Definition, Scope and Objectives

Definition: The Food and Agriculture Organization (FAO) defines farm inputs as materials and services required to carry out agricultural activities. From a theoretical point of view, they may be grouped as:

1. materials used in current agricultural production: e.g., seeds, fertilizers, pesticides, insecticides, feed, fuel;

2. Factor services: which include such items as wages for farm labor, farm rentals, interest on capital, insurance and taxes;

3. investment goods: these include equipment, machinery, vehicles, etc., which are generally not fully consumed during an accounting year; and construction and fencing materials used for the creation of fixed assets on the farm (Ref. 2, p 22).

This paper is intended to stimulate discussion relating to the present situation with respect to agricultural inputs supply and delivery system and make alternative policy recommendations on how the current system could be improved to get the appropriate and needed farm inputs to farmers at affordable prices and on time.

Given that the subject matter is very broad, we will limit our discussion to the first category of inputs as desired above. This includes, seeds, fertilizers, feeds, pesticides, herbicides, insecticides and small tools.

Historical Review and Current Situation

One cannot effectvely review the input supply and delivery system without first reviewing Liberian agricultural policy in general. Liberia has a long history of not having a clearly defined agricultural policy. From time to time, official

government statements emphasized the importance of the agricultural sector in national development. President Tubman often said during the early 1960's "nothing is more important than that we should become self-sufficient particularly in our food requirements and export more than we import (Ref. 11, p 73). However government initiatives in the development of the agricultural sector, where they were made, were ineffective simply because there was a lack of commitment on the part of the government to stimulate the sector through public investment. In the words of Lowenkopt (1976) "Liberia's vision of agricultural self-help," a device to mobilize farmers for greater production, which is popular elsewhere in Africa, was simply a source of patronage....(Ref. 9, p 74).

Government efforts were concentrated in trying to mobilize private investment in the agricultural sector. To an extent some achievement was made, but most of the private investment in the sector was in the development of rubber plantations. The public attempts to encourage private investment in the production of food for domestic consumption failed. This was reflected in the policy statement of the Department of Agriculture (now Ministry of Agriculture). In its proposed development plan for 1967-70, the Department defined its responsibility as that of stimulating private investment in medium, large-scale commercial and modern agriculture. "To the extent that private investment does not come fast enough and in sufficient amounts to exploit opportunities which appear to be commercially viable on the basis of government elaborated feasibility studies, the government in cooperation with international organizations, shall establish commercial enterprises as public corporations" (Ref. 7).

This was the beginning of direct government investment in agricultural development in Liberia. Prior to this time, the input supply and delivery was left almost exclusively to the free-market system to handle. However, in response to the changing economic conditions, the Government of Liberia established various agencies to provide technical and financial assistance and farm inputs to farmers. In early 1960's the Agricultural Credit Cooperation (which later became the Agricultural and Cooperative Development Bank in 1978) was established to provide credit to small and medium size farmers. The Liberian Produce Marketing Corporation (LPMC) was also established in 1962. In addition to its primary functions of buying and selling produce (coffee, cocoa and palm kernels and locally produced and imported rice), it was also mandated to provide tree crop seedlings and other assistance to farmers. In the same direction, the Agricultural Mechanization Company (AGRIMECO), a wholly government-owned corporation, was established in 1972 to undertake land development work and provide other technical assistance to farmers. Accordingly, area specific Agricultural Development Projects (ADP's) and other parastatals were established in the mid 1970's,

inter alia, to provide farm inputs and other services to farmers. The role of the ADP's and parastatals in the present input supply and delivery system will be discussed later in this paper.

Current Government Policy on the Importation and Production of Inputs

At present, government has no well-defined policy regarding the importation and/or local production of agricultural inputs. Our guess is that anyone who wants to import or produce agricultural inputs in Liberia is required to follow the normal procedures of engaging in any business understanding, e.g., first being an established business under the laws and statutes of Liberia by obtaining the necessary papers from the Ministries of Finance and Commerce, the National Investment Commission (NIC) and other concerned agencies of government. We do not know whether the Ministry of Agriculture is involved in any way in the granting of import permits or the granting of production rights of agriculture inputs. What is known, however, is that almost all agricultural inputs, with the exception of chemicals and some equipment which have other commercial uses other than agriculture, are duty-free.

Government Supply and Delivery System

Several agricultural institutions and private businesses are involved in the procurement, supply and delivery of inputs to farmers in Liberia. These include the Minstry of Agriculture, the Agricultural Development Projects (ADP's) and other parastatals, LPMC, Farmers Cooperative Societies and the Central Agricultural Research Institute (CARI) in a limited away.

The Role of the Ministry of Agriculture

The Ministry of Agriculture is the central policy-making body of government responsible for the overall national agricultural development. Among other things, it is responsible for reaching all farmers throughout the country with information and ensuring that support systems are available to provide credit, markets, inputs and other services necessary to promote agricultural development.

Prior to the establishment of the ADP's and other agricultural extension agencies, the Ministry provided farm inputs directly to farmers through its regional extension offices in the various counties and territories. Improved rice seeds produced from the special multiplication centers (Kpatawee, Gbedin, Kpen and Gawola) were distributed to farmers by the Extension Division of the Ministry. It also provided fertilizers, vegetable seeds, and other inputs to farmers. At present, a greater share of the supply of farm inputs has been taken over

by the ADP's and parastatals. Except in the areas where there are no ADP's, most farm inputs to the farmers are supplied by the ADP's, the parastatals and Farmers Cooperative Societies.

The Role of the Agricultural Development Projects

The role of the Agricultural Development Projects in the supply and delivery of farm inputs is more defined and direct than in any other areas. Among ADP's under the same external funding agencies, the rule of the game is even more uniform.

Prior to the inception of the ADP's, farmers in the project areas depended primarily on private traders for the purchase of such commonly used farm tools as hoes, cutlasses, axes and knives. In principle, the local traders are willing to sell all the goods for which there is a stable demand and a reasonable profit. Since the local demand for fertilizers and farm chemicals is almost non-existing within the hinterland, local traders are usually not willing to store these items. The absence in the local markets of these yield multiplying inputs posed some problems for the few progressive farmers in these areas. Farmers interested in using fertilizers and chemicals have had to travel to Monrovia to purchase large quantities that will last for a long period. Farmers usually got such inputs as seeds and tree crops seedlings, either from friends, LPMC and to a small extent from CARI. Some progressive farmers grow their own seedlings using local varieties (not improved).

With the inception of the ADP's, the whole farm input supply and delivery system within these areas not only experienced a complete transformation, but the process was made functional. The ADP's procure, either locally and externally, all farm inputs needed for their participating farmers. In terms of system, the ADP's first procure the input (either locally or externally) and stock the bulk in their central warehouses. From that stage they are distributed to zonal warehouses on the basis of farmers needs. Thereafter, the inputs are issued to farmers through the credit personnel and the local cooperative societies who will document the farmer's account and forward same to the central office. It is important to note at this juncture that the system of ADPs like any other system has its merits and demerits: 1) it has a project farmer bias, i.e., it only caters to project farmers; and 2) it does not contain an explicit quality control mechanism. With regard to tree crop seedlings, the ADPs produce their own seedlings at zonal levels for distribution to farmers. They are delivered to farmers through the ADP's credit personnel and local cooperative societies. Incidentally, all project farmers are members of local cooperative societies.

The Role of the Cooperative Development Agency

At the moment, the Cooperative Development Agency, is by and large concerned with providing market and marketing facilities, for farmers primarily in ADP areas. The agency is not directly involved with farm input supply and delivery to farmers, although there are some efforts underway to arrange for credit facilities for simple agro-processing machineries for its member farmers.

The agency is quite young, but it is hopeful that, when given the necessary support (logistics and adequately trained management team), the potential is great to provide its members such services as markets and marketing facilities, produce processing, produce quality improvement facilities and input supply and delivery facilities.

The Role of Central Agricultural Research Institute

The role of the Central Agricultural Research Institute in the supply and delivery of farm inputs has been somehow limited to its immediate environment. This is probably so because farmers are not aware of the work of CARI. The institute has developed many new high yielding crop varieties about which only farmers within its immediate environment know. The high yielding cassava varieties: CARICASS I, II, and III are just a few of the many developments at CARI. The institute's participation is more on the supply side than delivery. Supply, as used here, has to do with DEVELOPMENT and or the PRODUCTION OF PLANTING MATERIALS.

Problem Identification

The problems facing the Farm Input Supply and Delivery System include:

a) Availability of farm inputs

b) Distribution system and marketing of farm inputs

   1. Government

   2. Private

c) Pricing system

d) Farmer's awareness

e) Quality control

We will now briefly discuss each of the above mentioned problems.

Availability of Farm Inputs

By and large, the availability of farm inputs on the Liberian market seems at the moment to be confined to Monrovia and cities within forty miles radius to Monrovia. It is not clear whether the level of supply of these inputs at any points in time is sufficient to meet the demand. What one could, however, confidently say is that there are occasional shortages of certain farm inputs on the market. No doubt there have been instances when one searched for a certain farm input (chemical or feed) and could not find it.

The constant availability of these inputs could encourage their usage by farmers.

Distribution System & Marketing of Farm Inputs

Farm inputs are distributed and marketed by two groups of people: a) government; and b) private.

The government's involvement in the distribution and marketing of farm inputs is somewhat limited. The ADPs and such agricultural parastatals as LCCC, LPPC (now NPC), LPMC, etc., represent the government's delivery system and outlets. Aside from these special projects and corporations the government (Ministry of Commerce) only serves as a license granting agency for the importation of these inputs. To a very minimum extend, the government (Ministry of Agriculture) through its regional extension personnel distributes inputs to farmers. The government is in no way directly involved with the marketing farm inputs.

The private group on the other hand, do more marketing than actual delivery to farmers. The bulk of the farm inputs is marketed in Monrovia, Kakata and Harbel. This poses serious difficulties to farmers in non-ADP areas and at distant places from Monrovia and these distribution centers. In addition to the small size of the market and the highly localized distribution centers, most of the centers outside of Monrovia will stock only those items for which there is a high demand. That is, most of such stores will carry more hand tools than fertilizer and farm chemicals. Table 1 presents a partial list of some of the supplies of farm inputs.

Pricing System

It is not very clear to us what constitutes the prices of the farm inputs on the Liberian markets. Based on information received from the Ministry of Finance, it is given that, except for farm chemicals and insecticides on which the government levies 25% and 5% duties respectively, all other farm inputs are imported duty-free. These include hand tools and fertilizers. Inspite of the duty-free privileges enjoyed by

Table 1. Partial Listing of Agricultural Input Supplies, Liberia, 1983.

Supplier	Location	Inputs
1. African Fertilizer & Chemical Corporation	Randall St., Monrovia	Tools, feed, chemicals, rubber materials, seed.
2. ATMARK	Kakata	Tools, fertilizer rubber materials
3. Baker Farms	Paynesville Freeway Junction	Chicks, feeds.
4. Farm Supply Store	Kakata	Tools, rubber materials.
5. Firestone (Rubber seller only)	Harbel	Tools, rubber materials.
6. Kakata Supermarket	Kakata	Seeds.
7. LCCC (Project farmers only)	Broat St., Monrovia	Tools, seedlings fertilizer.
8. LINDUSCO	Bushrod Island Monrovia	Mechanical equipment
9. MESURADO	After Bushrod Island, Monrovia	Feeds
10. Pan African Chemicals	Randall St., Monrovia	Chemicals
11. Petro-Chemical - Shell	Freeport Monrovia	Chemicals
12. Agro-Trading Agencies	Randall St., Monrovia	Tools, feeds, fertilizer, plastic containers and chemicals

Source: Planning Division, Ministry of Agriculture.

the private importers, the prices of these items are still too high for the local farmers. By and large, most farmers can not yet affort the prices at which some of these items are marketed. Could the high price be explained by the transportation cost or simply HIGH MARKUPS? Table 2 gives a partial representation of the prices of some of the primary farm inputs.

Table 2. Partial Listing of Comparative Prices cf Agricultural Inputs by Store*.

Items	Description	Weight	Prices 1982	Prices 1983-84
Fertilizers				
Fertilizer	NPK-15-15-15	110 lbs.	$24.95	$25.85
Fertilizer	NPK-15-15-15	100 lbs.	24.00	24.00
Fertilizer	NPK-15-15-15	50 kg.	16.05	14.70
Fertilizer	NPK-9-18-27	50 kg.	15.91	14.60
Triple Super Phosphate	26%	110 lbs.	N/A	30.50
Phosphate	20%	1 lb.	0.20/lb.	0.20/lb
Insecticide				
Dieldrin		20 liters	164.36	164.36
Dieldrin		1 liter	N/A	12.50
Dieldrin		25 liters	122.00	150.00
Dieldrin		1 liter	2.70/lb	20.45/gal.
Dieldrin	18 percent	25 liters	190.00	190.00

* Name of store omitted.

Source: Planning Division, Ministry of Agriculture with selected update by the Authors.

Conclusions and Recommendations

Agricultural inputs are as crucial to the production process as food is to the human body. As the human body has a definite path through which it receives food, so must the agricultural sector have a clearly defined and a relatively inexpensive means of receiving its needed inputs. The present input supply and delivery system is not only inadequate, but is faced with such problems as: (a) availability; (b) poor marketing and distribution mechanism; (c) high prices; (d) the lack of quality control measures; and (e) farmers' awareness of what is available. Consequently, new policies must be initiated that will:

1) ensure a relatively constant supply of inputs on the local market at affordable prices;

2) help to educate farmers of the importance and usage of the available improved seeds, farming methods, fertilizers and any new technological breakthrough;

3) ensure that a well coordinated input supply and delivery system is developed and instituted which will be controlled or supervised by government;

4) ensure that quality inputs are imported or produced locally for distribution to farmers.

In this connection, we would like to make the following policy recommendations which are intended to alleviate the problems that have been identified.

1) With respect to the availability and distribution of inputs, we would like to propose for the establishment of a "Centralized Input Supply and Delivery System" through which all basic farm inputs will be procured and supplied by a public corporation. This can be done in one of three ways:

   a) LPMC which already has the institutional capabilities and the infrastructure could assume the role of importer and wholesaler of all basic farm inputs (fertializers, small hand tools, seedlings, etc.). Inputs will be supplied to farmers through the ADPs and viable farmers cooperatives. In areas where ADPs and functional cooperative societies do not exist, all efforts should be made to organize cooperative societies in those areas. All input supply to farmers must be done through the local cooperative society.

   b) Alternatively, a separate corporation to be called "National Farm Input Supply Corporation" (NFISC) with

branches in the various agricultural regions, should be established and authorized to be the sole wholesaler of all essential farm inputs. This recommendation in no way calls for a complete takeover of the input supply business by government; rather, the restriction of the importation of the basic inputs that are commonly used by small traditional farmers to LPMC or the proposed NFISC.

The framework within which the centralized input supply and delivery system should operate will be worked out. However, what we conceive is a system in which one institution (a public corporation) financed by the ACDB will be responsible to supply inputs through arrangements to be made between the institution, the ADPs, farmers cooperatives and the ACDB with the Ministry of Agriculture monitoring or supervising the entire system.

c) The ADPs will eventually phase out. In the long-run, Farmer Cooperative Societies will be one of the appropriate means of maintaining contact with farmers. Therefore, instead of establishing a new corporation, the Cooperative Development Agency (CDA) could be restructured and given additional trained manpower and logistics to handle the farm input supply and delivery business. The cost implications of each of these alterratives must be carefully investigated.

2) Farmers' Awareness. The extent to which farmers are aware of the available inputs and their superior qualities is likely to encourage their usage. Presently, most traditional farmers are not knowledgeable of available improved seeds, fertilizers and basic chemicals which will help alleviate some of their production constraints. Therefore, we would like to recommend that an elaboraate farmers' educational program be launched on both radio, television in the local dialects, town/village meetings, field days, etc., to provide relevant information to farmers on available inputs. This should be a major responsibility of the Extension Department of the Ministry of Agriculture in collaboration with CARI, WARDA, suppliers of farm inputs and other related institutions.

3) Quality Control. At present, there is no system of analyzing or determining the quality of inputs imported into the country or produced locally. One would suspect that feeds of low nutritional values, fertilizers with less than the required elements and chemicals with adverse environmental impact (i.e., DDT) which have been banned in other countries are still being imported and

distributed throughout the country. To control this situation, we recommend that the following alternative measures be taken:

a) That the Division of Standards which concentrates primarily on the control of local industrial production to meet international standards, be upgraded by providing additional trained and qualified manpower, logistics, the necessary equipment and laboratory facilities. With the availability of such facilities, the Division should develop operational linkages with the Bureau of Regulatory Services at the Ministry of Agriculture so that both will work together and ensure that quality inputs are provided on the local market.

b) As an alternative to the above, CARI should assume the role of quality controller for farm inputs. CARI has the laboratory facilities, the necessary manpower: chemists - capable of analyzing fertilizers to determine their chemical compositions, the nutritionists who have the expertise to determine the nutritional values of feeds and the entomologist and pathologists who are very knowledgeable about chemicals, their uses and those banned on the international market. Samples of inputs (imported or locally produced) will be taken to CARI's facilities on a periodic basis for analysis. We should however, be mindful not to get research and the regulatory functions mixed up. In this connection, the findings of the analysis from CARI should be passed on to the appropriate regulatory agency for action. Except for potential transportation problem, this recommendation will be less costly and relatively easier to be implemented.

c) The third alternative is to expand the scope and responsibilities of the Bureau of Regulatory Services within the Ministry of Agriculture to include quality control by providing it with the facilities and additional manpower in the areas of chemistry, nutrition, etc. The Bureau already has teams of inspectors at the various ports of entry into the country. What will be required is an addition of some trained personnel to the existing staff and equipment to also inspect for quality of farm inputs.

It is our view that if these recommendations are implemented, the input supply and delivery system will be improved. This might result in the alleviation of some of the production constraints, currently facing the Liberian farmers.

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SUMMARY OF THE THIRD DAY
THURSDAY, MARCH 28, 1985

Topic: Agricultural Credit Issues

The first session of day three was dedicated to a discussion of the status of Agricultural Credit in Liberia. It began with a prayer by Mr. Huburn Edwards of the MOA. A background paper entitled "Institutional Arrangements and Policy Considerations for Agricultural Credit in Liberia" was presented by Dr. J. Chris Toe of the MOA in collaboration with Messrs Wilson K. Tarpeh and Boakai Sirleaf of the ACDB. Dr. Toe presented an overview of recent developments in Liberia's money and banking sector, Mr. Tarpeh discussed the nature and performance of major agricultural credit institutions, while Mr. Sirleaf dealt with informal credit arrangements such as the "susu". The final portion of their presentation focussed on policy matters and obstacles confronting the efficient delivery of agricultural credit to the farm clientele, especially small farmers.

The general discussion following the presentation of the paper keyed in on several problems. Some of these problems are:

1. Repayment of Loans Awarded to the Food and Tree Crops Subsectors - While loans made to tree crop farmers have a relatively acceptable rate of recovery, the majority of those for food crops are still outstanding.

2. The Extent of GOL Subsidies to Credit Institutions - it was agreed that public subsidization of institutions such as the ACDB may remain necessary since their lending rates are inadequate to cover their borrowing costs. An alternative may be to let interest rates to farmers reflect the true and real cost of funds.

3. The Relationship Between the ACDB and the ADPs - Most of the participants felt that this relationship ought to be strengthened to the extent that all funds earmarked for credit by the ADPs ought to be channeled through the ACDB.

4. Lending and Collection - It was resolved that lending to farmers in and of itself cannot assure the financial and operational viability of the delivery institutions. A vigorous program for collection must be devised. This should entail the monitoring and supervision of activities for which loans were made.

5. Savings - The problems confronting rural savings mobilization were discussed in depth. Since interest rates charged to farmers are kept artificially low, possibilities for major increases in deposit rates are very slight. In addition, the National Bank's reserve requirements ought to be lower for agricultural credit outlets such as the ACDB.

In conclusion, the participants recognized funding as the primary issue confronting credit systems in Liberia. Low loan recovery and the efficient management of agricultural enterprises were seen as additional impediments to credit delivery. Consideration for technical assistance in improving the operational aspects of credit institutions was also urged.

Land Tenure and Resource Use

Discussion included:

1. Redistribution of land ownership should be carried out with emphasis on small farmers.

2. That land ownership is necessary. However the bureaucratic processes involved in obtaining a deed for farmland are numerous and they often take about two to three years to be completed.

   The question of "how can these inconvenient procedures be minimized" was asked. Someone then suggested that the Government's intervention is required to insure that it is the rural population, farmers who are the benefactors of said intervention.

3. The need for an established system that should discourage speculators from buying most of the land away from potential farmers was stressed as an issue of prime concern.

4. The concern for squatters' right of land ownership was suggested as a topic that should be discussed in depth.

The Role of Research in Liberia Agriculture Development

Discussion:

1. In order to motivate research awareness, documentation of research findings at CARI should be circulated over a much wider range then those of previous years.

2. A detailed soil study is desirable and necessary. Unfortunately, soil development planning is very expensive; nevertheless, this should be considered as an

issue for discussion since detail work for said study has not been undertaken since the establishment of CARI.

3. A closer link should be established between CARI and the ADP's extension services whereby research findings could easily reach the small farmers.

4. CARI was commended for its field trials that it has been carrying out and request was made for crops other than cassava.

Agricultural Research and Extension

1. Emphasis was made regarding the necessity of training for the nationwide Agricultural Extension Services.

   Mobility was stressed as the major problem facing the Ministry's Extension Service; both the field and Central Office staffs need to be able to travel to the farmers.

2. Steps through which a better relationship could exist between Research, Extension and Training include:

   a. Finding out the problems of farmers and establishing research objectives in reference to these problems.

   b. Establishing a flow of information from the research stations to the extension aids then to the farmers and a feed back from the farmers to the research station.

3. The availability of markets is an issue that should be addressed since farmers would be faced with this problem when they are attempting to increase production.

Liberian Agricultural Parastatals

During the evening session, Director-General Akinselure presented a paper prepared by Marian Varfley and himself. A lively discussion followed with general agreement being reached about the following points:

1. After a reasonable period of organization and development, a parastatal must be profitable or the alternative of liquidation of the enterprise must be seriously considered.

2. The idea of a Management Contract Plan should be pursued. Management should have a period of independence and there should be definite performance criteria against which the management and the corporation should be judged. Rewards should exist for

exceptional performance; penalties (including loss of position) should exist for failure to meet contractual goals.

3. To the extent that a parastatal is expected to do activities for which there are social returns instead of enterprise profits (i.e., extension teaching), these should be recognized in advance and allowances made for the cost they incur to the enterprise.

Organization of Work Groups

Prior to adjournment for the evening, the Seminar participants were organized into small groups and assigned problem questions which they were to consider. Reports were due at mid-morning.

The papers presented during the third day follow.

INSTITUTIONAL ARRANGEMENTS AND POLICY CONSIDERATIONS FOR AGRICULTURAL CREDIT IN LIBERIA

J. Chris Toe
In collaboration with
Wilson K. Tarpeh and Boakai Sirleaf*

Introduction

The importance of agriculture to Liberia's development efforts warrants no elaboration. In recognition of the sector's past, present and potential contributions to this country, the Government of Liberia has formulated national objectives and associated strategies for the achievement of these goals.

The overall objective as spelled out by the Ministry of Agriculture, the Government of Liberia's coordinating institution for all agricultural and other related activities, is to "expand Liberia's agricultural output until massive economic and social benefits are gained for the total population, consistent with the judicious use and prudent conservation of resources."

The specific objectives include:

1. The increased involvement of the majority of Liberia's farm families in the development of the agricultural sector;

2. Stimulation of increases in farm productivity, employment, and income;

3. Equitable access to means of production and equitable distribution of returns from agricultural product diversification; and

4. The overall expansion of agriculture as the base for self-sustaining development.

The corresponding set of strategies for the accomplishment of these objectives includes, among others:

1. Development of an effective extension service;

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2. Decentralization and improvement in the administration of agricultural programs;

3. Provision of technical information and service in support of development;

4. Increased and improved agricultural research efforts and agricultural training;

5. Improved coordination of input supply, markets, credit, roads, wells, etc; and

6. Use of producers' cooperatives for increased production and improved marketing activities.

The provision of agricultural banking services is a crucial determinant of rural resource mobilization and capital formation. Farmer accessability to institutionalized credit is therefore a precondition for the accomplishment of the GOL's goal of integrated rural development. Institutionalized credit must assert its preponderance over informal credit sources so as to surmount inelasticities in the supply of credit as opportunities for economic gains are increased, reduce the gravity of seasonal financial needs for rural farmers, and encourage smallholders to produce a marketable surplus.

The primary thrust of this paper is to discuss the status of agricultural credit in Liberia. The specific objectives are to:

1. Describe and analyze the monetary environment in which agricultural credit institutions operate;

2. Describe the institutional settings, scope, and performance of agricultural credit arrangements;

3. Discuss the policy issues which determine the financial viability and success of credit delivery systems; and

4. Suggest ways in which an efficient national agricultural credit program can be pursued and to pinpoint the integral components of such effort.

Chapter I describes the role of the National Bank of Liberia in recent money and banking sectoral developments. Commercial bank performance and the extent of agricultural lending by these financial institutions are also discussed.

Chapter II presents performance indicators for major agricultural credit outlets such as the ACDB, LBDI, and the ADP's. In the third and final chapter, an attempt is made to outline the major components of a workable agricultural program and the conditions necessary for its successful implementation.

Chapter I

The Monetary Sector of Liberia

The money and banking sector of Liberia is characterized by a monetary authority with little or no control over money supply, and predominantly foreign-owned financial intermediaries that continue to exhibit a traditional reluctance to venture into significant agricultural lending.

This sector comprises a quasi - central bank, the National Bank of Liberia (NBL), three financial institutions, and seven commercial banks. The financial institutions are: the Liberia Bank for Development and Investment (LBDI), District Trust Corporation (DTC), and the Liberia Finance and Trust Corporation (LFTC), Liberia Trading and Development Bank (Tradevco), Citibank, International Trust Company (ITC), Chase Manhattan Bank, National Housing and Savings Bank (NHSB), Agricultural and Cooperative Development Bank (ACDB), and the Bank of Credit and Commercial International Overseas, Ltd. (BCCI). These are the primary sources for agricultural and/or commercial credits. Information on ownership, branches, and main banking activities is presented in Chart I.

The National Bank of Liberia and Monetary Policy

The National Bank of Liberia was established in 1974 with all the functions of a central bank except the issuance of currency notes. The U.S. dollar is therefore, both legal tender and reserve asset in Liberia. The limited money supply control exercised by the NBL is restricted to Liberian coins which contribute not more than 12 percent to the Liberian economy's total liquidity needs. Thus, money supply is effectively determined by balance of payments considerations.

Since 1977, a liquidity crisis caused by severe reductions in the supply of money has plagued lenders, borrowers, and other economic agents. Between 1979 and 1981, recorded money supply fell by almost 35 percent, from $80.2 million to $52.5 million. Quasi-money composed of time and savings deposits also tumbled by 38 percent during the same period, from $82.2 million to $51.0 million. As a result of these developments, private sector liquidity suffered a 36 percent erosion, from $162.4 million in 1979 to $103.5 million in 1981.

But as Table 1 illustrates, a change in the direction of these monetary aggregates is already underway. The percent change in recorded money supply was 22 percent between 1981 and 1982 while quasi-money and private sector liquidity rose by 23.3 percent and 22.7 percent respectively. The major sources of these improvements were increases in demand and time deposits and the introduction of a $5.00 Liberian coin which substantially contributed to a rise in the quantum of Liberian coins outside the banking system.

Chart I

The Banking System——1982

Banks	Year Established	Ownership	Branches/Agencies	Main Banking Functions
National Bank of Liberia	1974	Government of Liberia	Four Agencies: Harper, Maryland County, Greenville, Sinoe County, Robertsport. Cape Mount County & Zwedru, Gedeh County	Central banking
1) Liberia Trading & Development Bank (TRADEVCO)	1954	A Subsidiary of Mediobanca of Milan, (Italy)	No branches	Trade Financing
2) Citibank	1955	A branch of Citibank N.A. of New York	One branch in Yekepa, Nimba County	Corporate banking
3) International Trust Company	1958	Owned almost 100% by the International Bank of Washington, D.C.	One branch in Yekepa, Nimba County	Consumer loans and corporate lending
4) Chase Manhattan Bank	1962	A branch of Chase Manhattan N.A. of New York	Two branches in Harbel, Marshall Territory and Bong Mines, Bong County	Trade financing and Corporate lending
5) National Housing & Savings Bank (NH&SB)	1976	Government of Liberia	Three branches in Sinkor, Monrovia; New Kru Town, Monrovia; Robert International Airport, Marshall	Mortgage financing and home construction and improvement
6) Agricultural & Cooperative Development Bank (ACDB)	1978	Majority ownership by Government of Liberia and Private Individuals	Five branches: Gbarnga, Bong County; Voinjama, Lofa County; Gompa City, Nimba County; Zwedru, Grand Gedeh County and Greenville, Sinoe County	Agricultural credit
7) Bank of Credit & Commercial International Overseas Ltd.	1978	An affiliate of the BCCI Holdings (Luxembourg) SA	No branches	Full service commercial bank

Source: National Bank of Liberia Annual Report, 1982.

Table 1. Money Supply and Private Sector Liquidity (1979-1982)
(Million $)

Item	1979	1980	1981	1982	% Change 79-1981	% Change 1981-1982
Recorded Money Supply	80.2	72.3	52.5	64.1	-34.5	+22.1
Liberian Coins Outside Banks	(11.0)	(11.3)	(11.6)	(15.7)	+5.5	+35.4
Demand Deposits	(62.2)	(70.0)	(40.9)	(48.3)	-40.9	+18.1
Quasi - Money	82.2	54.9	51.0	62.9	38.0	+23.2
Time Deposits	(37.4)	(18.5)	(16.6)	(24.5)	-55.6	+48.0
Savings Deposits	(44.8)	(36.4)	(34.4)	(38.4)	-23.2	+11.6
Private Sector Liquidity	162.4	127.2	103.5	127.0	-36.3	+22.7

Source: National Bank of Liberia Annual Reports, 1979 and 1982.

