Credit needs and extension possibilities among traditional rice farmers in the northwest province Cameroon

Thomas Lachlan Vollrath

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To the Graduate Council:

I am submitting herewith a dissertation written by Thomas Lachlan Vollrath entitled "Credit needs and extension possibilities among traditional rice farmers in the northwest province Cameroon." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Agricultural Economics.

Merton B. Badenhop, Major Professor

We have read this dissertation and recommend its acceptance:

David Brown, James Snell, Walter Neale

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)
To the Graduate Council:

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Merton B. Badenhop, Major Professor

Accepted for the Council:

Vice Chancellor
Graduate Studies and Research
CREDIT NEEDS AND EXTENSION POSSIBILITIES
AMONG TRADITIONAL RICE FARMERS IN THE
NORTHWEST PROVINCE CAMEROON

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Thomas Lachlan Vollrath
March 1977
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ABSTRACT

Rice is the primary source of cash income for a small but increasing number of farmers in the Northwest Province. It is grown in both upland and swampland areas, under supervised as well as unregulated conditions, where hand technology is the mode of cultivation. The primary purpose of this research is to determine the credit absorptive capacity in this setting of smallholder rice producers.

The first task of this study was to identify the desirability of extending production credit to peasant rice farmers by examining the likely impact on output and income of additional input usage. A socioeconomic survey conducted in nine villages throughout the Province during mid-March to mid-May provided the data base for an inquiry into this issue.

The analysis was cast into a production function framework from which cost and revenue relationships were estimated. The empirical findings confirmed farmers' contention that labor is the most constraining resource. It was shown that it is more profitable at the margin for a farmer to hire labor than to purchase fertilizer given existing production patterns. Moreover, increasing product returns were associated with additional hired labor usage.

The second task of this study was to evaluate the institutional arrangements through which credit can be extended to the small farmer and to suggest possible structural modifications. To this end, ways in which the government sponsored National Rural Fund for Development
could intervene into the rice sector of the Northwest Province was described. In addition, an assessment of the socioeconomic impact of indigenous credit societies was made. And suggestions followed about the kind of linkages which might be established between modern and traditional institutions in order to facilitate the flow of additional credit to rural areas.
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The intensive study of the problem of economic development has had one discouraging result: it has produced an ever lengthening list of factors and conditions, of obstacles and prerequisites. . . . For a long time, certainly until 1914 and perhaps until 1919, natural resources held the center of the stage. . . . Later on capital, a man-made and quantifiable entity, came to be the principal agent of development. . . . Among the proximate causes of economic development, the supply of entrepreneurial and managerial abilities now occupies in official documents a position of pre-eminence.

. . . while we were at first discouraged by the long list of resources and circumstances whose presence has been shown to be needed for economic development, we now find that these resources and circumstances are not so scarce or so difficult to realize. . . . development depends not so much on finding optimal combinations for given resources and factors of production as on calling forth and enlisting for development purposes resources and abilities that are hidden, scattered, or badly utilized.

CHAPTER I

AN OVERVIEW OF THE ROLE OF CREDIT AND
INDUCED TECHNOLOGICAL CHANGE

It is obvious to even the most casual traveler in West and West Central Africa that there is an abundance of both land and labor. Upon becoming more familiar with the West and West Central African setting, it becomes apparent that the surplus of land exceeds that of labor. In general land is so plentiful that it is not the object of open exchange in the market. However, a flexible and active labor market does exist. This is indicated by a substantial degree of labor mobility. While throughout most of the year there is considerable underemployment in agriculture, labor is scarce during peak seasons. It then becomes a critical constraint to agricultural production. The market responds to seasonal needs by adjusting both the supply and price of labor.

There is a large potential agricultural surplus which could be realized if unutilized labor and unutilized land were mobilized. One of the relevant questions with regard to growth and development, therefore, is how to summon these latent resources for development purposes. Writing in the 1960's Helleiner contends that farmers "are unemployed as a matter of conscious preference for leisure over additional materiel output, at prevailing prices and the existing level
of technology."¹ This statement implies that farmers will not alter their behavior unless relative costs and profits become more favorable.

Following World War II and up to the recent past, agricultural output expanded considerably in Africa in response to the introduction of export cash crops and market opportunities. Before commercial linkages were established with the outside world, the African male engaged in little, if any, agricultural activity other than clearing bushland and occasionally assisting women with the harvest. McCullock has estimated that men in traditional Cameroon settings, contributed only about ten days of agricultural labor per year.²

According to Myint, the expansion in output took place because of increased usage of traditional factors of production and not to improvements in the agricultural techniques used in subsistence agriculture.³ Today, the growing internal demand for food is an emerging force inducing additional use of existing land and labor resources. This stimulus is likely to gain momentum as the rate of urbanization proceeds and the relative importance of the export market declines.


The Role of Technological Change

The diffusion of modern technology can also stimulate additional agricultural production as well as augmented labor and/or land use. There are three basic kinds of technological change:

1. The plant biological type innovations which augment the amount of yields per unit of land;
2. Large-scale machinery that increases the area of land under cultivation; and
3. Intermediate technology which involves both biological inputs and capital equipment that relieve production bottlenecks without displacing labor.

Lele has defined rural development as "... improving the living standards of the mass of the low income population residing in rural areas and making the process of their development self-sustaining." It is important to assess the implications of promoting one kind of technology over another in terms of this objective. The technique chosen will affect social welfare and the long-run growth potential of society. Yudelman, et al., advocate pre-emptive structural change because of the likelihood that unregulated modernization will widen wealth disparities and decrease the ability of a large proportion of the population to contribute to national growth.

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change refers to the selection of a development strategy involving choices about technology and institutional reforms which insure that a substantial portion of the benefits of aggregate output is retained within agriculture by the majority of household producers.

Modern plant biological technology includes such innovations as improved high yielding varieties of seed, inorganic fertilizers, pesticides, fungicides, and herbicides. With the exception of herbicides, the adoption of these inputs increases the need for farm labor, ceteris paribus. It has been reported that the adoption of improved seed in India has been accompanied by a 35-50 percent increase in the quantity of labor used.\(^6\) Forty percent of this increase has been in the form of hired labor. Johnston and Cownie suggest that the less developed countries pursue a policy promoting the use of improved seed and chemical fertilizer.\(^7\) They note that such a strategy has the potential of drastically increasing production and absorbing a growing population and labor force.

The term "green revolution" has been associated with the package of plant biological inputs. It implies a transformation of traditional agriculture and is dependent upon the widespread adoption of optimum farming practices and an efficiently operating marketing system. Experience has shown that the term green revolution is a misnomer.

\(^6\)Yudelman, et. al., pp. 76-78.

because of limiting cultural, production, and distribution bottlenecks. Considerable education, training, and extension is required to impart changes in the mode of production as a complex set of innovations is associated with the plant biological technology. The soil has to be properly prepared and maintained. The agricultural calendar has to be meticulously respected. Different rotational patterns have to be followed. Furthermore, farmers must be convinced of the advantages of altering their crop mix. And they must learn when and how to use the new factors of production. In addition, there must be an adequate supply of the modern biological inputs and they must be made available on a timely basis. Moreover, it is essential that there be an outlet for the increased production. In most rural African settings the supporting infrastructure is not yet sufficiently developed to provide the services required to backstop a veritable revolution.

Large-scale machinery technology characterizes commercial agriculture in the United States where the supply of labor is more inelastic than the supply of land. Hayami and Ruttan provide an economic rationale for this phenomenon.\textsuperscript{8} Noting that mechanized equipment is a substitute for labor, they contend that the major force leading to the greater use of mechanical equipment has been the drive to reduce labor costs. According to theory, large scale machinery is appropriate whenever the ratio of the marginal produce of a unit of labor to its economic price is greater than the marginal product of a unit of land to

the economic price of land for a less capital intensive form of technology. The introduction of large-scale machinery is designed to rectify the imbalance of these ratios by bringing about greater output per worker through increasing the land area which can be operated per worker.

The West and West Central African nations resemble the United States in that labor is a relatively more constraining input than land. Hence, some form of mechanized equipment, which utilizes land and economizes labor, should be made available. Whether a particular kind of machinery is suitable depends upon relationships between the degree of capital intensity manifested by this equipment and the land-labor factor endowment. However, in general the use of large-scale machinery should not be encouraged in African countries. There are a number of arguments supporting this contention:

1. Despite the greater abundance of land relative to labor, there is little economic incentive for sophisticated machinery because the price of labor is so much lower than the price of highly capital intensive equipment.

2. The adoption of large-scale machinery would release labor to other sectors in the economy. But this labor cannot be absorbed in the other sectors because there is little demand for it.

3. Large-scale machinery requires an exorbitant capital investment which is far beyond the financial means of the typical African farmer. In Africa, the benefits of this technology would accrue to very few individuals and would merely aggravate the already growing income disparity between the rich and the poor.
Intermediate technology includes improved tools, biological inputs, and selected machinery such as plows and seeders that are used primarily as a complement rather than as a substitute for labor. Sophisticated equipment such as tractors and irrigation pumps may be a part of the intermediate technology package. The distinguishing difference between the large-scale machinery technology and the intermediate technology is that the focus of the former is on mass production while the latter is concerned about production by the masses. Intermediate technology is ideal for Africa because it is particularly suited to the land and labor abundant endowment.

The problem with intermediate technology is that it is ill defined at the operational level. Schumacher states, "... it still requires a systematic, creative effort to bring this technology into active existence and make it generally visible and available." Many technical problems have yet to be resolved. In addition, the profitability and risks associated with various intermediate level technological packages are not known. As a first step toward the identification of the appropriate package, the labor constraints confronting the individual farmer using both modern and traditional techniques need to be made explicit. An analysis of family budgets is also required to determine the capability of farmers to finance farm investment. Finally, an economic appraisal, using shadow prices rather than market prices, is needed in order to differentiate between the social and private costs

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and benefits of introducing and implementing various intermediate technology packages.

The Role of Credit

Once the appropriate technology has been defined, credit can facilitate development by inducing and enabling farmers to modify their production patterns. Credit may provide the necessary spark to disrupt the vicious cycle of poverty that prevents latent resources and abilities from being used more effectively. And it may result in the utilization of new inputs and factor combinations that render agricultural activity more remunerative. There is little doubt that, if made available at the right time and under the right conditions, credit can be an accelerator to development. 10

In general, commercial credit institutions do not cater to small farmers because of high administrative costs and high risks. But shortage of loanable funds does not appear to be a major constraint. It has been purported that $1-1/2 billion is being spent annually by multinational and national agencies on extending agricultural credit to small farmers in the less developed countries. 11 The problem is that very few credit programs have been successful. The literature is full

10 Arthur T. Mosher in Getting Agriculture Moving (New York: Frederick A. Praeger, 1966), classified credit as an accelerator as opposed to an essential factor of agricultural development.

of one failure after another. Common malaises are: (1) high incidence of default, (2) low productive impacts, and (3) drifts to large farm clientele.

In order to increase the likelihood of credit effectiveness, it is advisable to restrict the extension activities to situations where the following set of preconditions has been satisfied:

1. There is a potential for increasing and sustaining output and incomes.
2. Inputs are readily accessible.
3. There is an adequate supporting infrastructure. This is to say, the market and transportation systems are sufficiently developed. And it appears as though the administrative and technical personnel will perform satisfactorily.
4. Finally, improved farming practices are known to exist, which may or may not include new factors of production.

As has already been indicated, credit, in and of itself, is neither a sufficient nor even a necessary condition for development. But it may, indeed, be a very useful condition. The primary role of credit should be to augment output and income through an increase in yields obtained per unit of land and/or an increase in the expansion of the area under cultivation. There are three situations in which credit may be extended to achieve this objective:

1. When no new technology is available and where the aim is to increase the use of existing factors of production;

2. When there are relatively inexpensive innovations and where the goal is to use credit as a catalyst for the adoption of these innovations; and

3. When the modern technology being promoted involves capital requirements that surpass the small farmers' investment capabilities.

Credit can also be used as a mechanism for the redistribution of income. While it is not advisable to extend credit for welfare purposes, there could be economic justifications for using credit to transfer income from the rich to the poor or from one area of the country to another. Redistributing income may have desirable implications in terms of diminishing income disparities, of stemming disturbing migration flows, or of stimulating output indirectly through increases in effective demand for commodities produced in different sectors of the economy.

A third role of credit is to induce structural change. The provision of credit and subsequent factor and commodity flows can improve the efficiency of the overall market system. Furthermore, it may bolster the supervisory and technical services by requiring more and better assistance. Most assuredly, institutionalized credit will provide healthy competition to the local moneylender who may be charging usurious rates of interest. Finally, credit extension is likely to reinforce the positive impulses and voluntary efforts of those who wish to participate in the transformation process by providing them with
opportunities to become affiliated with modern institutions and to increase their production.
CHAPTER II

HOW THIS STUDY OF PEASANT RICE PRODUCTION AND SMALL FARMER CREDIT EVOLVED

This study of the capital and credit needs of small rice farmers in the Northwest Province grew out of a concern for the development opportunities associated with credit extension and induced technological change discussed in Chapter I. Early in the author's research design, it was decided to direct attention toward production credit. Later the research focus was altered as the investigator became more familiar with the Cameroon setting as well as with the conditions under which field investigations could be undertaken. At progressive intervals, decisions were made to narrow the focus to the agricultural sector, the rice subsector, and finally to the small farmer in the Northwest Province. This chapter explains and justifies the recursive inductive-deductive approach used in arriving at the objectives of this study.