Two other monetary problems which have significantly effected the general decline in Liberia's economic activities are the depletion of external assets of the NBL and commercial banks, and NBL's interest rate policy which is wholly determined by usury laws and government directives. The National Bank is virtually impotent with regard to its control over interest rates. With little or no controls on the repatriation of capital, and the ability of major commercial banks to raise funds on international money markets, Liberia's central bank usually imposes a ceiling on lending rates. This ceiling is influenced by rates existing on New York's financial markets and domestic considerations of risk and other cost factors.

The magnitude of the problem posed by the depletion of NBL's foreign exchange position since 1979 is depicted in Table 2. In that year, the central bank's assets, comprised of balances with banks abroad, convertible currency, SDR holdings, and IMF gold tranche stood at $55 million with liabilities of 67.4 million; the net foreign assets position was therefore, a deficit of $12.4 million, which subsequently grew to $71.9 million, 109.7 million, and $166 million in 1980, 1981, and 1982 respectively. A prime cause of this precarious external position lies with NBL balances with banks abroad; they eroded from $36.3 million in 1979 to about $300,000 in 1980. These balances have embarked on a modest upturn; they were $2.7 and $4.1 million in 1981 and 1982 respectively. Liberia's foreign exchange position is not likely to improve significantly inspite of continuing IMF financial assistance as long as prices for the nation's major exports remain sluggish and increases in NBL liabilities are not effectively controlled and ultimately reduced.

As mentioned earlier, Liberia's interest rate structure is directly related to rates existing on New York money markets. Government of Liberia usury laws as well as NBL directives, determine the magnitude of the spread between rates obtained in Liberia and foreign market-determined rates. In essence, lending and deposit rates in the country are not influenced by the scarcity of money, be it the demand for or the supply of money.

In 1981, the average lending rates for overdrafts and personal and mortgage loans were 12.5, and 21.1 percent respectively. These rates rose to 21.6 percent for overdrafts, 14.4 percent for personal loans, and 12.5 percent for mortgage borrowings in 1982 as a result of the tight domestic liquidity problems which amplified the increased demand for money from various sectors. Unfortunately for domestic resource mobilization efforts, the level of deposit rates fell over the same period. While savings, time, and certificate of deposit averaged 8.0, 11.5, and 11.4 percent respectively in 1981, these rates declined in 1982 for time and CD's (9.2 and 9.5 percent) but remained stable for savings (Table 3).

Table 2. Foreign Exchange Position of the Banking System (1979-1982)
(Millions of dollars)

	1979	1980	1981	1982
National Bank (net foreign assets)	12.4	-71.9	-109.7	-166.0
Assets	55.0	4.0	13.4	12.3
Balances With Banks Abroad	36.3	-0.3	2.7	4.1
Convertible Currency	10.1	4.3	3.4	2.2
Holdings of SDR	8.6	-0.1	1.3	-
IMF Position (gold tranche)	-	-	6.0	6.0
Liabilities	67.4	75.9	123.1	178.3
Commercial Banks (net foreign assets)	-27.1	-31.8	-40.9	-42.5
Assets	35.7	23.6	15.5	12.1
Liabilities	62.8	55.4	56.4	54.6
Banking System (net foreign assets)	-39.5	-103.7	-150.6	-208.5
Assets	90.7	27.6	28.9	24.4
Liabilities	130.2	131.3	179.5	232.9

Source: National Bank of Liberia Annual Report, 1985.

Table 3. Weighted Averages of Commercial Banks' Deposit and Lending Rates (1981-1982)

	1981		1982	
	Range (%)	Average (%)	Range (%)	Average (%)
Lending Rates				
Overdrafts	15.0-22.0	21.5	20.0-22.0	21.6
Personal	6.0-16.0	12.5	6.0-19.0	14.0
Mortgage	11.5-18.5	12.1	12.0-19.0	12.5
Deposit Rates				
Savings	8.0	8.0	8.0	8.0
Time	8.8-13.0	11.5	8.0-13.0	9.2
Certificate of Deposits	10.0-13.0	11.4	9.5	9.5

Source: National Bank of Liberia Annual Report, 1982.

A major consequence of the enormous difference between lending and deposit rates is the less than normal increases in savings and other traditional financial instruments, and the encouragement of interest arbitrage bordering on destabilizing speculation. With major commercial banks controlled by foreign entities, justifications for narrower interest spreads fall on deaf ears even when mandated by the National Bank. A significant increase in deposit rates is warranted, and should form part of an overhaul of the nation's interest rate regime if increased domestic resources are expected to aid in resolving Liberia's liquidity crisis.

Commercial Banks and Agricultural Lending

Commercial banks in Liberia are characterized by their essentially foreign ownerships which make them accessible to international markets, mainly the Eurodollar market. With little or no effective publicly - mandated specific measures or instruments for domestic savings mobilization, access to these foreign capital markets allows most of the banks to augment scarce domestic funds. As a result, they maintain relatively large accounts, impose high mininum deposit requirements, and they have limited rural operations (see Chart I).

The liquidity crisis currently confronting Liberia's economy and the erosion of foreign balances have taken a toll on commercial banks' deposit base, lending to economic sectors, and net foreign assets.

In 1980, the overall deposits of residents and financial institutions totalled $122.5 million, of which demand, time, and savings deposits accounted for $61.0, $18.5, and $36.4 million respectively (Table 4). Between 1980 and 1981, the deposit base fell by 18% to 99.6 million. The economic and political uncertainty prevailing in these years led to withdrawals of deposits, primarily personal. For example, personal demand deposits declined from $11.0 million in 1980 to $6.7 million in 1981, personal time deposits from $5.0 million to $3.6 million, and personal savings from $33.5 million to $30.3 million in the same period. But 1982 brought about modest improvements in the deposit base. Total deposits of residents grew from $91.8 million in 1982 to $112.2 million in 1982, resulting in a 14.9 percent increase in the deposit base, from $99.6 million in 1981 to $114.4 million in 1982.

Such an improvement as mentioned above ought to be encouraged in every possible way given that the deposits of residents constitutes a large portion of total commercial bank resources. In 1980, the deposits of residents (time, savings and demand) accounted for approximately 56.8 percent of total resources. This share fell to 52.5 percent in 1981 but rebounded to 59.2 percent in 1982. The bulk of the rest of resources are derived from banks abroad. The contribution of

Table 4. Resources and Deposits of Commercial Banks, 1980-1982
(Millions of dollars)

RESOURCES				DEPOSITS			
Items	1980	1981	1982	Items	1980	1981	1982
Deposits of Residents	115.9	91.8	112.2	Demand Deposits	61.0	40.9	48.3
Demand	61.0	40.9	48.3	Personal	11.0	6.7	8.4
Time	18.5	16.6	25.5	Public Corps.	11.3	2.9	9.9
Savings	36.4	34.4	38.4	Private Enterprises	38.7	31.3	30.1
Deposits of Monetary Authority & Financial Inst.	7.8	8.3	3.1	Time Deposits	18.5	16.6	25.5
NBL	.6	.5	.6	Personal	5.0	3.6	7.4
Commercial Banks	6.0	7.3	1.6	Public Corps	8.2	5.5	7.0
Other Financial Inst.	1.2	.5	.9	Private Enterprises	5.3	7.5	11.2
Foreign Banks	55.4	56.4	54.6	Savings Deposits	36.4	34.4	38.4
Balances Due	55.3	56.2	54.5	Personal	33.5	30.3	34.7
Non-Resident Deposits	.08	.1	.08	Public Corps.	.4	1.1	.6
Capital & Reserves	25.1	18.3	19.7	Private Enterprises	2.5	3.0	3.1
Total	204.2	174.8	189.6	Total Deposits of Residents	115.9	91.8	112.2
				Deposits of Monetary Authority & Inst.	7.8	8.3	3.1
				Grand Total Deposits	122.5	99.6	114.4

Source: National Bank of Liberia Annual Report, 1982.

these foreign entities to total commercial bank funds was 27.1 percent in 1980, 32.3 percent in 1981, and 28.8 percent in 1982 (Table 4).

The liquidity crunch has also precipitated an undesirable decline in commercial banks' assets and foreign exchange position. With the increase in domestic deposit withdrawal, Liberia's predominantly foreign-owned financial institutions have had to reduce their balances with banks abroad. These funds fell from $31.2 million in 1979 to a paltry $6.9 million in 1981 and $7.1 million in 1982 (Table 5). At the same time, balances due banks abroad have remained fairly stable. They were $60.2 million in 1979 and $54.5 million in 1982.

The obvious result of these developments has been an increasing deterioration of the net foreign assets position of commercial banks, which when considered along with the depletion of NBL foreign exchange position has led to a banking system grappling for liquid funds. Between 1979 and 1982, the foreign assets of commercial banks fell from $35.7 million to $12.1 million, foreign liabilities stood relatively stable so that the net foreign assets position of these domestic entities incurred a deficit which grew from $27.1 million in 1979 to $42.5 million in 1982. This contributed to an overall deficit position for Liberia's banking system over the same period (Table 2).

The political and economic uncertainty in Liberia which has led to rising illiquidity and deterioration of commercial banks' deposit base has also adversely affected the quantum of loans and overdrafts to the Nation's economic sectors and the distribution of their loan portfolios. Total credit to agriculture, manufactures, construction, trade, etc., stood at $166.2 in 1980 but fell by 19 percent to $134.6 million in 1982.

The decline in total credit has led to a realignment in the volume and sectoral shares of commercial banks' loan portfolios. For example, the share of commerce (trade, hotels, restaurants) fell from 33.8 percent in 1980 to 27.5 percent in 1982, in spite of the fact that trade-related concerns have been the traditional consumers of bank credits. The percent of total bank loans and overdrafts for manufactures also declined from 4.5 percent in 1980 to less than one percent in 1982 (Table 6).

A similarly progressive reduction also affected total agricultural lending by commercial banks. In 1980 and 1981, the volume and shares of agricultural credit in total lending amounted to $17.6 million or 10.6 percent, and $11.7 million or 9.2 percent respectively. By 1982, the amount and share for the agricultural sector had fallen to an all time low of $8.9 million or 6.6 percent of total banks credit. The volume and percent of loans accruing to all agricultural subsectors also fell with the exception of the rubber industry whose share of total bank loans and overdrafts rose from less than one percent in 1980 to 5 percent in 1982.

Table 5. Commercial Bank's Aggregate Balance Sheet, 1979-1982

	1979	1980	1981	1982
Assets				
Cash on hand	5.2	11.6	9.6	7.6
Balances with banks	7.0	7.3	7.6	3.6
Balances with NBL	13.8	9.3	26.8	37.3
Total Credit & Investment	187.1	168.5	128.5	135.7
Other Domestic Assets	43.1	57.5	54.5	60.3
Balances With Banks Abroad	31.2	13.1	6.9	7.1
Total Assets	287.4	267.3	233.7	251.5
Liabilities				
Deposits of Residents	143.0	115.9	91.8	112.2
Deposits of GOL	-	.06	.06	.06
Balances Due Banks	14.0	7.2	7.8	2.5
Capital & Resources	18.6	25.1	18.3	19.7
Other Domestic Liabilities	34.0	56.5	56.5	60.4
Balances Due NBL	1.5	.6	.5	.6
Balances Due Banks Abroad	60.2	55.3	56.2	54.5
Non-resident Deposits	2.6	.08	.1	.08
Acceptances in Favor of Banks Abroad	13.6	6.6	2.4	1.5
Total Liabilities	287.4	267.3	233.7	251.5

Source: National Bank of Liberia Annual Report, 1982.

Table 6. Quantity and Percent Distribution of Commercial Banks' Loans and Overdrafts by Economic Sector, 1980-1982 (Millions of dollars; percent)

Sector	1980		1981		1982	
	Quantity	Percent	Quantity	Percent	Quantity	Percent
Agriculture	17.6	10.6	11.7	9.2	8.9	6.6
Rubber	1.3	0.8	2.9	2.3	6.8	5.0
Forestry	9.5	5.6	3.4	2.7	1.5	1.2
Fishing	.7	0.5	0.7	-	-	-
Other Agriculture	6.2	3.7	5.2	4.2	.6	0.4
Mining & Quarrying	.6	0.4	.1	-	-	
Manufacture	7.5	4.5	2.5	2.0	.8	0.6
Construction	13.0	7.8	13.4	10.6	10.5	7.8
Transportation, etc.	1.3	0.8	3.1	2.4	1.0	0.7
Trade, Hotels, Restaurants	56.1	33.8	33.7	26.6	37.1	27.5
Services	3.6	2.1	1.8	1.4	4.7	3.5
Personal	14.9	8.9	5.2	4.1	7.1	5.3
Government of Liberia	2.9	1.7	3.9	3.1	3.8	2.8
Public Corporations	41.1	24.7	31.9	25.2	41.8	31.1
Others	7.7	4.7	19.6	2.2	18.9	1.6
TOTAL	166.2	100.0	126.8	100.0	134.6	100.0

Source: National Bank of Liberia Annual Report, 1982.

Although the amount of credit allocated to most of Liberia's economic sectors and subsectors has declined, an unprecedented increase in public corporation lending especially, and GOL indebtedness to commercial banks has emerged. Loans to public corporations grew from about $1.1 million in 1977 to $41.1 million in 1980 and $41.8 million in 1982. The shares of bank credit to these institutions has also grown progressively from about 25 percent in 1980 to 31 percent in 1982. A large portion of these credits were used to finance working capital.

In essence, it is fair to say that until the air of uncertainty which now exists is cleared, banks' liquidity and offshore asset positions may not improve substantially in the near future. Without such improvements, the shares of total credit allocated to important economic sectors such as agriculture and manufactures will undergo continuing declines.

Chapter II

The Structure and Performance of Institutions for Agricultural Credit

Up until recently, there existed a dearth of financial institutions committed to investment lending for agricultural development in Liberia. Commercial bank reluctance to allocate a significant portion of their loan portfolio to agricultural subsectors, the lack of viable alternative financial institutions to meet rural demands for money or harness rural savings, the poor state of rural infrastructure, and the disincentives created by various aspects of GOL's agricultural policies and arrangements are but a few of the factors which have retarded increases in the volume and distribution of agricultural credit.

Prior to the establishment of the Agricultural and Cooperative Development Bank (ACDB) by an Act of the National Legislature in December 1976, attempts at institutionalizing agricultural lending were either outright failures, or they met with limited success. Borrowers therefore had to place their fates in the hands of informal lenders, conservative commercial banks, or an ill-prepared Liberian Bank for Development and Investment (LBDI). Over time, farmers residing within agricultural development project (ADP) areas such as in Bong and Lofa Counties gained access to input credits.

In what follows, an attempt is made to describe various arrangements for institutional and non-institutional credit as they exist in Liberia.

Early efforts at agricultural credit institution building will be reviewed, and the organization and performance of institutions contributing a significant portion of their loan portfolio to agricultural development will be analyzed. The last section of this chapter will be devoted to a description of major informal lending and saving arrangements currently existing in Liberia's rural areas.

Institutional Sources of Agricultural Credit

Early Agricultural Credit Efforts (Ref. 1)

In 1953, an Act of the Legislature created an Agricultural and Industrial Credit Corporation (AICC). The authorized capital stock, to be wholly subscribed to by the GOL, was $1 million. These subscriptions never materialized and the AICC was forced to cease operations in 1962. Records showing contributions from the GOL or AICC's loans made and loans recovered are nonexistent.

The next effort was made with the formation of an Agricultural Credit Corporation (ACC) which began operations in 1962. Funding arrangements for ACC differed from those made for the AICC. Instead of relying on GOL subscriptions, the ACC operated on funds collected from delinquent debtors of the defunct AICC. But several problems led to the demise of this institution. It is said that the ACC isolated itself from its primary clientele who were farmers, and never had the institutional capabilities to effectively administer its mandate. Over-reliance on funding arrangements with LBDI has been cited as an additional determinant of the ACC's dissolution in 1967.

The Ministry of Agriculture, through its Cooperative Marketing and Credit Division (CMCD), thereafter, took over small farmer and cooperative lending. All loans were credits-in-kind funded by budgetary appropriations which exhibited severe discontinuities. In 1975, the CMCD was reorganized and renamed the Credit Division (CD). Between 1971 and 1975, the CMCD and the CD loaned out $603,805.31 but recovered only 19.9 percent of this amount or $98,075.30. This low recovery rate, coupled with irregular monetary injections and the inappropriateness of MOA as the setting for agricultural credit were some of the factors which encouraged the establishment of the ACDB in 1976.

The Liberian Bank for Development and Investment (LBDI)

LBDI was established in 1961 with the following objectives:

1. To assist in the establishment, expansion, and the modernization of private productive business and enterprises in Liberia;

2. To encourage and promote the development of internal and external private and public capital availabilities in the financing of such enterprises; and,

3. To encourage, sponsor, and facilitate private establishment, acquisition, or ownership of productive business and industrial investment, shares and securities (Ref. 2).

Following its establishment, LBDI's charter underwent subsequent revisions in 1961, 1965, and 1974. The 1974 revision resulted in a change of name for the LBDI from LBIDI (Liberian Bank for Industrial Development and Investment) inorder to give increased emphasis to the Bank's sectoral activities in agriculture.

Long term debt in 1983 was held by domestic and international entities such as the Government of Liberia, World Bank (IBRD), the African Development Bank (ADB), Kreditanstalt fur Wiederaufbau (KFW), American Life Insurance Company, European

Investment Bank (EIB), Deutsche Genossenschaftsbank (DG), Deutsche Gesellschaft fur Wirtschaftliche Zusammenarbeit (DEG), and the Caisse Centrale de Cooperation Economique (CCCE).

A summary of the LBDI's operations for 1982 and 1983 is presented in Table 7. It shows that $10.27 million worth of projects received approvals in 1983, up from $4.5 million in 1982; $7.52 million in loans, $1.52 million in guarantees, and $1.22 million in equity investments. Disbursements rose by 6.4 percent between 1982 and 1983, from $4.09 million to $4.35 million. Net profit also increased from $320,000 in 1982 to $470,000 in 1983, a 46.9 percent change between the two years. About 20 percent of total advances were overdue in 1983. Regional and sectoral distribution of approvals and gross advances are shown for 1983 in Table 8. Out of a total of 77 projects which were approved, Montserrado County's share was 67, followed by Bong with 3 and Sinoe and Lofa with 2 projects each.

In terms of the percentage of total amounts accruing to each county, Montserrado again dwarfed every other region by accounting for 80 percent of all approvals or $6.02 million out of a total of $7.52 million. No other geographic area received more than one percent of total approved amounts.

The biase in favor of Montserrado County is indicative of the fact that LBDI maintains no regional offices in which projects can be received and analyzed. It also illustrates the fact that the LBDI is not a bank in the conventional sense of the word. It only manages the accounts of firms and individuals committed to it and operates no deposit windows for the general public.

On a sectoral basis, manufacturing led all sectors with 53.8 percent of total approved amounts in 1983. This was followed by agriculture with 11 out of 76 projects or 16.9 percent of total sectoral approvals (see Table 8). If gross advances are considered, then other services (retail trade, amusement, etc.) garnered 22.9 percent but were closely followed by agriculture and manufacturing at 21.8 and 21.2 percent respectively. When agriculture, forestry and wood processing, and fishing are combined, the distribution of gross advances which accrued to these sectors was 48.8 percent.

The majority of the LBDI's loan and equity portfolio is concentrated in medium and long term financing. This is a reflection of the bank's mandate as spelled out in its charter. Out of $23.5 million made available in 1983, $1.94 million went for short-term projects, $10.14 million was for medium term loans, while long term loans and equity investments were allocated $9.29 and $2.10 million respectively (Ref. 3).

Table 9 shows LBDI outstanding loans and equity investments in agriculture and related activities in 1983. No short term loan was allocated to agricultural enterprises; one loan each was granted to forestry and wood processing and fishing. A total of 32 medium term and 28 long term loans were made to agriculture. Most of this financing went for the development of palm oil and rubber concerns followed by poultry. In essence, about $11.3 million was invested in agriculture and related activities in 1983. This was the cost of 73 mainly medium and long term loans. Specific agricultural activities accounted for 61 loans at a cost of $5.12 million while forestry and fishing subsectors were allocated 9 and 3 loans respectively at costs of $4.14 and $2.10 million.

Table 7. Summary of LBDI Operations, 1982-1983
(Millions of dollars)

Item	1982	1983	Percent Change
Approvals	10.27	4.50	+128.2
Commitments	5.98	3.87	+54.5
Disbursements	4.35	4.09	+6.4
Gross Advances Outstanding	23.46	20.25	+15.9
Loan Payments	6.07	5.66	+7.2
Overdue Advances	7.90	3.57	+121.3
Gross Income	4.19	3.79	+10.6
Operating Expenses	3.32	3.23	+2.8
Profit Before Portfolio Provision	0.95	0.55	+72.7
Reserve for Loan Losses	0.48	0.23	+108.7
Net Profit/Loss	0.47	0.32	+46.9

Source: LBDI Annual Report, 1983.

Table 8. Regional and Sectoral Distribution of LBDI Approvals and Gross Advances, 1983.

Regional Distribution of Approvals				Sector Distribution of Approvals				Sectoral Distribution of Gross Advances	
Region	No of Projects	Amount (M$)	Percent	Sector	No. of Projects	Amount (M$)	Percent	Sector	Percent
Montserrado	67	6.02	80.01	Manufacturing	12	4.05	53.8	Other Services	22.9
Sinoe	2	.90	11.67	Agriculture	11	1.27	16.9	Agriculture	21.8
Grand Gedeh	1	.33	4.39	Service	38	1.12	14.9	Manufactures	21.2
Lofa	2	.13	1.73	Construction	15	1.09	14.4	Forestry and Wood Processings	17.6
Bong	3	.12	1.57	Total	76	7.53		Fishing	8.8
Nimba	1	.04	0.52					Hotels & Tourism	7.7
Maryland	1	.008	0.11						
Total	77	7.548							

Note: The totals of $7.548 and $7.53 million shown in the amounts column differ from the actual sum of $7,518,149 reported by LBDI due to rounding.

Source: LBDI Annual Report, 1983.

Agricultural and Cooperative Development Bank (ACDB)

The Agricultural and Cooperative Development Bank is the single most important source for agricultural credit in Liberia. It was established on August 4, 1978 following the passage of an Act of Legislature on November 1, 1976. The bank did not officially open for operations until February, 1979. The objectives of the ACDB as spelled out in the 1976 Act are to:

a) provide short, medium and long-term credit to individual farmers either directly or through cooperatives or other farmers organizations to facilitate the investment of capital for productive purposes;

b) encourage development of cooperatives, or other farmers organizations at the county, district, and village level;

c) provide credit for marketing output, and increasing the supply of inputs for the rapidly growing agricultural sector;

d) increase capital formation by direct use of labor in land improvement and water resource development;

e) promote the establishment of agricultural enterprises to generate additional production in the rural areas to meet the growing consumption requirements of the urban sector, and for export; and

f) mobilize savings in the rural areas.

The ACDB was therefore conceived as an avenue through which the GOL could pursue its objective of integrated rural development by means of 'balanced regional planning'. This policy thrust of the Government is aimed at:

a) The development of Liberia's rural economy through the building up of appropriate institutions;

b) providing incentives for the flow of private investment capital into the agricultural sector;

c) facilitating the creation of a climate favourable to integrated rural development;

d) developing the land and human resources in the rural areas; and

e) generating economic development activities in the rural areas with a view of providing additional employment and higher living standards for the rural people.

Table 9. LBDI Outstanding Loans and Equity - Investments In Agriculture and Related Activities, 1983

Sector	SHORT TERM No.	SHORT TERM Amount	MEDIUM TERM No.	MEDIUM TERM Amount	LONG TERM No.	LONG TERM Amount	EQUITY No.	EQUITY Cost	TOTAL No.	TOTAL Amount
Agriculture										
Rubber	-	-	12	319,186	10	1,019,919	-	-	22	1,339,105
Palm Oil	-	-	1	12,020	3	2,162,937	1	49,250	5	2,224,207
Poultry	-	-	8	325,664	8	899,230	-	-	16	1,224,894
Fruits and Vegetables	-	-	5	174,865	1	6,966	-	-	6	181,831
Rice	-	-	1	2,000	1	17,946	-	-	2	19,946
Cocoa and Coffee	-	-	2	22,692	5	85,809	-	-	7	108,501
Sugar cane	-	-	2	25,490	-	-	-	-	2	25,490
Others	-	-	1	1	-	-	-	-	1	1
SUBTOTAL	-	-	32	881,918	28	4,192,807	1	49,250	61	5,123,975
Forestry and Wood Processing										
Lumber and Veneering processing	1	100,000	5	1,896,873	1	466,608	2	1,672,120	9	4,135,601
SUBTOTAL	1	100,000	5	1,896,873	1	466,608	2	1,672,120	9	4,135,601
Fishing										
Fishing, Shrimp Processing	1	35,586	2	2,018,462	-	-	-	-	3	2,054,048
SUBTOTAL	1	35,586	2	2,018,462	-	-	-	-	3	2,054,048
TOTAL	2	135,586	39	4,797,253	29	4,659,415	3	1,721,370	73	11,313,624

Source: LBDI Annual Report, 1983.

The original authorized capital stock of the ACDB was $2.0 million. This amount was raised to $5.0 million in 1983 when the 1976 Act was amended and is held by the GOL (65%), LPMC (15%), and the National Federation of Cooperative Societies (10%). The 1983 amendment of the Bank's charter also permitted it to offer general banking services to the public in addition to its role as a specialized dispenser of agricultural credit.

ACDB is headquartered in Monrovia and governed by a board of directors with the Minister of Agriculture as Chairman. Direction and management of the bank's day to day activities rest with the president who is assisted by a general manager (see Chart 2). There are five departments, six branches, and one sub-branch. The departments consist of projects, internal audit, administration, research and planning, and operations.

The Operations Department is directly in charge of the six branches located in Voinjama, Gbarnga, Ganta, Zwedru, Greenville and Harper, and the sub-branch at Foya. The establishment of these branches is in accordance with the aims and objectives of ACDB's rural development mandate.

ACDB has experienced monetary losses since it opened its doors to the public; the only profitable year of operations was 1983. Between 1978 and 1982, the bank accumulated a total loss of $2.33 million compared to the modest 1983 profit of $302,000 (see Table 10). These losses can not be wholly attributed to internal operating inefficiencies, but to the risky nature of agricultural lending and other mainly external factors such as the existence of agricultural policy disincentives, and the poor state of rural infrastructure.

Factors accounting for ACDB losses between 1978 and 1982 include a low level of lending activities relative to its increased deposit base, a low capital base which constrained lending, development costs associated with its branch network, and other increases in operating expenses relative to its income - generating capacity (Ref. 4).

But the ACDB has made some impressive gains in its financial and credit performance. Improvements in the institution's financial viability are manifested by the increasing growth in total assets, loans, advances and overdrafts, total deposits, savings mobilization, and interest income. Development statistics for these performance indicators can be found in Table 11.

Total assets grew from $2.6 million in 1978 to $16.1 million in 1983; the overall rate of change was 519 percent. During the same period, loans, advances, and overdrafts grew by more than 2,000 percent, total deposits rose by 1714 percent, passbook savings increased by 2,183 percent, and interest income recorded a 1,303 percent growth rate.