In the early stages of the author's research project design, it was decided to use the credit union movement operating in West Cameroon as a working model to determine what kind of structural modifications were needed and to identify where and under what conditions the system could be transplanted to East Cameroon. According to the "byelaws," the objectives of the credit unions are: (1) to promote thrift and an opportunity to save, (2) to provide a source of credit for provident or productive purposes at fair and reasonable rates of interest, (3) to provide an opportunity for members to use and control their money for
mutual benefits, and (4) to promote economic interests of members. Such statements suggest that credit unions provide a decentralized institutional means whereby farmers can obtain credit for agricultural investment and participate in the national growth and development process. It became obvious shortly after arriving in the country, however, that the credit union movement was dominated by salaried civil servants, merchants, and the larger commercial farmers and that an insignificant proportion of credit union loan extension capability was being used to assist the small producers.2,3

The author recognizes that the credit union system provides a means through which credit can be channeled to the typical farmer. It would appear that minor adjustments in structure and a major reorientation of purpose could result in the credit union movement having a major impact on increasing agricultural output and productivity, mobilizing additional rural savings, and augmenting incomes of farmers. Of particular interest, therefore, is the pilot "directed agricultural production credit" project.

1 "West Cameroon Credit Union Bye Laws, Ekona," no date.

2 No data have been collected on the loan composition by individual credit unions to its members. However, the view among informed personnel was that most loans were made for consumption reasons and that the primary purpose of productive borrowing was to finance trade enterprises. See S. S. Shang, "The Development Cooperative Enterprises in Cameroon" (Yaoundé: Director of Cooperation and Mutuality, June, 1973), p. 5.

3 With regard to the Credit Union League's lending activity, it has been reported in "Project Statement of the Directed Agriculture Production Credit" (Nairobi: African Cooperative Savings and Credit Association, 1974), p. F-2, that "the league's major credit operations have been primarily with non-member [market] cooperatives. . . . Very few credit unions are receiving productive credit loans from the league . . . ."
which began in the fall of 1974. The target objective of this project is to establish model credit unions that focus on the productive needs of the small farmer. The developments of this program should be followed closely and, if successful, duplicated on a large scale.

After four months in the country, the author decided to alter fundamentally the nature of his research program for two reasons:

1. Very little agricultural credit was being funneled through the credit union system and few farmers were obtaining loans for productive purposes from this institution, and
2. It was not clear whether a means of transportation would become available to enable the researcher to make field trips to widespread areas in East and West Cameroon.

The research emphasis remained on productive credit. But the primary target of the investigation was narrowed to the small rice producing farmer within the Northwest Province. This more sharply defined focus was promising for the following reasons upon which further elaboration is provided in the remaining portion of this chapter:

1. It seemed appropriate to restrict attention to the agricultural sector and the small farmer because of national development goals.
2. The decision to concentrate upon a single crop was made in order to reduce the study of agricultural credit to manageable

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4 "Directed Agricultural Productive Credit" project has been approved by the Ministry of Agriculture and the Director of Cooperation and Mutuality and is being supervised by the Credit Union National Association in conjunction with the African Cooperative Savings and Credit Association.
proportions. And rice seemed to be a particularly good choice because of the need and possibility of increasing production in response to growing domestic demand.

3. Finally, the Northwest Province was considered a suitable geographical area upon which to concentrate because the basic preconditions for credit extension appeared to be satisfied.

National Development Goals

Since independence, the primary development goal in Cameroon has been to double real per capita income between 1960 and 1980. The fundamental emphasis, therefore, has been geared toward increasing output. Some consideration has also been given to equity issues. The Third Plan (which covers the five years 1971/72-1975/76) mentions, for instance, the objectives of balanced development of various parts of the country and improvements in the distribution of incomes.

Doubling real per capita income in 20 years is certainly a laudable objective. It would indeed be myopic to gauge development achievements by this single criterion, however. Per capita income is an average concept. It can be a misleading indicator of development. McNamara, in an address to the Board of Governors of the International Bank for Reconstruction and Development, pointed out that the poorest 40 percent of the population in the less developed countries receive only 10-15

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percent of the total national wealth while the richest 40 percent claim
75 percent of the total income.\(^6\) Per capita income strongly reflects
the welfare of the upper income groups. It does not measure social
welfare in terms of allocation of wealth.

Eicher et al., have noted that most African nations (like Cameroon)
have "concentrated on expanding the growth rate of per capita income as
their primary policy objective."\(^7\) While high rates of growth have been
attained in many African countries, this has occurred in an atmosphere
of increasing unemployment, widespread underemployment, and widespread
disparities in the distribution of incomes. It is obvious that problems
of wealth allocation, uneven development, and unemployment are not
necessarily solved by high growth rates. Thus, Eicher and associates
suggest that employment generation be an equally important development
objective as growth in per capita income.

It is perhaps noteworthy that, in the developing world where the
broad development goals have been defined in terms of growth (as in
raising real per capita income) and equity (as in augmenting employment),
there has frequently been a tendency for growth considerations to rank
higher than those dealing with equity.\(^8\) The emphasis on production is

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\(^6\) Robert S. McNamara, "Address to the Board of Governors" (Nairobi:

\(^7\) Carl Eicher et al., Employment Generation in African Agriculture,
("College of Agriculture and Natural Resources Report," No. 9; East

\(^8\) Francine R. Frankel has pointed out in India's Green Revolution:
Economic Gains and Political Costs (New Jersey: Princeton University
Press, 1971), that growth considerations have been given a higher
particularly evident at the operational level when decisions about program planning and implementation are made. Generally when there are apparent conflicts between growth and equity issues, efforts to equalize the distribution of wealth are viewed as being of secondary importance to attempts to increase output, incomes, and productivity.

Given a desire to orient development policies toward both growth and equity goals in Cameroon, it is advisable to focus attention upon the agricultural sector for several reasons:

1. Agriculture deserves particularly close inspection by virtue of the fact there are so many people in this sector. In Cameroon, agriculture provides the source of livelihood for about 80 percent of the population.\(^9\)

2. Higher rural incomes induce investment in both the industrial and the commercial sectors as the demand for factor inputs, consumer goods, and marketing services increase.

3. It has been shown that attempts to solve urban unemployment by creating jobs in urban areas are self-defeating. Harris and Todaro have illustrated empirically that direct efforts to combat urban

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\(^9\)Cameroon, Bulletin on the Ngaoundéré Grand Agricultural Show (United Republic of Cameroon, December 10-11, 1974).
unemployment will be frustrated by the influx of new migrants from rural areas.  

The Importance of Rice

Import Trends

"Cameroon's trade balance has generally been in deficit since the mid 1960's with the exception of 1968, 1969, and 1973." While the recent deficits have been attributed to a decline in agricultural production caused by unfavorable weather and a deterioration in cocoa prices, the increase in imports has undoubtedly been a contributing factor to the growing deficit. Total imports increased 10.5 percent per annum between 1965-1970 and 4.0 percent between 1971-1973.  

10 The findings of a study conducted in East Africa by John R. Harris and Michael P. Todaro, "Urban Unemployment in East Africa: An Economic Appraisal of Policy Alternatives," The East African Economic Review, Vol. IV, No. 2, 1964, pp. 19-36, are also likely to be applicable to Cameroon. The analysis is based upon the assumption that urban wage rates are institutionally determined. In Cameroon, minimum wage rates are guaranteed by law for all salaried workers. The system of wage regulation is based upon Salaire Minimum Interprofessional Garanti (SMIG) and upon Salaire Minimum Agricole Garanti (SMAG). There are different SMIG and SMAG rate schedules depending upon the location of the worker. Highest wages are paid to laborers in the principal cities of Douala, Yaoundé, Edea, and Buea. A second assumption made is that the shadow price of urban wage rates is lower than the going market rates. This conforms with the situation in Cameroon where neither the willingness of the urban unemployed to work at lower than prevailing wages nor the loss of agricultural output resulting from migration induced by the urban-rural income differentials is reflected in the urban wage rates.


particular concern is the growing size of the "food, beverages, and tobacco" portion of the total import bill (Figure 1). Imports for food, beverages, and tobacco increased (while total imports declined) from a rate of 4 percent between 1965-1970 to 6 percent between 1971-1973.

Rice and wheat flour represent the most important items among the food imports. And the value of rice imports has exceeded that of wheat (with the exception of 1970) at an increasingly divergent rate (Figure 2). In 1973, 1.3 billion CFA francs and, in 1974, 2.1 billion CFA francs were spent on rice imports. Such large expenditures drain foreign reserves and divert national resources from needed investment.

Consumption

Despite the efforts by the government to expand the area of rice cultivation, domestic production has not kept pace with growing internal demand. Auffret estimates that between 1963 and 1970 the consumption of rice in Cameroon increased at the rate of 13 percent per year. Yet,

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14. The exchange relationship between the dollar and the CFA franc averaged $1.00 = 2.42 CFA francs in 1974.

Figure 1. Yearly Imports of Food, Beverages, and Tobacco.

Figure 2. Yearly Imports of Rice and Wheat.
according to informed sources, production increased by only 6 percent within this same time period.\textsuperscript{16}

A noticeable increase in the demand for rice has taken place within the last decade. Per capita rice consumption has risen from 2.7 kilograms in 1964-1964 to 4.2 kilograms in 1974.\textsuperscript{17} There is little doubt that this trend will persist in the years to come. Auffret has calculated that if the projected production targets are attained by 1980, the average consumption per capita will be 10 kilograms.\textsuperscript{18} And judging from the statistics compiled in the Ivory Coast, where 42 kilograms of rice is consumed per capita, it appears as though the market in Cameroon could easily absorb additional production increases.\textsuperscript{19}

\textsuperscript{16} There is often a lag after the introduction of modern technology before production increases are realized. This delay explains why output has not increased at a greater rate despite the expansion in total area under cultivation. As a case in point, one can cite the large irrigation project involving small farmers which has been operating for a number of years at Yagoua in the North Province. In addition to plant biological inputs, tractors and electric pumps comprise the technological package being promoted at Yagoua. The average yield per unit of land obtained by farmers using the modern technology was actually less (945 kg/ha) than for those producers employing traditional techniques of production (950 kg/ha) between 1968-1972. See Jacques du Lac, "Nouvelle Phase Dans le Développement de la Riziculture Dans le Nord-Cameroun," Cameroun Contact, No. 1 (Douala: Electricité du Cameroun, janvier, 1974). But in 1975, the impact of the new technology was beginning to become evident. Farmers who adopted the modern farming techniques averaged 2,665 kg/ha during the first cycle of production according to an interview with Jacques du Lac, Directeur, Société et de Modernisation de la Riziculture de Yagoua, Yagoua, July 24, 1975.

\textsuperscript{17} Cameroun, Ministère de l'Agriculture, Etude de Previsions de la Production et de la Consommation de Riz au Cameroun, 1975-1985, no date, p. 12.

\textsuperscript{18} Auffret, pp. 107-108.

According to Chabrolin, the two primary factors causing a shift to the right in demand for rice are expansion in urbanization and increases in living levels. City dwellers substitute rice for traditional foodstuffs. And the urban population in Cameroon has been growing at an accelerated rate since independence. According to demographers at the Office de la Recherche Scientifique et Technique Outre-Mer (ORSTOM), the growth rates for Yaoundé, Douala, and Bamenda have been 9.2, 7.5 and 8.5 percent, respectively.

Rice consumption is likely to increase further over time as the dynamic forces of the market interact. Given relatively high profit margins, more farmers will be induced to produce rice as a source of cash income. The increase in the number of producers will augment supply and eventually exert downward pressures on price. In addition, the retail price of rice is likely to fall as farmers gain greater technical expertise and as improvements are made in the distribution system. Price declines stimulate consumption. And preliminary estimates of the price elasticity of rice suggest that total expenditures by consumers for rice will increase with a decline in the retail price.

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22 According to informed persons who have observed the situation in Cameroon, the price elasticity has been estimated to fall within the range of 1.5-2.5.
Production Perimeters

Cameroon has the physical resources to become self-sufficient in rice. And it is conceivable that Cameroon could eventually export rice to neighboring countries belonging to the Union Donanière des Etats de l'Afrique et l'Ouest (UDEAC) free trade zone.

Many regions within Cameroon are suitable for rice production. The government has identified specific perimeters in which to focus expansionary efforts (Figure 3). In 1971, the Société d'Expansion et de Modernisation de la Riziculture de Yagoua (SEMYR) was created to promote irrigated rice production along the Logone River in the North Province. According to informed sources, the project is heavily capitalized—costing 2,264 million CFA francs. SEMRY is accountable for 11,000 farmers and 5,800 hectares of land. As of June, 1975, 2,194 farmers were participating in the program cultivating 3,604 hectares. Plans for an extension of the SEMRY project to include an additional 7,000 hectares were being formulated in early 1975.

On the Mbo plain in the West Province, the Mission de Développement de la Riziculture dans le Plaine des Mbos (MIDERIM) has been granted the authority to engage in applied research, to operate an industrial rice production project, and to provide technical supervision to participants of an intermediate level technology pilot program. The focus is on upland production.

Interview with Jacques du Lac, Directeur, Société d'Expansion et de Modernisation de la Riziculture de Yagoua, Yagoua, July 24, 1975.
Figure 3. The United Republic of Cameroon.
The Mbo plain is very sparsely populated. Yet, it is vast in size. "The total suitable surface is about 10,000 hectares of land that is temporarily flooded each year and about 12,000 hectares of dry land." Noting the production potential of this plain, Jellema contends, "The valley of Mbo can become the supplier of all Cameroon's needs for rice for many years to come. . . ." 

In 1970, the Upper Noun Valley Development Authority (UNVDA) was established to promote rice production on the Ndop plain in the Northwest Province. Emphasis has been put upon the introduction of biological inputs and irrigation using a system of man-made dikes and channels. No attempts have been made to introduce mechanical technology. According to the director of the UNVDA, there are 18,620 hectares of suitable land for rice production. Twenty-five percent of this area is flood plains on which only rice can be grown. Relative to the Mbo plain, the Ndop plain has a dense population. Choffart contends that the number of inhabitants on the latter is six times that on the former. And in 1970, de Martin estimated that the 14 villages on the Ndop plain

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25Jellema, p. 41.