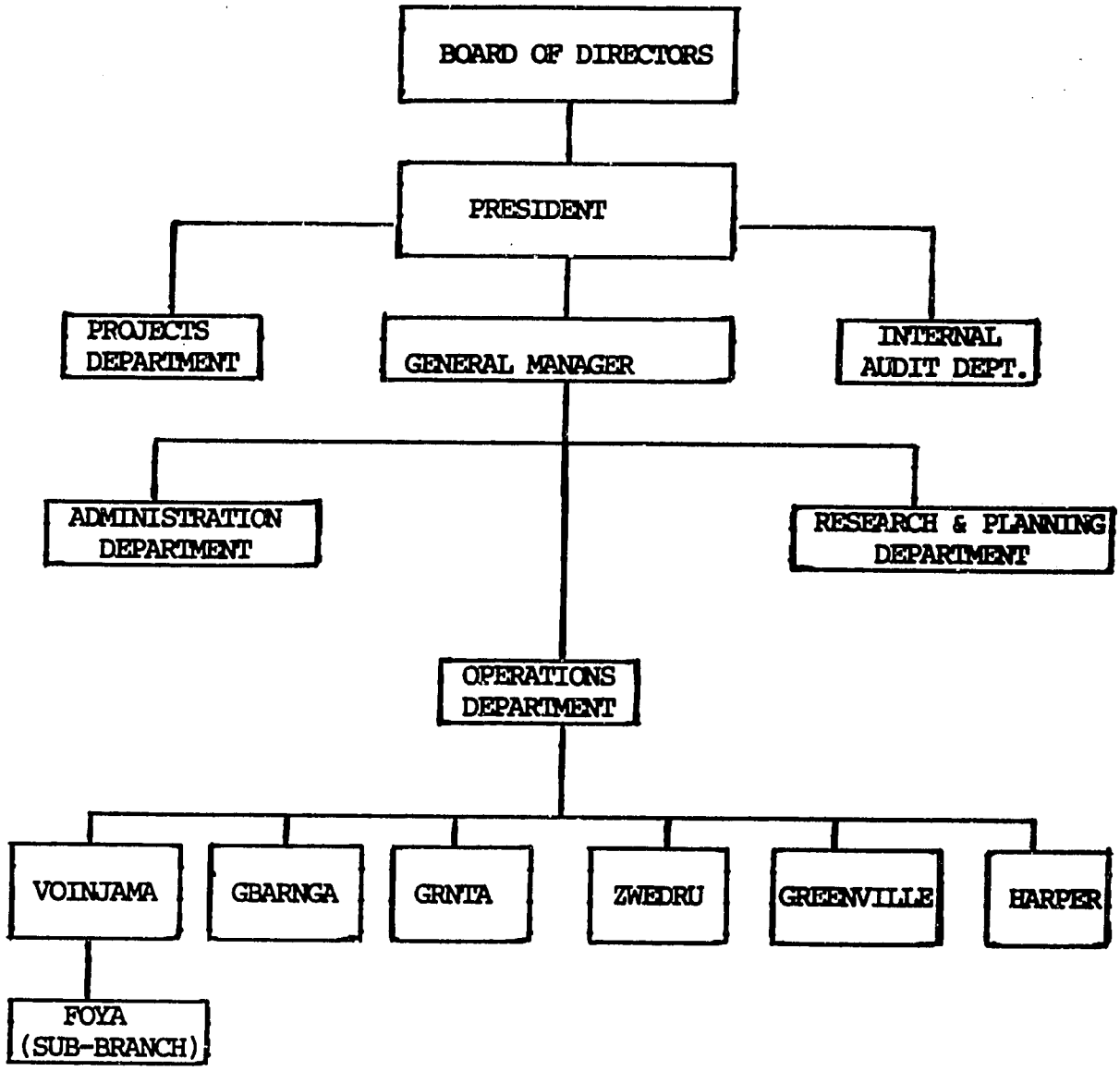
Table 10. Selected Financial Development Statisticc of the ACDB, 1978-1983

(In Thousands of L Dollars)

Year Ended December 31	1983	1982	1981	1980	1979	1978
Total Interest Income	981	453	635	506	289	70
Total Interest Expense	208	120	124	89	35	1
Net Interest Income	773	333	511	417	254	69
Provision for Possible Loan Losses	437	539	297	187	-	-
Net Interest Income after Provision for Possible Loan Losses	336	(206)	214	330	254	69
Other Operating Income	1,426	34	124	172	72	-
Government of Liberia-Subsidy	500	500	250	-	-	-
Capital Assets donated by Agriculture Ministry	-	-	-	-	-	9
Other Operating Expenses less Provision for Possible Loan Losses	1,960	1,401	1,033.	834	625	229
Net profit (Loss)	302	(1,073)	(445)	(428)	(229)	(151)
At December 31	1983	1982	1981	1980	1979	1978
Total Loans & Advances	10,937	2,167	2,148	3,382	1,742	514
Total Assets	16,051	6,187	6,323	6,094	5,982	2,600
Total Deposits	7,275	4,436	3,331	2,723	2,389	401
Shareholders' Equity	3,603	1,544	2,617	3,037	3,465	2,100

Source: ACDB Annual Report, 1983

Chart II. ACDB Organizational Structure



The major sources of funds used in ACDB's operations include demand, time, and savings deposits, stockholders' equity, and other liabilities. Deposits which grew from $4.4 million in 1982 to $7,275 million in 1983 accounted for 45.3 percent of total bank resources in 1983, with other liabilities and stockholders' equity providing 32.2 and 22.5 percent respectively. Most of the ACDB's deposits are generated in Monrovia and at its branches in Gbarnga and Voinjama. Together, these three areas contributed over 91 percent of total deposit funds in 1983, slightly down from the 92.2 percent share enjoyed by them in 1982.

The rest of ACDB deposit funds in 1983 were generated at its branches in Ganta, Zwedru and Greenville. These three branches were not sources of funds in 1982 (see Table 12). Most of the funds mobilized in Monrovia came from demand deposit sources while those provided by ACDB's branch network are predominantly savings. It is significant to note that ACDB's efforts at rural resources mobilization appear to be gaining an appreciable amount of momentum. This assertion is additionally manifested by the fact that resources from these rural bank branches provided 64.3 percent of deposit funds in 1982 and 45 percent in 1983.

Although the bank offers commercial, consumer, and agricultural credit facilities, most of its lending has been allocated to agricultural enterprises since its inception. In 1982, 334 loans amounting to $2.6 million were outstanding (see Table 13). Produce marketing and working capital accounted for 45.7 and 23.5 percent respectively. By 1983, loans for tree crops development had risen from 9.8 percent of total loan portfolio in 1982 to 42.7 percent. It was followed by produce marketing at 23.8 percent and working capital at 12.6 percent. A revolving credit fund arrangement with BCADP was responsible for the growth in tree crops' share of ACDB's total loans outstanding. Other agricultural uses of ACDB's credit facilities include livestock, equipment, and vegetables and food crops. Their combined share of loans outstanding was 6.4 percent in 1982 and 5.2 percent in 1983. The percentage of total loan portfolio outstanding which accrued to agricultural purposes was therefore 61.9 in 1982 and 71.7 in 1983.

Cooperatives held 49 percent of the above mentioned commitments in 1982 and 29 percent in 1983 (Table 14). Individuals and others accounted for 28 percent of total outstanding debt in 1982 and 12 percent in 1983 while public corporations borrowed 23 and 59 percent respectively in these two years. Regional shares of ACDB's loan portfolio are primarily determined by differences in rates of growth and levels of economic activities. In 1982, Montserrado, Nimba, Lofa and Bong counties held 45 percent, 24 percent, 10 percent, and 8 percent respectively of total credits (Table 15). With the transfer of BCADP's credit responsibilities to the ACDB in June 1983, Bong

Table 11. ACDB Brow th Statistics, 1978-1983 (Millions of dollars)

Year	Total Assets	Loans, Advances & Overdrafts	Total Deposits	Passbook Savings	Interest Income	Interest Expense	Commissions & Fees
1978	2,600	0.514	0.401	0.093	0.070	0.001	-
1979	5.982	1.742	2.389	0.839	0.289	0.035	0.072
1980	6.094	3.382	2.723	1.206	0.506	0.089	0.172
1981	6.323	2.148	3.331	1.466	0.635	0.124	0.124
1982	6.187	2.167	4.436	1.741	0.453	0.119	0.134
1983	16.051	10.937	7.275	2.124	0.982	0.208	1.425

Source: Graphs presented in ACDB Annual Report, 1983.

County led all others with 42 percent of the $4.7 million borrowed in 1983. Montserrado, Nimba and Lofa held 19.3, 15.0, and 13.6 percent respectively.

A significant portion of ACDB's credit in 1983 was in the form of advances; these rose from 4 percent of total loans and advances outstanding in 1982 to 52 percent in 1983 (Table 16). Short, medium and long-term lending accounted for 40 percent, 23 percent, and 9 percent respectively in 1982, and 9 percent, 7 percent and 20 percent respectively in 1983. The magnitude

Table 12. Source of ACDB Funds, 1982-1983

Office	December 31, 1983 Saving	Demand	Time	December 31, 1982 Savings	Demand	Time
Monrovia	177,630	3,139,727	700,000	82,548	1,499,572	..
Voinjama	918,278	277,205		815,930	412,497	..
Gbarnga	597,121	826,318		602,311	674,950	..
Ganta	309,859	145,837	..	239,786	108,793	..
Zwedru	108,643	61,955	..	..	..	..
Greenville	12,361	..	..	..	..	..
Total	2,123,892	4,451,042	700,000	1,740,575	2,695,812	..
Total Deposits	7,274,934			4,436,387		

(In L Dollars)

Office	1983 Amount	% of Total	1982 Amount	% of Total	Percent Change 1982-1983
Monrovia	4,017,357	55.2	1,582,120	35.7	153.9
Voinjama	1,195,483	16.4	1,228,427	27.7	2.7
Gbarnga	1,423,439	19.6	1,227,261	28.8	11.4
Ganta	455,696	6.3	348,579	7.8	30.7
Zwedru	170,598	2.3	..	..	..
Greenville	12,361	0.2	..	..	..
Grant Total	7,274,934	100.0	4,436,387	100.0	64.0

Source: ACDB Annual Report, 1983.

of short-term credit extended by ACDB is indicative of the Bank's increasing accessibility to small farmers. Their effective demand for credit results from seasonal requirements.

In addition to its association with BCADP, the ACDB maintains credit relations with a number of other agricultural institutions. It administers LCADP's Phase II credit component for which $5.5 million was provided for a revolving credit fund. Similar arrangements exist with the Liberia Rubber Development Unit (LRDU) for ACDB to finance replanting and rehabilitation activities to small holders. As of June 1983, 1201 of these farmers had received credits totalling $1.8 million in cash and in kind. The Bank also assists LPMC with its short term working capital needs and has reached an agreement with LPPC (now NPC) to extend credit to small farmers. The size of each individual farmer loan is restricted to a maximum of $2,612; $1,507 of this amount is to be disbursed in kind.

Bong County Agricultural Development Project (BCADP)

The Bong County Agricultural Development Project (BCADP) commenced its Phase I operations in January 1978 with funding from GOL ($6.7 million), USAID ($6.6 million) and the World Bank ($7.0 million). It is an integrated rural development project which provides farm-support services, develops rural infrastructure, and extends inexpensive but appropriate crop technologies in its project area. This area covers 2,317 square miles containing 21,500 farming units; 8,800 of these units were targetted during the profect's initial phase. Phase II of BCADP's activities have been underway since July, 1984.

BCADP provides a credit package which includes development and seasonal loans. Development loans are awarded to farmers for coffee, cocoa, and swamps while seasonal loans are used to purchase farm inputs such as improved seeds and seedlings, fertilizers, pesticides, and rudimentary agricultural implements. Table 17 lists the yearly disbursal of development and seasonal loans since the first year of BCADP 's activities while Table 18 exhibits amounts disbursed and repaid since the 1977-1978 year of activities.

According to Table 17, about $2.0 million in cash and in kind has been given to project farmers since the 1977-1978 year of inception up to 1983-1984. Of this amount, $1.73 million or more than 90 percent was for development purposes and the rest allocated to seasonal needs.

The recovery of development credit is still insignificant due to the longevity nature of the activities for which credit was awarded. Seasonal loan repayment averaged about 80 percent during the period under review (see Table 18). Note the discrepancies between the figures given in Table 17 and those

Table 13. ACDB Outstanding Loan Portfolio By Purpose, 1982-1983 ($)

	1983			1982		
	No. of Loans	Amount	% of Total	No. of Loans	Amount	% of Total
Tree Crops	8,451	$2,024,642	42.7	161	$ 254,554	9.8
Marketing (Produce)	30	1,128,058	23.8	25	1,188,773	45.7
Working Capital/Pub. Corp.	5	597,016	12.6	3	611,500	23.5
Commercial	27	389,446	8.2	13	196,105	7.5
Personal/Other	123	274,806	5.8	44	99,732	3.9
Livestock	9	114,880	2.5	5	36,484	1.4
Agricultural Equipment	23	111,277	2.4	18	64,847	2.5
Housing/Construction	104	80,280	1.7	56	81,793	3.2
Vegetables/Food Crops	12	12,806	0.3	9	64,690	2.5
Total	8,784	$4,733,211	100	334	$2,598,476	100

Source: BCADP Annual Report, 1983.

Table 14. ACDB Outstanding Loan Portfolio By Borrower Type, 1982-1983

	1983			1982		
Borrowers	No. of Loans	Amount	% of Total	No. of Loans	Amount	% of Total
Cooperatives	26	$1,356,923	29	23	$1,262,542	49
Individuals/others	8753	2,779,272	12	308	724,434	28
Public Corporations	5	597,016	59	3	611,500	23
Total	8784	$4,733,211	100	334	$2,598,476	100

Source: BCADP Annual Report, 1983.

in Table 18 for the years 1982-1983 for seasonal lending. Figures for 1983-1984 reported in Table 17 were not available for Table 18. The source of these errors is not attributable to statistical compilation. Explanations are therefore being sought. However, they are quite sufficient to indicate the quantum of BCADP lending to farmers in a relative sense.

Table 15. Regional Distribution of ACDB Outstanding Loan Portfolio, 1982-1983

	1983		1982	
County/Territory	Amount	% of Total	Amount	% of Total
Bong County	$1,967,105	41.6	$204,205	7.9
Montserrado County	913,161	19.3	1,162,198	44.7
Nimba County	703,433	15.0	617,373	23.8
Lofa County	645,282	13.6	262,635	10.1
Grand Cape Mount Co.	250,000	5.3	22,583	0.8
Grand Gedeh Co.	75,213	1.6	38,605	1.5
Gibi Territory	69,744	1.4	58,443	2.2
Sinoe County	45,000	1.0	115,016	4.4
Rivercess Territory	20,440	0.4	25,000	0.9
Maryland County	20,021	0.4	29,677	1.4
Grand Bassa County	15,248	0.3	7,038	0.3
Bomi Territory	8,564	0.1	12,904	0.4
Kru Coast Territory	..	..	42,800	..
Marshall Territory	..	..	..	..
Sasstown Territory	..	..	..	..
Total	$4,733,211	100	$2,598,476	100

Source: ACDB Annual Report, 1983.

Table 16. ACDB Loan Portfolio and Advances by Loan Type 1982-1983

	1983		1982	
	Amount	% of Total	Amount	% of Total
Advances	$5,876,435	52	$108,077	4
Short Term Loans	2,072,070	19	1,086,486	40
Medium Term Loans	756,040	7	607,487	23
Long Term Loans	2,258,961	20	244,757	9
Post Due Loans	259,435	2	659,746	24
Total	$11,222,941	100	$2,702,743	100

Source: ACDB Annual Report, 1983.

As a result of BCADP's Phase II arrangements, ACDB is now the administrator of a revolving fund and has taken over some of BCADP's credit roles. 8,000 individual loan accounts were transferred to ACDB as of April, 1984 in partial fulfillment of these accords.

Table 17. Disbursal of Loans, 1977-1984, BCADP

Year	Dev. Loans	Seasonal Loans	Total
1977-78	$11,400	$11,200	$22,600
1978-79	111,900	24,700	136,600
1979-80	314,600	44,900	359,500
1980-81	280,300	47,200	327,500
1981-82	486,500	46,900	533,400
1982-83	288,614	4,690	293,304
1983-84	235,208	5,179	240,387
Total	$1,728,522	$184,769	$1,913,291

Source: P.M. Joshi, "First Cooperative Study on Cooperative Credit and Marketing in Bong County," Suakoko, Bong County, 1984.

Table 18. Repayment and Disbursement of Development and Seasonal Loans, BCADP, 1977-1983 ($)

	DEVELOPMENT LOAN			SEASONAL LOAN		
Year	Disbursed	Repaid	%	Disbursed	Repaid	%
1977-78	11,400	-		11,200	9,000	80%
1978-79	111,900	-		24,700	12,500	50%
1979-80	314,600	-		44,900	27,500	61%
1980-81	280,300	6,700	1%	50,200	77,400	15%
1981-82	486,500	-		46,900	34,050	73%
1982-83	311,500	-		22,800	-	-
Total -	1,516,200	6,700	1%	200,700	160,450	80%

Source: P.M. Joshi, "First Cooperative Study on Cooperative Credit and Marketing Structure in Bong County", Suakoko, Bong County, 1984.

Seasonal loans recovered by BCADP were turned over to ACDB to form the initial revolving credit fund account of $144,514 while development credits totalling about $2.0 million were also transferred to ACDB. With these new arrangements, BCADP will now be limited to the tasks of identifying farmers eligible for credit, examining the technical feasibility of loan applications, arranging for technical and extension service advice, and supplying seasonal farm inputs such as chemicals, implements, and seeds (Ref. 5).

Lofa County Agricultural Development Project (LCADP)

Phase I of the Lofa County Agricultural Development Project (LCADP) was the first major agricultural project in Liberia. Operations started in 1976 and were terminated in 1982. Funding sources were the International Development Association (IDA), USAID, and the Government of Liberia. Phase I objectives included increased production of rice, cocoa, and coffee by small farmers residing in two districts of Upper Lofa, along with the provision of input supply, credit, and cooperation development services, and rural infrastructure building. Phase II of this project began in 1982 and is expected to consolidate gains achieved during the previous phase as well as to increase its coverage of Lofa farmers.

The credit package which existed during Phase I operations and is continuing in Phase II of the project consists of development and seasonal loans in cash and kind. Medium term lending is made available for rehabilitation of existing farms and the development of new swamp rice, cocoa, and coffee farms. In-kind loans are given for farm implements such as tools and equipment, coffee and cocoa seedlings, fertilizers, and other chemicals. Cash loans are made available for hired labor used in swamp land development and the establishment of new cocoa and coffee farms. On the other hand, seasonal credit-in-kind is provided for upland and swamp rice producers for seeds and fertilizers. For cocoa and coffee, the objective of seasonal credit is to lend farmers inputs of fertilizer, agricultural chemicals, and sprayers after their development phases.

During LCADP's Phase I and up to the second year of Phase II operations, a total of 15,811 farmers were issued inputs (Table 19). This includes 4,327 farmers in Voinjama, 4,439 in Kolahun, 5,899 in Foya, 1,895 in Zorzor, and 251 in Vahun. As of September 30, 1984, $2,176,755.50 was disbursed as development loans while $257,313.91 was made available to farmers to meet their seasonal input requirements (Table 20).

The recovery rate for development oriented lending since the inception of the project is less than one percent while that of the seasonal component averaged about 62 percent over the same period. Development credit has ceased since year three of the

Table 19. Number of LCADP Farmers Issued Inputs, 1977-1984

Region	UPLAND Farmers	SWAMP Farmers	NEW COF Farmers	NEW COC Farmers	REHAB COF Farmers	OCT 1,'84 TO SEPT. 30, '84 Farmers	COMMULA-TIVE Farmers
Voinjama	-	24	373	168	-	565	4,327
Kolahum	-	102	270	275	-	647	4,439
Foya	-	352	274	213	-	839	5,899
Zorzor	-	3	285	38	-	326	1,895
Vahun	-	51	54	59	-	164	251
Total	-	532	1,256	753	-	2,541	15,811

Source: LCADP Annual Report, 1983-1984.

Table 20. Status of Seasonal and Development Loan Disbursement and Recovery of LCADP (L Dollars)

Development Loan	Year I 1976	Year II 1977	Year III 1978	Year IV 1979	Year V 1980	Year VI 1981	Year VII 1982	Year VIII 1983	Total
Disbursed	55,895.80	293,999.51	394,270.70	292,266,60	328,588.99	214,848,40	275,683,50	321,202.40	
Has been Recovered	5,290.00	4,715.83	1,463.90	-	-	-	-	-	11,469.73
% of Recovered	9.46	1.60	37	-	-	-	-	-	.52%
Seasonal Loan Disbursed	9,189.70	38,680.35	53,178.83	43,178.83	56,426.68	19,341.65	20,230.70	16,933,65	257,313.91
Recovered	9,189.70	35,520.20	43,086.09	25,413.95	30,293.20	8,782.75	5,558.97	-	157,844.94
% of Recovery	100.00	91.83	81.02	58.02	53.68	45.42	27.47	-	61.34

Source: LCADP Annual Report, 1983-1984.

first Phase but seasonal loans are still being allocated to project farmers.

Table 21 shows the regional distribution and repayment status of seasonal loans apart from those allocated for coffee and cocoa; comparable information for these two enterprises is given in Table 22.

Out of a total of $206,909.14 allocated to seasonal requirements other than those incurred by coffee and cocoa farmers, $135,139.76 was repaid and $73,769.38 is still outstanding as of September 30, 1984. Although regional differences in loan repayments exists, the overall average rate of about 64 percent is modestly impressive. For cocoa and coffee, $35,274.94 was made available in seasonal credit between 1980 and 1983. $15,708.74 or 44.5 percent of total amount extended has been recovered. Again, while Zorzor, Kolahun and Foya farmers' repayment rates average roughly 55 percent, the percent of cocoa and coffee seasonal loans recovered from Voinjama farmers leaves much to be desired at 32 percent.

LCADP maintains a revolving credit fund which is administered by the ACDB in agreement with the GOL. As of September 30, 1984, a total of $135,903.89 including $118,134.07 in deposits and $17,769.82 in interest were deposited with the ACDB.

Liberia Credit Union National Association (LCUNA)

The Liberia Credit Union National Association (LCUNA) is an umbrella organization for credit unions registered under the Cooperative Society Act of 1936. Its objective is to promote the economic and social interests of its members. At the end of 1983, LCUNA was comprised of 48 societies with a total membership of 12,015, savings of 4.0 million, and loans amounting to $2.93 million (see Table 23).

LCUNA is included as a source of rural resource mobilization for two reasons. First, some of its members are rural farmers who view its facilities as the only avenues for deposits and credit. Much of this credit is used to purchase consumable goods. Secondly, most of the societies which comprise LCUNA in rural counties like Nimba, Bong, and Lofa were Susu's and money clubs which evolved into full-fledge credit unions as the advantages of such conversion became clear.

A major source of funds for LCUNA's activities is externally generated grants. In 1983, the Konrad Adnauer Foundation of West Germany and the Cooperative Development Foundation of Canada contributed $73,600 to LCUNA's total external funding of $102,200. The rest came from the Rabbobanken of Holland ($9,800) and the Bread for the World Organization of West Germany ($18,000).

Table 21. Summary of Seasonal Loan Repayment as of Sept. 3, 1984 by Region, LCADP

Region	Total Amount Extended	Total Amount Paid	Total Balance Due	Percentage of Repayment
Voinjama	39,752.79	21,232.58	18,520.21	53.41%
Kolahum	52,545.11	22,896.21	29,648.90	43.57%
Foya	107,198.41	72,944.89	34,253.52	68.04%
Zorzor	4,726.24	3,501.10	1,225.14	74.07%
Vahun	2,686.24	1,564.98	1,121.26	58.25%
Total	206,909.14	133,139.76	73,769.38	64.34%

Source: LCADP Annual Report, 1983-1984.

Table 22. Coffee and Cocoa Seasonal Loan Repayment Form 1980 to 1983 for LCADP

Region	Total Amount Extended	Total Amount Paid	Total Balance Due	Percentage of Repayment
Voinjama	16,728.10	5,370.37	11,357.73	32.10%
Kolahum	7,276.95	4,127.18	3,149.77	56.71%
Foya	6,335.05	3,627.28	2,707.77	57.25%
Zorzor	4,934.84	2,583.91	2,350.93	52.36%
Total	35,274.94	15,708.74	19,566.20	44.53%

Source: LCADP Annual Report, 1983-1984

Table 23. Development Data of LCUNA, 1980 - 1983

Indicators	1980	1981	1982	1983
No. of Societies	17	41	45	48
No. of members	7,290	10,600	12,000	12,000
Amount of savings($)	762,450	2,000,000	3,600,000	4,000,000
Amount of loans(4)	744,620	1,600,000	3,000,000	2,930,000
Total reserves($)	21,320	48,000	186,000	144,790
Total Assets ($)	993,960	2,600,000	4,000,000	3,699,890

Source: LCUNA Annual Report, 1984.

Although this apex organization is managed by a Board of Directors or Management Committee which meets as often as six times a year, lack of adequate financial management expertise on the national level has resulted in misappropriations and embezzlement of funds. For example, LCUNA is presently obligated to its primary societies to the tune of $131,000 for shares and savings. Table 24 presents the regional distribution of LCUNA's member unions and their numbers, membership, shares, loans, reserves, and total assets.

The financial viability of LCUNA is threatened as long as selected officials and other concerned parties continue to demonstrate a lack of accountability and financial responsibility. Without such improvement, farmer confidence in this institution will most likely dissipate to the point where rural dwellers will feel more secured with informal arrangements such as the Susu and money clubs rather than rudimentary institutions like LCUNA. LCUNA's internal accounts must be properly maintained and its supervisory role over societies strengthened if it is to increase its involvement in agricultural and rural development.

Small Enterprises Financing Organization (SEFO)

The Small Enterprises Financing Organization (SEFO) was established and implemented in 1982 for the purpose of providing financial assistance and services to small scale enterprises. It is headquartered in Monrovia and has its only branch in Nimba County.

The sectoral distribution of projects received and reviewed by SEFO in 1983 were agro-business (12%), services (14%), manufacturing (22%) and trading and provision stores (52%). A schedule of the projects which were sanctioned in 1983 can be found in Table 25.

The agro-business lending component of SEFO's loan portfolio was concentrated in enterprises like livestock and food processing.

The role of SEFO in agricultural and other sectoral credit will remain limited in the immediate future due to its limited capital base. In 1983, funding sources comprised loans and paid-in-capital as shown in Table 26.

As a result of its limited funding, SEFO has been experiencing a liquidated constraint engendered by less than expected projected loans and share capital funds.

Assuming that funding problems can be resolved, it is not difficult to state that SEFO has the potential to develop the technical and managerial capabilities necessary for significant agro-business lending. It is still too early to estimate the magnitude of this projected impact.

Table 24. Summary Statistics of Active Credit Unions December 31, 1983

County	No. of Unions	Member-Ships	Shares	Loans	Reserves	Total Assets
Maryland	10	3,836	559,778	266,198	11,988	648,764
Montserrado	24	5,333	2,370,720	1,860,310	81,473	2,557,540
Nimba	7	1,950	1,029,140	773,400	50,730	1,089,120
Lofa	5	616	33,350	22,600	600	38,250
Bong	2	280	9,000	7,500	-	9,000
Total	48	12,015	4,001,988	2,930,008	144,791	4,342,674

Source: LCUNA Annual Report, 1984.

Table 25. Schedule of projects Sanctioned by SEFO in 1983

Projects	Short Term		Long Term		Total	
Furniture/Woodwork	2	9,975	5	93,760	7	103,735
Charocoal	3	14,975	1	11,670	4	26,645
Distillery	-	-	4	97,510	4	97,510
Services - Garages	-	-	2	36,960	2	36,960
Food Processing	-	-	3	44,130	3	44,130
Construction/Manufactures	7	42,750	1	15,100	8	57,850
Livestock	2	8,000	-	-	2	8,000
Garment	-	-	1	11,490	1	11,490
Metal Works	-	-	1	3,270	1	3,270
Trading/Provision Stores	39	186,811	-	-	39	186,811
Medicine/Drug Stores	3	15,000	-	-	3	15,000

Source: SEFO Annual Report, 1983.

Table 26. Types, Sources, and Amounts of Funding for SEFO, 1983

Type	Sources	Amount($)
Loan	LBDI	-
	FMO (Ordinary Loan)	$241,875.00
	FMO (Conditional Loan)	-
	IDA Credit	43,717.59
Paid-in-Capital	LBDI	93,000.00
	LFTC	-
	PfP/Liberia	3,585.00
	ACDB/NHSB	24,000.00
	Total	406,177.59

Cooperative Development Agency (CDA)

The present Cooperative Development Agency (CDA) has its roots in the Cooperative Division of the Ministry of Agriculture. The division was established in 1970 to implement the "Cooperative Societies Act" of 1936. This Act provided for a registrar as the head of the cooperative movement. Instead, the registrar was relegated to a lower position, that of a director.

In 1976, the Act was revised with powers of registrar vested in the Minister of Agriculture. But in 1981, a return to the spirit of the 1936 Act was achieved with the formation of the CDA as an autonomous body to be headed by a registrar.

The cooperative movement of Liberia is in its early stages of development. The organization of Credit unions which began in 1966 provided the major impetus for this development. Today, most cooperative societies in the country are multi-purpose institutions owned and operated by members for their mutual benefits. They are engaged in produce marketing (serving as buying agents for LPMC), agricultural production, arts and crafts, and they operate consumer goods stores among other activities. Among the 135 registered cooperative societies presently operating under the auspices of the CDA, about 94 of them are inactive. Most of these inactive societies are in Bong and Nimba Counties.

The CDA has been included in this exercise on agricultural credit institutions because it fosters the development of cooperative societies and credit unions. These associations play an essential role in credit delivery and their members are major borrowers of agricultural credit funds as well as prime sources of rural savings. The CDA is also important because it operates a referral service for cooperatives desiring loans from the ACDB. The CDA also administers a small farmers loan referral service.

The major requirements of the CDA for ACDB cooperative loans include the following: the cooperative must be active and must be registered with the CDA, it must have an Agency Agreement with and a turnover statement from the LPMC (for buying agents), and it should be able to furnish its semi-annual balance sheet and profit and loss statement.

Many of the cooperative societies which have taken loans from the ACDB are still indebted to it. This indebtedness is due to the poor financial and administrative performance of societies. Aside from these internal deficiencies, other factors beyond the control of individual cooperatives continue to retard their development. A few of these performance determinants include the lack of access roads for farming

areas, agricultural policy disincentives for increased productivity and efficiency, and limited cooperative education.

Unless the environment which currently deters the maturity of these farmers associations is improved, the roles of the CDA and cooperatives in agricultural credit delivery will remain limited.

Informal Savings and Credit Arrangements (Ref. 6)

A significant amount of Liberia's rural credit needs and savings facilities are provided through informal channels involving friends and relatives, middlemen, money lenders, merchants, and other non-institutional set-ups such as money clubs, the Su-Su, and the work kuu. Estimates of the volume of total credit allocated to rural economic activities by these sources is not available. Yet, evidence which has emerged from other parts of Africa and Asia where similar informal arrangements exist indicate that friends and relatives of borrowers provide 50 percent of total credit needs while middlemen, money lenders, merchants, etc., provide 27 percent of agricultural credit (Ref. 7).

It is in view of the potential magnitude of the impact on rural credit and resource mobilization exerted by these informal financial intermediaries that we choose to present a brief description of the organization and operations of the SuSu, work kuu, and money clubs. These credit outlets are prevalent in Liberia's rural areas and are likely to continue operating until formal financial facilities are introduced. But even then, their involvement in credit may only be reduced.

The SuSu

The SuSu is a collective organization in which members contribute resources into a pool which is given to one member at a time until all subscribers have been paid. It has a leader and a business manager (also known as treasurer) who maintains the SuSu's accounts until all funds collected have been disbursed. At the outset of the SuSu, a consensus is reached by members concerning matters such as the amount to be paid by each subscriber, the duration of the SuSu, the timing and order of disbursements, and other operational procedures.