27Interview with Jean Robert Choffart, Agricultural Engineer, Upper Noun Valley Development Authority, Bamunka, Ndop, March 10, 1975.
contained 80,000 people. As of 1975, 2,250 farmers were working with the UNVDA program. And 575 hectares of irrigated paddy were under cultivation.

The government has commissioned the Centre National d'Etudes et d'Expérimentation du Machinisme Agricole (CENEEMA) to conduct experimental field trials using heavy equipment to determine the feasibility of establishing a large-scale upland industrial rice project in Mbandjock, situated along the highway and railroad routes, 100 kilometers north of the capital Yaoundé in the South Central Province. Mbandjock is already a prosperous center of activity. Unemployment is virtually nonexistent. In 1964, an industrial sugar cane factory called La Société Sucrière du Cameroun (SOSUCAM) was built in Mbandjock. Within the following decade the population swelled to 4,000 inhabitants, 40 percent higher than it had been in 1964. According to Lefebvre, Mbandjock is assured of becoming a center of dynamic growth with or without the projected rice scheme:

Mbandjock et un vrai pôle de développement, un centre qui par ses besoins, ses services et les échanges qui s'y pratiquent entraîne avec lui un ensemble géographique, économique, et humain . . . Mbandjock et même de toute la région au Nord de Yaoundé, le seul centre urbain dont

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29 Interview with Perychou.

30 André Lefebvre, Perspectives de Développement des Départements Autour de Yaoundé: Mbandjock un Grand Destin dans un Petit Arrondissement (Yaoundé: UNDAT, octobre, 1974).
Selection of the Rice Subsector

In addition to the specifically identified production perimeters identified above, there are numerous areas in which peasant farmers grow rice often with little or no supervision. The Northwest Province is one producing area in which a high concentration of rice farmers can be found because of favorable ecological conditions in mountain, forest, and swampland areas.

As has been indicated earlier, it is becoming increasingly apparent that policies need to be oriented toward both growth and equity goals so that the benefits of development become widespread. It is not always possible, of course, to pursue these twin goals simultaneously. Thus, if a high priority has been given to eliminating the need to import rice by increasing domestic output, industrial projects on the Mbo plain and at Mbandjock may be in order.

It is important, however, to look beyond limited project objectives to the broad development goals. When this is done, the question arises whether it would be advisable to pursue a broadly based strategy of increasing the capabilities of the typical rice farmers. This would enable such producers to provide the country's rice needs. Alternatively, it could be preferable to continue concentrating efforts in selected development zones. The primary advantages of the latter approach are

Lefebvre, p. 40.
that output increases will occur more quickly and tangible payoffs to development efforts will be more visible. There is, of course, a trade-off between augmenting total production within the shortest possible time frame and addressing such issues as distribution and long-term growth potentials. When emphasis is placed upon large-scale production and restricted to a few areas, not very many farmers are likely to play an instrumental role in the development process. Nor are many likely to reap the benefits of change. It was largely due to an interest in weighing equity as well as growth considerations that this study was restricted to the small farmer.

Another motivation of this study was to determine whether it would be advisable to use credit as a tool to stimulate increased output and productivity within the context of the existing institutional and technological environment. Many small farmers utilize few if any modern inputs. Some development theorists do not believe that additional investment in conventional input factors is worthwhile. Schultz states, "the price of the sources of income streams from agricultural production is relatively high in traditional agriculture."32 This statement implies that the return to traditional factors of production is low and that a more profitable set of resources is needed to transform peasant agriculture. But even when some new resources are available, development planners rarely know the extent to which the modern level

of technology being promoted is profitable on small farms where factor combinations and modes of production differ from those at experimental stations.

In order to investigate the issue of credit extension to small farmers, it was decided to study a group of farmers where there were rural institutions through which credit could be channeled. During field excursions in November 1974 and February 1975, it became apparent that in the Northwest Province the organizational structure within the rice subsector was promising. Most farmers who grew rice had their rice milled by hullers. These processing facilities, which were dispersed throughout the province, represent possible credit control points. It also appeared that not an inconsiderable number of farmers were members of traditional mutual aid societies which extend credit on a regular basis to its members. And initial inquiries suggested that these societies can perform additional economic functions.

33 Questions included in a survey (see Chapter III and the Appendix) revealed that many respondents were members of traditional mutual aid societies where savings were deposited and credit obtained. Seventy-three percent of the farmers interviewed received loans from such institutions throughout the year previous to the interview. The predominance of traditional credit and savings societies among the rice farmers causes one to pause and reflect about the possibilities of utilizing these institutions as well as modern agencies in the promotion of productive credit.

The survey confirmed observations made during initial field inquiries that very few farmers had dealings with modern institutions which extend credit. Two percent of the farmers had accounts in the metropolitan banks. Twelve percent of the farmers belonged to village credit unions. Only a few farmers of Mbaw Nsaw and Tingoh Valley were able to obtain credit for fertilizer in exchange for rice following the harvest from the local rice cooperatives. In other areas no such credit-in-kind was extended.
In addition to the institutional setting, the other consideration which justified the selection for study rice producers in the Northwest Province was that the basic preconditions for credit extension were satisfied in this setting:

1. Rice production seemed to be a profitable activity judging from the increased numbers of farmers growing it within the Northwest Province.

2. There appeared to be possibilities for the expansion of output and income, given increased use of modern plant biological technology which was available in certain localities in the province.

3. Supervision, which is required to teach producers how to farm using modern techniques and new factors of production, was likely to be available because of the presence of rice demonstrators employed in those regions where there were rice mills.

4. Finally, it seemed that repayment problems could be avoided because of the rice farmers' affiliation with local credit institutions and processing facilities.

Objectives

The specific objectives of this study are as follows:

1. To identify the agricultural practices being used to produce rice in the upland and swampland regions of the Northwest Province.
2. To determine the likely impact on small farmer income and production of extending credit for the purchase of additional inputs which are available.

3. To evaluate the institutional arrangements through which credit can be extended to the small farmer and to suggest possible structural modifications.

A socioeconomic survey (the details of which are found in Chapter III and the Appendix) provided the informational base for investigation of the objectives cited above. Objective two, which deals with the economics of peasant agriculture and rice production, is analyzed in Chapter V using data from the survey sample. Objective one, entailing descriptions of existing agricultural practices, is contained in Chapter IV. Knowledge about traditional farming was secured not only from manipulation of sample data but was also obtained in the process of conducting the survey in the field and from supplementary material acquired from secondary source readings. In Chapter VI, an evaluation is made of both modern and indigenous credit institutions. In addition, suggestions are made with respect to possible structural modifications. This is the subject matter of the third objective.

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CHAPTER III

THE FIELD INVESTIGATION AREA AND SURVEY PROCEDURES

An Overview of Primary Producing Areas

The Northwest Province is characterized by 6,230 square kilometers of diverse topography (Figure 4). There are numerous successions of hills with savannah grassland vegetation separated by 2,000-3,000 feet escarpments at the bottom of which are lowland rain forests or swamp plain areas. Unlike other areas in Africa so far from the coast, there is considerable rainfall in this area because of the rough topography that upsets the rain bearing winds from the southwest causing heavy precipitation. The rainy season usually begins in the second week of March and continues for 8-1/2 months until the end of November when the dry-dust laden Harmattan winds from the North invade the province.

The altitude within the Northwest Province ranges from 1,000 to 10,000 feet. Temperature, which is highly correlated with altitude, varies, therefore, considerably over the province. At the higher elevations tea, arabica coffee, and potatoes are produced and wheat could be cultivated. At the lower elevations where it is hot and humid,

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Figure 4. The Northwest Province.
palm oil, cocoa, and rubber are grown. Hawkins and Brunt, in their study of The Soils and Ecology of West Cameroon, have recommended that efforts be made to promote the production of food crops in the Northwest Province because the most ecologically productive soils are found at intermediate levels not favorable for tea, coffee, palm oil, or cocoa. They identify four areas which have particular agricultural promise in this regard: Ndop plain, Mbaw plain, Wum-Weh region, and Menchum Valley. All four regions are suitable for rice production.

The Menchum Valley is a small area of relatively low altitude in which rice and palm oil are the major sources of cash income. Unlike most other areas in the Province, land is often a limiting factor especially in Tingoh where swamp rice is grown. Upland rice is found in the villages of Otang, Essimbi, Modélé, Béfang and around Oshie to the west and Mejam-Biachang to the east.

The Wum-Weh region is characterized by fertile soils, an absence of rocks, and a gently undulating relief. A few farmers grow rice between Wum and Weh. However, it is in an area northeast of Weh—in the villages of Esu, Zoa, and Menkalp—where rice is an important activity for many farmers.

The Mbaw plain extends from Sabongari in the Donga Mantung division to south of Mbaw Nsaw in the Bui division. A towering escarpment, almost 4,000 feet above the plain to the west, makes communication difficult. A steep and tortuous road from Banso through Mbiami to Mbaw Nsaw connects

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3 Hawkins and Brunt, p. 63.
the plain to the highlands in the Bui division. A similar rough road descending eastward from the Ring Road through Ntumbo to Ntem and then Sabongari provides a transportation link in the Donga Mantung division.

The Mbaw plain is very sparsely populated. Fulani herdsmen can be found during the dry season grazing their cattle. From time-to-time villagers living along the Ring Road descend upon the plain to engage in hunting. There are some permanent inhabitants of the plain however. And many of them cultivate rice. In addition, there are migrant farmers producing rice at Mbaw who maintain their primary residence in Banso and Ntumbo.

Hawkins and Brunt assert that "the Ndop Plain should rate high on any development programme." Indeed, the plain has many positive attributes which lend credence to this contention. With a mean altitude of 3,100 feet, the climate is healthy for both humans and animals. The Noun River and its many affluents assure a ready source of water. The communication infrastructure is good. The primary provincial route—the Ring Road—runs through the plain and provides a market outlet for both labor and commodities. A secondary road extends towards the southeast.

4 Rice is cultivated on the alluvium fans, the most productive soils on the Mbaw plain. Hawkins and Brunt, p. 58, have noted that large tracts of such depositional soils would be exploited under the western escarpment in the event a road was built between Nsop and Mbaw Nsaw.

5 The Banso producers have the largest rice farms in the province. They are also members of the most successful cooperative in the country. Most of them may be classified as entrepreneurs. Frequently, they hire laborers from their own village as well as permanent residents of the plain at New Camp to cultivate their farms.

6 Hawkins and Brunt, p. 156.
to Mbouda connecting inhabitants of the plain to the Bamiléké and Bamoun country in East Cameroon. Relative to the Mbaw plain, there is an abundant supply of labor. Fourteen villages dot the plain. There is also an abundance of land rich in organic matter and gentle in relief. Food crops are grown on the better drained depositional soils. And since the creation in 1970 of a special development agency, called the Upper Noun Valley Development Authority (UNVDA), efforts have been made to encourage growers to make better use of existing resources by planting swamp rice on seasonally flooded soils not previously used and at a time in the agricultural cycle (after the first harvest in July) when the demand for farm labor is relatively low. Without any doubt, the Ndop plain possesses a comparative advantage with respect to development and has excellent growth potentials.

Data Acquisition

In order to obtain more information about peasant agriculture and small rice producers, a socioeconomic questionnaire (reproduced in the Appendix) was devised in early 1975. A cross sectional survey based upon a purposive stratified sample was conducted over a three month period from mid-March to mid-May. One hundred twenty-nine farmers who

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7 The sample survey included only those farmers using manual tillage technology. At the time of the survey, few farmers were utilizing alternative forms of mechanized technology. On the Ndop plain, only two farmers had harnessed oxen for cultivation purposes. In the Wum-Weh area, a few farmers grew some rice using mechanized technology. But these producers belonged to a special program supervised by the Wum Area Development Authority (WADA) called the Block Farming Scheme. In early
employed conventional rice production techniques were interviewed within nine villages situated in the regions identified above: Bamali-Bamessing, Baba, Balikumbat, Banso, New Camp, Tingoh, Otang, Esu, Mejam-Biachang (see Figure 4, page 33). Each of these villages was placed in one of the following four strata groupings, depending upon the kind of technology used and the location of the villages: Ndop, Mbaw Nsaw, Tingoh, Upland.

No population lists were available so it was not possible to make a random selection of farmers to interview. Given the time constraint, the difficulty of travel, and problems in locating farmers and arranging interviews in advance, it was decided to select respondents on the basis of ease and accessibility while weighing strata sample size insofar as possible by the number of rice farmers in each grouping and the apparent variation in response within these strata. Village rice demonstrators proved to be helpful in the selection process by providing indications as to the relative progressiveness of different farmers. This information was useful as it insured that some farmers with a broad range of income, rice productivity, and social status characteristics within each region would be interviewed. A wide range of input levels is desirable.

1975, the development planners of WADA were scaling down this program because it had not proven to be a financially viable endeavor. In 1975, the experts at WADA were seriously contemplating a major reorientation of purpose focusing on animal traction technology. Plans were being made to establish a training center at which farmers would spend one to two years learning mixed farming techniques. Topographical considerations limit the area in which animal traction technology is a possibility. The relief must be relatively level. And the altitude must not be lower than 3,000 feet without endangering cattle to trypanosomiasis. Two areas which satisfy these conditions are the Ndop and Wum-Weh regions.
especially in small samples, because of possible high correlations among factors.

Data were collected on the 1974 production period during which there were usually one, but sometimes two, crops grown. A certain degree of flexibility was required in order to obtain the most accurate information possible using the "one-shot" approach. For instance, a farmer was allowed to respond to the question about yields in terms of either paddy or clean rice, and in whatever units of measure he preferred (cups, tins, bags). Later conversions were made to metric tons of paddy. In addition, attempts were made to rectify any inconsistencies which became apparent upon getting two conflicting responses from questions expressed in different ways. Thus, if the quantity of rice sold and the quantity consumed did not correspond with the volume harvested or if the income obtained from selling rice did not agree with the summation of the quantity times price gotten for each transaction, the enumerator pointed out the discrepancy to the respondent. Discussions between the interviewee and the interviewer followed until a reasonable and consistent response was obtained.