The longevity of the SuSu and the timing of disbursements are directly related to the number of subscribers. For example, an annual SuSu with 12 members may require each contributor to pay $50 per month. The total collected amount of $600 is then paid to a member previously designated by the group during its organizational meeting. Each subscriber will in turn receive $600 until every participant has been paid at the end of the 12 months. The attractiveness of this traditional resource pooling mechanism is restricted to those members whose

activities are postponable but not those who engage in seasonal undertakings.

The Work Kuu

The Kuu is similar to the SuSu in that they are all collective organizations. But the Kuu is a reciprocal labor arrangement among members while the SuSu pools financial resources. Kuu's are usually organized during the rice farming season when a high demand for labor results in rural labor market tightness. Each member agrees to provide the same amount of labor which he receives from the other members. Reciprocity is therefore the key feature of the kuu.

A Kuu may be hired and women are not excluded since most of the farming activities undertaken by the group include brushing, undergrowth, felling trees, clearing, tilling, planting, and harvesting. Activities such as planting, weeding, and harvesting are traditionally the domain of women in Liberian agriculture.

Money Clubs

These have been described as modernized versions of the SuSu and predecessors of credit unions. Like the SuSu, all procedural matters such as the total amount to be contributed and given to each participant per unit of time, total membership, and timing of contributions and disbursements are decided by all concerned parties at the organizing meeting. But unlike the SuSu which only lends to its members, a money club may credit a non-member for a specific length of time.

A money club has legal and organizational documents such as by-laws and constitutions. Its leaders are elected and funds may be deposited in interest-bearing accounts in areas where deposit and withdrawal windows are available. New members are accepted at the time of liquidation, which is after each member has been paid. Membership delinquency is dealt with through the forfeiture of the member's earlier contributions.

Other types of credit and savings arrangements in addition to the Susu, Kuu and Money Club do exist. Apart from the facilities offered by merchants, middlemen, etc., rural dwellers may save their funds by keeping them somewhere at home or with some one in the community, or they may receive credit through the Legal Power of Attorney (LPA) mechanism. The LPA system allows GOL employees in rural areas to receive cash or credit-in-kind from financial institutions, business firms, merchants, etc. Prevalence of this system is limited in rural settings due to the low level of public (GOL) employment.

Chapter III

Agricultural Credit Issues

The economic environment in which credit programs are implemented as well as the operational status of delivery institutions affect the quantum and efficacy of agricultural lending. A national program for increased allocation of financial assistance to the agricultural sector must define the role of credit in agricultural and rural development, contain a discussion of policy issues, and it must inquire into the nature of the institutional arrangements necessary for efficient credit delivery.

In the discussion which follows, an attempt is made to delineate the role of credit in agricultural development, define program objectives and clientele, and pinpoint those conditions which serve as pre-requisites for the productive utilization of farm credit. Policy issues to be discussed will include credit distribution, level of interest rates and merits of interest rate subsidies, factors affecting repayment performance inclusive of defaults and delinquencies, and eligibility criteria and security requirements for the successful delivery of agricultural credit. Finally, an analysis of the institutional and non-institutional aspects of credit disbursement will be undertaken. This entails a discussion of the advantages and disadvantages of alternative delivery systems such as the weaknesses of special credit programs and the role and limitations of informal sources of agricultural lending, and graduation. These deliberations will be conducted within the frame work of prevailing Liberian conditions.

Specific references to ACDB's operational and lending policies will be made.

Role of Credit

It is of crucial importance to acknowledge from the outset that credit is not a productive input such as labor or agricultural capital. Credit is borrowed money. Agricultural credit must be viewed as loanable funds which are used to gain access to productive inputs. It is these purchased resources which determine increases in farm output and productivity when combined in cost-minimizing proportions. This distinction is warranted if faulty assumptions and less than desirable operational results are to be avoided in the performance of credit programs and institutions.

Credit allocation is an exercise in financial intermediation; the intermediaries may be institutionalized or informal avenues for resource mobilization or credit disbursement.

Institutionalized financial intermediation has several advantages for rural development, some of which are (Ref. 8):

1) Increases in the exchange of services and commodities which is otherwise hampered by farm family heterogeneity;

2) Increased efficiency in rural resource allocation;

3) Gains in risk management with specific reference to the amelioration of variations in farm family incomes and expenditures;

4) Improvements in the capabilities of farm families to acquire crucial consumer durables or to make other important agricultural investments; and

5) Reductions in the economic burdens imposed on rural dwellers due to farm family life cycles.

Assuming that the social and economic benefits of these advantages outweigh their respective costs, the next step in credit program formulation is the definition of goals and objectives and the derivation of assumptions underlying the need for such assistance.

There are two categories of objectives, efficiency and equity (Ref. 9). Efficiency considerations entail a cost-minimizing approach to credit program implementation and the allocation of the program's resources among alternative enterprises and the farm clientele. This objective is usually pursued in settings with a market orientation and established financial institutions. Equity is a social objective pursued as an avenue for the realization of economic justice. It is a welfare consideration which involves the just disbursement of credit benefits among members of the targetted populace.

These two sets of objectives are not necessarily mutually exclusive. In the context of a mixed enterprise economy such as Liberia where public sector involvement in economic activities is enormous, a national program for agricultural credit must include both efficiency and welfare considerations in relative proportions.

Liberian agriculture is currently characterized by five major institutions. These are the traditional small holder farms, Liberian owned commercial farms, parastatal corporations, large foreign-owned plantations, and agricultural concessions. Traditional smallholders comprise approximately 90 percent of all agricultural households in this country. These farms use a bush fallow approach in predominantly upland soils to grow mainly rice interplanted with cassava and sometimes maize and groundnuts. In recent years, there have been increased plantings of cocoa, coffee, oil palm, coconuts, sugarcane,

etc. The average farm size is small and output per acre so low that most enterprises undertaken are for subsistence. Some of these farms are currently under the supervision of area-specific agricultural development projects.

The primary thrust of a national agricultural credit policy should be the facilitation of traditional small holder access to productive inputs via credit channels. These are the farmers who lack accessibility to institutional credit. The credit needs for this farm clientele are mostly seasonal or short term in nature and their effective demand for credit is a derived demand for productive farm inputs. The demand for inputs, and therefore farm credit, hinges on enterprise profitability and other crucial factors.

The necessary, though not sufficient conditions warranted for the productive utilization of credit facilities include the following (Ref. 10):

1) The existence of opportunities for economic gains through the application of new production technologies or other farm improvements. In specific terms, this means that the technology must be appropriately applicable and its innovations modestly risky so as not to stifle the demand for credit by the typically risk-adverse small farmer. Such a technology ought to embody divisible components so as to deter the disadvantages associated with credit fungibility, divisibility, and substitutability. The current state of agricultural technology in Liberia leaves much to be desired. Farm implements are rudimentary and gains in currently available new technologies have yet to be realized.

2) Widespread recognition and acceptance of such technologically induced economic opportunities by the farmer, and training in skills required for the effective utilization of said technology. Communication between the Liberian farmer and other economic agents is hampered by the lack of an appropriate and functional information network. Agricultural training institutions have yet to display their responsiveness to farmer training needs. Agricultural extension, with the possible exception of those systems situated in area-specific agricultural development projects, is in a state of disarray and is inefficient. These constraints deter the adoption and acceptance of new technology.

3) A delivery system capable of supplying production inputs in a timely fashion and economically efficient outlets for farm output surplus. This set of conditions entails the availability of basic infrastructure such as farm to market roads, a reliable supply of inputs, an adequate

marketing system for agricultural produce, and pricing policies conducive to the adoption of new technology, increased productivity, and enterprise profitability. It is clear that these conditions will not be met in the near future in Liberia despite serious attempts by the GOL and MOA to improve the environment for increased and profitable farm production. Rural infrastructure is still inadequate and remains a contributing factor for above-normal marketing costs. Inputs are often in short supply and are usually distant from producing centers. Agricultural pricing policies subsidize urban consumption of farm output and most enterprise returns do not cover costs of production. In essence, publicly-mandated prices are low and they discourage increased farm productivity and profitability. Liberia's marketing system continues to display its inability to purchase farm surplus at reasonable prices and in a timely fashion.

Additional factors which ought to be considered along with those mentioned above include the presence of purchaseable consumer goods in rural areas, the impact of cultural and social attitudes on innovation and risk-taking, and land tenure arrangements. The objective and rationale for enumerating these necessary conditions is to urge the adoption of a comprehensive approach to agricultural credit. The success of any credit program will depend on the extent to which such requirements are satisfied.

Policy Issues

The issues to be discussed in this section include the distribution of credit, eligibility criteria and security arrangements, interest rates, and repayment performance.

1. The Distribution of Credit

The current pattern of agricultural credit distribution is difficult to determine for several reasons. First, no distinction is made by ACDB with respect to the percent of total loans outstanding accruing to various classes of the farm clientele. No distinction is made between loans obtained by small farmers and those of large farmers. Secondly, ACDB's accounts do not distinguish between its agricultural and commercial credit operations. No separate profit and loss statements are issued.

However, ACDB does distinguish between individual, cooperative and public corporation borrowings. The bank also differentiates its outstanding loan portfolio by terms and by enterprises.

Given this available information, certain implicit development are evident. First, loans for agricultural purposes constitute a significant portion of ACDB's outstanding loan portfolio. These activities accounted for more than 70 percent of total ACDB lending between 1982 and 1983. Secondly, the small farmer is possibly being reached by ACDB's lending activities. The number of branches is increasing at an impressive rate with the increased mobilization of rural savings. The short-term component of ACDB total credit is also substantial. This information is crucial only if one assumes that the seasonal needs of small farmers require short-term credit. Finally, cooperative credit appears adequate. These farmer associations include small farmers. But most cooperative credit is used for produce marketing, not to purchase physical farm inputs.

These conclusions are being reached in the absence of the necessary required information. They are tenuous and open to debate.

A major difficulty inherent in analyzing credit to small farmers is the definition of who constitutes the small farmer. Although the smallholder is usually related to the size of his holdings in the Liberian context, it is necessary for policy makers to include other indicators such as net income and net assets for accuracy of small farmer identification. It is also necessary for ACDB to be reminded that the increasing concentration of its loan portfolio in the financing of working capital for public corporations could adversely affect the quantum of loans allocated to individual farmers and cooperatives. This could lead to credit rationing unfavourable to its immediate rural clientele.

2. Level of Interest Rates and Fees

The level of interest rates charged by the ACDB is determined by NBL lending ceilings and ACDB loan servicing costs. These rates are as follows:

a) Short-term loans - For advances, interest bearing loans, and production loans borrowed by agricultural concerns, the annual rates are 16 percent, 15 percent, and 12 percent respectively; those for uses other than agriculture are charged 20 percent, and 18 percent respectively.

b) Medium-term loans are awarded for production purposes only. The interest rates per annum are 12 percent for agricultural uses and 18 percent for all others.

c) Long-term loan rates are 15 percent per annum for farm credit and 19 percent for any other type of credit.

In addition to these rates, ACDB charges a legal fee of 1.5 percent per annum for the probation of documents, 1.5 percent for project investigation, a $2.00 loan application fee, and a 1.5 percent commitment fee charged on the undisbursed portion of approved loans.

Whether these rates are adequate depends on whether they cover the following costs: the opportunity cost of capital, ACDB's cost for loan administration, a risk premium for delinquency and defaults, and an inflation premium.

The highest nominal interest rate charged per annum by the ACDB is 20 percent on commercial advances. Assuming a modest inflation rate of 30 percent per annum for the Liberian economy translates into a negative real interest charge of 10 percent for such a transaction. It is not inconceivable to believe that interest subsidies are employed on ACDB's agricultural loan portfolio. If this is the case, then there are compelling arguments for raising the level of nominal rates currently charged by the ACDB to cover economic costs.

The arguments for charging rates which reflect the real costs of credit funds are controversial but crucial for a credit institution's financial viability, and necessary for the retardation of institutional decapitalization usually associated with small farmer credit. High deposit rates are also crucial for encouraging and mobilizing rural savings and rural capital formation.

A national agricultural credit program must seek to pass on the costs of capital to those who consume these funds. Low rates constrain the availability of funds, the participation of the poor in credit programs, and increase the reliance of credit institutions on discontiunous external sources. Low rates are also economically unjustifiable because the implicit subsidy embedded in these charges underprice capital. Cheap capital encourages its substitution for labor. In a labor-abundant society such as ours, such credit policy could be disastrous. Subsidized rates also discriminate against traditional small holders by increasing the credit demands of commercial operators. Thus, higher nominal interest rates are warranted if deposits are to be encouraged and exploitative informal rates reduced through competition. Deposit rates, currently 8 percent for savings, must be high enough so as to mobilize savings and increase the rate of rural capital formation, administrative costs reduced, and real rates raised to assure the financial viability of credit operations.

3. Eligibility Criteria and Security Requirements

Current ACDB acceptable collaterals include land, farm machinery, farm buildings and equipment, rolling stock, inventories, accounts receivables, crops, government securities, and cash (i.e., savings, time or other deposits).

ACDB also accepts other valuable items at its own discretion. The Bank requires the probation and registration of liens and other legal documents.

One major source of difficulty for the small farmer in obtaining loans under the above mentioned criteria is the presently low valuation of rural farm land and the lack of certified titles to such land. These are not of ACDB's own making. They are a result of the lack of intestinal fortitude on the part of policy makers in coming to grips with Liberia's land tenure problems. It is of obvious and paramount importance for the GOL to recognize the nature of these problems and to embark on their immediate resolution if agricultural programs in general, and credit policy in particular, are to yield desirable outcomes.

4. Repayment Performance

No statistics on loan recovery are currently available at the ACDB for public use. Figures around 50-70 percent were suggested. But judging from the repayment experiences of the LCADP and BCADP, it would appear that while this is not a major problem for seasonal loans, it surely is a problem for development components of their loan portfolio. Most development loan recovery rates are poor while those for short-term, seasonal purposes are average (about 60-75 percent).

In any case, the need for increased surveillance of repayment arrangements is necessary for the financial stability of credit institutions and the success of credit programs. Poor loan discipline impairs program development and growth by restricting loanable funds which are locked up as arrears. As a result, resources do not revolve full cycle and potential new customers for credit services are denied access to fund usage (Ref. 11).

The opportunity cost of arrears is often high. It creates collection problems which consume the lender's scarce resources at the expense of other activities. Rural development is also determined by loan discipline; defaulters become adversaries of credit institutions, their partners in development. A concise repayment regime is therefore necessary for program success and the deterrence of institutional decapitalization.

In addition to the four main policy issues which have been discussed are ancillary concerns such as credit monitoring and supervision, and the economic efficiency of credit administration.

Institutional Concerns

The key institutions involved in agricultural credit are the ACDB, the ADPs, LBDI, and the commercial banks. The credit components of BCADP and LCADP Phase II operations are now administered by ACDB under revolving credit fund agreements. These ADPs will now be able to concentrate their scarce resources on other project activities.

The current institutional arrangements will be adequate for credit delivery as long as the conditions necessary for the efficient and productive use of credit are improved. The only major source of concerns lies with the undesirable pace of cooperative development. These farmer associations are expected to play an important role in credit delivery and input supply. Unless their management and financial postures are improved, their ability to perform their designated roles will be constrained. This means that GOL and MOA attempts at decentralized decision-making and planning could face relatively insurmountable odds.

GOL must increase its efforts to encourage more commercial bank lending to the agricultural sector. This will warrant a relaxation of the NBL's usury laws so that these financial institutions can venture into the risky business of agricultural lending.

The channeling of public agricultural credit funds through private institutions such as Liberia's commercial banks is an undesirable delivery alternative. Public sector control of the distribution and ultimate utilization of such funds will be lost.

Direct lending to small farmers imposes very high costs on loan administration and is not an advisable alternative channel for credit delivery by itself. The optimum strategy for credit disbursement must therefore involve the cooperatives by and large with a small percentage of loans directly delivered to individual farmers. Modalities for farmer graduation from these programs must be devised.

A viable agricultural credit policy must seek not to dismantle current informal arrangements for credit, but to harness these available resource avenues by creating conditions unfavorable to usurious exploitation.

Summary and Conclusions

The Government of Liberia has recognized the importance of agriculture as the primary catalyst for the development of the nation's rural resources. In furtherance of this recognition, the GOL has formulated objectives and strategies for increasing the scale of economic opportunities available to rural inhabitants.

As the GOL's major institution for the coordination of all agricultural and related activities, the Ministry of Agriculture has spelled out specific strategies for the expansion of agricultural output and productivity and increases in rural standards of living. One of these strategies involves improvements in input supply, marketing, and the accessibility of rural farmers to increased financial assistance through the provision of agricultural credit.

The overall aim of this paper was to inquire into the nature of the existing institutional arrangements for agricultural credit delivery and to suggest alternative modalities for the formulation of a national agricultural credit policy.

In the first chapter of this study, a survey of recent developments in the money and banking sector of this country was undertaken. The evidence accrued points to serious liquidity problems and continuing erosion in the net foreign assets position of Liberia's banking system. The volume of agricultural credit emanating from these sources has been declining because of these problems.

The second chapter described existing institutional and non-institutional agricultural credit delivery systems. Institutionalized financial intermediaries like the Agricultural and Cooperative Development Bank (ACDB) were found to be making impressive inroads into the extension of financial facilities to Liberia's rural areas and the mobilization of rural savings. These achievements are being made in the face of adversities in the money and banking sector of Liberia. Although ACDB's monetary base serves as a constraint to its operational efficiency, this credit institution continues to display an amazing degree of economic and financial resilience.

The third and final chapter of this paper dealt with several issues which must be considered and resolved if an effective national agricultural credit policy is to emerge. The role of credit in agricultural and rural development, interest rate and repayment regimes, and the advantages and disadvantages of alternative credit delivery approaches comprised the bulk of this last section. The evidence indicates the need to distinguish between equity and efficiency objectives in the formulation of credit programs. The merits for institutionalized financial interrediation as well as the

necessary conditions for effective credit disbursement were discussed. Most of these crucial prerequisites appear to be in a rudimentary and fragmented state at this stage of Liberia's development. Technology is inapplicable and inappropriate in the Liberian context, opportunities for economic gains are frustrated by ineffective pricing policies, and the system lacks the desired buoyancy conducive to the timely supply of productive inputs and economically efficient marketing channels. The state of rural infrastructure also leaves much to be desired.

The problems besetting cooperative development are another source of concern for the continuing success of Liberia's agricultural credit delivery, marketing, and input supply arrangements. Cooperatives must improve their administrative and financial management profiles if they are to successfully carry out their designated role in rural and agricultural development.

The thesis to be advanced by the evidence accumulated during this exercise points to the need for a comprehensive and group approach to credit delivery. Some of the external conditions necessary for efficient credit delivery will have to be satisfied along with a strengthening of agricultural institutions crucial to credit disbursement, like the cooperatives. The components of such a comprehensive credit package will thus provide the essential ingredients of a workable national agricultural credit policy.

References

1. This section draws heavily from "Preparatory Assistance to the Liberian Credit Institution - Consultant Report", FAO, Rome, 1977 and discussions with concerned MOA sources.

2. The original charter spelled out means through which objective #3 could be accomplished. These included medium and long term financing, guarantees, technical advice, etc., for borrowers and others.

3. See LBDI Annual Report, 1983, page 24.

4. See P.M. Joshi, "First Cooperative Study on Cooperative Credit and Marketing Structure in Bong County", Suakoko, Bong County, 1984.

5. P.M. Joshi.

6. This section relies heavily on, but is not restricted to information presented in "Project Paper - Liberia Agricultural Credit Bank Project (669-0145)", USAID/Liberia, June 9, 1978.

7. See "Agricultural Credit - Sector Policy Paper", World Bank, 1975.

8. See Dale W. Adams, "Effects of Finance on Rural Development," in Undermining Rural Development With Cheap Credit, ed. by Dale W. Adams, et al., Westview Press, Inc., 1984.

9. See "AID Guidelines on Project and Program Planning for Small Farmer Credit" - mimeographed copy.

10. See "AID Guidelines on Project and Program Planning for Small Farmer Credit" and "Agricultural Credit - Sector Policy Paper," World Bank, 1975.

11. J.D. Von Pischke et al, "The Political Economy of Specialized Farm Credit Institutions in Low-Income Countries," World Bank Staff Working Paper No. 446 World Bank, 1981.

LAND REFORM

MacArthur M. Pay-Bayee*

Introduction

Land reform is defined as the Redistribution of land ownership and/or use right, as opposed to all the other activities involved in agricultural development such as information flow (research and extension), credit flows (capital and operational), technical inputs (fertilizers, pesticides, new seeds, etc.), and access to output marketing channels - it mainly implies major equity consideration as compared to agrarian reform which includes other aspects of agricultural development. It is in effect, any Government program involving the redistribution of large holdings of agricultural land among the landless. It may result in one or more consequences, among which are:

1) Relatively fair distribution of land.

2) Increased productivity per acre.

3) Increased employment.

4) Fairly equitable distribution of income.

5) High market growth, etc., etc.

In any case, it must meet the approval of the people whose life will be affected by such redistribution, and if its result is destabilizing, it could be traced to:

1) the degree of pre-existing social change within the society; and/or,

2) the manner in which the reform was carried out.

However, over the long-run it has been found that accomplished land reform has stabilizing influences.

There are three basic variations of bureaucracy designed to implement land reform:

1) Central implementation in a single government agency;

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2) Division of implementing responsibility among several different agencies;

3) Development of authority for significant aspects of land reform implementation to local government leaders, or non-government groups whose loyalty/ies and responsibilities are to their own constituent rather than to a superior heirarchy of officialdom.

Let me emphasize and recognize here that land reform gives the traditional farmer that security that the tribal right of occupancy gave to his forefather. Without this security of freehold tenure, it is doubtful whether there would be any incentives to the subsistence farmer to make the capital and labor investment which are necessary and sufficient conditions to producing above the current subsistent level. Land reform institutions are important means for providing such security of expectation and are also key determinants of income distribution in the farm sector - a sector which frequently includes half or more of the population in less developed countries.

Economic and Political Power Distribution

Economic and political powers are positively related to income levels. The rich have more power than the poor and where the agrarian sector is large (in an economic sense), relative to the total economy, those who control the land resources are frequently very influential in the political process in a measure dispropotionate to their numbers. Thus, in addition to income distribution with its demand ramifications, the land tenure system influences the political power structure and the goals and policies that are formulated through the political machinery.

As a result, it becomes rather difficult to enact legislations affecting the distribution of income - whether by changes in land tenure or by other means - and if such legislation is passed, it is nearly as impossible to enforce it. Taxes are usually low, the system of taxation confused, and the compliance rate is very minimal. The same problems exist relative to the enforcement of labor laws governing working conditions, and laws governing land, rentals, etc.

Investment in Agriculture and Supply Consequences

Two distinct aspects of this question are distinguishable even at a glance: investment by individual enterpreneurs or private groups, and investment by government. These two are, however, inseparable to the extend that individual/private investment efforts are guarded by laws enacted by government. The basic question is, to what extent if any, particular land tenure arrangements affect investment and thereby the supply response from agriculture. There are arguments that "...capital formation in farming is rarely concentrated either in space or time.

(Rather) it accumulates by an increamental process that is best discribed as accretionary..." (an increase by natural growth or gradual external addition). Land tenure security can contribute to this by making use of productive assets, the preclusive right of an individual or group. This security of expectation is crucial for biological forms of capital, for slow-maturing enterprises, and for undertakings, involving numerous incremental additions made successively over many production cycles, e.g., cattle.

There is another argument that "The tenure system of a country influences the productivity of agriculture both through the incentive which the tenure arrangements offer for the effective participation of workers, managers, investors, etc., and through the capacity of a tenure system to adjust to the requirement of the economy such as, the adoption of new technology, changes in the size of farms, the equalization of the labor earnings between agriculture and other sectors."

I do not intend to elaborate on the pros and cons of a particular tenure form since this topic is covered in many land economic literature. I would only mention that there are cases of progressive agriculture outside the pattern of family farming. Finally, I should not forget to re-emphasize that cultural and social factors are extremely significant in determining the success of different tenure arrangements.

In the remainder of this paper, I wish to raise some other points regarding the relationship between land tenure institutions and investments in agriculture. In discussing these issues, it is necessary to remember the distinction between production for export and production for the internal markets.

Although there are exceptions, the export crops of the less developed countries have generally shown higher rates of increase in production than have crops and livestock grown primarily for the internal market. The crux of the world food problem is found in the slow rate of growth in food production for domestic use (relative to population increase). In part, this may be traced to the colonial experience and the long history of foreign enterpreneurs operating in the export crop field, among many other factors.

For one thing, most of the less developed countries are concerned with balance of payments problems, and the export crops are frequently large earners of foreign exchange. Thus, there is more interest and government effort to enhance production of export crops. Current foreign loans adds to already large international debts increase the need for exports to service these debts. Hence, a government's concern and its efforts to encourage expansion of production in the export sector are understandable.

This emphasis on exports, however, often gives the statistical impression of high rates of growth in the agricultural sector, while in reality, the standard of living and level of income of the majority of farm people may actually be deteriorating (example: "Guatemala and Nicaragua with rapid growth in the production of cotton for export have deteriorating conditions in the countryside"). The feature of land tenure system that is important here is that production for export is frequently organized in large-scale operations or plantations and often financed or run directly by some external assistance or enterpreneur as the case may be. These external financiers often require stringent conditions for the establishment of such projects - conditions which are in themselves bottlenecks to the development of the host nation.

My discussion thus far has been rather theoritical and in some cases abstract. I find this necessary in order to lay a base for our Liberian situation, mainly because theory in itself, is a blueprint of real world situation. Let me therefore diverge a little and look at our particular situation in light of the past and present agricultural development activities. As I wish to leave the discussion of Liberian land tenure system to another speaker, let me take a peep at the historical development and its resulting effects on land distribution in the country at least up to 1980.

Long before the granting of citizenship to tribal Liberians in 1905 by President Arthur Barclay, which was mainly due to pressures from foreign countries on the frontiers of Liberia, and up to the beginning of the 1980, the ownership of land in Liberia began to shift from traditional lineage ownership as previously to the Western fee-simple/block ownership with the "civilized" Liberians taking most of the land, especially along the main highways. Most often, the land was purchased for little of nothing out of which the original residents gained nothing and in some cases understood nothing. We must recall that the traditional African believes that he belonged to the land and not the other way around.

As I do not wish to go into how these tribal holdings were taken over by a number of families, but the effects of such distribution cannot be overlooked. Thus, in Bong, Montserrado and parts of Bassa, Nimba and Cape Mount, some of the original dwellers became squatters while others moved further and further away from the main highways which are the arteries and veins providing the life blood of the economy.

As if these displacements were not enough, Firestone came in 1923 and was given 1,000,000 acres of the land area of the then Marshall Territory now a part of Margibi County. The door was opened and Firestone was quickly followed by B.F. Goodrich, Cocopa Rubber Plantation, Allen Grant, Liberia Mining Company, Lamco Joint Venture, to name a few, and concession agreements

were signed with each to operate in various parts of the country, which in effect, displaced even more people from agricultural land. Additionally, a list of selected large Liberian rubber farmers indicates that over 7,000 acres of rubber farms were owned by no more than five farmers. If we all briefly think of the implication of this fact, remembering that most of such farms exist only along the main road, often referred to as the "Rubber Belt of Liberia," we will understand the dimension of the harm done to agriculture as less and less land became available to a population which continues to grow at an alarming rate of between 3 to 3.5 percent per annum. Hence, it is not strange that a lot of people began to move into our few cities and large towns and thus shift the responsibility of producing food for this population to the rural people and then external sources.

No one can deny that these establishments have contributed in one way or others, to the overall development of Liberia. In fact, it would be an outright disservice to humanity to do such. However, looking at our track record especially in regards to providing food needs for our people and raising the general standard of living of Liberians, we still have a long way to go.

From around 1937, when the importation of large quantity of rice became a part of government's activities, up to the present, so much resources have been literally wasted, often accompanied by a chorus of slogans; e.g., "No more imported rice after 1980", "Operation Production," "From mat to matresses", etc. In some of these selected cases, concerned Liberians have remained reserved while some have expressed their willingness to "stand by" for the result. Thus, "We stand by for 1980" became the phrase to taunt Ministry of Agriculture employees after the 1976 Independence Day pronouncement of this slogan at Fendell.

In any case, however, some of these efforts have not gone unrewarded. Rubber, for one thing, has filled some of the vacuum previously in the Liberian (annual) National budgets. At one time or the other, such contribution was as high as 50 percent of the GDP. By the same token, iron ore and/or other concessions have played and continue to play their parts in the development efforts. The question, however, continues to be whether we can effectively change the diet, socio-economic and other conditions of the Liberian people mainly through a few large concessions some of which have long since folded up, and a selected group of rubber farmers owning so much of the land while others - mostly traditional/subsistent farmers - continue to struggle for a kinkin of rice? Furthermore, can/should we continue to encourage such ideas as a 100,000 acre (Korean) farm knowing that so many people are going to be displaced? If not, how can we guarantee the security that the small farmer will not have his holding (basically traditional and not fee-simple), taken from him for a million acre farm?

More questions arise if we take the overall activities of the Ministry of Agriculture; for instance:

1) Acknowledging the need for an estate large enough to run a processing plant for rubber, oil palm, etc., how do we or should we limit the size of plantations and encourage small, private farmers who would sell to these plants and thus encourage a fairly equitable distribution of income?

2) What should happen to rubber estates established by LRDU as the project is due to phase out soon due to the current financial problems?

3) After the change of government in 1980, farms belonging to former government officials (most of which contain some rubber plantations) were "reacquired" by the government. The question is, what really should be done with these "reacquired" plantations? Were these properties (land in particular) unduely taken from the residents of the respective areas and should therefore be redivided among them? Can the deeds of such properties be found, and if deeded, can the titles of such deeds be respected under a rule of law? Should they become the nucleus of a development project?

4) How best can we preserve our forest resources, and do we really know what lands should be in forest and which in agriculture? In direct line with this question, is a land capability study not so important that its pricrity should be higher? If such study should be made a higher priority, how can we convince donors or change internal priorities so that some part of our development budget can go towards getting this study done? Perhaps, we should make it a condition for the next major project - if a donor is willing to spend a million dollars on ADP, then a land capability study of that area must first be mapped. Or if a donor wants to put a million dollars in research, then some of that money should go into a national land capability study.

5) Some time ago some donors and selected government agencies were interested in doing a land tenure study. What bothers me is, why the current lack of interest? It seems that some external forces continue to "help" us set our priorities, just when we thought we were going to set our own priorities without interference from the outside.

These and many more are issues that we, and the Ministry of Agriculture should consider as we take a greater role in influencing national decision making. The Ministry of Agriculture cannot meet the need of the anxious people in the streets asking "What is the Ministry of Agriculture doing?" without some general indication of the resource base, as well as

the general interest of the Liberian people in terms of their overall development aspirations. Neither can we at the Ministry try to answer this question of what we are doing even though the paradox remains that LPMC, a parastatal of same Ministry has been flooded with locally produced rice which it has found difficult to sell due to many reasons some which we have already heard during the course of this seminar.

Conclusion

The Liberian people at this moment, do not seem to realize the importance of land tenure and land reform issues. Yet, I do not see any period during which this particular issue should be considered more seriously. As concessions, large rubber farmers, etc., continue to swallow up the land while population growth rate continues at 3 to 3.5 percent per annum, one wonders infact if government should not make a land tenure and land capability study a top priority so that agricultural land can identified and reserved (maybe in the form of agricultural districts). This way, the Ministry of Agriculture can pinpoint areas feasible for the various agricultural activities.

LAND TENURE

Simeon M. Morib

Liberia has a land area of about 37,743 square miles which is equivalent to 24,155,220 acres. Taking current population to be about 2 (two) million people, and assuming equitable distribution of land, there would be about 12 acres for each person. If the active (farming) number of agricultural households is taken as a basis for distribution, the area per household would be much greater. The arable land is just about 12 million acres. Assuming all of this was in cultivation and equitable distribution prevailed, the area/person or household would be cut down by half. The actual area under cultivation is however, estimated to be about 4 million acres. The distribution of the cultivated area according to farm size is given in Table 1.

With about 70 percent of Liberians living in rural areas and being subsistence farmers (agrarian), the data below shows that 19 percent of the cultivated area is owned by them while a greater percentage is in the hands of concessions or plantation owners. The medium sized farms are owned by a small number of Liberians who also have plantations. Although these lands are leased to investors, it has been observed in many cases that plantations development results into:

1. Attention being given to few crops.

2. Less attention being given to food crops which may have adverse effects on food security.

Table 1. Distribution of Number of Farms and Land Area by Size of Farm

Size of Farm Hectares	Percent of Farms	Percent of Area
Under 2	77	19
2 - 20	21	32
20 +	2	49
	100	100

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3. Reduced human resource development.

4. Underutilization of land.

5. Labor intensive technology and in some cases seasonal operations.

6. Workers loosing their freedom and some degree of insecurity prevails.

Plantation development may also have little future impact on the socio-economic life of the people and the area.

Ownership of land in Liberia is slowly but noticeably changing. The communal structure is breaking down slowly and is being replaced by private ownership. As a result, communities are losing large parcels of holdings to individuals and groups of investors through government. Tree crops plantations, being one way of ensuring long term ownerships of communal land, are taking up most of the land in many parts of Liberia. It is interesting to note that in Liberia, qualification for election to high offices in government and the right for a citizen to vote were based on real estate property. Economic and political power were therefore previledges and rights of a few people. Persistence of such a system may have its own adverse effects (this has been demonstrated in Liberia).

The involvement of rural people in agricultural development activities has had some bearing on land ownership, and collateral for credit extension. Such issues although addressed to some degree remain in large part unsettled. With the population growing at a rate of 3.3 percent, people becoming more concerned about securing their small parcels of land, and the projects coming in with some reforms in agriculture that may warrant land reform, there is need to give serious thought to the matter. The stage has not been reached in Liberia where government can be forced to undertake severe land reform or reallocation measures. It is, however, appropriate that the situation be adequately assessed to avoid a possible future catastrophe.

It is becoming increasingly clear that the current tenure structure in Liberia especially the communal ownership will not stand the test of time. It must be remembered that agrarian structure in Liberia has no short tenure outlook. The future of most Liberians lies in the soil. Land reform itself has some meaningful benefits if policies are geared towards:

1) reallocation of a productive resource (land);

2) better socio-economic condition of peasants;

3) conserving natural resources;

4) supporting medium and small size farms;

5) spreading political power;

6) employing labour or increasing employment;

7) infrastructural development; and

8) increasing agriculture's contribution to the economy.

It is important to remember that policies developed should in no way destroy the traditional community.

Although reforms carry with them some benefits, the costs are also critical. Such costs, in most cases serve as impediments to suitable reforms. Costs basically include:

1) compensation of people who have to give up land;

2) reduction in political and economic power for some people;

3) the institutional framework for reform; and

4) not all will be satisfied.

Reform itself fosters and brings into existence a process of greater change. It is revolutionary and must be approached cautiously.

THE ROLE OF RESEARCH IN LIBERIAN AGRICULTURAL DEVELOPMENT

J. Qwelibo N.N. Subah*

Background

There exists a complex relationship between the research services and the agricultural industry. In Liberia, as is the case in most under developed countries, very few people have ventured to explore this relationship. Hence there exists on a large scale a lack of appreciation for the existence of a meaningful research entity. In the present critical stage of the development of the agricultural industry in Liberia the maximum possible general understanding of the role of research in the production, marketing and utilization of agricultural products must be sought if Liberian agrculture is to get the kind of research service that is necessary to sustain and promote increased efficiency.

The problem of understanding the value of research is not confined, however, to farmers on one side and the research services on the other; it emerges among educators, policy makers, officials of government, and even among research scientists. Because this situation exists--that people who ought to know better appear not to know or understand the value of research--the prospects for meaningful advancement in research in this country are not promising.

Agriculture in the developing countries is characterized by low productivity per unit of land and labor. According to FAO, average yields of many food commodities in the developing regions are less than half of those in the developed market economics. With the rapid population growth rates, limited opportunities for expanding cropped areas and the rising cost of energy, it is essential for developing countries to use modern science in developing improved but low cost technologies to increase agricultural production and by so doing improve rural incomes.

However, major breakthroughs in research require considerable time and a determined, continued effort. Some outstanding examples highlight this point: Nearly 30 years of painstaking research on the breeding of wheat and rice led to development

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development of the high yielding varieties (HYV) now in use around the world. A similar amount of commitment went into the development of hybrid corn--an innovation which very significantly transformed American agriculture. The success achieved with corn, wheat and rice could be obtained with respect to other cereals, pulses, roots and grain legumes. Research in other areas could also have far reaching effects on production and productivity.

Agricultural research by developing countries is essential as farming systems and problems are highly location-specific and improved and appropriate technology can only be produced through concerted research effort conducted on the spot. It is thus vital to create an institutional structure and a national cadre of research scientists whose perception and experience of local farm problems qualify them to judge the relevance of new technology and assess its adaptability to prevailing farming condition. These are functions which cannot be delegated to outsiders or to non-scientists.

Role of Research in Economic Development

In most countries, technological change in agriculture has been the impetus of economic transformation and growth. In Europe as well as in the United States, new technology in agriculture has been the mechanism that permitted production of food to be increased and, simultaneously, capital and labor for non-agricultural activity to be released.

It is now widely accepted that a steady increase in agricultural productivity through tecnological change is indispensable to sustained economic growth. It is notable that increases in productivity in the past 100 years have come largely from the application of science-based farm technology, and from changes in management and inputs developed through organized research. Since most countries are now running out of good arable land, it is essential that agricultural research generate new technologies that will permit higher-yielding crop and livestock production, if malnutrition is to be reduced, increased food costs avoided, and economic growth not threatened. It is also vitally important that effective agricultural research must be accompanied by a strong extension system and other support services if these production gains are to be realized.

Fifty years ago, average grain yields in the industrialized countries were approximately equal to those in developing countries. Today, yields in industrialized countries have more than doubled those in developing countries. While growth in yields reflects many social, economic and ecological factors, the differences between the productivity of developed and developing countries can be attributed, in part, to the size and effectiveness of national agricultural research efforts and

to the use of research-derived technologies in the agricultural activities. In this context, agricultural research is defined as a systematic effort to develop new methods (technology) to increase agricultural productivity or technical efficiency. These methods can include socio-economic research, as well as conventional field and laboratory work by agricultural scientists.

It is useful to divide the research activity into two functional components - science and technology. Science is that research activity which results in the generation of knowledge with varying degrees of applicability to immediate problems. Technology is that research activity, based on scientific knowledge, that results in a mechanized, biological, or institutional innovation. Basic research generates knowledge, while applied research is more akin to the generation of usable technology. Both basic and applied research represent extremes on a spectrum of research activities, and in practice, the resolution of a particular research problem may utilize both types of research.

In any particular country, the agricultural research needed is a function of the unique soils, climate, and social, as well as other conditions in existence there. The cost for research can sometimes be reduced by the transfer of technology from one country to another, or from an international center to a national research system. However, for the developing countries, the vast majority of which have tropical or subtropical climates, effective transfer of technology from the developed countries, which by contrast largely have temperate climates, is often difficult, if not impossible. Because of these and other factors, the developing countries have particular research needs that must be met mainly through research carried out in the agroecological and socio-economic circumstances in which the resulting technology is to be employed.

Other characteristics of agriculture in developing countries also determine the spatial and institutional framework within which agricultural research must be organized. In Liberia, as in most developing countries, agriculture comprises large numbers of small producers, many of whom have relatively little economic or political power. Individual farmers do not undertake research because it is too expensive in relation to their operation and because any resulting benefits are likely to be widely shared by all in the industry, not just those who finance the research. Since the increased production from a new technology generally causes costs to decline, a substantial share of the long-term benefits of technological change goes eventually to consumers. Because social benefits are potentially large, and because producers are frequently unwilling or unable to finance it, agricultural research in most developing countries is mainly financed by government. How

benefits are distributed among farmers and the extent to which they are shared by others depend on the characteristics of the research effort. These characteristics are decided mainly by those who design and implement research programs at all levels.

If the main goal of agricultural research is greater output through increased productivity, the determination of research priorities and strategies is a relatively simple and straight-forward matter. But when research is also viewed as an instrument for achieving broader socio-economic objectives, then the problem of selecting appropriate strategies becomes more difficult. Successful agricultural research produces knowledge or improved materials which may be fed back into the research process for further development or release to farmers as new technology.

Several direct benefits accrue from such technology (i.e., increased efficiency, change in composition of output, reduced production risk, etc.). Any of these results, affecting production, input use, and consumption, may contribute to the achievement of national development objectives through changes in farm income and its distribution or foreign exchange earnings.

The goal of agricultural development in Liberia is to increase Liberia's food self-sufficiency, promote export crop production and raise the income of the country's small, subsistence farmers who constitute 70 percent of the nation's work force. More than 97 percent of all holdings or 150,000 farm families are in the traditional sector of the Liberian agriculture. The greater impediment to agricultural development is the low productivity of these subsistence farmers. Obstacles to agricultural production include, lack of capital, the rolling terrain, the thin, acidic and iron toxic soils, and numerous pests and diseases affecting crops and livestock in the country. Giving these obstacles, the subsistence farmer has few alternatives to the traditional farming practices he has used over generations. This system is characterized as a slash-and-burn, shifting cultivation built around rice, cassava, vegetables and a host of other food crops for the farmer's own consumption. Only in recent years has there been a trend to grow cash crops like coffee, cocoa, sugar cane and oil palm. The traditional system is highly labor intensive and produces low yields. If Liberia is to raise the output of the subsistence farmers to meet its goal of greater food and cash crop production, it must develop improved technologies suited to the environmental, economic and social context of the farmers. CARI has been reorganized and given the responsibility to do this through adaptive, applied research.

Research Organization and Management

Organization

The Central Agricultural Research Institute was established on 18th August, 1980 as a semi-autonomous organ of the Ministry of Agriculture and evolved from the Central Agricultural Experimental Station which was established in 1953. By either account, the history of agricultural research in Liberia is brief. CARI is headed by a Director. As outlined in the "Blue Book", the institutional arrangement for agricultural research in Liberia include the following:

1) The Minister of Agriculture shall have responsibility for the overall coordination of the national agricultural research program. He shall serve as Chairman of the Agricultural Research Committee.

2) The Agricultural Research Committee shall be a policy making body established as an independent committee to decide and approve policies for applied, adaptive research in agriculture in the country at the national level. The Committee shall decide on priorities, taking into consideration the importance, urgency and availability of resources. It shall allocate and approve funds for research proposals as submitted by the Technical Committee. The Research Committee is to solicit, approve, and receive funds from Government and all other possible sources for agricultural research. The Committee shall approve the results of research for application to the development of agriculture in Liberia. All parties engaged and/or interested in agricultural research shall be represented, taking care not to make the Committee too unwieldy for efficient functioning. It shall be incumbent on the Committee to lay down procedures for release of funds and for proper accounting and auditing. The Committee shall meet twice a year to consider matters relating to agricultural research.

3) The Technical Committee shall provide broad direction for the research program at the Agricultural Research Institute. The Chairman of this Committee, the Deputy Minister for Technical Affairs, shall act as the link between the Agricultural Research Committee and the Institute. This Committee shall examine the various proposals for research in agriculture. It shall suggest (when necessary) new topics or lines of research, continuously review all research work in progress and give directions for further investigations. It shall seek to establish a working relationship with other agricultural research institutions and organizations

throughout the world and particularly with those in neighboring countries.

The Technical Committee shall meet at least four times a year. Additional meetings may be called by the Chairman when necessary. The Chairman may invite persons who are not members of this Committee to attend meetings as observers or advisors.

4) The Advisory Committee will provide an input to the Research Committee from donor agencies that support the Agricultural Research Institute.

5) The Research of the Institute will be organized into seven Technical Departments under the Research Coordinator. These are: 1) Crop Sciences and Propogation; 2) Land and Water Resources Management; 3) Animal Science & Production; 4) Plant Protection; 5) Food Technology; 6) Engineering and Appropriate Technology; and 7) Fisheries.

Such is the institutional framework, at least on paper. In practice, however, the situation is quite different. After nearly five years of existence, CARI finds herself placed in a very difficult situation in so far as policy is concerned. The Agricultural Research Committee has never met. The Technical Committee has met five times only and on no occasion has it dealt with technical matters. Moreover, Technical Committee members have shown little interest in research matters. In the absence of a functioning Agricultural Research Committee, the Technical Committee has assumed its role but only in administrative and peripheral matters instead of the technical issues of planning and formulating a meaningful research program. Over and above this, there exists serious problems regarding interpretation of the semi-autonomy of CARI relative to its function, linkage and administration vis-a-vis the Ministry of Agriculture.

As a consequence, research policy formulation, which normally should be at three levels, exists only at the institutional level. The need for contribution at the National and Ministerial levels in the planning, approval, evaluation and reappraisal of research strategies and policies is unmet. Given this situation there is a dire need to organize (reorganize if need be) the institutional framework to ensure that research programs are geared to solving problems which are of immediate interests to the farmers and which provide the necessary data, information, know-how, and ideas for the planning of agricultural development and implementations of these plans in the context of national agricultural development.

Resource Allocation to Agricultural Research

The provision of research facilities, technical education and training programs is essential for the technological

development of the agricultural industry and the achievement of an increase in its efficiency. Liberian agriculture obtains most of its funds from central government either directly or as a result of negotiations made by and through government, the noticable exception being the few concessions actively engaged in rubber production. Because of such government involvement, the government, therefore has responsibility for the direction in which available funds are applied. Little, if any, contribution comes from the industries ancillary to agriculture.

Government expenditures for agriculture over the last two decades have sharply increased and this was accompanied by some real growth in resources allocated to research. Inspite of this, underfinancing remains a problem. Studies by the World Bank and by FAO in several developing countries indicate that serious problems exist of understanding and underfinancing in agricultural research. Among low-income countries the equivalent of only 0.24 percent of agricultural GNP was spent on research; in middle-income countries, the equivalent of 0.42 percent was spent. In developed countries between 1 and 2 percent of GNP is spent on agricultural research.

Global expenditure on agricultural research has grown sharply in recent years, so too has the portion spent in developing countries. World-wide, research expenditures may now approach $5,000 million a year, or about three times the amount spent in the early 1960's. The portion spent in Latin America, Africa and Asia has risen steadily, but still accounts for only about one fourth of the total. Research expenditures by the developing countries are heavily supplemented by external assistance from multilateral and bilateral donors and by private foundations. Much of the assistance by bilateral donors supports research programs in certain commodities or in a particular discipline. The perception that technological change can be an efficient source of growth in traditional agriculture has been a major factor in the notable increase of the agricultural research effort in developing countries in recent years. As a consequence the increase in expenditure has increased very significantly. Nevertheless, expenditures for research in developing countries still falls far short of what is adequate to support research needs in those countries.

A spin-off effect of this inadequate funding situation is the number of agricultural research scientists present in developing countries. An FAO study involving 65 countries of Africa, Asia and Latin America showed that in 1975 the number of professional staff engaged in agricultural research (about 23,000) was hardly more than the numbers that exists in Japan alone and much less than that in the U.S. This general underfunding of agricultural research in developing countries also affects the extent of support services available to research scientists is poor. At international research centers

and in developed countries there is a ratio of 2:1 to 7:1 of technicians to researchers. In contrast, among developing countries, only about four countries had up to two technicians per research scientist, and over half had fewer than one technician per researcher. As a consequence, research scientists are generally over-spread in terms of their coverage and thus can manage only superficial coverage of the topics covered.

The extent to which a country benefits from research findings both of her own as well as those of other countries depends on its own investment in research. A case study on the subject of technology transfer from developed to developing involving productivity in wheat and maize illustrates this. The idea was to determine how much of the research discoveries of other countries could be borrowed by or transferred to other countries. The finding was that those countries which did have indigenous research capabilities in wheat and maize production benefited significantly from research done in other similar regions, but not from research conducted outside of those regions. This makes research policy and planning in developing countries more important and accentuates the need for building and maintaining a national research capability.

Program Planning, Evaluation and Reappraisal

To ensure that the research undertaken accrues the most good for its ultimate users, the farmers, more account needs to be taken than has been the case in the past, of the language and understanding of farmers themselves. This is both because of the desirability of understanding farmers' perceptions of the constraints under which they operate, and of the appreciation that cultivation may have knowledge which is no less valid than that of research scientists and quite often this is unknow to the latter.

Research planning should ensure that research activities are consistant with agricultural priorities, farmers' needs, prevailing economic conditions and institutional capabilities and are likely to produce viable results. To avoid distortions, research systems should be continuously monitored and periotically reviewed. While research priorities should derive from the agricultural planning process, earlier discussion on policies and resource allocation indicated that this is not the case in Liberia. Decisions on whether to initiate, expand or re-orient lines of research reflect priorities set by CARI staff, and once established, research programs and institutional arrangements were rarely cut back to accommodate new lines of research. Policies, in many cases, are unduly influenced by projects assisted by external aid agencies. Often these projects make substantial demands on national finance and manpower, thereby affecting the distribution pattern of resources for agricultural research. No formal procedures exist for macro-planning of research.

Because of the weak system for research planning, proposals originate from CARI researchers and are critiqued only by CARI staff. There is no input either from the Ministry of Agriculture or from the Agricultural Research Committee to ensure that research undertaken is in line with national agricultural policies or priorities. The planning process tends to degenerate with increasing financial difficulties because funding of research appears to occupy a position of low priority from people deciding on the allocation and disbursement of funds at the national level.

The foregoing discussion was intended to highlight the need for adequate planning and monitoring of research in Liberia. The lack of this planning and programing effort is crucial to the continuation and maintenance of the existing capability that has been developed over the past four years. The alternative is a description in programing and a possible loss of very scarce trained manpower now existing at the Institute.

Conclusion and Recommendations

The role of agriculture in the economies of underdeveloped, non-industrialized nations like Liberia is a critical one in light of the disproportionately large percentage of the population engaged in agriculture directly as well as in agricultural related enterprises. For any meaningful economic development to occur, therefore, major transformations are required to upgrade the productivity of the agricultural sector as well as to increase the income generating capacity of the majority of the populace. Well defined and properly planned national agricultural policies need to be formulated and implemented. At the core of this policy/strategy must lie a realistic and productive agricultural research entity. For it is through the implementation of a sound research program that technologies are generated to sustain the agricultural development needed to boost economic activities in the country.

The primary agricultural development thrust in Liberia must aim for maximum participation in the development process by the large mass of subsistence farm families throughout the country. There is sufficient land to sustain major growth and development in the agricultural sector. Development policy must encourage and permit Liberia's many small farmers to use this abundant land resource more extensively and more effectively.

Development efforts must be directed toward measures that encourage and make it possible for all Liberian farm families to farm more acres and to increase productivity on the acres that are farmed. This is a logical approach for both increasing the nation's agricultural output and for improving living conditions for the mass of small farmers.

Implementation of this development policy requires that the Ministry of Agriculture develop a capability for: 1) reaching

the masses of small farm families throughout Liberia with information that improvement is possible and on how improvement can be made; 2) developing and screening improved technical information and farming methods that are adapted to conditions in Liberia; 3) insuring that support systems are available to provide credit, markets, inputs, and other services and conditions necessary for development; and 4) administering a coordinated development program.

To achieve these objectives, the following policy recommendations are listed for consideration:

1. Formation and implementation of a National Agricultural Research Committee. This should be a central body responsible for formulating national policies and for organizing and implementing research programs. It should be vested with the powers to discuss and implement measures for improvement and coordination of research in all fields of agriculture and for the acquisition of funds, on a timely basis, for implementing research programs. To ensure coordination with the Ministry of Agriculture, it is desirable that the membership of this committee be determined jointly by the scientific community and the Ministry.

2. Policy decisions regarding the relative emphasis to be given the different branches of agricultural production or the need to establish new branches need to be made by a committee consisting of people from the Ministry (Planning), research, extension and training. Decisions at this level will distinguish between fields in which full-scale research effort is required, those in which research should be limited to application of known principles, and those in which any further research effort appears not justified.

3. There are problems affecting the national agricultural research program at CARI, because no involvement exists at the ministerial or national levels to monitor priority setting, planning, project preparation, evaluation and technical support to work at the Institute. It is therefore recommended that a Technical Committee be formulated to meet these needs.

4. The present pattern for the disbursement of funds approved for research is inappropriate and, infact, detrimental to the implementation of a successful research program. Both the allocation of funds and the frequency with which funds are disbursed to research are incompatible with a planned research programme, especially bearing in mind the need for timeliness in agricultural operations. A point for consideration is the imposition of an excise tax on imported and exported

agricultural commodities proceeds of which could finance agricultural programmes.

5. The availability of adequately trained manpower is a major constraint. In order to attract and retain highly trained manpower in agricultural research, it is recommended that adequate remuneration (attractive salaries, working conditions, and other benefits) be made available to research scientists. Unless this is done, CARI stands to lose a substantial portion of the scarce but vitually needed manpower which it has begun to accumulate.

6. Major weaknesses exist in the linkages between research, extension and training, even in places where extension activities appear to flourish. The establishment of a research/extension liaison unit is recommended.

7. To ensure that research results benefit the farmers, it is recommended that a production systems approach to research be instituted. By so doing: a) a clear picture will be formed of the system and particularly of constraints on the farm; b) technology is developed to overcome those constraints; and c) the usefulness of proposed improvements is confirmed by farmers before being disseminated.

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COUNTY EXTENSION IN LIBERIA

Huburn G. Edwards*

Extension Defined

In the ordinary sense, extension means something projected or reaching out. In agriculture it is an informal educational system; its cirriculum is based on the people it serves; its students are rural people; its goal is to help these people attain a more satisfying farm, home and community life. Through participation, people learn new scientific facts in agriculture and home making. They learn how to apply these facts to improve their farms and homes. Extension teaches people how to work for these people for their common good locally and nationally.

The purpose of extension is to induce people to make more desirable changes in their behavior, ideals, understanding and ways of life. These changes can only come about if people are motivated by the increase in the amount of information, teaching new and improved skills, ability, habits and teaching more desirable attitudes and ideals. The extension worker, who is a rural teacher, will be primarily concerned with the increase in production of farm products through education thereby strengthening individual farmers' buying power.

Organization and Implementation

In October 1977, the National Extension Service was reorganized with the former County Agents becoming County Coordinators with a much broader scope of responsibility being delegated to them in such manner that they were dubbed Mini-Ministers. These officials were to organize a headquarters in each county where each bureau or division in the Ministry was to be represented by a counterpart. A further revamping of the Bureau of Regional Development and Extension, in 1981, re-named the County Agent as the County Chief Agricultural Officer.

In extension, there are several technicians or officers responsible for rice, tree crops, poultry, livestock, agronomy, fisheries, vegetable, agricultural training, marketing, crops, home economics, cooperatives, etc.

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Objectives of an Agricultural Extension System

While agricultural extension is concerned with teaching of new ways and ideas within the agricultural discipline geared towards solving practical food problems in the rural areas, thereby justifying its existence to the rural people, it is of utmost importance that an agricultural extension system be justified to the entire population. To this end, agricultural extension must satisfy immediate needs for its rural clientele as well as contribute to national welfare, both in the long and short run.

Agricultural Extension Strategy in Liberia

The Liberian extension strategy is designed to support the development needs of farmers at all stages. These development needs are classified by A.T. Mosher in his book entitled Getting Agriculture Moving as essentials and accelerators of agricultural production. Among the essentials of agricultural production are:

1. Markets for farm products
2. Constantly changing technology
3. Local availability of supplies and equipment
4. Production incentives
5. Transportation

While the accelerators include:

1. Education for development
2. Production credit
3. Group action by farmers
4. Improving and expanding agricultural land
5. National planning for agricultural development.

The Basis of Extension

Society expects certain activities to be carried on by government in developing the people in the counties. Part of this development is in the agricultural sector of the economy. To bring about agricultural development; a great deal of leadership, information and guidance is needed. The obligation of the extension service is to spearhead the effort to bridge the information gap and provide rural and local leadership.

The basis of extension is multi-sided as follows·

1. **Extension starts** where the people are, and establishes **confidence by simple** demonstration of practice that can **be readily adopted.**

2. **Extension work** should be based on clearly stated and **understood objectives.** Upon acceptance, projects and **programs can be more** readily organized, and goals set to determine **progress.**

3. Extension work should be based on the culture, needs and interests of those to be reached. Habits, beliefs, religion, customs, educational levels, communication facilities, interests and traditions should be seriously regarded in this effort.

4. Functionally, extension work is largely educational. Developing the individual by helping him help himself.

5. Extension work should reach all people (men, women, boys, girls, and the various community groups) for whom the programs are intended regardless of politics, tribalism or religion. Although extension is designed for rural people, others will desire the service and should be included when and where needed.

6. Extension work should be based on facts wherever they are found to promote the general welfare. Organized research is necessary for new knowledge.

7. Observation, surveys and evaluation of extension programs should be a continuous process.

8. The extension service should encourage the use of volunteer leaders, involving and interesting them in the promotion of extension objectives, through local committees and through the use of key local people or opinion leaders in extension meetings and demonstrations.

9. The extension service should be supported at all levels by government - at national, county, chiefdom, clan, town and village.

10. Extension work should be associated with research and teaching and coordinated to avoid needless duplication and provide a two-way flow of information.

11. Extension work should employ the best trained and most capable personnel possible, provide in-service training and opportunities for career development.

Extension Officer

The extension officer is one of the most unique educators anywhere in the world. His role in serving farm people should grow out of a combination of grass roots initiative and cooperative arrangement between the government, agricultural institutions, viz: Booker Washington Institute, Rural Development Institute, University of Liberia Agricultural College, etc. His sole mission is to serve the needs of farm people whenever and wherever they arise.

After winning the confidence of farm people, extension officers have found many new responsibilities. They assume the responsibility for establishing and conducting new programs in the interests of the national welfare. As the problems of agriculture become more complex, extension officers are expected to deal with problems of management, marketing, community services and public policy.

Hence, in the same day, an extension officer may find himself diagnosing a crop or livestock disease, meeting with a local civic group to advise on their agricultural program, or supervising a production-marketing program. The officer has to plan how to allocate his time between these various functions and also decide to which he must give priority if he can't do all of them. New jobs are added in keeping with the district, regional and national problems of agriculture and yet his constituents in the county continue to call on him to help with the many problems which arise on the farm. He is also an important member of the county Superintendent's Consultative Council. Emphasis should be placed on:

1. Providing information on specific farm and home practices.

2. Teaching the underlying principles of farming and home-making.

3. Consulting in the analysis and management of the total farm and home enterprise.

4. Providing information and leadership for community services and activities (recreation, health, safety, etc.).

The extension officer must see a distinctive role for himself and prepare for it. He may see himself as a person with technical knowledge who keeps up with the latest information either in most or in specialized aspects of farming, or he may see himself as a farm business analyst which requires not only technical knowledge, but also "economics" of the farm and the capacities and motivation who is able to stimulate and activate the interests of people about local, regional and national problems.

Agricultural officers should think through their roles and try to define them more clearly in terms of their long term effects as well as in terms of more immediate results. The officer should take into account local and national interests without being a captive of anyone. But he should know when to say "no" convincingly to demands made upon him in order to perform those functions which others cannot.

Public Relations

Extension Public Relations is doing good work in a way which develops in the public mind an appreciation for and a recognition of the program, "Public Relations is living right and getting credit for it", according to one writer.

Good Public Relations is a way of life. Moreover, it is a way of life for every member in extension work from the smallest farmer on up to and including the county agricultural officer. This implies that it is an everyday process that includes every concept of every individual in the system. There can be no acceptance of the term "General Public" for effective operation of an extension public relations program.

Examination of the public discloses that extension's public is not a simple group or mass of people, but instead it consists of many groups, a large number of which have an interest in common with extension, but in varying degrees of intensity. Special programs introduced to the field for effectiveness must be adjusted with a view to the characteristics of the ultimate target.