It was discovered that farmers have excellent recall of previous yields, income, and factor expenditures. This may be so for a variety of reasons:

1. Incomes are relatively low and it is, therefore, easier to keep track of where money goes.

2. Expenditures do not take place regularly but rather are associated with particular tasks around which farming is organized.
3. There is prestige in employing others as laborers and in providing food and drink to workers.\footnote{While the prestige factor facilitates recall, it may also bias results to the extent that exaggerated responses were recorded toward higher expenditure for hired labor than in fact took place.}

4. Farmers are interested in responding in detail to queries about their farming activities, especially to outsiders whom they think may be of future assistance to them.

The reliability of the data on land area is probably not as accurate as would be desirable. The measurement of land proved not to be a major problem on the Ndop plain because the UNVDA had partitioned swamp areas into standard sized "rooms" of 10 by 20 meters. Elsewhere, however, plot sizes were not measured with such precision. To obtain an estimate of area, fields were paced after having been divided into rectangular and right-triangular shapes. The respondent was then asked how big his present fields were in comparison to the previous years for which production data were obtained. The results were then tallied algebraically.
According to oral accounts, rice was introduced into the Northwest Province in 1948 by farmer BongNji of Esu who had brought seed of the *o.glaberimma* type from Ghana, its source of origin. While it is possible that rice of the *o.glaberimma* type was cultivated elsewhere in the province before 1948, perhaps even many years prior to this date, the significant point is that, until the very recent past, rice was a minor crop for virtually all producers of rice. This is no longer the case. The increasing importance of rice followed the establishment of the Tingoh rice scheme in 1968 by the Nationalist Chinese. Since then, rice has become a primary source of income for many of those growing rice. However, rice production has remained of secondary importance in relation to the group of basic foodstuffs: cocoyams, cassava, and maize. This may be attributable to the "felt need" that each African family must satisfy traditionally defined subsistence requirements as well to the underdeveloped market structure for rice.

Growth in demand has been a primary stimulus for augmented production inducing farmers who grew rice in the past to increase their productive efforts and encouraging other farmers to incorporate rice into their farming pattern. The demand for rice within the Northwest Province has been accelerating at a rapid rate in response to increases in per capita incomes especially in provincial towns. Before the 1970's rice was considered a luxury food and was reserved for consumption on
days of local celebration. Rice is no longer considered to be "Christmas chop" or reserved exclusively for festive occasions. Rather, it is eaten throughout the year and it can be acquired in all the major markets. Furthermore, cooked rice is more readily available than any other prepared food at road-side and work-site chop stands as well as in urban restaurants.

The rural population in the rice growing areas has responded positively to increases in the price of rice over the 1972-1975 period.\(^1\) The area of land allocated to its production on the Ndop plain, for instance, increased from 26 to 574.1 hectares.\(^2\) However, not only did the area of land under rice cultivation expand, but different segments of the rural population became involved with rice productive activities. In Banso, 40 percent of those interviewed began growing rice in 1972, 33 percent started in 1973, and the remainder began in 1974. And many of these producers in Banso are entrepreneurs engaged in diverse nonfarm occupations for whom farming is a secondary activity which supplements their income. Represented in

\(^1\)In Bamenda, the price of rice has increased steadily over the last few years. In the first half of 1972, the market price of a kilo of locally produced clean rice was 50 CFA; see, Rapport d'Informations Statistiques Province Nord-West ("Service Provincial de la Statistique du Nord-West: Serie No. 1"; Bamenda: Direction de la Statistique et de la Comptabilité Nationale, novembre, 1973). During the first six months of 1975, the author observed that the price of rice per kilo was 110 CFAF in the Bamenda market. The price rise for rice exceeded the inflation rate indicating that the value of rice has increased relative to other commodities. Using international inflation rates and 1974 as a base year, the market price of one kilo of clean rice in Bamenda was 73 CFAF in 1972 and 96 CFAF in 1975.

\(^2\)Information obtained in an interview with the director of The Upper Noun Valley Development Authority, Monsieur Perichou on May 30, 1975.
the sample of Banso rice producers are transporters, educators, traders, and politicians.

And in Esu there is evidence that rice production is becoming an attractive alternative means of earning cash income for single young male adults. According to single men informants, cash is used primarily for dowry related expenditures required to obtain a wife and for the accumulation of assets needed in the construction of compounds. In order to acquire the necessary wealth to satisfy these objectives, young men often migrate to urban and coastal cities in search of employment. Twenty-nine percent of the rice farmers in Esu were bachelors who had chosen to remain at home and farm because of the profitability of rice production rather than to migrate elsewhere in search of nonagricultural sources of income.

The recent increase in the volume of rice produced may also be attributable to promotional efforts. The Upper Noun Valley Development Authority (UNDVA), created in 1970, was issued a mandate by the government to promote the production of rice on the Ndop plain. In some other areas (Tingoh, Esu, and Banso) rice cooperatives and agricultural extension agencies render services to farmers. But by no means can the increase in producer interest be attributable solely to these organizations. Growth in output has taken place in the Ntem to Sabongari region of the Donga Mantung Division and the Essimbi and the Otang-Obang producing areas of the Menchum Division where change agents have had little, if any, contact with farmers. Furthermore, it is likely that, where rice CPMS cooperatives are established, their
existence is due more to a response by the development authorities to an interest displayed by local farmers in rice production than to preconceived planning on the part of public officials to create such cooperatives in order to encourage farmers to grow rice.

Upland Production

Rice farming takes place in both upland and swampland areas and under supervised as well as unregulated conditions where hand cultivation is the primary mode of production. It is likely that upland rice cultivation is practiced more extensively than swampland. According to the National Academy of Science, "upland rice accounts for at least two-thirds of the total acreage in West Africa." While it was not possible to determine whether or not the upland to total rice area in the Northwest Province Cameroon is typical of the ratio for West Africa in general, it is certain that there are many farmers growing upland rice scattered throughout the province frequently in difficult-to-locate production enclaves. Two distinctive types of traditional upland cultivation patterns were identified—black-bush and mountain-grassland—both of which are found on steeply sloped terrain. In the rolling forest and mountainous regions of the province, rice production practices are very similar to what they were in earlier years. Rice is grown on very steep inclines usually at the base of hillsides and mountain escarpments.

where rich colluvial soils have been deposited and where the moisture content of the soil meets the critical growing requirements.

According to Intsiful, upland rice needs at least 25-30 inches of rainfall well distributed over the five month vegetation cycle.\textsuperscript{4} While rain falls abundantly throughout the upland producing regions in the province (except from the middle of December to early March) there are periodic dry spells during which the only source of water available to the rice plant is from the soil.\textsuperscript{5} One such period for the upland rice planted in mid-July is in August when the rains taper off before the start of the second rainy season in September. And several such periods are likely to affect rice sown in mid-April that is dependent upon the less regular and less abundant rains of the first season. Planting rice at the base of hillsides and mountain slopes, therefore, prevents water from being a limiting factor.

Land selected for cropping is cleared using traditional slash and burn techniques. Rice is planted haphazardly; that is to say, it is dilled in pockets containing four to six seeds which are distributed randomly and is frequently, though not always, intercropped with other crops. No chemical fertilizer is applied to the soil.\textsuperscript{6} Farmers engage


\textsuperscript{5}Rains start about mid-March, reach a peak in June and decrease gradually to a dry spell in August. The main rains are from September to November with peaks in October and harvest in December.

\textsuperscript{6}Farmers who are participants of special projects, such as the Wum area Development Authority Block Farming Scheme and Father Kolkman's resettlement scheme at Mbaw Nsaw, do experiment with fertilizer
in very little weeding of their fields. And often not much weeding is required as the burning-shifting cultivation patterns are relatively effective in containing weed growth, especially during the first productive cycle. High yielding varieties of seed developed at research and seed multiplication stations are not readily available for purchase and most farmers are not aware that such improved strains of rice exist. However, upland farmers are cognizant of quality differences between traditional varieties. They select for seed the best grain from their own harvest and some produce local strains which are reputed to possess desirable characteristics from neighboring areas. However, in virtually all traditional upland fields, the rice which is found in an average field is of mixed origins. Due to different rotational cycles, there are problems of uneven ripening and excessive breakage in fields not planted with pure strains. This causes production, milling, and marketing difficulties for the traditional upland farmer.

Black bush is the predominant upland cultivation pattern. The highest concentration of such producers are located in the rolling forests east of Akawaya in the northern Momo and southern Menchum divisions around Otang, Modélé, and Essimbi. Little is known about either the people inhabiting these forests or the characteristics of this zone. No detailed investigations have been made in this region. Even Hawkins and Brunt in their comprehensive study of the ecology of applications on upland rice. But these farmers are very limited in numbers. They work land which is relatively flat; and they do not, therefore, represent the typical upland rice farmers who cultivate on steeply sloped terrain.
English speaking Cameroon excluded from examination only one area in the Northwest Province. This was the black forest region in the west-northwest portion of the province. Moreover, local civil servants are not very knowledgeable of this zone. Officials responsible for collecting taxes, for instance, have divergent opinions as to the number of people living in the forests. Some records are kept by a few rice demonstrators stationed in the area. But the data which is gathered is not adequate—lacking depth, uniformity, and accuracy.

Despite the absence of knowledge, it is apparent that rice is an important commodity for many inhabitants of this region. Rice is transported by individuals who carry sacks weighing from 30 to 50 kilos on their heads over the "highway of footpaths" across the Cameroon-Nigerian border. Official concern over the loss in revenue resulting from the processing and sale of rice to eastern Nigeria suggests that sizable quantities of rice are produced in this region. And the willingness of producers to evacuate rice over considerable distance and difficult topographical terrain exemplifies the importance to which inhabitants of the area consider rice to be a source of cash income.

The black bush cultivation pattern is characteristic of semi-permanent slash and burn system. Trees are felled and combustible material is burned during the short dry season beginning in November. Timber is left lying in the fields, for evacuation of wood to urban market areas is difficult even for those farmers possessing fields adjacent to the major roads. The cleared fields are cultivated for a period of two to three years and then are laid to fallow for three to five years.
Upland rice is grown in association with maize, groundnuts and cocoyams. However, a discernable rotational pattern exists. During one of the two productive cycles, usually the second starting in July-August, rice is the predominant crop. Seventy to 80 percent of the cultivated surface on which rice is grown is allocated to this grain. For the other producing season in the year, either tubers, maize, or frequently a combination of both are sown with little or no rice being grown at the same time.

Following a fallow period of several years, farmers reclaim fields formerly used. Such reclamation is not due so much to a shortage of land availability, but rather is practiced in order to reap optimum returns from fixed cost investment incurred by having trees felled and by obtaining usufructuary rights over land use.

The "mountain grassland" upland is the more temporal of the upland shifting agricultural systems. This method of rice cultivation is practiced seven kilometers northeast of Esu. Mountain grassy slopes situated close to the valley floor are the sites selected for cultivation. From the farmers' perspective these lands are desirable in that the soils are rich in organic nutrient matter and possess a high degree of water absorptive capacity which permits planting to take place during a slack labor period beginning in late March and mid-April after the first rains. Moreover, grasslands are relatively easy to clear and require only a minimum amount of effort in preparation of the land before sowing. However, the mountain bush mode of production should be either modified or discouraged. Upon being exploited for rice production, the mountain
grassland fields quickly lose their fertility. No conservation measures are taken. As a consequence, in late August following the harvest of a single cycle of rice, farmers abandon the bush fields for a period of 15 to 20 years.

In contrast to the black forest upland where felled trees act as a barrier to soil erosion, there is no prevention against soil losses that accompany disrupting rice farming in the mountain bush upland areas. From an ecological point of view, it would be preferable for farmers to utilize the valley flat lands. There are, however, obstacles which, when taken together, act as formidable constraints precluding this alternative. The first obstacle is that it is an extremely arduous task for farmers using a short-handled hoe to rid valley fields of elephant grass. The second obstacle is that there are no dikes through which to channel water or to prevent uncontrolled flooding of the plain. And the third is the absence of a road system which, if it existed, would enable technicians to engage in pedological studies as well as extension activities required to develop a modern system of rice cultivation in the area and which would also facilitate the flow of input supplies and product outputs.

The long run solution to agricultural production in this area is to change both the location and mode of production. A permanent rotational system of agriculture using animal traction on the plateau flatlands surrounding Esu appears to be a viable option. However, before definite recommendations can be made for the mass of producers, additional agronomic research and extensive field trials conducted over a period of
years is needed. Hence, for the immediate future before specific rice production alternatives can be suggested, it is advisable to modify only slightly the traditional mountain bush pattern of rice production being practiced by inducing the farmer to incorporate relatively simple "stop gap" measures that would mitigate against soil erosion. Indigenous hedge legumes which have a dense root system could be planted every 5 to 10 meters, depending upon the severity of the slope, and perpendicular to the incline of the land. Rice could then be sown in rows parallel to these hedges rather than in scattered pockets.

Swampland Production

A swampland farmer is defined as one who cultivates rice in flooded areas. In the Northwest Province, most swampland farmers grow rice in paddy fields that are circumscribed by a system of hand-dug dikes which impound water and that are separated from each other by a series of canals that channel water to individual plots. Such irrigated systems were first introduced to the Northwest Province in Tingoh in 1968. Prior to this date, no systematized pattern of production in inundated lowlands existed. High risks were associated with swamp production because of frequent water shortages and excess flooding. But a well-organized irrigated system, which enables a farmer to regulate the flow of water, minimizes such risks.