No program can be strong unless the staff responsible for its execution is composed of capable people. Farm people of today are much better educated than those of yesterday. They expect their county officers to know as much as, or more than they do about scientific agriculture and the best in home management. They also expect the agricultural officers to talk intelligently about public policy, because they know public policy affects agriculture.

Deep within each extension worker lies attitudes that brighten or dim relations with other people. These attitudes, if good, bolster the work; if poor, severely hamper success. The opinion of other people toward extension tends strongly to reflect the attitudes of members of its own staff toward their own organization and their work in it.

A reknowned statesman, once said: "Public sentiment is everything. With public sentiment nothing can fail; without it nothing can succeed; consequently he who molds public sentiment goes deeper than he who enacts statutes."

Questions and Comments to Stimulate Discussion

1. Do Liberian farmers perceive information about practices to be relevant to their situations?

2. In what ways can the Mass Communication system assist in extension work?

3. Would the reactivation of Vocational Agriculture in the secondary schools help the Agricultural Program?

4. Who should be preparing extension teaching material?

5. In what fields should extension workers be given specialized Training?

6. When should agricultural education be offered?

7. How can an agricultural educator contribute to the rural development of his country?

8. What is meant by education for development?

9. Are salaries for research workers in Liberia adequate to attract competent men and women? Extension workers? Professors?

10. Is training in research methods associated with most research projects?

11. Are the right research problems in Liberia being studied? How can the farmers' problems be made important research priorities?

Recommendations

1. Mass media channels, viz, newspapers, radio, TV, etc., should be available to Extension workers for two purposes; first reinforce direct teaching and second, to reach people not ordinarily available for face-to-face contacts.

2. Improvement must be made in county offices and facilities.

3. Regular refresher courses for field staff should be arranged.

4. After students have completed the agricultural schools and joined the government service as agricultural assistants, etc., it is suggested that they should receive an intensive on-the-job training.

5. Due to shortage of trained personnel and vehicles it will not be possible to make frequent direct contacts with the individual farmers in any certain locality. As a consequence groups of selected farmers should be chosen in various places of the locality and concentrated extension work should be carried out with them.

6. Opinion leaders should be identified and selected from the most experienced, progressive farmers and new farmers be brought into the training program.

7. A more efficient method of administering and staffing a program is by promoting a man in the job, not out of the job. This would absolve the practices that whenever a man is due for promotion, he must be assigned to another job. Or if he runs into a personality problem, etc., he is shifted.

8. The attrition rate of technically trained agriculturalist is rather high in Liberia. Poor conditions of service, "bush postings", low salaries, long hours, attraction to higher prestige positions, etc., all mitigate against keeping qualified and trained personnel in agriculture. This must be seriously examined and corrective actions taken.

THE ROLE OF TRAINING IN LIBERIAN AGRICULTURAL DEVELOPMENT

Clement Kemba Koha*

Introduction

The single most important resource that a nation has is its people. Before the change and increased productivity necessary for development will occur, the knowledge and skills of this most important resource must be improved. Any formal, organized method of bringing about this process we will call training.

One of, if not the, most important part of the Liberian economy is agriculture. This is true for a number of reasons. Agriculture is the only activity in the country which renews itself. It is a continuous, self-sustaining production of new goods. Properly conducted, it does not use up the soil but uses the sun, rain and soil nutrients to produce and yet leave the soil as rich or richer. Agriculture is also the activity which we in Liberia can be sure about in the future. It is the work where we have some of the greatest advantages.

Thus, I am concerned in this discussion with the most important economic sector in Liberia's future, the most important resource we have, and the necessary activity to bring about development. Agricultural training is critical but is not being given the attention it needs. I hope efforts such as this seminar will correct that.

Although my charge was to just consider training, I can not consider it in complete isolation. I must also discuss something of research and extension because they are so interrelated. I will leave the formal relationship to Professor Ampadu and trust you will understand that I am not straying from my topic but only presenting it as I believe it must be considered.

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Selected Historical Notes

Research

The establishment of the Central Agricultural Experiment Station in Suakoko, Bong County in the early fifties, marked the beginning of serious agricultural research in Liberia. By 1953, the Station was already in full swing with experienced agricultural experts from the United States of America at work. These experts from different agricultural and related disciplines conducted research in many branches of agriculture: Soil Science, Crop Science, Farm Management, Agricultural Engineering, Animal Science, among others.

For eleven consecutive years (1953-1964) intensive agricultural research continued at the Central Agricultural Experiment Station, Suakoko, Bong County. However, research discontinued in 1964 after the American experts returned home.

When Cuttington College was reopened in 1949 at Suakoko, Bong County, it offered among other degrees a B.Sc. in General Agriculture. Like other institutions of higher learning, the agricultural program at Cuttington College conducted research in several branches of agriculture: Soil Science, Animal Science, Agricultural Extension, Crop Science, etc.

Because of the short distance and cordial relationship that existed between Cuttington College and the Experiment Station, the agricultural students attended some classes and observed some of the experiments conducted at the Agricultural Experiment Station. Agricultural research was enriched both at Cuttington College and the Experiment Station because of the close coordinations and cooperation between the Institutions. However, the Agricultural program at Cuttington became the College of Agriculture at the University of Liberia in 1962.

Through hard research, scientists have developed two varieties of rice in Liberia. The Suakoko 8 (S-8) swamp rice and the LAC-23 upland rice. Both varieties grow and yield very well in this country. We are not aware of any contrary report from any where else.

Since their establishments in Liberia, rubber plantations are using both foreign and local research results to improve their yields. The Firestone Plantations Company has already developed high yielding clones over the years. It is not only the foreign companies which benefit from their research results, but some individual rubber farmers are now planting the high yielding varieties from the Firestone Plantations Company.

It is almost forty (40) years ago when agricultural program was established at Booker T. Washington Institute (BWI). This program has emphasized more training than research. However, research in animal science, crop science and farm management among others, have been conducted at BWI since it was established.

Training

The agricultural experts who worked at the Central Agricultural Experiment Station (1953-1964) not only conducted research, but some of them also taught agricultural courses at Cuttington College. This cordial relationship between the College and the Station enriched the agricultural program at Cuttington College during the time.

Although some agricultural classes were held at the Experiment Station and students made frequent observation tours to see the experiments, the agricultural program at Cuttington College had a very intensive training program. In addition to the classroom and other agricultural activities each student had to carry on an individual agricultural project. These projects were a necessary part of the agriculture degree program at Cuttington College. The projects were conducted under strict regulations and high agricultural standards. This rigorous agricultural training program was intended to prepare those who pass through this institution to be hard-working and independent citizens in the future. Graduates were to become assets and not liabilities to society. The agricultural training program at Cuttington College and the research work at the Central Agricultural Experiment Station were to complement each other for the benefit of the trainees.

While the agricultural program at the Cuttington College was the only degree granting agricultural program in Liberia at the time, the intermediate level agricultural training program was established at BWI. The BWI agricultural training program had both college preparatory and vocational components.

Therefore, BWI was a feeder Institution to the degree agricultural program at Cuttington College and provided both senior farm managers/supervisors and trained independent future farmers. The BWI agricultural training program served its purpose adequately.

Extension

Agricultural Extension Education as a necessary educational service to farm families was formally accepted by the Government of Liberia as integral part of the Ministry of Agriculture in 1960. The Extension Program was introduced by the Extension Services of the United States of America. Therefore, the Agricultural Extension Service of the Republic

of Liberia is patterned after that of the United States of America. For several years after its introduction, the Liberian Extension Services had American Advisors who worked along with their Liberian Counterparts. As per agreement between the Governments of Liberia and the United States of America, the extension advisors had to leave after a given period of time. This left Liberians alone in charge of the extension services.

Current Training Activities

Agricultural training in the country can be grouped into four:

1. Degree level training at the College of Agriculture and Forestry, University of Liberia.

2. Intermediate level training programs at:

   1) BWI (4 years and 2 years).

   2) R.D.I. (2 years).

   3) Youth Training Center - Bentol (1 1/2 years).

   4) WARDA - Rice Training (6 months).

   5) LOIC - Agriclture (1 1/2 years).

3. Annual Pre-service Staff Training at LCADP and BCADP 4-10 weeks at a time.

4. Farmer Workshop and Staff In-Service Training at LCADP and BCADP (1-3 days at a time).

Training is not so much the amount of knowledge that the trainee accumulates, as it is the change that training introduces in the behavior of the Trainee.

The four year Agricultural and Forestry Training Program at the University of Liberia is intended to equip the graduates with enough agricultural and forestry knowledge as to introduce a permanent agricultural and forestry behavior in him. By the same token, the above intermediate level training programs are intended to introduce a change in the behavior of the Trainees.

The Staff and Farmer Training programs at the LCADP and BCADP are in a different category because, they are under constant supervision. The behavior of the Staff and Farmer Trainees must change to conform to that of the Project requirements because a Project representative is in constant contact. However, training should change the behavior of the trainee after the training periods without constant contact.

Inorder to be more effective, agricultural extension agents must be trained, equipped, mobile and coordinated. All of these must be monitored constantly and kept up-to-date with periodic evaluation. The Extension Staff of LCADP and BCADP receive pre-service (introduction) training before they are employed and participate in the frequent in-service training programs as a constant on-the-job training.

Participants in Agricultural Development

The agricultural development of most nations is probably dependent on the proper coordination of the efforts of all personnel trained in agricultural sciences, agriculturally related businesses and more importantly the farmers among others. Liberia is no exception. Therefore, agricultural development of this nation is dependent on the proper coordination of the sincere efforts of all personnel trained in the agricultural sciences, the agriculturally related businesses and the farmers. The personnel trained in agricultural sciences include: Soil Scientists, Crop Scientists, Animal Scientists, Meteorologists, Extension and Rural Sociologists, among others. The agriculturally related businesses would include those in agricultural chemicals, agricultural implements, agricultural machinery and those involved in the storage and distribution of food and fiber.

Farmers are among the most important group of people who are directly involved in the agricultural development of most nations. In Liberia the farmers fall in the following groups:

1. Full-time farmers - including those who derive all of their livelihood from farming.

2. Part-time farmers - including those who derive part of their livelihood from farming. They may be teachers, carpenters, masons or tailors but also make farms for partial support.

3. The last group is the absentee farmers - these own farms but for some reason they do not operate the farms. The farms are operated by hired people. The livelihood of an absentee farmer may or may not come from the farm.

In Liberia a majority, if not all, of the consumer crops producers are illiterate farmers. In our opinion, the illiterate farmer with only the cutlass and knife in his hands, is not capable of feeding this country. It must take an educated or semi-educated and trained farmer plus small hand machines (like power tiller, etc.) to feed Liberia sufficiently first and later with a surplus.

Therefore, vocational agricultural institutions are a necessary prerequisite to the training of a very large and available manpower in the Liberian society today. There are many able-bodied youth, all over Liberia today who have nothing to do. They could be taken into institutions for useful training purposes. There are institutions already in operation which could be used for this program.

The Role of Training

While Research provides scientific solutions to specific agricultural problems, training prepares and continues to improve the quality of the researcher, of the extension personnel, of the farmer and all others involved in agricultural activities. On the other hand, extension incessantly carries to the farmer the scientific solutions provided by research in the language of the farmer and brings the problems of the farmer to research for scientific solution.

It is now obvious that without research, training and extension agricultural development is almost impossible. Research has proved that a swamp farmer can harvest two crops in his plot in one year. This was done at Gbedin in the early sixties and it is being done at the Foya swamps in the eighties. A trained, equipped, mobile and coordinated extension service can be effective in Liberia.

A systematic, constantly monitored and evaluated training program for farmers and extension personnel will, among other things, make farmers more productive and extension service more effective.

Training, however, is more than just the showing people new ways of doing things. It also introduces people to new ways of thinking. This is most important in problem solving. Where before a person might accept a situation as unchangable, as he sees new solutions to other problems, he begins believing his own problems may also have solutions. Change once instituted feeds upon itself and can bring about even greater change.

As new ways of thinking are accepted, then the younger students who enter school will question and solve problems better. With each generation, we will have better researchers, teachers and extension agents. When training as a necessary component of agricultural development plays its role effectively and incessantly, other things being equal, agriculture will develop in Liberia and make her a surplus producer in a few decades.

Recommendations

The following recommendations are made to strengthen agricultural training, and by adoption, research and extension,

so that they may play a more meaningful role in the development of Liberia:

1. That the Ministry of Agriculture should have a curriculum committee composed of trained personnel from the various branches of agriculture:

   1) Soil Science

   2) Crop Science

   3) Animal Science

   4) Farm Management

   5) Agriculture Engineering

   6) Meteorology

   7) Others
   to contribute the position of the Ministry of Agriculture on the degree and intermediate level training in Agriculture.

2. That the Curriculum Committee of the Ministry of Agriculture should work together with the Curriculum Committee of the University of Liberia (College of Agriculture and Forestry), Ministry of Education, Rural Development Institute (RDI), and the Youth Training Center in Bentol to determine the actual course contents of the degree and intermediate level programs in agricultural and related sciences.

3. That the Ministry of Agriculture take the lead in determining ways that the trained agriculturalists at CARI and any other branches of the Ministry become envolved in teaching at the various schools and in organizing in-service workshops. Our trained people need to be better used in developing the next generation.

4. That the practical component of the agricultural and related curriculum be considerably increased to allow the Liberian agricultural student to work more with his hands than he has done in the past.

5. That the National Extension Service conduct, annually, an induction (pre-service) training program for all newly employed persons at the service at each key location and a quarterly in-service training program for all employees.

6. That only trained persons (subject matter specialists - SMS) including agricultural extension educators, should

teach at the pre-service and in-service training programs.

7. That attendance at the in-service training program by staff (assistants and officers) be mandatory.

8. That the Ministry of Agriculture conducts annually an agricultural seminar early in the year for the key agricultural and related personnel to determine policies and make annual plans of work.

Extension

That the National Extension Service be trained, equipped, mobile, coordinated, and supervised:

1. All junior field assistants be high school graduates - preferrably from agricultural or related institutions.

2. All senior field assistants be RDI graduates or have many years (5 or more) of work experience in agricultural field work (not office).

3. All field officers be college graduates from agricultural or related institutions; or exceptionally good RDI graduates or equivalent.

4. That the Ministry of Agriculture creates a National Extension Coordination Committee composed of all the heads of the County Extension Service and Agriculture Managers of Projects; to make a periodic critical evaluation of the extension services and make recommendations to the Deputy Minister for Extension. At least two members of this committee should be on the Curriculum Committee.

Research

1. That there should be a Central Agricultural Library within the Ministry of Agriculture, possibly located at CARI.

   a) The Central Agricultural Library should have branches at the key locations throughout the country.

   b) Results of all agricultural and related research about Liberia done in or outside of Liberia by public and/or private institutions and individuals should be made available to the Central Agricultural Library.

   c) Reports of all agricultural and related projects should be made available to the Library.

d) The Central Agricultural Library should be well equipped, including facilities to provide copies of any document upon request.

2. That the Ministry of Agriculture create an Agricultural and Related Research Coordinating Committee composed of all agricultural and related sciences represented in the country to monitor agricultural and related research. At least two members of this Committee should be on the Curriculum Committee.

Conclusion

Research, Training and Extension have been part of the agricultural development of Liberia for a few decades. Apparently, however, their individual roles have not been so coordinated as to make a positive production impact on the Liberian agriculture.

Therefore, we must first strengthen our base by improving our training activities and then make the greatest use of our skills by coordinating the activities of those in these activities. We have very few resources. By working together instead of in separate services or schools, we can multiply our strength.

Also, we can not rely only on educating and training people who will become researchers or teachers. We must keep in mind our goal of development and our resources of many hard working people. With this in mind, the National Extension Services must be trained, equipped and made mobile to coordinate and make available the scientific agricultural solutions provided by research to the farmers of this country. Farmers and extension personnel must be continually trained in order to appreciate and practice the improved cultural practices that are necessary components of higher productivity.

The illiterate farmer, with only the cutlass and knife without proper training and improved working tools, cannot feed this country. It is necessary, therefore to make productive farming attractive to the untouched masses of the semi-educated youth of Liberia.

Agricultural Vocational Institutions should train the attracted youth to become productive in their communities. This training and ownership must never be done on communal basis. It will be a failure. However, it will succeed if it is done on individual effort and individual benefit basis.

An agriculturally trained, semi-educated farmer with small hand tools (power tiller, etc.) will triple his productivity and eventually feed Liberia. That, after all, is what we are really trying to do.

NECESSARY INTERRELATIONSHIPS BETWEEN AGRICULTURAL RESEARCH, EXTENSION AND TRAINING

Clement K. Ampadu*

Introduction

Liberian Agriculture like Agriculture in other African countries suffers from the following constraints, among others:

1. Low per capita income of farmers.
2. Low production of food crops and cash crops.
3. Population drift from rural to urban areas leaving behind an ageing farm labor force.
4. Inadequate facilities for processing and marketing of farm products.
5. Inadequate institutions to deal with farm supply procurement and distribution.

The solution to these problems rests on both an efficient transfer of modern technology to the farmer and the setting up of institutions to deal with the input distribution problem. The vehicle for carrying out these proposals is a well organized extension services. Extension officers must have something to extend to the farmers and what they extend must also come from years of research since they involve new ways of doing things. Additionally, as has often been said "the educator must himself be educated" and hence extension officers must have the necessary education.

It seems therefore that there exist some basic interrelationship between the three concepts: research, extension and education.

This paper discusses some of the issues involved. To be more specific the paper examines the necessary interrelationship between research, extension and education.

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Concepts and Definitions

This section of the paper briefly reviews the meaning of the three cpncepts. C.W. Chang has defined extension as "an informal out-of-school educational service for training and influencing farmers (and their families) to adopt improved practices in crop and livestock production, management, securing adoption of a particular improved practice, but with changing the outlook of the farmer to the point where he will be receptive to, and on his own initiative continuously see means of improving his farm business and home (Ref. 1).

Addison H. Maunder on the other hand broadly defines extension as "The extending of or a service or system which extends the educational advantages of an institution to persons unable to avail themselves of them in a normal manner (Ref. 2).

Applied narrowly extension according to Addison is "A service or system which assists farm people, through educational procedures, in improved farming methods and techniques, increasing production efficiency and income, bettering their levels of living and lifting the social and educational standards of rural life (Ref. 3). The three definitions given imply the following:

1. There exists rural farmers whose current farm practices need to be improved.

2. The basic approach is that of out of school educational services (informal).

3. The basic aim of extension is to change the farmers ways of doing things so that his current output can be increased and his level of living can be bettered.

Agricultural Extension is traditionally known to cover:

1. The distribution of improved seeds.

2. The use of fertilizers.

3. The application of pest control measures.

4. The use of improved farm implements.

5. Improved cultural methods.

6. Marketing.

7. Farm management.

8. Land use.

9. Home improvement (food and nutrition, home management, clothing, health).

10. Rural youth training (4-H, head, heart, hand, health).

Definition of Research

Rummed and Ballaine define research as "a careful inquiry or examination to discover new information, and to expand and to verify existing knowledge" (Ref. 4).

Agricultural research aims at finding out ways of solving some of the problems mentioned before. Among the areas covered are:

1. Plant/animal breeding, e.g., finding out new breeds whose yields are very high and finding out new varieties which are disease resistant.

2. Soils and fertilizers.

3. Pest and disease control.

Education involves the training of a team of persons of various levels of competence. Education is required for both the educator and the rural farmer.

A Brief Look at Extension, Research and Education in Liberian Agricultural Development

The Ministry of Agriculture through its Department of Regional Development and Extension is responsible for the three mentioned above. The main objectives of this department are:

1. To develop a mixed farming system that would tend to discourage the farmers from practicing shifting cultivation and adopt the more modern methods.

2. Encourage a diversified farming system in order to introduce the practice of adherence to a balanced diet.

3. Continue the establishment of home management programs at the district and village levels.

4. To assist in bringing the subsistence farmer to the money economy.

It will be interesting and useful to find out the extent to which these objectives have been achieved and identify the constraints.

The research component is carried out by the Central Agricultural Research Station (CARI). It is not too clear what role the Agricultural colleges are playing in terms of

research. The Ministry has county and district representatives. Extension covers:

1. Upland rice, swamp rice, tubers.

2. Vegetables.

3. Livestock (mainly poultry and swine).

4. Home economics and rural youth activities.
   Extension education is carried on both at home and abroad.

Since the effectiveness of any extension service depends on the ratio of farmers to extension officers, I present in the Table below an idea about this at the Ministry.

The figures indicate that extension in the form of contact is almost non-existent. According to the publication entitled: Production Estimates of Main Crops 1982 to 1984, 86% (145,340 out of 169,000) of farmers interviewed indicated that extension aids were not helpful. The advent of BCADP, LCADP, NCRDP and other projects have helped to improve the extension work in the counties greatly.

Interrelationships

It is logical that for agricultural development efforts to succeed there should be a link between the three concepts, extension, research and education.

Table 1. Measuring the Effectiveness of Extension at MOA

County	No. of Small Holder Farmers (Agric. Households) (a)	No. of Extension Technicians (b)	Ratio a - b
Montserrado	21,000	97	216
Grand Bassa	17,000	-	-
Cape Mount	6,700	-	-
Bong	29,600	85	348
Lofa	25,900	105	247
Nimba	36,400	228	160
Maryland/Kru Coast	9,100	21	433
Grand Gedeh	10,500	35	300
Sinoe	8,700	30	290

Source: Annual Report, Department of Regional Development and Extension, MOA - Production Estimates of Main Crops 1982 to 1984, page 15.

Bernor and Harrison have described the relationship between extension and research as follows "To remain effective, extension must be linked to a vigorous research program, well tuned to the needs of the farmers. Without a network of field trials upon which new recommendations can be based and without continuous feedback to research from the fields, the extension service will soon have nothing to offer to farmers and the research institutions will lose touch with the real problems farmers face" (Ref. 5). Biggs has suggested interrelationships at three different levels. These are:

1. At the International Level.

2. At the National Level.

3. At the Local Level (Ref. 6). I will build on these three points from the Liberian perspective inorder to reach some conclusions about what we need to do to strengthen the links between extension, research and education:

1. Interrelationships at the International Level

This will normally take the form of exchange of new findings between researchers in different countries. This will happen at international conferences.

2. Interrelationship at the National level

Here we can identify the following necessary interrelationships:

1) Between all the institutions involved in research, extension and training. All institutions that are doing agricultural research need to meet annually and find out what each is doing. Any duplication of efforts must be corrected at these meetings.

2) Between the ADPs and the research institutions. Each year the Monitoring and Evaluation Units of these ADPs do a lot of evaluation work on the projects. There should be a joint effort in this area. I am suggesting that the work program of the Social and Economic Analysis Section of CARI should also reflect what these M&E officers are doing. Annual meetings between the M&E officers and the Social and Economic Analyst should be encouraged.

3) Physical interrelationship. This involves the location of extension and research facilities. Chang has suggested that "Efficiency in the use of limited research resources calls for the establishment of a strong central research station in a country, at

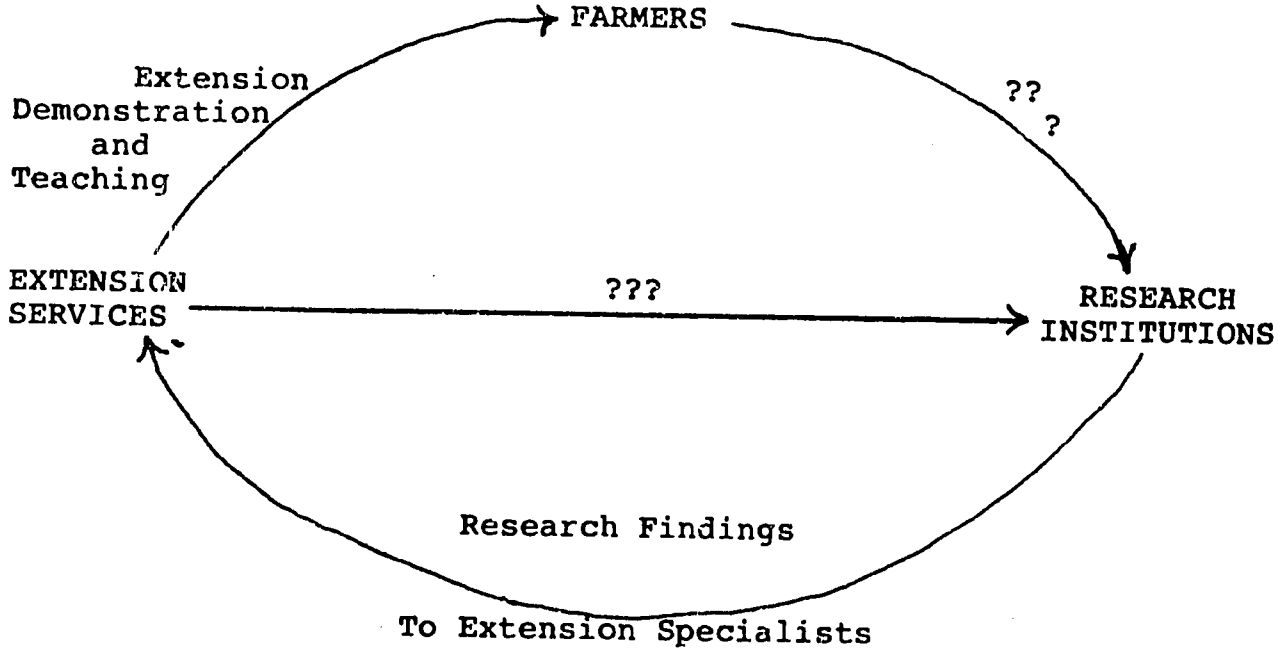
which scientists in various disciplines can work together as a team (Ref. 7). The location of CARI is very ideal because it is at the heart of the country and reduces transportation costs to other counties. However, well built regional extension centres must be set up with offices and facilities for training. It is also important that CARI continues to remain part of the MOA.

4) Interrelationship between policies. Here the problem is on policy thrust. What crops should extension and research concentrate on and how much thrust should be put on extension training and research? On the first issue I will simply say that the thrust should reflect the felt needs of the people and in line with Government's policy on self-sufficiency in food production. Baseline studies will normally give us an idea about which of the three to concentrate on. Infact there have been cases where agricultural development has occured without much laboratory research. Research must be relevant to our setting.

3. Interrelationship at the Local Level

1) Grassroots Interrelationships. At the local level the interrelationship will be between the farmer and the researcher or the research institutions. In most cases research results go from the researcher to the extension officer and then to the farmer. This relationship is shown in Figure 1.

Figure 1. Interrelationships Frequently Observed Between Research, Extension and Farmers.



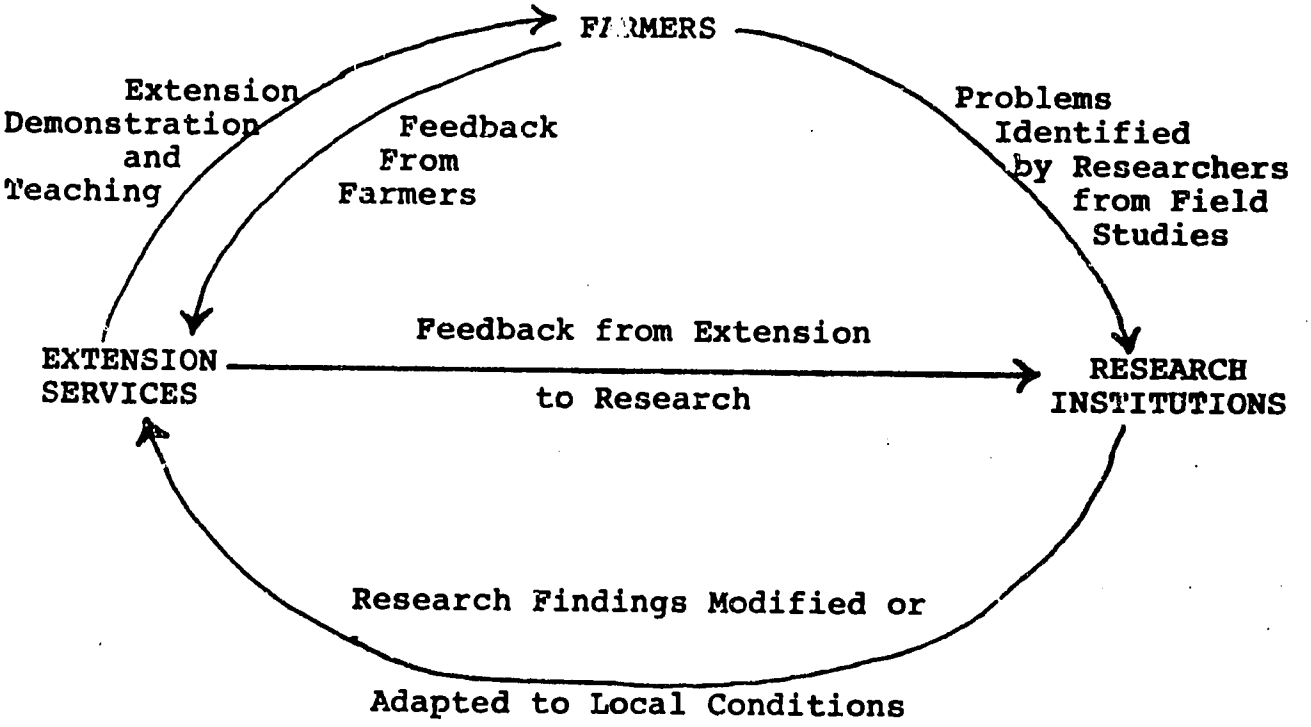
It is clear from Figure 1 that there is a gap between farmers and research institutions. The farmer is always at the receiving end. Infact, I have my doubts whether there is any interrelationship in Liberia between the extension officers and researchers. A logical question here is do these extension workers communicate the results of their contact with the farmer to the research institutions?