Swampland production is considerably more labor intensive than either black bush or mountain grassland production. Construction of embankments, digging draining ditches, maintenance of nurseries, leveling
of paddy plots, and transplanting rice are tasks not performed by upland producers. Yet, despite increased labor requirements, farmers acquainted with the swampland technology prefer it over existing upland systems of production.⁷

⁷In Tingoh where flooded lowlands are in limited supply relative to black bush land, farmers select the swampland technology whenever possible. Those who grow upland rice in Tingoh do so only because there are not sufficient swampland areas.
CHAPTER V

CAPITAL AND CREDIT NEEDS OF SMALL RICE PRODUCERS

The second objective of this study is to determine the likely impact on small farmer income and production of credit extension for the purchase of additional inputs which are available within the existing environmental context. Numerous policy questions emerge:

1. For which factors of production, if any, should credit be extended?
2. What is the responsiveness of small farmer output and income to increase in input usage?
3. Where are credit programs likely to have the greatest impact—in which geographical regions characterized by what technology and what kind of institutions?
4. To whom should credit be extended—to farmers with relatively large rice holdings or to small producers?

An effective base from which answers to such questions are provided can be obtained through an investigation of existing farm management practices. In this study, the analysis is cast into a production function framework in which both cost and revenue relationships are examined. The primary focus is on gauging both the output and income effects of altering the availability of input factors. Such a paradigm is justified in that it enables one to address the crucial explanatory variable affecting human behavior often used by economists—that of
maximizing incomes—while at the same time permitting one to weigh the primary development objective of the state—that of increasing production.

Factors of Production

Labor

From an economic point of view, labor is the most important input in smallholder Cameroonian agriculture. Farmers perceive labor to be the biggest constraint to increased output given existing agricultural practices. Researchers who have conducted farm studies in Africa are likely to concur with them. Collinson claims that labor availability and use is the "key" to understanding the African agricultural system.\(^1\) Spencer asserts that labor usually accounts "for over three-fourths of the total costs of production."\(^2\) Osifo corroborates empirically Spencer's assertion in a study of upland paddy production in the Eastern State of Nigeria. He discovered that over 86 percent of total production costs were attributable to the labor factor.\(^3\)


chief. The granting of such token gifts is an expression of homage and appreciation. It reinforces and adds solidarity to the traditional sociopolitical system.

Capital

"Capital is subordinate to labor and land as a factor of production in traditional agriculture." The primary capital items in smallholder Cameroonian agriculture are the hoe, a machete, gunny sacks, baskets, basins, seed, and fertilizer. The hoe and machete form the basic tool kit of every farmer, be he a producer of rice or not. Gunny sacks, baskets, and basins represent fixed costs as these items are used year after year. Improved seed developed at the agronomic research station in Dschang is widely distributed throughout the province and is sold at concessionary prices, comparable to prices of local seed grains.

Fertilizer is the primary capital factor that is a variable input. According to the Rice in West Africa study conducted by the United States Agency for International Development, there is no doubt about the profitability of fertilizer under conditions of improved rice production in both upland and swampland areas. In the Northwest province, fertilizer is being applied to rice fields by swampland farmers. In upland areas, fertilizer is not readily available for purchase. An adequate delivery and extension system is not yet

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6 Collinson, p. 247.

developed. But in swampland areas, fertilizer may be purchased through a local cooperative or from the field extension worker.

Economic and Statistical Analyses

The economic framework within which rice producers organize their production has been described. The factors which affect output and income responses are now brought together into economic models of cost and revenue.

The Cost Models

In order to assess the impact throughout the province of alternative levels of hired labor usage, two cost functions are estimated—one which permits a comparison of the upland and swampland technologies and another which contrasts three swampland producing regions. Embedded in these cost functions are both technical relationships linking yields to hired labor and economic relationships highlighting the returns to hired and family labor. The empirical analysis is designed to answer questions about the output effects of extending credit to enable the rice farmer to hire additional labor. The first question of interest is whether hired labor is, as the farmers contend, a constraint to increased output. If so, in which villages characterized by what environmental factors (what technology and what kind of rural institutions) is credit extension for hired labor likely to have the biggest impact on production? Finally, does it appear feasible that such credit extension can be financed by rechanneling a portion of the producers' surplus in these villages?
The formulation of the cost model consists of two equations, the first being for the swampland farmer group and the second for the set of both swampland and upland producers:

1a. \( X_L = f(Y_p, R) \)

2a. \( X_L = f(Y_p, T) \)

where:

\( X_L \) = hired labor expenditures (CFAF/ha)

\( Y_p \) = yield of paddy (kg/ha)

\( R \) = swamp region

\( T \) = technology

As the production function approach assumes a static time horizon equal to a single agricultural cycle, a differentiation between labor tasks has not been made. The hired labor variable is equal to the summation of total cost outlays and market value of payments made in-kind for land preparation, cultivation, weeding, sowing, transplanting, birdscaring, and transportation from field to village per hectare of land.

The ensuing analysis assumes that the farmer purchasing labor in exchange for either a cash settlement or payment-in-kind does so as a perfect competitor. This is to say, the individual producer cannot influence the price for which he pays labor. This indicates that the supply curve for hired labor that confronts the individual producer is perfectly elastic and that there is a unitary price for labor. It also implies that the summation of cash labor expenditures is proportional to the amount of hired labor used.
Economic theory and various statistical measures were employed to determine the explanatory powers of the estimating equations, the reliability of the regression coefficients, and interpretation of the empirical results.

Neoclassical economic theory indicates that in the short run, nonlinear functional forms be used. Quadratic, polynomial, semilog, and Cobb-Douglas functional forms were used in estimating the cost functions. It was decided to let the data determine which among these alternative powers should be used in the subsequent analysis.

The structural equations were specified in terms of linear expressions mathematically equivalent to the curvilinear functional forms and were estimated using multiple regression procedures. The criterion for selecting which of the alternative forms to adopt for each of the four equations was to choose that functional form which best fit the data as indicated by the $R^2$ statistic while inspecting the significance of the estimated coefficients. The polynomial form explained the greatest amount of variation of the dependent variable in terms of the independent variables for the two cost functions:

1b. **Statistical Cost Equation of Swampland Production:**

$$X_{L.1} = b_{1.1} + b_{2.1}(Y_{p.1}) + b_{3.1}(Y_{p.1})^2 + b_{4.1}(Y_{p.1})^3 + b_{5.1}(R_{1.1}) + b_{6.1}(R_{2.1})$$

2b. **Statistical Cost Equation of Upland and Swampland Production:**

$$X_{L.2} = b_{1.2} + b_{2.2}(Y_{p.2}) = b_{3.2}(Y_{p.2})^2 + b_{4.2}(Y_{p.2})^3 + b_{4.2}(T_{p.1})$$
where:

\[ X_{L.1} \& X_{L.2} = \text{hired labor expenditures: cash outlays and market value of payments made in-kind for land preparation, cultivation, weeding, sowing, transplanting, birdscaring, harvesting, and transportation from field to village, per unit of land (CFA/ha).} \]

\[ Y_{P.1} \& Y_{P.2} = \text{Paddy per unit of land (MT/ha).} \]

\[ R_{1.1} \& R_{2.1} = 0-0-1 \text{ type dummy variables for Ndop, Mbaw Nsaw, and Tingoh swamp rice regions. Tingoh was eliminated to avoid singularity.} \]

\[ T_{0.1} = 0-1 \text{ type dummy variables for swampland and upland production denoting technology. Upland production was eliminated to avoid singularity.} \]

The structural equations and their coefficients were estimated using the ordinary least squares techniques (O.L.S.). The coefficients of multiple determination and the F ratios for the two cost equations together with the regression coefficients of the independent variables and their estimated standard errors are presented below.

1c. Estimated Total Cost Function for Swampland Production:

\[ X_{L.1} = -0.65369 + 48.19638(Y_{P.1}) - 16.97991(Y_{P.1})^2 + \]
\[ (12.25881) \quad (3.77294) \]
\[ 2.02775(Y_{P.1})^3 - 2.10234(R_{1.1}) - 12.57122(R_{2.1}) \]
\[ (0.33926) \quad (5.22117) \quad (5.60490) \]
\[ R^2 = .75 \quad F = 42.98 \]

2c. Estimated Total Cost Function for Swampland and Upland Production:

\[ X_{L.2} = -11.59663 + 45.51022(Y_{P.2}) - 16.94041(Y_{P.2})^2 + \]
\[ (8.83876) \quad (2.92163) \]
\[ 2.06572(Y_{P.2})^3 + 11.14526(T_{0.1}) \]
\[ (0.27669) \quad (4.57577) \]
\[ R^2 = .71 \quad F = 64.47 \]
The coefficient of multiple determination was high for both cost equations. Seventy-five percent and 71 percent of the variation in costs of hired labor per hectare was explained by equations 1c and 2c respectively. This indicates that the estimated functions closely fit the data and that both equations have good explanatory qualities. And in both equations, most of the variation in costs is explained by the independent yield factors. Eliminating the dummy variables in equations 1c and 2c diminishes the $R^2$ statistic by .03 and .12 respectively.

The next step is to determine the significance of the regression coefficients. The F-test provides a general test and the t-test specific tests. The F ratios for the two cost equations are high. And after having employed the F-test, it can be concluded that the likelihood of getting a correlation coefficient equal to zero is less than .001. This indicates that if not all, at least some, of the independent variables were significant. The t-test corroborates this conclusion. The linear, quadratic, and cubic terms in both cost functions were found to be significant at the 99.9 percent level. And in equation 1c, one of the two regional dummy variables was significant at the 98 percent level. The other was insignificant. In equation 2c, the technological dummy variable was significant at the 98 percent level.

Dummy variables were added to the cost equations in order to determine whether there are differences between swampland areas and whether a distinction should be made between upland and swampland production in terms of the efficiency with which hired labor is employed.
The statistical results indicate that significant cost differences do exist between swamp production on the Mbaw Nsaw plain from that in Tingoh. No significant differences were found between Ndop and Tingoh, however. There are, in fact, similarities between Tingoh and Ndop which separate these areas from Mbaw Nsaw. One of the primary distinguishing characteristics is the institutional infrastructure. Both Ndop and Tingoh have an extension system whose personnel have been under the tutelage of expatriate development experts. On the Mbaw Nsaw plain, rice demonstrators are and always have been accountable to local authorities. Given the strong externally supporting system in Tingoh and Ndop, it was surprising to discover that farmers in Mbaw Nsaw were obtaining higher yields per unit of hired labor expenditures. This is largely due, no doubt, to more favorable factor prices in Mbaw Nsaw. Unlike Tingoh and Ndop, Mbaw Nsaw is geographically isolated from major market centers. There are fewer alternative employment opportunities for earning cash. Hence, the price of a unit of labor is less than elsewhere where the opportunity cost of labor is higher.

There are other possible explanations for why hired labor expenditures at given levels of output are lower in Mbaw Nsaw than in the other two swamp regions:

1. There could be some economies of scale. On the Mbaw Nsaw plain, many farmers are entrepreneurial types from Banso town who manage large rice holdings. These holdings average 1.7 hectares, which is over four times the average size of swamp farms in Tingoh and Ndop.

2. There could be a trickle-down demonstration effect. The highly productive entrepreneurial type farmers employ many laborers who
maintain permanent residence in New Camp on the Mbaw Nsaw plain. Recently, these indigenous farmers have established their own rice farms and they tend to emulate the farming practices of the larger farmers.

3. There could be externalities stemming from the existence of a rice cooperative on the Mbaw Nsaw plain which is a branch of the most viable cooperative system in the country. As both rice demonstrators and farmers affiliate themselves with this organization, an environment is created which is conducive to mutual exchange and communication.

In the second cost equation, the null hypothesis that no significant differences exist between upland and swampland production was, as anticipated, rejected. While swampland technology is more labor intensive and wage rates are higher than in upland areas, it was discovered that less hired labor expenditures were associated with given levels of output in swampland regions than in upland regions. This can be attributed to the greater productivity of swamp production to upland production where total costs for swamp technology are below that for upland technology.

The signs of the polynomial coefficients for both equations 1 and 2 conform to the theory of short run costs in which average variable labor costs fall, reach a minimum, and thereafter rise. Eighty-six percent of the rice producers are in stage I. In this stage the average variable cost decreases as additional units of hired labor are employed. In order to minimize costs on hired labor expenditures per unit of output, therefore, farmers should hire more labor. Another
justification for the employment of additional labor is that it generates increases in output per unit of expenditure. Stage I is also characterized by product increases per unit of both the variable and fixed inputs. Assuming that capital costs are negligible the product per unit of the variable hired labor input as well as the produce per unit of the fixed factor, land, increases as more is spent on employing labor.

As mentioned earlier, land is in relative abundant supply and tenure is based upon either the tribal communal system or the jurisdiction of the development authority. Hence the rice producer incurs minimal costs when acquiring rights to land use and receives little, if any, rent for holding it. Assuming that capital factors are either held constant or are relatively unimportant, the rice farmer will minimize their production costs by operating at the intensive margin for hired labor. The intensive margin is defined as the boundary point between stages I and II. A farmer who moves beyond this boundary into stage II incurs increasing costs on hired labor per unit of output and does not receive compensating benefits in terms of decreasing costs on land because the land factor has no economic value.

An examination of the output elasticities provides a measure of the relative responsiveness of output to changes in the volume of hired labor expenditures. The output elasticities are greater than one over major segments of stage I. They are especially high over the yield range from 2 to 3.5 tons of paddy per hectare, Table 1. These high elasticities indicate that output is very responsive to changes in hired
labor expenditures. It substantiates the view that labor is a major constraint in the production process. Most farmers who hire workers to relieve labor constraints obtain much higher yields per unit of land. This is less true, however, of those producers at the extremes of the total cost curve. In the early portion of stage I, the output elasticities are comparatively low and even reach degrees of inelasticity. Farmers who have yields less than one metric ton per hectare either do not have the ability to hire enough labor to break critical production bottlenecks or lack sufficient motivation and/or knowledge to effectively manage their farms. This may be attributable to low educational levels, poor health, flooding, or some other kind of disrupting event.

**TABLE 1**

RANGE OF OUTPUT ELASTICITIES FOR SWAMPLAND RICE AT DIFFERENT LEVELS OF PRODUCTIVITY

<table>
<thead>
<tr>
<th>Paddy Yields (M.T./ha)</th>
<th>Range of Output Elasticities$^a$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>.42- .88</td>
</tr>
<tr>
<td>1.0</td>
<td>.98- 1.60</td>
</tr>
<tr>
<td>1.5</td>
<td>1.60- 2.45</td>
</tr>
<tr>
<td>2.0</td>
<td>3.33- 4.71</td>
</tr>
<tr>
<td>2.5</td>
<td>10.00-14.29</td>
</tr>
<tr>
<td>3.0</td>
<td>11.11-14.29</td>
</tr>
<tr>
<td>3.5</td>
<td>2.56- 3.45</td>
</tr>
<tr>
<td>4.0</td>
<td>.97- 1.22</td>
</tr>
<tr>
<td>4.5</td>
<td>.53- .68</td>
</tr>
</tbody>
</table>

$^a$The output elasticities were computed as being the reciprocal of the cost elasticities:

$$\xi = \frac{1}{\frac{dc}{dy} \cdot \frac{Y}{c}}$$
The Revenue Models

Rice is considered to be a cash crop by growers in the Northwest Province. A very small percentage of the harvest is reserved for family consumption. Hence, farmers are more interested in maximizing income rather than maximizing output with respect to rice production activities. It is, therefore, useful to investigate the financial rewards to farmers' efforts which is a function of not only yields but also prices.

The price that the producers receive for their rice varies considerably, especially between, but also within regions. The price obtained depends upon:

1. The transportation costs incurred by the purchaser as reflected in the difficulty of getting the rice from the producing regions to major market centers;

2. To whom the product is being sold—to final consumers in local markets who purchase small quantities at one time, or to traders, or cooperatives that buy in bulk; and

3. The timing of the transactions—whether sales take place before the harvest, immediately following the harvest, or later in the year when the availability of rice is relatively scarce.

The empirical analysis is designed to answer questions about the revenue effects of credit extension:

1. To what extent is there a divergence between the social desirability of hiring additional labor as expressed in the
cost analysis in terms of increasing output and the profitability of doing so in terms of maximizing farmers' income?

2. Would it be more advisable, given existing farm practices, to extend credit for fertilizer or for hired labor?

3. Does it make any difference, from an economic return per unit of land viewpoint, whether credit is extended to the small or large farmer?

Two revenue functions are estimated, one which is restricted to swampland farmers and one which is inclusive of the total sample of rice farmers:

3a. \( Y_R = f(X_L, X_A, X_C, R) \)

4a. \( Y_R = f(X_L, X_A, T) \)

where:

\( Y_R = \) gross rice income (CFA/ha)

\( X_L = \) hired labor expenditures (CFA/ha)

\( X_C = \) fertilizer expenditures (CFA/ha)

\( X_A = \) area of cultivation

\( R = \) swamp region

\( T = \) technology

A distinction has been made between swamp production and upland production in order to assess the impact of fertilizer on rice income. As fertilizer is not used by upland farmers, incorporating it into the revenue function for all firms would result in misspecification errors.
The statistical models selected for the two revenue functions are as follows:

3b. **Statistical Revenue Equation of Swampland Production:**

\[ Y_{R.3} = b_{8.3}(X_{L.3})^{b_{9.3}}(X_{C.3})^{b_{10.3}}(X_{A.3})^{b_{11.3}} + b_{12.3}(R_{1.3}) = b_{13.3}(R_{2.3}) \]

4b. **Statistical Revenue Equation of Upland and Swampland Production:**

\[ Y_{R.4} = b_{8.4}(X_{L.4})^{b_{9.4}}(X_{A.4})^{b_{11.4}} + b_{14.4}(T_{0.4}) \]

where:

- \( Y_{R.3} \) & \( Y_{R.4} \) = gross rice income: cash receipts and market value for rice consumed within the household per unit of land (CFA/ha).
- \( X_{L.3} \) & \( X_{L.4} \) = hired labor expenditures per unit of land: cash outlays and market value of payments made in-kind for land preparation, cultivation, weeding, sowing, transplanting, birdscaring, harvesting, and transportation from field to village, per unit of land (CFA/ha).
- \( X_{C.3} \) = fertilizer expenditures per unit of land valued at 2500 CFA per 50 kilogram bag (CFA/ha).
- \( X_{A} \) = area under cultivation (ha).
- \( R_{1.3} \) & \( R_{2.3} \) = 0-0-1 type dummy variables for Ndop, Mbaw Nsaw, and Tingoh swamp rice regions. Tingoh was eliminated to avoid singularity.
- \( T_{0.4} \) = 0-1 type dummy variables for swampland and upland production denoting technology. Upland production was eliminated to avoid singularity.

As with the cost equations, the data were fitted to several functional forms. The Cobb-Douglas function gave the best statistical results for both revenue equations. The independent variables in the semi-log function explained less variation in the dependent revenue
variable than did the Cobb-Douglas and therefore was rejected. Although the quadratic and polynomial forms had higher $R^2$s than did the Cobb-Douglas, the independent variables were insignificant and some had standard errors more than twice the size of the coefficients.

The revenue equations are expressed below in terms of the estimated regression coefficients of the independent variables, their standard errors, the coefficients of multiple determination and the $F$ ratios:

3c. **Estimated Total Revenue Function for Swampland Production:**

$$Y_{R.3} = .59952 .29190 -0.08883$$
$$Y_{R.3} = .88621(X_{L.3})^{0.12756}(X_{C.3})^{0.09655}(X_A)^{0.07527} +$$
$$0.09003(R_{1.3}) + 0.14278(R_{2.3})$$

$$R^2 = .48 \quad F = 11.61$$

4c. **Estimated Total Revenue Function for Swampland and Upland Production:**

$$Y_{R.4} = .62765 -0.23731$$
$$Y_{R.4} = .96019(X_{L.4})^{0.09476}(X_A)^{0.06652} + 0.16621(T_{0.4})$$

$$R^2 = .53 \quad F = 37.26$$

The $F$ ratios for both revenue equations estimated using the Cobb-Douglas function are moderately high. Use of the $F$-test indicates that the group of independent variables are significant at the 99.9 percent level. And on examination of the individual coefficients, using the $t$-test criterion, reveals that all independent variables are significant with the exception of the area of land under cultivation ($X_{A.3}$) and the dummy variables ($R_{1.3}$, $R_{2.3}$) in the third equation.
Regional dummy variables were added to the swamp revenue equation to ascertain whether there is a distinction between income generated from the employment of hired labor and fertilizer inputs in Ndop, Mbaw Nsaw, and Tingoh. Use of the t-test indicated that no significant differences exist between these regions. Analysis of equation 1c revealed that greater yields per unit of land are obtained in Mbaw Nsaw. This resulted in differentials in cost-yield relationships between Mbaw Nsaw and Ndop-Tingoh. On the revenue side, however, price differentials operate in the opposite direction from yields and neutralize differences in revenue-inputs between the two swamp regions identified in equation 1c.

The area under rice cultivation was incorporated in both revenue equations to determine whether revenue was affected by the scale of operation. The area coefficient proved not to be significant in equation 3c. This suggests that there are not economies of scale with swamp production. The conclusion is reasonable. One would not expect any scale economies given the preponderance of labor and the nonintensity of capital characterizing irrigated production.

In equation 4c, the area coefficient was significant and carried a negative sign. The result is explicable. It pinpoints the contrast between swamp and upland production, the former being an example of intensive agriculture and the latter being extensive in nature where smaller revenues are obtained per unit of land.

The revenue elasticities can be read directly from the Cobb-Douglas function. The revenue elasticity with respect to hired labor is less
than one and is approximately the same for both revenue equations. It is equal to .60 and .63 for equations 3c and 4c respectively. The low magnitude of the revenue elasticities of hired labor indicate that revenue elasticity of fertilizer is even smaller than that for hired labor. It is equal to .29. This signifies that given the average producer's farming pattern hired labor is more remunerative than fertilizer.

A higher return to fertilizer usage was expected. The low response may be due to poor management practices. In order to obtain optimal results from the use of fertilizer it is necessary that certain technical requirements be met. The rice fields must be properly tilled and leveled. Sowing and weeding must occur at the right dates. The water level should be controlled. And fertilizer applications must be made on time. It is doubtful that all of these conditions are being fulfilled.

The low returns to fertilizer are also likely to be due to the use of insufficient quantities. It is not economically profitable to apply small amounts of fertilizer to a unit of land. The sample results show that one half or less of the recommended fertilizer dosage is being applied to paddy fields in four of the six villages surveyed.8,9

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8 One fourth of the swamp farmers did not use any fertilizer. They were excluded from the regression in order not to bias the statistical results.

9 Fertilizer trials were conducted on the Ndop plain by French agronomists in 1973. On the basis of this study it was suggested that the optimum fertilizer dosage was 250 kilograms per hectare of 160-40-50; see Institute de Rescherches Agronomiques Tropicales et des Cultures Vivrières, Rapport de Synthese 1973 (Yaoundé: Institute de Rescherches Agronomiques Tropicales et des Cultures Vivrières, 1973), pp. 90-91. The mean ratio of actual to recommended dosages associated with the six swampland producing villages are as follows: .37 Bamali, .92 Baba, .35 Balikumbat, .50 Banso, .48 New Camp, .90 Tingoh.
It is interesting to note that in Baba and Tingoh where farmers have been growing rice for the longest period of time, near optimum quantities of fertilizer are being used. This suggests that the return to fertilizer, when used correctly, is probably much higher than is indicated by the regression results. It also foreshadows future increased demand for fertilizer in those areas where swamp rice has recently been adopted.

The sum of the hired labor and fertilizer elasticities provides a measure of the revenue elasticity with respect to both inputs. The sum is equal to .89, which is less than one, indicating an inelastic overall relationship. This is tantamount to saying that farmers are in stage II of their revenue function.

The question immediately arises whether there is a discrepancy between the results found using the cost equations from that obtained using the revenue functions. On the cost side, it was discovered that farmers were in stage I of their cost function and that the output elasticities of hired labor was highly elastic over wide ranges. This was interpreted as meaning that farmers would most assuredly acquire more labor in the market if they were financially able to do so. The apparent inability of farmers to escape from stage I provides a justification for the extension of credit.

The statistical results on the revenue side indicate that farmers are in stage II of their revenue function and that the revenue elasticities for both hired labor and fertilizer are relatively inelastic. An inference from the analysis is that financial limitations
preventing additional investment is not such a severe constraint as thought earlier because farmers are in stage II of their revenue function. The implication of being in the diminishing returns section of the revenue function is that the rate of return to income of additional investment is lower than one would have anticipated based upon the high output elasticities derived in the cost analysis.

The discrepancy in the findings may be partially explained by divergent market behavioral patterns. Farmers who invest heavily in nonfamily inputs and who, in turn, obtain higher yields per unit of land are likely to be more commercially oriented than others who spend less and who get smaller yields. Being more fully integrated into the commercial system, the farmers rely upon middlemen to perform the primary marketing functions. They sell their produce in large quantities at relatively low prices to either traveling merchants or to cooperatives. However, those producers who obtain smaller yields per unit of land assume more marketing function. They do not specialize in production. Having less to market, it is in their economic best interest to obtain the highest possible price for their rice by selling it by the kilo-cup-full in local markets rather than selling it in bulk.

The Rent Model

The returns to family labor and management provide a measure of the credit carrying capacity of rice farmers. Unfortunately, there are formidable difficulties in measuring family labor in a partially
commercialized economy such as one finds in the Northwest Province.\textsuperscript{10} One way to circumvent the problem is to impute a value to family labor and management. Friedman provided the idea for this approach in an article on the relationship between cost and supply curves in which the concept of "entrepreneurial capacity" is introduced.\textsuperscript{11} He defines entrepreneurial capacity as those "factors specific to the firm and not capable of being rented or hired out by other firms."\textsuperscript{12} And he

\textsuperscript{10}It is very costly to adopt the "manhour" or "work measurement" technique. This method requires that enumerators document actual labor activities. According to Martin Upton in Farm Management in Africa: The Principles of Production and Planning (London: Oxford University Press, 1973), pp. 147-148, each enumerator can tabulate the activities of only one farm family per day. And in order to obtain a picture of the availability and utilization of labor over time, members of each family selected in the sample must be observed on a regular basis throughout the year, say twice every two weeks.

Besides the time-consuming nature of the man-hour approach, another drawback to this method of measurement is conceptual imprecision. H. A. Luning in Economic Aspects of Low Labor Income Farming ("Center for Agricultural Publications and Documentations, Agricultural Research Report No. 699"; Wageningen, Netherlands), p. 62, objects to the use of man-hours on the basis that the actual working day in agriculture varies over the course of the year. He contends that "adding up the number of hours and then dividing them by eight is permissible only when a constant length of day is envisaged."

As an alternative, Luning suggests that the labor input be measured in man-days. He defines a man-day as being the amount of work done by an average adult male during a twenty-four hour period. Spencer, p. 13, justifies the man-day approach under the assumption that "the length of the working day is a part of the cultural pattern of the society." A major objection to the man-day method is that it skirts the work-spreading problem by equating labor days during the slack season with those during the peak season. Another objection is that though the man-day approach entails less effort and money than the man-hour approach, it nevertheless requires more time collecting the data than the researcher may have at his disposal.

\textsuperscript{11}Milton Friedman, Price Theory: A Provisional Text (Chicago: Aldine Publishing Company, 1962), pp. 74-122.

\textsuperscript{12}Friedman, pp. 95-96.
associates entrepreneurial capacity with rents whose return is "price determined rather than itself determining price."\textsuperscript{13}

The rent model employed here utilizes Friedman's concept of entrepreneurial capacity. A value for family labor and management for each strata is imputed by subtracting mean expenditure outlays from gross revenues based upon farm gate market prices and output yields. The assumption is made that the returns to family labor and management are equivalent to that portion which, together with other input costs, exhausts total revenue.