A necessary interrelationship will look like Figure 2.

In Figure 2 the farmer is fully involved. The decision as to what problems to research should be based on baseline information and the researchers work program should be based on this:

2) Another necessary interrelationship is between the farmer and the whole research extension program. This will involve the farmer who thereby becomes convinced of the extension or research potential. To elaborate on this concepts I will summarize a simple example given by Professor Idabacha from Ibadan University in Nigeria. He reported on technology transfer and the involvement of farmers. The aim of the transfer was to help the

Figure 2. Desired Relationahip Between Farmers, Extension Officers and Researchers.



farmer double or tripple existing yields of selected cereals including rice, maize, wheat, millet and sorghum. There were three steps in the transfer of this technology:

1. The Mini Kit Stage.

2. The Production Stage.

3. The Mass Adoption Stage.

At the minikit stage each farmer had 10 plots of land and each of 6 of these plots was planted with a different variety including the local variety while 4 plots were for different fertilizer observations. At the production kit level the farmer choose the best variety fertilizer combination from his minikit trial and planted this on a one tenth hectare land. The results of the production kit was to be made available to the masses for production. The results indicated that there was a dramatic decline in yields from the minikit to the production stage. This was due to the fall in the intensity of extension (Ref. 8).

The most important lesson to be learned here is the involvement of the farmer in the whole process.

Concluding Remarks

Extension does not only involve input distribution but teaching the farmer how to carry out proper cultural practices. In the three counties of Bong, Lofa and Nimba the extension work has been taken over by the ADPs. These projects, especially the first two represent 'shock' to the traditional system of farming. Up to now it is not too clear what the shocks have done to the system. I will therefore end my presentation by making the following recommendations:

1. A survey be launched in all these projects to assess the situation of Extension Service and its effect so far on the farmer. My hypothesis is that most of the farmers have returned to their old practices. This will be so with the old ones.

2. A national Committee be set up to start thinking about the future of Extension Services in these projects after these projects phase out.

3. A comprehensive evaluation be done to assess the MOA Extension work as it exists now. The result will form a guide which modifications can be made.

4. Annual meetings of researchers on problems of agricultural development need to be called to find out exactly what is going on. At these meetings, Extension personnel from all over the country can be invited. Major discussions will revolve around the relevance of ongoing research.

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THE STRENGTHS AND DIFFICULTIES ASSOCIATED WITH LIBERIAN AGRICULTURAL PARASTATALS

Emmanuel O. Akinselure
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Introduction

Poverty in the third world, of which Liberia is a part, continues to have significant and devastating impact on the people of that part of the world. The effect of this has compelled governments of such countries in no small way to adopt strategies and establish objectives directed at addressing the crucial issue of relief for Africa's suffering masses. Now more than ever there has been a redirection of emphasis from the urban dwellers to the once neglected rural population.

One measure adopted by the Government of Liberia in its overall strategy of national development is the use of parastatals (public corporations) as vehicles through which the needs of the people can be met.

This paper, therefore, discusses factors responsible for the creation of agricultural parastatals (public corporations), their strengths and associated difficulties and measures for improvement in their performance.

The Creation of State Owned Enterprises (Public Corporations)

Parastatals - public corporations (Ref. 1) as an organizational concept as well as a development strategy, although practised in other parts of the world, did not come into general use in Liberia reportedly until the 1960's probably around 1968. What is; however, known is that in the past, a few began as part of government ministries or bureaux. Its existence became widespread as government's role and involvement in activities once reserved for private sector expanded. The reasons for this will be discussed later.

What is interesting to note is that today the agricultural parastatals, (about 15 of them) are involved in activities

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directed at improvement in the standard of living of rural Liberia at levels never before experienced. These organizations play important roles as well as achieve worth-while objectives in the overall strategy of National Development.

The state owned enterprises have made steady gains in areas of the National Economy which, because of traditional or other reasons, have not attracted private investment.

Since we have introduced the concept "public corporations" and have also briefly stated its significance to our developmental aspirations, let us also state within the context of our discussion what a public corporation is.

A state owned enterprise (public corporation) by definition is an undertaking, a business entire established and owned partly or wholly by a state, local authority/government (Ref. 2).

This according to Mr. G.K. Kariithi, Permanent Secretary of Kenya in his paper: Government Control and Managerial Authority of Kenya Parastatals gave the following definition: "A parastatal (state owned enterprise) is a creature of the Government." Continuing, he states further, "that it is an embodiment of an expressed wish on the part of the government to create a new agency."

State owned enterprises (public corporations) have a legal personality separate from the government as well as the persons who carry out their affairs. This arrangement assumes that the corporations will achieve their objectives with minimun interference from external forces.

The creation of state owned enterprises (public corporations) can be said to be the result of several factors. These factors are:

1. Government's realization that goods and services could be produced/provided more efficiently under a business organization than under a government ministry.

2. The absence of private venture capital to establish operations to provide certain essential goods/services and the need for those goods and services meant that government itself had to establish such operations.

3. Maintenance of the security of the state through direct ownership of corporations providing essential services electricity, water, broadcasting, telephone/telex, and more recently petroleum refining. The latter reinforcing this need when the present refinery stopped its operations when a conflict developed between GOL and the owners (Sun Oil of California and Danaelectron).

4. The creation of these corporations also serves as a developmental strategy in the area of agriculture - thus the emergence of the National Palm Corporation (NPC), the Liberian Coffee and Cocoa Corporation (LCCC), and Decoris Oil Palm Corporation (DOPC), etc....

5. Through purchases of the equity of the partners in the cases of the Liberian Produce Marketing Corporation (LPMC) from the East Asiatic Company and the Liberia Petroleum Refining Company (LPRC) from the Bank of Liberia (now defunct through foreclosure - sale).

Although the factors listed gave a fair representation of the creation of state owned enterprises other areas which relate to their creation also need to be examined. These include the following:

1. The presence of the political dimension (Ref. 3) in the creation of state owned enterprises (public corporations) provides national assurance that the resources of the country will be under public control. The other aspect of the political dimension is that it provides a backdrop against which the efforts of Government are viewed as essential to national development. The political impact in this regard is considerable.

2. While the creation of state owned enterprises (public corporations) addresses the economics of the situation, there is the tendency to believe that the mere creation of the organization is the same as the achievement of the goals and objectives for which the creation is focused. Public corporations do not by their mere creation guarantee their success. There must be a conscious effort to bring into play those factors which are prerequisites for positive contribution to National Development.

3. The remaining dimension for the creation of state owned enterprises (public corporations) is a social one. Here the social dimension takes the form of the creation of opportunities for nationals to gain valuable and usable experience as well as secure for themselves participation in the economy of the country. This aspect of the social dimension is significant enough to have impact on the creation of a public corporation.

The many factors and dimensions involved in the creation of state owned enterprises (public corporations) should be considered as part of a whole system directed at the achievement of desirable goals and objectives. The tendency to put undue emphasis on any one of the dimensions at the expense of the others can be a cause for failure. In fact, this has

contributed to the inability of many of the enterprises to achieve the desired expectations.

Strengths of Agricultural State Owned Enterprises

The wide variety of reasons for establishing state owned enterprises, gave expression to the Government (Liberia) desire to achieve the twin objectives of growth and equity through:

1. Increase in the total National Income.

2. Improvement in the distribution of the National Income.

The realization of these objectives can be translated into a better standard of living for the masses of the people which in this case are the farm families of this Nation.

In its pursuit of economic as well as other goals, the Government continues to adopt measures useful for its purposes. In the agriculture sector, the Integrated Agricultural Development Project Approach and the State Owned Enterprises serve as channels through which development can occur.

These institutional arrangements have strengths useful for obtaining results especially linked to the following goals of the agricultural sector:

1. Increase participation of poor farm families in agricultural development.

2. Increase farmers' productivity and income.

3. Diversification of agricultural production.

4. An expansion of agriculture as a point of departure for self-sustaining development.

Therefore, the focus of the strengths of agricultural state owned enterprises is a significant point of departure for a number of reasons. This emphasis allows for:

1. The acceptance of state owned enterprises as contributors to the development of rural Liberia.

2. The need to utilize limited resources in such a way as to increase state owned enterprises' contributions to rural Liberia.

3. The development of programs and strategies directed at making state owned enterprises' contributions a reality.

The diverse nature of their operations and participation in activities specifically tailored to the needs of rural Liberia allow the agricultural state owned enterprises to occupy a unique position in the arena of national development.

In so far as the strengths of the agricultural state owned enterprises can be viewed as contributions, the following can be cited:

1. Introduced and developed better farming methods, especially in tree crops.

2. Improved standard of living of inhabitants of rural Liberia.

3. Provided market outlets for farm produce.

4. Employment creations.

5. Manpower development.

6. Regional development.

7. Provided increased income.

The state owned enterprises/parastatals involved are:

The Liberian Produce Marketing Corporation (LPMC)

Initiation of the distribution of farm inputs to rural farmers has made an impact on the farmers. The activities of this corporation has significantly contributed to improved farming methods with the result that productivity has increased.

LPMC also provides marketing outlets for farmers. The importance of this is that with access to markets for their produce, farmers receive income which serves to positively improve the standard of living of the farmers.

The Lofa County Agricultural Development Project (LCADP), The Bong County Agricultural Development Project (BCADP), and The Nimba County Rural Development Project (NCRDP)

These projects provide farm inputs to farmers. The standard of living of the farmers is improved through the construction of wells, latrines and other facilities. Information necessary for the well-being of the farm families continues to be disseminated by the projects. The project activities provide employment opportunities and income to the project areas.

Smallholder Rice Seed Project (SRSP)

The project produces improved rice seed for distribution to farmers. This provides the assurance of increased productivity/yield. The uniqueness of the project is the introduction of a systematic approach in the distribution of rice seed. This approach insures that:

1. Improved seed will be available to all farmers.

2. The high quality of the seed will be maintained.

The importance of the involvement of the agricultural state enterprises at this level is that it provides the opportunity for improvement in the agriculture sector, taking into account the fact that 70 percent of the labor force is employed in the agriculture sector.

National Palm Corporation (NPC), Decoris Oil Palm Corporation (DOPC), Butaw Oil Palm Company (BOPC) and the Liberian Coffee and Cocoa Corporation (LCCC)

These projects are all engaged in activities directed at improving the standard of living of the rural people. Specifically, these activities are directed at consolidating the Government of Liberia (GOL) oil palm holdings for better results and the development of nuclear estates and smallholders sector in oil palm, coconuts, coffee and cocoa.

Since poverty in Africa (Liberia included) is a situation which has a devastating effect on the rural inhabitants, raising the farmers' productivity and income offers relief.

There is convincing evidence to support the view that the strengths of the agricultural state owned enterprises have been instrumental in the achievement of the Government's goals for the agricultural sector.

Other agricultural state owned enterprises which share the strengths outlined include the following:

Forestry Development Authority (FDA)

Is charged with the responsibility of managing the forest resources of Liberia. This involves monitoring of logging concessions, conservation, reforestation and wildlife management. Through its activities, the Corporation insures that opportunities will continue to be available to rural Liberia.

Rubber Corporation of Liberia (RCL) formerly
Liberia Rubber Processing Corporation (LRPC)

Operates a processing facility in Gbarnga and buys rubber from mostly small rubber farmers. Its activities provide employment opportunities, income to small farmers and impetus to the economy of the area of its location.

The Liberia Rubber Development Unit (LRDU)

The project provides inputs such as fertilizers, rubber stumps and poly bags to farmers on a credit basis. It also provides in conjunction with ACDB, a revolving credit fund to assist farmers in replanting or rehabilitating their farms.

The objectives of this project is to increase rubber export earnings and improve the income and welfare of small and medium sized farmers.

The Central Agricultural Research Institute (CARI)

The Institute conducts national research programs in areas such as crop science, animal science, fisheries and food technology. It is geared towards developing technical crop and livestock production packages that allow the subsistence farmers to earn an adequate income from farming both by assisting them increase their farm size and also by increasing productivity per acre. These packages are further introduced to the farmers by the Agricultural Development Projects (ADP's) thru their extension agents.

The Agricultural and Cooperative Development Bank (ACDB)

As development projects continue their growth in the country, ACDB was established to finance the production and distribution of agricultural activities. In carrying out such activities, it provides:

1. Credit for development and training in the agricultural economy.

2. Technical assistance to individual farmers and farmers' organizations, such as cooperatives.

3. Research on agricultural credit and marketing of agricultural projects.

ACDB has also established a Branch Credit Network System in the rural areas (which account for the highest proportion of agricultural activities) to provide the needed banking facilities.

In addition to the strengths outlined, easy access to funds from international financial institutions for development purposes and short-term credit facilities provide management of the enterprises adequate operational funding. There are, however, some serious drawbacks to this type of financing, especially where counterpart funding may be required from the Government.

Although the state owned enterprises' arrangement provides some degree of effectiveness as a measure for achieving certain goals, there are also associated difficulties which must be addressed in order to avert deterioration of the system.

Difficulties Associated with Agricultural State Owned Enterprises

In an era when governments of the developing countries (Liberia included) must deal with the problems associated with poverty and slow economic growth, it is necessary to establish a strong linkage between performance and potential in such a way that the Government plays a strong part. In this way the shortcomings and difficulties of the state owned enterprises associated with the agriculture sector can be resolved.

The difficulties associated with the agricultural state owned enterprises are numerous, therefore, no attempt will be made to list them and ad infinitum. For the purposes of this paper, the concern will be on the main areas of difficulties.

The followings are, therefore, the focal points:

1. Since the agricultural parastatals rely on financing from the Government, any constraints faced by Government is usually passed on to the parastatals. The parastatals, therefore, encounter serious difficulties when Government is unable to provide its counterpart funding.

2. The adoption of investments program that exceed financial and managerial capacity is a serious difficulty. The effect of this is that implementation schedules are often interrupted. It seems appropriate under the circumstances to start fewer new projects.

3. The failure to minimize cost is a serious problem which affects the efficiency of state owned enterprises. It is, therefore, necessary for Government to take measures that minimize economic costs to achieve desired goals.

4. The failure to adjust objectives and reorder priorities consistent with changing situations.

The difficulties are also shown in the following situations where:

1. New methods without sufficiently proven track records are accepted for implementation. An example of this is the establishment of the Liberian Coffee and Cocoa Corporation (LCCC); hence certain assumptions about the size of farm families, farming practices and motivational aspects where wrong. The project eventually suffered as a result. Failure to critically evaluate/assess studies intended for implementation to ascertain suitability with local conditions such that undue hardships do not result or failure guaranteed. Again a case in point is the LCCC - when study focused size of farm families as success factor when in fact size of farm family has a much smaller impact than study indicated; this definitional difficulty resulted in a project size much too large to suit local conditions. The result was that projected targets were not achieved. Farms were abandoned, farmers became disappointed and reluctant to take Government seriously. Resources were wasted that may otherwise have been deployed in much more productive areas.

2. Management difficulties: The problem manifest itself in several ways: Firstly, the wrong personnel are selected for senior management positions; such individuals often lack the requisite experience and show some degree of reluctance to be subjected to training opportunities. There is usually reluctance on the part of management to take initiatives which could improve the performance of the enterprises. A further manifestation of management difficulties is the practice of management's use of the enterprise to protect its position through political posturing often to the detriment of the enterprise.

   Management of the enterprises also resist certain goals because it is difficult to measure their performance. Conflicting and ill-defined objectives together with the reluctance of some of the Boards as well as other policy-making bodies to critically assess the performance of management make it easy to adopt practices not in the best interest of the enterprise.

   The resorting to the "don't rock the boat attitude" contributes to management difficulties such that changes which affect any powerful group are avoided. Redundant workers are not dismissed and staff are not disciplined for misbehavior.

   Management's feeling that it is the trustees of national interest, strong linkage to the Mansion as a means of by-passing Board's decisions or simply intimidating

policy-making bodies and use of the press to influence decisions continue to adversely affect state owned enterprises.

On the basis of the need to achieve results from the state owned enterprises consistent with national objectives and aspirations, concrete measures should be considered to insure improved performance of the enterprises and minimization of the difficulties outlined.

The following recommendations/measures are, therefore, made:

Recommendations for Improved Performance and Mobilization of Difficulties

Since economic progress in any society requires that resources be used efficiently by organizations in both the public and private sectors - emphasis being placed on the public sector for the purposes of this paper, especially in attaining the ultimate goal of a strong state and economy - the following measures are being advanced and directed at some improvement in performance of the state owned enterprises:

1. Clear definition of objectives and terms of reference must be made.

2. An incentive system conducive to efficient performance should be introduced.

3. A clear understanding between Government and the state owned enterprises defining the annual financial and production plans within the framework of agreed long-term objectives should be established.

4. The "contract plan" should be introduced. This consists of performance contracting between the Government and an individual public corporation. The contract is a negotiated agreement between the Government and a state owned enterprise describing the objectives Government assigns to the public corporations as well as the resources it will provide and the degree of control which it will exercise. The state owned enterprise in turn promises certain results; in other words, performance is to be judged by mutually accepted indicators over a period of time.

   The state owned enterprise contract allows political choices to be made in full awareness of thier costs.

5. Management independence in day-to-day operations should continue.

6. Independent personnel management should be a definite policy.

7. The principle that under certain circumstances liquidation of a state owned enterprise may be a reasonable alternative should be recognized.

8. The introduction of effective corporate planning - the five-year plan should be pursued.

9. A comprehensive audit should be carried out during which the process of objective appraisal is extended to all aspects of management. This will include an examination and appraisal of the soundness of pursuing certain objectives and methods used to obtain them; the efficiency of performance as measured by the benefits received and the resources utilized should also be determined.

10. Boards of Directors and Policy-Making Bodies should become more aware of their role and responsibility; they should adopt a more critical approach in assessing or evaluating the performance of the state owned enterprises.

11. That existing link between agricultural extension and research at CARI must be strengthened as early as possible to benefit farmers and obtain feedback from such farmers.

It should be noted that reform of state owned enterprises not only improves performance and contribution, but has a far-reaching developmental significance.

Since improved performance in the state owned enterprise sector is an important point of departure for faster growth and increased access to goods and services, serious attention ought to be given the situation by the Government.

A major reform program that should be introduced is an effective centralized system of control. This will substantially minimize the incidence of the plural principals - numerous bodies issuing conflicting directives and objectives to the state owned enterprises.

Finally, measures directed at improved performance of state owned enterprises are not simply increasing resources available to Government in the short-term - important as this is - it is far more fundamentally involving the whole question of long-term growth prospects.

Conclusion

In this paper, we have stated factors responsible for the creation of state owned enterprises. Their strengths and difficulties have been noted.

Against this and other backgrounds, the above measures have been proposed for improved performance of the state owned enterprises.

References

1. State owned enterprises, public corporations and parastatals will be used interchangeably in this paper.

2. See Encyclopedia Britanica, Volume 18, 14th Edition, published by Encyclopedia, Inc. 1973.

3. Public Enterprises in Developing Countries, Garth Glentworth, Makerere Institute of Social Research, May, 1978.

SUMMARY OF THE FOURTH DAY
FRIDAY, MARCH 29, 1985

The small groups organized themselves in independent work sessions. They had done some work the previous evening and they continued working on their individual assignments until the mid-morning break. The membership of the four groups and their assigned questions follow:

Group I - National Rice Policy Issues

Mr.	Milton Forkpa	Chairman
Mr.	Harrington Cummings	Secretary
Mr.	Boima Rogers	Member
Mrs.	Rudene Wilkins	Member
Mr.	Joseph Musah	Member
Ms.	Zoe Norman	Member
Mr.	Peter Quoie	Member

Assigned Questions

1. What kind of price policy should be pursued for rice, coffee, cocoa, rubber, and oil palm?

   a) Should markets for Liberian produced rice be privatized? If not, what should be LPMC's role in marketing and the control of prices?

   b) Should tree crop inputs (e.g., fertilizers, seedlings, etc.) be subsidized and/or exports taxed?

2. For food security, should the Government of Liberia (GOL) hold a rice security reserve fund or reserve stocks?

3. Assume the GOL has $5 million of new money to allocate to agriculture each year for the foreseeable future. How would you allocate such funds among the many possible areas such as price supports, research and extension, credit, food reserves, and so forth?

4. Assume the GOL receives $5 million from donor agencies for the establishment of one agricultural development project for a three year period. What kind of project would you recommend and why?

Group II - Input Supply and Credit Issues

Mr. Roland Toweh	Chairman
Mr. Jerry Mason	Secretary
Mr. Arthur Gedeo	Member
Mr. Joseph Famolu	Member
Dr. J. Chris Toe	Member
Mr. John Dorliae	Member

Assigned Questions

1. What problems do you believe are preventing an adequate and sufficient supply of production inputs reaching Liberian farmers? How would you solve these problems?

2. It is widely believed that farmers must have assistance in the form of financial credit if they are to change from traditional farming methods to commercial enterprises. Identify the principal problems associated with the current agricultural credit system and recommend solutions.

3. Assume the GOL has $5 million of new money to allocate to agriculture each year for the foreseeable future. How would you allocate such funds among the many possible areas such as price supports, research and extension, credit, food reserves, and so forth?

4. Assume the GOL receives $5 million from donor agencies for the establishment of one agricultural development project for a three year period. What kind of project would you recommend and why?

Group III - Land Tenure, Research, Training and Extension

Mr. Eric Eastman	Chairman
Dr. Joseph Subah	Secretary
Mr. Clement Ampadu	Member
Mr. Huburn Edwards	Member
Mr. Simeon Moribah	Member
Mr. MacArthur Pay-Bayee	Member

Assigned Questions

1. Which enterprises (crops as well as livestock and poultry) should be emphasized in public research and extension? List priorities.

2. What areas of research need to be strengthened in the immediate future?

3. What changes, if any, should be made in Liberia's land tenure policies?

4. How can the extension activities of the MOA be made more effective? What needs to be done with regards to developing extension teaching materials.

5. Enrollment in the College of Agriculture and Forestry is declining. Are we training enough agriculturalists? Is the training appropriate for Liberia? What should be the relationship between UL and RDI? Between CARI, the universities, and the extension service?

6. Assume the GOL has $5 million of new money to allocate to agriculture each year for the foreseeable future. How would you allocate such funds among the many possible areas such as price supports, research and extension, credit, food reserves, and so forth?

7. Assume the GOL receives $5 million from donor agencies for the establishment of one agricultural development project for a three year period. What kind of project would you recommend and why?

Group IV - Parastatals, Cooperatives, and Agricultural Investment Strategy

Mr. Melvin Thornes	Chairman
Mr. R. Mando Momoh	Secretary
Mr. Emmanuel Akinselure	Member
Mr. James Mehn	Member
Mr. George Borbor	Member
Mr. Victor Yates	Member
Mr. Hilary Gbunblee	Member

Assigned Questions

1. Should the number of agricultural parastatals be such that consistent funding could be maintained for those retained? If so, how would you determine which parastatals should be funded? But if not, how can consistent funding be provided to all current parastatals organizations?

2. What measures should be taken to speed up the financial viability of parastatals so as to reduce their dependence on GOL and external funding?

3. What defines a favorable situation for Liberian cooperatives to exist in? How can farmer participation be encouraged? What activities should they be involved in, as opposed to other alternative arrangements.

4. Assume the GOL has $5 million of new money to allocate to agriculture each year for the foreseeable future. How would you allocate such funds among the many

possible areas such as price supports, research and extension, credit, food reserves, and so forth?

5. Assume the GOL receives $5 million from donor agencies for the establishment of one agricultural development project for a three year period. What kind of project would you recommend and why?

Each group chose a spokesman who presented a summation of the groups decisions to the rest of the seminar participants. Open discussion followed. The secretary for each group was responsible for preparing a written summary of the groups decisions. These are presented on the following pages together with a set of notes taken by other assigned individuals of the open discussion following each report.

Closing remarks were made by several participants in the Seminar. Among those speaking and a summation of their remarks are as follows:

Minister James Mehn (MOA) - Concluded this section at the end of the Seminar with words of thanks to everyone for coming and participating in the seminar.

Mr. MacArthur Pay-Bayee (MOA) - Also thanked the participants and presenters for putting aside their very busy schedules and coming. He hoped that many and other resources will be available so that the seminar will continue probably on a yearly basis.

Honourable Victor L. Yates (INA) - It is an honor for us to participate in this important seminar in order to understand the existing problems in agriculture deliberated under free expressions of opinions in the interest of development of our one nation. It is our audent hope that we can make and/or encourage laws to enhance these situations. We want to congratulate the organizers of this seminar and hope this will not be the end of such a magnanimous effort.

Minister Peter D. Youn (MOA) - I want to first of all thank and recognize the agencies and individual participants in this seminar including the University of Liberia, Cuttington University College, Agricultural and Cooperative Development Bank, the ADP's, Ministry of Finance, National Palm Corporation, Smallholder Project, Honourable Yates and Ms. Zoe Norman of the Interim National Assembly (INA, RL), the Director General of the Bureau of State Enterprises, USAID, and LAMCO Management as well as all others whose names I may have overlooked not because they are insignificant. After yestersay's unexpected change, one of the things that occured to us was that once this seminar was organized with the people of Liberia at heart, we will succeed in gathering the kind of responses we desire considering the composition of the group.

Hence, the seminar became like a legacy and the spirit continued as from the beginning until this moment of closing.

Let me extend thanks and appreciations to all once again on behalf of the Ministry of Agriculture staff who organized the Seminar - Mrs. Wilkins, Dr. Chris Toe, Minister Moribah, and Mr. Pay-Bayee as well as Dr. Edwards and Minister Mehn. These people and of course the Ministry of Agriculture in general, could have done all the preparations, but in the absence of the other agencies and you individual participants, little or nothing would have been achieved. We at the Ministry of Agriculture have come to believe that it is not just how you perform a job that counts, but rather how well you perform it. This is indicative of the level of performance exhibited by the seminar Organizing Committee of which we are very proud.

I want to extend more thanks to the USAID and the Oklahoma State University for both financial and technical assistance for this seminar. These are our partners in progress with whom we will remain committed in our overall development efforts.

I thank you all for attending and actively participating in the Seminar to its end. While this is the end of the Seminar, it is not the end of our work. We must continue the spirit we found here and go out to finish the work we have started.

Mr. MacArthur Pay-Bayee, Chairman of the Seminar Committee announced that the activities would close with a final luncheon.

NATIONAL RICE POLICY ISSUES

Group I

Report of Workgroup I

1. The rice price support system should depend on the actual cost of production to farmers from which a suitable selling price could be set. A Committee comprising of MOA, Commerce and LPMC should be set up to determine cost of production and propose exactly how a selling price for paddy should be derived.

2. Rice Handling: The Government of Liberia should continue to encourage the cooperatives to handle a greater proportion of paddy rice. However, in the interim, LPMC should also continue to accept rice from existing private sources/agents within an expanded network. In the long run, LPMC should eliminate those private sources/agents and eliminate transportation allowances. These should be replaced by the the establishment of purchasing centers with varying weekly/monthly schedules to which farmers can bring their produce and sell directly to LPMC so that they can get a relatively higher share of the market.

3. Prices of Coffee, Rubber and Palm Oil: In the cases of these (cash) crops whose prices are governed by the international market, they should be left to follow such trend. However, Government should establish some link with these international markets (possibly in the form of a secretariat/s) that will gather price and other data from these markets and determine our farmers' share of the market. This is in line with our findings that at times when there is a general increase in the prices of these products in the international market, our farmers do not realize any commendable increase in their prices as well. Our farmers tend to feel price fall in the world market more than price rise and if there is ever a rise it is delayed. Maybe farmers can be made to delay the sales of the produce just a little longer for seasonal crops and sell when there is less of the crop, especially for those crops for which there is no international quote.

4. Tax Exemption: The group suggested that tax exemption and credit facilities for tree crop inputs should be continued. Moreover, GOL, through those agencies directly linked with these operation, especially credit

facilities, should improve conditions and requirements necessary for receiving these credits so that more small farmers can benefit from the program.

5. Rice Stock: Being mindful of food security and the countries' level of dependence on imported rice, the group suggested that the Ministry of Commerce, LPMC and the other responsible members of the Rice Committee should always make sure that there is in stock a minimum of three month supply of rice. The Rice Committee should also continue to monitor the inflows and the stock of rice so as not to allow more than a six month supply of rice into the country to create another glut on the market. This might take the form of a restriction on the tonnage of rice an importer can bring into the country as well as time limit during which such rice can be brought in. It should be recommended that a tender system be implemented for imported rice to allow government to receive maximum tax and differentise benefits.

6. On the general question of a grant of five million dollars to be invested in agriculture, the groups' concensus was that the money be used to strengthen or re-establish the Extension wing of the Ministry of Agriculture and to expand the research capability of CARI with emphasis on food crops. The group also felt that research at CARI has produced a considerable amount of information that could be useful to farmers. Such information should be made into easily understandable articles for the Extension Division and disseminated to farmers once this unit is strengthened. Such effort would definitely call for some level of cooperation between MOA and CARI probably to the level of the establishment of a coordinating office linking these two activities, and the recently established Liberia Rural Communications Network (LRCN).

7. After much discussion, the group felt that if it was to recommend a single agricultural project to be implemented within three months with a five million dollars grant to have a lasting effect, it would strongly recommend an agricultural commodity processing facility. Such facility (or the choice of) would depend on the MOA, but should be located in a central point where the commodity(ies) can easily be reached or better-still where the item is produced in large quantities.

Notes of the General Discussion

What kind of price policy should be adopted for rice? That there should be a price support for rice funded from an annual budgetary allotment.

The prices for cocoa and coffee should be left with the forces of supply and demand. However, since LPMC has a monopoly over the purchase and sales of these cash crops, it should allocate some of its profits to the benefit of (local) farmers. One example of this would be the institution of commodity grading and quality control programs. This could increase the overall value of the crops as well as provide incentives and rewards to farmers doing better jobs. Another example would be the establishment of local purchasing stations of a temporary or mobile type to cut farmers transportation costs.