Strata mean values for gross revenue, rents, and costs using the residual returns concept are tabulated in Table 2. On the basis of information contained in this table, profitability ratios are calculated for each of the producing regions. Profitability ratios highlight the relationship between rents and the local market value of the product. The ratios range from 22 percent to 46 percent between swampland strata and 16 percent for upland production. The high mean profitability ratios suggest that, on the average, there are substantial returns to rice production and that there is little risk associated with credit extension. However, high standard errors point to considerable heterogeneity between farming units within the various groupings. The large variations indicate the importance of establishing criteria to determine which farmers would qualify for credit. But, given effective institutional selection and recovery arrangements, there is likely to be few, if any, problems of loan repayment.

\textsuperscript{13} Friedman, p. 98.
<table>
<thead>
<tr>
<th>Observations</th>
<th>Rice Farm Area (ha)</th>
<th>Output of Paddy (MT)</th>
<th>Yields (MT/ha)</th>
<th>Price (CFA MT)</th>
<th>Total Gross Revenues (CFA)</th>
<th>Total Variable Costs (CFA)</th>
<th>Total Costs (CFA)</th>
<th>Total Net Revenues (CFA/ha)</th>
<th>Average Variable Costs (CFA/ha)</th>
<th>Average Total Costs (CFA/ha)</th>
<th>Average Net Revenues (CFA/ha)</th>
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*All CFA expressed in one thousand units.
CHAPTER VI

THE CREDIT INSTITUTIONAL TASK SETTING

It has been demonstrated in the previous chapter that additional increases in the use of existing factors of production would have a beneficial impact on both output and income. This provides a justification for the extension of credit to rice farmers which would enable them to hire more labor and to acquire fertilizer and other biological inputs as they become available. In addition, a case could be made for the extension of credit to farmers experimenting with intermediate levels of mechanical technology such as an animal traction scheme or a small equipment package.

The profitability of rice production is one precondition for credit extension. There remains the question, however, how such credit can be extended to small farmers. Credit programs often fail because of weak linkages between the administration and the farming population. In addition to profitability and availability, it is essential that there are effective mechanisms through which credit and repayment can flow. Chapter VI focuses on this issue using the existing institutional framework to illustrate possible linkages. Two basic approaches are investigated:

1. The conventional approach whereby capital from outside sources is channeled, preferably in the form of credit-in-kind, through modern institutions;
2. The innovative approach whereby indigenous savings and external funds are utilized to extend credit-in-cash through a symbiotic system that is established between modern and traditional credit institutions.

How Government Programs Can Become More Effective

Many difficulties are encountered in grafting modern credit programs onto traditional, partially commercialized rural societies. It is instructive to review previous attempts in order to become sensitive to problem areas and to identify program designs that perhaps should be repeated and shortcomings that can be avoided. A brief review of some government sponsored credit programs follows:

Historical Accounts

As early as 1926 the French, who intervened more into the affairs of the African economies than did the British, devised a formula to extend credit to the Cameroonian farmer. The scheme was based upon a three tier "metropolitan" concept.\(^1\) The central bank was situated at the summit. At the two lower levels there were regional credit banks and village mutuals. The pyramidal organization is theoretically ideal in terms of channeling funds to the small farmer. But the formula proved difficult to operationalize. By 1931, after several years of

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implementation, the requirements for credit extension were considered too stringent. Only the privileged plantation owners along with political and religious leaders, were able to benefit from the system. The collateral stipulations were subsequently relaxed. By 1936, however, it became apparent that the lowered mortgage requirements were too lenient. According to Gosselin, it was at this time that farmers first began to equate credit originating from exterior sources with gifts coming from an inexhaustable fund.²

Le Crédit du Cameroun came into being in 1954 in the West and South Central Provinces.³ The emphasis was put upon extending credit through cooperatives on the basis of productive potentials rather than on a capacity to repay. In 1960, Le Crédit du Cameroun was replaced by La Banque Camerounaise de Développement (BCD). The BCD was created to render financial and technical assistance promoting economic and social development within the context of the national development plans. The BCD continued to support the cooperative credit program started by Le Crédit du Cameroun. However, during the transition period to national independence fundamental changes had occurred. Beginning in 1959 the purposes for which credit was extended became more diversified as consumption loans gradually replaced production loans. And starting in 1959, the rapid expansion in the number of credit cooperatives tapered off considerably. Buisson notes that after 1961 there was no

²Gosselin, p. 75.
³Gosselin, p. 45-49.
longer a genuine cooperative credit movement but merely a distribution scheme for extending credit. And Gosselin states that ten times the amount went out as came in. By 1963 the movement had all but subsided—only a token number of loans having been granted to the small farmer. According to some observers, the BCD preferred to restrict its clientele to salaried civil servants and large scale development projects.

Some lessons learned from the credit experience in the 30's and the late 50's/early 60's are as follows:

1. The basic problem with small farmer credit is how to design a viable program that reaches the client who has little equity upon which loans can be guaranteed. Crops with high profitability potentials can be used for collateral, as suggested by the early Crédit du Cameroun program, if there are adequate market controls.

2. Certainly, more knowledge of the client environment would be helpful, as indicated by the French credit scheme in the 1930's, in determining the conditions under which loans can and should be extended. However, the lack of understanding can be, to a degree, compensated by having the farmer become more involved with program implementation and accountability.

3. It is important to re-evaluate credit programs over time. Should there be a monopolization of the use of credit funds by the wealthy, as was the case in the 30's, it is necessary to alter lending policies to better suit the targeted population. The credit experience

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in both the 30's and late 50's/early 60's suggests that there is a tendency for credit programs to degenerate over time. Signs of decay are diversion of funds to consumption purposes and default in payments. It is important not to allow conditions which characterized credit extension in the past to prevail, for to do so would ratify the belief that credit is a necessary condition for development.

National Rural Development Fund (FONADER): Its Birth, Responsibilities, and Performance

In the spring of 1973, the National Rural Development Fund (FONADER) was established. FONADER has a mandate that, in many respects, is similar to the initial purposes for which the BCD was created. The basic task of FONADER is to provide a mechanism whereby capital in the form of financial and technical assistance can be mobilized into productive investment. Specific ways in which FONADER can intervene into the economy have been delineated in the presidential decree No. 73/465 and include the provision of aid, credit extension, loan guarantees, advances to young farmers, and direct execution of projects. The focus of FONADER activities is on the nonindustrial sector.

FONADER has not fared much better than its predecessor, the BCD. The few beneficiaries of loans have been the large well-to-do producers and a few farmers affiliated with development projects such as the Food Development Authority (MIDEVIV) "green belt" program around Yaoundé. According to the June 1974 annual FONADER report, the first year of activity was spent establishing the internal organization of the bureau.
and publicizing the program to the people. By the middle of 1975, inhabitants throughout the rural areas of the country had heard about FONADER. But there was little evidence (and none in English speaking Cameroon) that such a fund was operational.

FONADER has not suffered from a shortage of loanable funds. A total of 800 million CFA francs was allocated for loans to farmers in the financial year 1973-1974. As of November 1974 only 200 million CFA francs had been used for this purpose. However, despite a balance of 600 million CFA francs, an additional sum of 1,105 million CFA francs was budgeted for the purpose of extending productive credit for the 1974-1975 financial year.5

A primary obstacle that prevents FONADER from reaching the small farmer is the cumbersome application procedure for securing loans. Dossiers have to be compiled which must contain the following information in order to receive consideration: (1) details about the project for which credit is solicited; (2) proposed guarantees offered; (3) information regarding the financial standing of the client; (4) an itemized account of cost of inputs to be purchased and expected yields; (5) receipts for past labor wages paid; (6) a letter authorized by the police authority from a third person who is willing to provide an "engagement solidare"; (7) signatures from the departmental delegate of agriculture, prefects as well as subprefects; and finally, (8) a 2,000 CFA francs money order to cover processing costs.6 The majority of

5"FONADER," Cameroon Tribune, November 9, 1974.
6"Le Credit FONADER Comment L'Obtenir," Cameroun Tribune, 14 janvier 1975.
farmers, having received little schooling, are not capable of properly completing such forms. And few farmers would be willing to risk 2,000 CPA francs without having first seen evidence in their communities of FONADER's activities.

The other major difficulty is an absence of a viable delivery and recovery system. In order to maximize the gain and to minimize losses of a credit program directed by FONADER, it is essential that a streamlined communication system be developed which extends down to the village level. Farmers and groups of producers need assistance in filling out application forms. A screening process identifying the better applications is required. And supervision is needed to insure that funds are not being diverted, that inputs are supplied on time and are utilized correctly, and that a portion of the farmers' gross income is channeled toward loan repayment at a time when they are financially solvent.

For FONADER to hire, train, and station a corps of credit specialists in the field is neither warranted nor needed. Such an undertaking would be costly and would mean a duplication of efforts at a time when existing technical services need reinforcement. It may be

7The financial situation of the Credit Union League provides a case in point. The League employs bureaucrats to manage internal operations and hires field workers to supervise individual credit unions. On the basis of the 1971 budget, Kees Harteveld concludes in "Savings and Credit in the Grassfields" (Holland: Agricultural University of Wapeningen, April, 1972), pp. 50-51, that the operating expenditures of the League were three times the income accruing to it. And he notes that the budgetary imbalance would have been much greater if the American and Dutch volunteers had been replaced by Cameroonian counterparts to whom the League would have had to pay salaries.
possible that FONADER could make use of existing personnel and institutions in rural areas. However, in the Northwest Province, no working arrangements have been established between FONADER and intermediate institutions such as produce marketing cooperatives, credit unions, and "development authorities." And no formal links have been established between FONADER and technical agencies such as the Department of Agriculture and the Department of Cooperation and Mutuality who employ field workers throughout the province.

Possibilities for Intervention into the Rice Sector of the Northwest Province

FONADER is in the throes of growing. The organization is having to bear the brunt of considerable criticism because expectations have not been realized. As a consequence, the planning authorities within the agency have been re-evaluating basic policy. Two fundamental changes are observable. In the March 19, 1975 issue of the Cameroon Tribune, it was announced that loan applicants no longer had to produce sureties "because moral guarantees can be given by subprefects, prefects, representatives of technical services, customary and political authorities." It is not clear what effect this change in policy will have upon the number of loans granted. It is likely that dispensing

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8"Development authorities" refer to expatriate sponsored projects such as the Upper Noun Valley Development Authority in the Mejam Division and the Wum Area Development Authority in the Menchum Division of the Northwest Province.

with collateral requirements would induce more farmers to make application for loans. However, the middle level authorities responsible for approving loans might reject a high proportion of these applications because of a fear that they would lose their jobs if the loans on which they had put their stamp of approval were not repaid. And it does appear that the incidence of default would increase as the loan recipient would risk little, if any, material loss for not repaying.

But whether eliminating sureties would cause repayment difficulties is perhaps not as critical an issue as whether such a policy would aggravate wealth disparities by making it easier for those who apply for credit to secure loans. Generally, it is the very large commercial farmer who possesses the awareness and motivation to complete credit applications and who has the influence and status that facilitates approval. It would appear that if the government is really interested in getting the greatest "mileage" out of FONADER's development funds—using credit as a tool for enabling large numbers of farmers to increase their output and income—credit to individuals would receive much lower priority than group credit.

Loans to individuals should be restricted to cases where the recipients' activities are in harmony with the local factor endowment and national and regional developmental objectives. It is, therefore, justifiable to extend loans to farmers adopting intermediate levels of technology and to those whose enterprises have positive welfare impacts on others as would be the case if recipients hired large numbers of local laborers. However, individual loans for the purchase of tractors and vehicles should not be approved.
The second shift in policy is that a greater emphasis has been put on group credit. In an article entitled "Some Points Which Influence the Granting of FONADER Loans" farmers have been exhorted to apply for loans as groups:

The general impression is that farmers do not yet appreciate or recognize the enormous advantage or benefit they would derive as groups vis-à-vis the obtainment of FONADER loans. It is easier for a farmer to obtain a loan as a member of a group rather than as an individual. In the case of cooperative societies, the society stands as surety and although information has to be supplied on the individuals applying for loans, there is no direct dealing between these individuals and FONADER.

It is hardly fair to cast blame on farmers for not making more group loan requests. In addition to providing the institutional means by which desired objectives can be attained, the raison d'être for the modern bureaucratic infrastructure is to render guidance and to educate the population about possibilities. FONADER could substantially increase its impact in rural areas at minimum cost by having a representative (who is provided with an adequate means of transportation) situated in each of the seven provinces in the country. The primary task to be performed would be to promote group loans and to reinforce innovative efforts by progressive farmers. To accomplish this goal, it

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10 In order for farmer groups to obtain from FONADER either credit or guarantees for the loans its organization extends, participants have to pledge in writing to work under the direction and supervision of the technical services. This is to say, members have to agree (1) to adhere to the advice of technicians and (2) to market their produce within the framework of their own particular organization and under the supervision of the services responsible for the collection of installments due. The above conditions are specified in Cameroon, "Decree No. 73/496." (Yaoundé: The President of the Republic, August 28, 1973).
would be necessary that the FONADER representatives collaborate closely with personnel in the existing institutional infrastructure that are in contact with the farming population and who are capable of providing essential technical and organizational services.

There are several ways that FONADER could intervene into the economy of rice farmers in the Northwest Province as spelled out by the original mandate:¹¹

1. "Direct aid could be granted for input supplies to farmers engaged in approved projects. Such aid would be reimbursable but free of interest." It would seem to be a relatively simple matter for the FONADER representative stationed in the Northwest to draft a project for the provision of credit in the form of inventory stocks of inputs to hulling factories scattered throughout the province. In this event, input factors that are often not found in rural areas—such as improved seed, fertilizer, pesticides, jute bags, sickles, and other small tools—would be readily available for purchase. Inventory stock loans could be of the revolving type whereby repayments would take place over time as supplies were sold and replenished.