Should tree crop inputs be subsidized? That tax exemption on these crops should be continued and more credits be extended to tree crop farmers. Beside this, there should be no other subsidy for tree crop farmers, even though Government should continue to put emphasis on the export crops in view of their contribution to the Government revenue.

The Rice Committee should continue to monitor the rice security policy (making sure that adequate supply of rice exists on the Liberian market). In addition, it should make some efforts to incourage importers to bring in quality rice, i.e., rice brought into the country should be on par with the American long-grain parboiled rice if all of these rice types should be sold at the Government ceiling price of 24 cents/pound.

Government should also continue to encourage local rice producers in accordance with the issue of rice security.

Government should continue to encourage local rice producers to produce more rice, and should continue to support the Rice Committee and the LPMC to create markets for the rice by limiting the import of commercial rice.

INUPT SUPPLY AND CREDIT ISSUES

Group II

Report of Workgroup II

INPUT SUPPLY: Group II had the responsibility of looking at issues surrounding the agricultural inputs (materials, chemicals and so forth) brought into the country by merchants and other dealers, and the existing delivery system. The general concensus of the group was that the following formed the core of shortage of these inputs:

1. Inavailability of farm inputs.

2. Inaccessibility of farm inputs to farmers.

3. A weak distrubution system and weak marketing outlets for delivery inputs to needy areas.

4. A general lack of awareness on the part of farmers.

5. A general lack of control over the quality of inputs brought into the country.

To minimize some of these problems the group discussed numerous alternatives in length. The aim was to arrive at those discussions that are feasible and applicable to our particular situation vis-a-vis current contributions. In the final analysis, the solution or suggestions the group arrived at included the followings:

1. Availability: If the item is one that has already been introduced to farmers, the question to begin with is, whether the item is obtainable in the immediate locality of the farmer. The group felt that it is not the case, Nationally or on the farm level even though some efforts in the past had educated farmers to understanding the use of these inputs. Consequently, the little that is available is found only in Monrovia and selected regions farther away from the farmer. In order to obtain such scarce inputs, the farmer must travel many miles to Monrovia or elsewhere, purchase the items at a relatively high price and transport it to his site. Additionally, while he may realize a higher yield from using these inputs, the general absence of a versatile market to easily absorb his produce discourages the producer.

2. The group suggested that selected agencies should be charged with the responsibility of assembling these inputs and making some available to farmers. These agencies should include ACDB, LPMC, Smallholder (SRSP), and small local groups, probably in decending order; that is ACDB provides the funds, LPMC imports the materials, CDA and Smallholders distribute to the cooperatives and small local groups and then the group can sell or distribute to individual producer or production units. The use of SRSP and CDA will ease the problem of distribution as these organizations already have the necessary systems. By the same token, the MOA Extension Services could be very helpful provided that there was a considerable level of support for the unit.

3. Farmers Awareness: The present level of understanding of traditional farmers regarding the use and benefits of these inputs is almost zero in some areas. Therefore, the group recommended that an elaborate farmer education program be launched on radio and television in the local dialects, accompanied by town/village meetings, field days and other community education programs. The Extension wing of the Ministry should, in collaboration with WARDA, CARI, CDA and other such groups, take lead in these exercises.

4. Pricing: The prices of these inputs should reflect import cost (i.e., FOB, storage cost, transportation cost), and a given percentage mark-up to cover the costs of distribution. Such mark-up should be such that the product will be affordable to the farmer.

5. Quality Control: The Bureau of Regulatory Services in the Ministry of Agriculture in collaboration with the Ministries of Commerce and Health should serve as the regulatory body for which CARI should play the part of support by analyzing the chemicals brought in by importers to make sure that they are not hazardeous to human health. The body should review requests sent in by importers regarding types, quality, and uses of these chemicals. These functions should continue even after the recommendation above takes effect, mainly in the interest of the farmers and the environment.

CREDIT ISSUES: The problems associated with obtaining credits by farmers are numerous. The group enumerated several of these problems but in the final analysis, narrowed it down to four items which are:

1. The problem of distribution.

2. The imposed interest rate and other associated fees.

3. Eligibility and security requirements.

4. Repayment schedules and supervisions (farmers performance).

Following are the conclusions and recommendations agreed upon:

1. ACDB, the largest agricultural credit agency, has to establish a system with set requirements for credit eligibility. This system should be supervised such that farmers meeting said requirements would be granted the requested loan.

2. CDA, the coordinating body of the various cooperatives within the country, has in the past been poorly managed. Therefore, most farmers have not been fully acquainted with the functions of a cooperative and also the credit facilities that should have been available to them.

3. LPMC, being the buyer of farmers crops, creates a problem through their purchasing procedures and their limited number of agents. It is suggested that LPMC should cooperate with both ACDB and CDA in the collection of credit funds through a deduction scheme carried out by the LPMC agents at the time of its purchase.

4. The level of interest rate and fees required by ACDB and the various cooperatives appears to be acceptable by the farmers. It was however, suggested that the ACDB bank seek soft loans from international or national institutions so as to increase the number of farmers receiving credit.

5. An eligibility and security requirement package should be compiled with reference to the various crops or farming activities for which funds are needed: a) for annual crops, the requirements should be a tribal certificate or squarter's right; and b) tree crops requirement should be a tribal certificate and/or a deed.

6. Repayment performance for both the Bank and cooperatives has not been positive. It was therefore stressed that the need for a highly supervised system be established for both agencies and, that strict measures are applied in the collection of payments.

Notes of the General Discussion

Group two was responsible for questions pertaining to input supply and credit issues. The issues of importance discussed under this heading are summarized here.

With regards to availability of farm inputs, it was discussed that Government establish or strengthen an already existing national agency to handle this problem. This agency should also be responsible for making sure that prices of these commodities are in the range of the farmers' purchasing power.

Relating to the question of distribution outlets and marketing of output, it was suggested that a procurement agency (CDA or SRSP) be developed or charged with such responsibility while LPMC continues to be the agency for purchasing farmers' produce. The extension services could work with either of the support (procurement) agencies in helping farmers' develop awareness for as well as making the inputs available to them.

Regarding the issue of pricing, the group also discussed that commodity prices be raised to such a level that will make the farmers' operation profitable in order to encourage the production of the particular commodity.

Another issue raised during this time was the issue of quality control in the face of farmers' continuous complaints that seeds, fertilizers, feeds and other agricultur inputs brought into the country by commercial traders are of low quality, some may even be hazardeous, and for which prices have been unnecessarily high. In this connection, it was suggested that agencies such as the MOA (through its Bureau of Regulatory Services), MOCIT and CARI (on a technical level) develop some means of regulating the type of inputs brought into the country. CARI should eventually assume the responsibility of testing the chemicals for their chemical contents, seeds for their germination rates, feeds for the protein contents, etc.

A general discussion was held about credit in terms of its availability to needy farmers, collateral requirements, interest rate and other eligibility requirements. The argument that most small farmers do not have the kind of collateral required by ACDB was raised, but ACDB remind the group of the low rate of payback, and of the high reserve requirement imposed by the National Bank (of about 15%). The interest rate of 12% for loans was said to be alright, but some query was made into the possibility of a soft loan for farmers. It was discussed in connection with such a query that, while there is a definite need for such a loan, present financial situations cannot permit it.

On the question of eligibility and security, it was disclosed that these are dependent on the type of crops. For instance, in the case of tree crops, a certified deed or equivalet could serve as requirement.

This group did not think that tree crops should be subsidized.

The group suggested that the $5 million for investing in agriculture should be put in the ACDB at an interest of 10% so that the Bank can make it available to farmers at 12%. Additionally, the ACDB should open more branches around the country to cater to farmers' needs.

Of the other $5 million, $2 million should be spent on research and extension, two million dollars on farm input supply, and one million dollars on price support programs.

The group also felt that CARI should be concentrating more on adaptive research.

Issues arising from this group's answers included, among other things, ACDB's branches not being established and unable to handle the needs of farmers. There was no consensus about whether the benefits of such establishment would exceed the costs.

A discussion was also conducted in connection with the level of efforts being made by ACDB to mobilize and encourage rural savings and not just lending money.

LAND TENURE AND RESEARCH, EXTENSION AND TRAINING

Group III

Report of Workgroup III

Our group was charged with answering questions concerning land tenure, research and extension, and training. Like all other groups, however, they were not restricted to the written questions or only those particular topics.

RESEARCH PRIORITIES: The following areas were identified by the group as areas of immediate concern for agricultural research:

1. Crops

   a) Tree crops: Under tree crops, the areas of concern are coffee, cocoa, oil palm and rubber.

   b) Rice: Both upland and swamp.

   c) Field Crops: The specific crops under this heading as recommended are roots and tubers, vegetables, oilseed/purse crops such as peanuts, and others like legumes.

2. Farming System (Production System): In this area, the group concluded that emphasis be placed on socio-economic research as well as a study and recommendation of a viable cropping pattern(s) in the light of growing population faced with fixed land resource which has infact, not been identified in terms of their respective production capabilities.

3. Soil and Water Management: The discussion was concluded that a soil classification is necessary (overtime); this reasoning falls in line with point (2) above. This study will determine the degree of fertility as well as the need and level of conservation for a particular locality. In addition to this, an agronomical study should be conducted to determine the various available waters, levels of rainfalls in each cropping region around the country, etc. The latter are essential in determining cropping patterns in Liberia.

4. Animal Production: The major thrust of this recommendation is the need for the improvement of livestock, especially cattle, goats, sheep, poultry,

and swine. Research in this area should also include fish culture and the production of feeds for some of these animals. Some attempts have already been made in most of these directions, for instance CARI's goats, swine, poultry and cattle projects are currently ongoing. CARI has also experimented with various combinations of animal feeds from cassava to rubber seeds. However, these efforts need to be intensified with a very strong support from GOL.

5. Post-harvest Technology: For post-harvest research the key emphasis should be placed on processing, storage, marketing and gathering of marketing information, and the general area of food technology. The FAO "Post-harvest Technology Project" which has been an ongoing part of CARI's annual planned programmes should not be neglected as FAO withdraws its commitment at the end of the project's life.

6. Annual Meeting: All persons involved in one way or the other in Agricultural Research should meet at least once a year to discuss their individual or collective findings, formulate research plans of action, designate responsibilities where necessary, formulate catalogues of research findings, etc.

7. Improvement and Development of Small Hand Tools and Implements: That the traditional farmer cannot improve his production in the absence of an effort to keep up with technological advances is clear. Hence, Liberian agricultural research should study ways by which farm tools can be improved and easily adopted. A quick solution may not be easily acceptable most especially if findings are complicated and require a deviation from traditional practices - what is termed as "adaptive," should be emphasized.

LAND TENURE: On the topic of "Land Tenure", this group considers the following as areas which need some plan of action by the GOL:

1. Reactivition of the Inter-Ministerial Commission on Land Tenure: Once activited, it should be charged with the responsibility of reviewing the (conflicting) dual patterns of land ownership practiced in Liberia, as well as the revision of the process of land purchase especially in rural Liberia. The committee should also be responsible to study and recommend how to make land readily available to the small farmer.

2. In the Interim: In addition to the revitalization of the Land Tenure Commission, the concept of squatters' rights should be defined in the Liberian concept and

vigorously enforced to ensure success of the agricultural development programs.

EXTENSION: In the area of extension, issues raised by the individual members of the group were many, but the general drift and conclusions were the following points:

1. Improve Planning of Extension Program: This will primarily be in the form of an action plan for extending the findings forwarded by the agricultural research unit of Ministry of Agriculture.

2. Training: Point one above will definitely require some level of understanding and therefore requires some training of the agents. The training could come in the form of a local seminar and/or some overseas training for top extension personnel. While overseas training would be highly rewarding, its cost and the fact that only a few people are often qualified to pursue such studies, should not be overlooked. Local training in such form as suggested, would on the other hand, benefit more people.

3. Support for Extension Programs: The crux of the problem with the extension program has been the general lack of support for the unit. Besides the unavailability of materials to extend which has been a major concern, serious logistics problems have continued to hamper all efforts in that direction. Hence, there is a general lack of supervision of the field staff as there is no means of transportation, gasoline, etc. It is therefore, recommended that the level of support for extension activities be expanded and materials be available when needed.

4. The Extension Liaison Unit: An Extension Liaison Unit has been proposed for the USAID/CARI Phase II project, most probably with a new institution (other than LSU) collaborating; this unit should be developed. Such a unit should serve as the nucleus for the development of a full-scale extension program. It should also serve as the link between CARI and the Extension Division of the Ministry.

5. On-Farm Trials: The current level of on-farm trials by CARI is best known to CARI. However, sizable numbers of farmers are being reached, and some cooperation exists with the Ministry's Extension Unit. There is need to expand this effort as it is the only way researchers will determine the response of crops to conditions different from the controlled conditions at the research station. On-farm trials, accompanied by periodic demonstrations, are emmensely help to farmers in

answering the "how to" question, especially where new ideas must be passed from the researcher to the farmers. Village or community level demonstrations of exhibiting adaptable techniques and technologies are very highly recommended in these particular instances.

6. The 4-H Club: The previous approach of introducing agriculture to school children in the form of the 4-H Club should be re-introduced.

TRAINING: In the area of agricultural training, some progress has been made especially for international training. Generally, such a training type has two dimensions; first the acquisition of skills, and second an attitudinal change in the individual, i.e., a change in outlook which will make him more responsible and in some cases dedicated to his job and thus utilize the skill obtained in the more formal educational process.

Agricultures' training needs and recommendations for such needs, as discussed by the group, included the following items:

1. The Curricula: There is a need to actually identify the manpower needs of the agricultural sector and to review and tailor the curricula of the agricultural institutions in the country. This will help determine the need for a stronger/better baccalaureate program, meaning the possibility of combining the degree and/or associate degree-offering institutions similar to Land Grant Universities in the United States. Above all, it will answer the question whether we are producing enough, qualified agriculturalists.

2. Coordination: The general lack of coordination of training activities needs to be rectified. Institutions providing training for agriculture and the organizations using these trained manpower need to work together in order to build programs to produce the requisite manpower.

3. Vocational Agriculture: High school curricula throughout Liberia should include basic agriculture training with some emphasis on practical fieldwork. This may or may not be in the form of the earlier recommended 4-H Club.

4. Extension Materials: Beside CARI, the higher educational institutions involved in agricultural training, such as RDI and ULCAF, should develop extension teaching materials which the extension unit can use. This is necessary as a function of such institutions as well as to fill the current vacuum of nothing to extend to farmers.

Notes of the General Discussion

Group Three believed that in the area of research, priorities should be given to tree crops mainly for their foreign exchange earnings, while food crops research, especially rice, should be continued or stepped up. Other areas needing immediate research attention are socio-economic, soil conservation, animal production, fishery, and feed production activities. The FAO post-harvest technology project should continue as a part of the institutes regularly planned, ongoing activities.

The group also felt that some attempts should be made by CARI and other agricultural research units in Liberia to work closely together. They should produce publications and listing of research findings and researchers so that energy and other resources will not be wasted duplicating efforts.

In the area of land tenure, it was suggested that the activities of the already established Land Tenure Committee be reactivited. Additionally, Government should introduce squatter's right in the ADP's for farmers who do not have the money and time to go through the so many steps necessary for acquiring deeded land in Liberia. This process of land purchase should also be reviewed by the Land Tenure Committee to make it easier for farmers.

To improve the capability of the extension unit, the group felt that the bottlenecks and areas needing improvement include a general lack of training, unavailability of adoptable research materials, and a general lack of support. These should be corrected. The extension unit at CARI should be strengthened, while the MOA should make greater efforts in monitoring the activities of its extension personnel in the field.

The training portion of this group's questions was treated with links to the declining enrollment at the Agricultural College, University of Liberia. The action plan proposed by Group III is to establish a coordinating body to ensure that training in agriculture be re-oriented to the felt needs of agriculture and that appropriate high school training be given in agriculture.

Major issues raised included the following:

1. That a senior research coordinator responsible to the Minister of agriculture be appointed.

2. The University of Liberia Agricultural College should become a major part of the research activities.

3. Small implements for agricultural uses should be developed locally (at CARI).

4. Development policies should now take into consideration the more distant future and the cost implications.

PARASTATALS, COOPERATIVES AND AGRICULTURAL INVESTMENT STRATEGY

Group IV

Report of Workgroup IV

This group was given the responsibility of answering questions about, but not limited to dealing with, parastatals, cooperatives and agricultural investment strategies. Beside the questions drawn by the Committee, we were to include where necessary, observations and/or recommendations concerning other aspects of the topics as well as addressing ourselves to other areas which may be of relevance to the development of agricultural policies. The following were the general concenscious of the group:

1. With respect to the number of parastatals being reduced to maintain those that Government of Liberia (GOL) is able to keep, the group decided that GOL should leave the number as it is but take all possible measures to strengthen them. The reasons for this suggestion include the fact that different projects perform different functions which activities cannot be interchanged. Secondly, some projects are area based such as the LCADP, BCADP, NCRDP, etc.

   Measures taken to sustain the viability of these projects would include: a) initiation of expenditure control; b) curtailing of certain activities to be identified and c) the merging of functions which are common among these Agricultural Development Projects (ADP's) e.g., monitoring and evaluation, supply purchasing, etc.

2. Inorder to speed up the financial viability of parastatals so as to reduce their dependence on GOL and external funding, it is necessary that the following be done: a) sufficient funding be made available as well as the timely disbursement of such funds from the initial stage; b) effective management; c) periodic review of the projects' activities; and d) eventual privatization.

3. The nomenclature of Liberia cooperatives should be made to identify the type of activities they are involved in and should be encouraged to become more production oriented, e.g., rubber planters cooperative, cocoa planters cooperative. Measures taken to encourage farmers' participation in the affairs of cooperatives

may include creating market outlets, extending soft loans to farmers, management training, farmers participation in the decision making process, farmers education and strengthening of the Cooperative and Development Agency (CDA), etc.

4. Looking at the present condition of the Liberian economy, the $5,000,000 mentioned in the general question could be allocated in the following manner:

Price support	40 percent
Research and Extension	30 percent
Credit	15 percent
Training	10 percent
Food Resources and others	5 percent

5. To establish an agricultural development project for a three years project costing $5,000,000, the most appropriate project to undertake according to the decisions of the group would be a Food Processing and/or Preservation Plant. The selection of plant type which would be among those preserving vegetables, fruits, root crops, palm oil, or similar type of commodity is to be done by the Ministry of Agriculture.

Notes of the General Discussion

Group IV was taxed with answering questions concerning the viability of projects and organizations and particularly the efficiency of public activities. This topic was discussed at length with individual participants raising thought - provoking issues some of which are listed below with their respective presenters:

1. Boakai Sirleaf (ACDB) - That the actual role of cooperatives be defined in terms of whether it is developmental (production oriented), or marketing oriented. That cooperatives should be encouraged to serve more as production units than as mere middlemen.

2. Dr. J. Chris Toe (MOA) - That due to the apparently poor performance of project managers, some methods of contract management should be initiated by GOL. This would include an effective penalty system for poor (mis)management as well as some system for rewarding effective managers, and once the contract is up, the performance of the manager determines the renewal of such contracts.

3. Dr. Joseph N.N. Subah (CARI) - That we should consider a long-term policy issue to privatize the Liberian agricultural sector since history tells us that privatization encourages efficiency.

4. Asst. Minister Simeon Moribah (MOA) - Addressed himself to the question of project viability, pointing out that some projects are not viable from the onset, but are implemented due to the politics involved. A reward and panalty system as suggested by Dr. Toe would be good in helping determine which of these projects to carry on from the political and managerial dimensions.

5. Professor Ampadu (CUC) - Stated that these parastatals should have a component whereby they will continue to generate funds in order to be self-sustaining. A project should not remain forever dependent on government expenditure, but must overtime, develop some means of sustaining iteslf.

6) Mrs. Rudene Wilkins (MOA) - Raised the question concerning what needs to be done when the projects will eventually phase out. Government needs to decide now how these projects will be run in the absence of external assistence before this phasing out process begins.

7. Mr. George S. Borbor (MOF) - Suggested that the cooperatives be developed to take over. It was also pointed out along this line that BCADP farmers' cooperatives are being trained to assume responsibilities and run the project after it phases out.

8) Minister Peter D. Youn (MOA) - Observed that many project personnel are not productive. As a result and since once you employ it becomes difficult to dismiss, the projects and other parastatals are stuck with these unproductive people. This size of personnel is going to be rather difficult to absorb after the projects phase out.

APPENDIX

Appendix I. Program of Activities, Liberian National Agricultural Policy Seminar, 1985

Date & Time	Subject & Activity	Presenters
March 25		
6:00-7:00 p.m.	Registration and Social hour	
7:00 p.m.	Dinner	
March 26		
7:30-8:30 a.m.	Breakfast	
	Morning Moderator	- Mr. S. Moribah
8:30-8:45 a.m.	Procedures	Mr. M. Pay-Bayee
8:45-9:30 a.m.	Opening remarks	Deputy Minister Mehn
9:30-10:00 a.m.	Keynote address	Minister J. N. Boakai
10:00-10:15 a.m.	Break	
10:15-10:45 a.m.	A Conference Perspective and Principles of Economic Progress for Agriculture	Prof. Tweeten Dr. R.J. Edwards
10:45-12:00	Comparative Advantage - Farm Budgets	Mr. J. Musah Prof. Tweeten Prof Trapp
12:00-2:00 p.m.	Lunch	
	Afternoon Moderator	- Mr. M. Pay-Bayee
2:00-3:00 p.m.	Resource Allocation for Liberian Farms	Mr. J. Musah Prof. Tweeten Prof. Trapp
3:00-3:15 p.m.	Break	
3:15-5:00 p.m.	Marketing Costs, Benefits and Income Redistribution of Liberian Rice Policy	Mr. J.B. Rogers Prof. Tweeten

Appendix I (Cont'd).

Date & Time	Subject & Activity	Presenters
6:00-7:00 p.m.	Social hour	
7:00 p.m.	Dinner	
8:30 p.m.	Movie	
March 27		
7:30-8:30 a.m.	Breakfast	
	Morning Moderator	- Mr. R. Fannoh
8:30-10:00 a.m.	Marketing Costs, Benefits and Income Distribution of Liberian Rice Policy (Cont'd)	Mr. J.B. Rogers Prof. Tweeten
10:00-10:15 a.m.	Break	
10:15-12:00	Food Security and Rice Policy	Mr. J.B. Rogers Prof Trapp
12:00-2:00 p.m.	Lunch	
	Afternoon Moderator	- Dr. Chris Toe
2:00-3:00 p.m.	Food Security and Rice Policy (Cont'd)	Mrs. R. Wilkins Prof. Tweeten
3:00-3:15 p.m.	Break	
3:15-5:00 p.m.	Input Supply Issues	Mr. A. Gedeo Mr. J. Mason
5:00-5:10 p.m.	Announcements	
6:00-7:00 p.m.	Social hour	
7:00 p.m.	Dinner	
8:30-9:30 p.m.	Micro-computer demonstration	

Appendix I (Cont'd).

Date & Time	Subject & Activity	Presenters
March 28		
7:30-8:30 a.m.	Breakfast	
	Morning Moderator	- Mr. J. Musah
8:30-10:15 a.m.	Agricultural Credit Issues	Dr. Chris Toe Mr. W. Tarpeh Mr. B. Sirleaf
10:15-10:30 a.m.	Break	
10:30-12:30 p.m.	Land Tenure and Land Resource Use	Mr. S. Moribah Mr. M. Pay-Bayee
12:30-2:00 p.m.	Lunch	
	Afternoon Moderator	- Mrs. R. Wilkins
2:00-3:30 p.m.	The Role of Research, Extension and Training in Liberian Agricultural Development	Mr. J. Subah Mr. H. Edwards Mr. C. Koha
3:30-3:45 p.m.	Break	
3:45-4:15 p.m.	The Necessary Inter-relationships Between Research, Extension and Training	Prof. C. Ampadu
4:15-5:15 p.m.	Discussion of the Issues	
6:00-7:00 p.m.	Social hour	
7:00 p.m.	Dinner	

Appendix I (Cont'd).

Date & Time	Subject & Activity	Presenters
March 28 - Evening session		
8:00-10:00 p.m.	The Strengths and Difficulties Associated with Liberian Agricultural Parastatals	Mr. E. Akinselure Mrs. M. Varfley
10:00-10:15 p.m.	Organization of small work groups	Dr. Chris Toe
March 29		
7:30-8:30 a.m.	Breakfast	
8:30-10:15 a.m.	Independent Workgroup meetings	
	Morning Moderator	- Deputy Minister Mehn
10:30-12:30 p.m.	Reports from small groups and discussion by participants	
12:30 p.m.	Closing luncheon	

Appendix II. List of Participants

Name	Position	Address
Hon. Joseph Boakai	Minister	Ministry of Agriculture Tubman Boulevard Monrovia, Liberia
Hon. Victor Yates	INA Chairman on Agriculture	Capital Building Monrovia, Liberia
Hon. Zoe Norman	Member, INA	Capital Building Monrovia, Liberia
Hon. Milton Forkpah	Asst. Min. for Economic Affairs	Min. of Pres. Affairs Monrovia, Liberia
Mrs. Mary Dennis	Sr. Economist	Min. of Planning Monrovia, Liberia
Mr. Emmanuel Akinselure	Director General	Bureau of State Enterp. Min. of Finance
Mr. Francis Dunbar	Managing Director	LPMC, Monrovia
Mr. Charles Bright	Vice President	Bright & Sons Poultry Kakata, Margibi County
Mr. Wilson Tarpeh	President	ACDB, Carey Street Monrovia
Mr. George Borbor	Ag. Economist	Dept. Tech. Services Ministry of Finance
Hon. James Mehn	Dep. Minister for Plan. & Dev.	Ministry of Agriculture Tubman Boulevard Monrovia
Hon. Peter Youn, Sr.	Dep. Minister for Technical Affairs	" "
Hon. D. J. A. Sirleaf	Dep. Minister for Reg. Dev. & Ext.	" "
Hon. Simeon Moribah	Asst. Minister for Planning	" "
Hon. Roland Toweh	Asst. Minister for Extension	" "

Appendix II (Cont'd).

Name	Position	Address
Mr. Daniel Goe	Project Manager	BCADP, Suakoko Bong County
Mr. Jeremiah Tulay	Project Manager	LCADP, Voinjama Lofa County
Dr. Joseph Subah	Research Coord.	CARI, Suakoko Bong County
Mr. Alfred Tubman	Acting Director	RDI/CUC Suakoko, Bong County
Dr. Alfred Kulah	Project Manager	PFP, LAMCO Yekepa, Nimba County
Mr. Clement Koha	Training Manager	LCADP, Voinjama Lofa County
Mr. Melvin Thornes	Project Manager	NPC, Paynes Avenue Monrovia
Mr. Arthur Gedeo	Soci-Economic Analysis Officer	CARI, Suakoko Bong County
Mr. Eric Bestman	Asst. Prof. Ag. Engineering	U.L. Fendell, Montserrado County
Mr. James Doe	Head	Planning Section FDA, Sinkor, Monrovia
Mr. Jerry Mason	Monitoring & Evaluation	BCADP, Suakoko Bong County
Mr. John Dorliae	Chief Ag. Officer	MOA, Sanniquellie Nimba County
Mr. Hilary Gbonblee	Planning Officer	NCRDP, Sanniquellie Nimba County
Mr. Robert Sele	Ag. Manager	LCADP, Voinjama Lofa County
Mr. Peter Quoie	Asst. Manager	LPMC Ganta Estate Ganta, Nimba County

Appendix II (Cont'd).

Name	Position	Address
Mr. Boakai Sirleaf	Research Economist	ACDB, Carey Street Monrovia
Mr. Richard Holden	Advisor	SRSP, Gbarnga Bong County
Mr. Joseph Famolu	Project Manager	SRSP, Gbarnga Bong County
Mr. Joseph Ketter	Registrar	CDA, Tubman Boulevard Monrovia
Mrs. Rudene Wilkins	Ag. Economist	Ministry of Agriculture Tubman, Blvd., Monrovia
Mr. Harrington Cummings	Ag. Economist	CMEU, Tubman Boulevard Monrovia
Mr. J. Boima Rogers	Director for Marketing	Ministry of Agriculture Tubman Blvd., Monrovia
Mr. Joseph G. Musah	Director for Planning	" " "
Dr. J. Chris Toe	Coor. Ag. Econ.	" " "
Mr. Mando Momoh	Planning	" " "
Mr. David Newman	Computer Prog.	" " "
Mr. William Diggs	Ads. Assistant	" " "
Mrs. Marian Varfley	Dir. Dev. Proj.	" " "
Mr. Huburn Edwards	Advisor/Rural Dev. & Ext.	" " "
Mr. Reginald Fannoh	Dir./Statistics	" " "
Mr. MacArthur Pay-Bayee	Director/Analyst	" " "
Mr. Arthur Tucker	Field Res. Off.	" " "
Ms. Olive Tulay	Secretary	LCADP, Voinjama Lofa County

Appendix II (Cont'd).

Name	Position	Address
Hon. J. Gonda Workie	Superintendent	Office of the Sup. Sanniquellie, Nimba Co.
Mr. Clement Ampadu	Asst. Prof. Econ. & Chair. Social Science Dept.	Cuttington University P.O. Box 277 Bong County
Dr. Luther Tweeten	Prof. of Agr. Economics	Oklahoma State Univ. Stillwater, Ok.
Mr. James Trapp	" "	" "
Dr. Gerard Neptune	Ag. Dev. Officer	USAID/Liberia Monrovia, Liberia
Dr. John Flynn	Ag. Economist	" "
Mr. Hugh Greenidge	UNDP Resident Representative	Tubman Boulevard Monrovia
Dr. Arthur Theisen	W/Bank Consultant to MOA	Gbarnga, Bong County
Mr. A.J. Menon	Project Manager	DOPC, Plibo Maryland County
Mr. Alvin K. Potter	Ag. Advisor & Statistics	USAID/Liberia Monrovia
Dr. Richard J. Edwards	Ag. Advisor & Economist/Plan.	" "