2. "Agricultural credit could be provided, preferably in-kind, to individual producers and/or groups of farmers on short, medium, and long term bases." FONADER could play an instrumental role in encouraging entrepreneurial groups of rice producers as well as individual farmers

¹¹Cameroon, "Decree No. 73/496" (Yaoundé: The President of the Republic, August 28, 1973).
who were interested in adopting intermediate technologies such as animal traction and/or improved upland production techniques. According to geographer Boutrais the tsetse fly is virtually nonexistent on the Ndop plain because of the relatively high altitude. Hence, unlike most other rice growing regions in the province where either cattle are susceptible to trypanosomiasis due to climatic conditions favorable to the tsetse or the topography of the land is too severe, animal traction appears to be a viable alternative method of land cultivation on the Ndop plain. However, the consensus among experts stationed in the field is that, before oxen can be used to cultivate swamplands suitable for rice production, the dense root system of these soils must be removed. Therefore, should attempts be made to experiment with animal traction, it would be desirable in the first year to have the land tilled using tractors. Credit extension for hiring tractor services and for later acquisition of oxen equipment could certainly facilitate the implementation of such trials.

On the Mbo plain in the West Province, a pilot project (MIDERIM) was begun in 1974 to introduce intermediate level upland technology

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13 Discussions on May 16, 1975, with Dr. H. D. Dreschler, director of the Wum Area Development Authority and informal conversations on various occasions throughout the month of April 1975 with Peyrichou and J. C. Choffart, director and head agricultural engineer of the Upper Noun Valley Development Authority, revealed that the administrators of both projects believed that animal traction could be used to cultivate swamp rice fields following initial land clearing and preparation.
among a selected group of farmers who agreed to establish their homestead on the plain and grow rice. The project is being supervised by expatriate personnel and Cameroon counterparts. In 1975, forty-three farmers joined the program. They received credit-in-kind and in-cash for land clearing and tractor discing, plowing, and leveling performed by the development authority; for hiring labor; for acquisition of seed, fertilizer, and pesticides; and for the purchase of improved mechanical equipment. Participant farmers adopted one of two kinds of mechanical technologies: (1) a small equipment package including hand operated sowers, weeder, threshers, and pumps and (2) a power tiller (combine) which allegedly could be used for planting, weeding, applying fertilizer, harvesting, and transporting. Should this project prove to be both financially profitable to the farmer and economically justifiable to the country after having made adjustments for subsidization, a similar program could be devised on the Mbaw and Ndop plains in the Northwest Province where land is relatively abundant and hence where improved upland technologies, extensive in nature, are likely to be suitable. FONADER could be called upon to make provisions in such instances.

3. "Advances for the purchase of agricultural implements and planting material may be granted (with a repayment moratorium of one year) to young farmers establishing themselves on the land. In addition, technical assistance related to land development can be assumed in cases

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14 Information about the intermediate level technological package being introduced by MIDERIM was obtained on June 5, 1975, by interrogating field technicians at Mbo and by interviewing Monsieur Audebert, director of the MIDERIM program, in Yaoundé on July 4, 1975.
of resettlement schemes." Thus, FONADER could be called upon to provide financial and technical assistance for projects similar to the one devised, directed, and partially funded by the Catholic Mission in the Bui division. In 1970, Father Kolkman recruited sixteen young farmers from Banso who agreed to resettle on the Mbaw plain. By 1975, the program had expanded to include thirty-three young men. Each participant has been given three hectares of land. The primary purpose of the program is to provide youth of working age an opportunity to begin an early investment in modern farming. Rice and palm oil are the two principal cash crops and each farmer is responsible for growing food crops sufficient to satisfy subsistence needs.

4. "Loans granted by precooperatives, cooperatives, and mutual societies of producers could be guaranteed who agree to work under the direction and supervision of the technical services." Noting that "The relatively low incomes of farmers seriously hamper their ability to shoulder too much risk," Norman has concluded that "The prospects of new technology being adopted will be much greater if, in addition to the proven increased profitability, the risk or standard deviation in returns from the improved technology is the same or

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15 Information about the Bui Catholic Mission Resettlement Scheme was obtained from discussions with participants of the program at Mbaw Nsaw on April 16, 1975, and through visits with Father Kolkman before and immediately following the field trip.

16 From 1970 through 1975 a total of forty-six farmers had participated in the resettlement program. Thirteen left because of the arduous work and spartan living conditions. In the first year everyone slept on the ground in make-shift houses. By 1975, 23 cinder block structures had been built and eight participants had married and were living in their own houses equipped with zinc roofs and window panes.
preferably less than under traditional indigenous practices."\textsuperscript{17} FONADER could keep profits within acceptable limits by providing lending agencies insurance that credit extended to farmers adopting modern technology which has a high risk component will be reimbursed. In the event the modern technology proved not to be profitable either because of a lag in the learning process as to how new techniques should be used or because the new technology was determined not to be suitable to the local environment, FONADER could assume partial responsibility for repayment.

Another possibility, discussed in the next section, is for FONADER to extend guarantees to the Credit Union League making productive cash loans to traditional mutual aid societies. Guarantees could also be granted to individual credit unions and market cooperatives that provided similar services to precooperative groups of farmers.

Meshing Traditional Structures with Modern Programs

There is a tendency to promote credit extension using modern institutions created by the government without acknowledging similar efforts being made within the indigenous system. Little consideration has been given to the idea of establishing linkages of native institutions to modern ones. Granted, the creation of a marriage between old

and new structures may be difficult to operationize. But it certainly
does seem worthwhile to investigate possibilities because of the
potential high payoffs of reaching a large number of farmers at minimal
costs. The first part of this section will be devoted to an examination
of indigenous institutions. The latter portion will inspect symbiotic
possibilities of combining modern and traditional institutions.

The Social Role and the Economic Significance
of Traditional Mutual Aid Societies

In the Northwest Province there are many traditional mutual aid
societies. These societies vary in function and organization. In
Chapter V reference was made about the communal work groups in which
food and nominal quantities of money are exchanged for human labor.
Similar organizations exist that function as credit, savings, and
investment institutions. Seventy-three percent of the rice farmers
interviewed belonged to such organizations.

Two basic kinds of such indigenous organizations can be differ-
entiated.\(^1^8\) One is called a meeting. The other is referred to as a

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\(^1^8\) Descriptions of traditional mutual savings credit and investment
societies are based upon informal field interviews and personal
observations. Supplementary information has been obtained from the
following studies: Shirley Ardener, "Comparative Survey of Rotating
Credit Associations," Royal Anthropological Institute of Great Britain
and Ireland, Vol. 94, pp. 201-229, July-December 1964; P. J. M. G.
Cuypers, "Cotisations at Caisses: Etude Anthropologique de Groupes de
Crédit Traditionnels au Cameroun Central," Studiecentrum, No. 11
(Leiden Holland: Mededelingen Afrika, 1973); Clifford Geertz, "The
Rotating Credit Association: A Middle Rung in Development," Economic
Development and Cultural Change, Vol. 10, No. 3, April 1962, pp. 241-
263; G. Gosselin, "Le Crédit Mutuel en Pays Bamiléké," Développement
ndjangeh. They can be distinguished from each other in terms of their membership, regularity and volume of monetary contributions, purposes for which loans are made, and rules and procedures in the allocation of funds. The strengths of ndjangehs and meetings are derived from the concept of reciprocity and individual contact. Both institutions perform social as well as economic functions and instill within the indigenous culture a solidarity for which African societies are renown. Members from all segments of the rural society participate in these organizations.

Meetings have a broader base than do ndjangehs as more people are involved directly in the affairs of this institution. The popularity of meetings can be explained by flexible arrangements which permit varying degrees of participation according to one's ability and desire. A member can place almost any amount of money whenever meeting gatherings are held into the central fund. The amount an individual contributes usually varies between 50 and 500 CFA francs. Larger sums are invested following the harvest when cash is relatively abundant.

The size of a typical meeting usually ranges from 30 to 40 members. Sessions are held immediately following specified market day intervals on a regular basis. Frequently, the profits gained by selling goods in

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the local market are the primary source of income from which savings are made.

In each meeting a cashier is chosen who is responsible for the collection and disbursement of the funds. He maintains financial records concerning how much each member saves and borrows. Requests for loans can be made at meeting sessions. Members borrow to meet unusual cash needs when, for instance, a trip to the city is envisaged and money for transportation is needed; sickness occurs and the purchase of medicine is required; a relative has a child, gets married, or passes on and a gift is needed to commemorate the occasion; situations arise that require the purchase of an identification card or a birth certificate. Loans are also made to hire labor when, for instance, critical labor requirements must be fulfilled.

The interest charged on these emergency type loans is relatively high, varying between 5 percent and 10 percent per month. The effective rates are actually less than the nominal rates as the revenue generated from interest payments are distributed to members in direct proportion to the amount of money they have saved at the end of the year. However, the individual costs of having an outstanding loan is substantial. There is, therefore, a big incentive to pay back the loan as soon as possible.

Frequently, meetings have a trouble fund in addition to the central fund. Members contribute 10 to 25 CFA francs per session to this kitty. The trouble fund is a form of insurance against emergencies. It is a source from which members, beset by events beyond their immediate
control such as sickness, can obtain quick cash. The recipient of such funds pays no interest and is not obligated to repay the principal if he is unable to do so.

Ndjangehs are rotating credit societies which entail relatively large monetary commitments from every participant. The amount of money contributed at each ndjangeh session is usually within the range of 500 to 2,000 CFA francs. Unlike the meetings, a fixed minimum must be presented. There is, however, no maximum figure limiting the amount of the primary contribution. In addition, a token sum is deposited in a security bank. Use is made of this bank to meet emergency and unusual expenditures often associated with birth, marriage, and death ceremonies.

The frequency of ndjangeh sessions varies according to the governing rules of each society. Ndjangeh gatherings are held either monthly, fortnightly, or every three weeks. The frequency depends in part on the size of the membership. The organization is often established on a yearly basis. Throughout the year, each member is allowed to cook one time. Cooking is the process whereby an individual receives the primary contributions collected during a session. The person designated to cook is responsible for providing the group with wine and kola nuts to celebrate the occasion. Generally, the president of the ndjangeh determines the order in which members cook. The criteria for selection depends upon individual need, reliability, and social rank. The amount of money which members present to the individual cooking is often the defined minimum level. However, two other factors may influence the volume relinquished: (1) the amount of money the contributor would like
to receive when his turn arrives, and (2) the kind of personal relationship which he has with the recipient of the primary contributions. Each individual is obliged to reciprocate in kind to every other member in the society. This is to say, that the person who cooks is responsible for reimbursing each member the same amount which he received from him at the members rotational turn.

Members of ndjangehs know in advance approximately the amount of money they will be getting and the time they will be receiving it. Such knowledge is conducive to planning. There are many different uses of ndjangeh funds, among the most frequent are hiring labor to perform critical tasks for which there is a need because of a shortage of family labor; paying school tuition and fees; constructing a modern building possibly having a zinc roof, cement floor, and/or window panes; and acquiring an inventory or stock of commodities in order to establish oneself as a trader.

Given the preponderant number of rice farmers who belong to ndjangehs and meetings, two questions arise: (1) To what extent do traditional savings and credit associations perform economic functions? (2) How might these institutions better serve the needs of both individual farmers and the rice producing regions?

A primary economic function of ndjangehs and meetings is to provide credit to the small farmer which banks and credit unions do not normally provide. Farmers borrow money to hire labor, pay for schooling, purchase
medicine, engage in building construction, and finance ceremonial expenditures.\footnote{Tabulation of sample survey results revealed that between the spring of 1974 to the spring of 1975, 118 loans were made by 89 rice farmers. Forty percent of these loans were for hiring labor, 26 percent for purchasing medicine, 10 percent paying school fees, and 10 percent for construction.}

The impact of ndjangehs and meetings on development is not restricted, however, to the provision of credit to individual farmers. Most researchers who have investigated indigenous mutual aid societies focus on the positive social and economic attributes at the macro level. Ardener notes that these associations create savings without withdrawing money from circulation in the rural areas.\footnote{Ardener, p. 217.} This can be contrasted with the loss of money which occurs when farmers put savings into a local credit union. By statute, only 60 percent of the money deposited in a credit union can be lent to its members. The result of such deposits is that there is an appreciable flight of capital outside the village.

Probably the most beneficial aspect of the traditional mutual aid society network is that it is a vehicle for an evolutionary transformation of the socioeconomic structure. Geertz contends that indigenous savings and credit associations are particularly suited to the less developed countries because they provide a means by which \textit{"traditionalistic forms of social relationships are mobilized so as to fulfill nontraditionalistic economic functions."}\footnote{Geertz, p. 242.} He goes on to say that they foster a coordinated pattern of change by integrating \textit{"traditional attitudes with modern functions in such a way that the}
former actually support the latter rather than hinder them and that the latter react back upon the former to alter them slowly.\textsuperscript{22}

There are, indeed, many changes taking place. Members of these associations are more aware about the possibilities for improving their living standards. They are being motivated to extend their commercial behavior. And they are becoming able to overcome problems of immobility.

The basis of such changes may be attributable to a fundamental shift of the role of savings. Savings is becoming more closely associated with investment than with consumption. The belief, rooted in the traditional culture, that savings should be distributed to others in the extended family is being replaced with the view that it can be directed towards the attainment of preconceived goals. When these goals are productive in nature, the result is that savings generate growth and income.

Not all ndjangehs and meetings are characterized by an optimum combination of tradition and modernity. There is a continuum along which these institutions are oriented toward, on one end, social functions and toward, on the other end, economic functions. Many groups start out primarily as social gatherings. At a later date members of the group may establish a pact binding themselves to various kinds of economic relationships. Thus, for instance, after-work palm wine gatherings of laborers who have collaborated together in communal fields may be transformed into formal meetings at which subscriptions are made

\textsuperscript{22}Geertz, p. 259.
on a regular basis. In the early stages, loans are usually made to meet emergencies and to satisfy basic consumption needs.

Geertz contends that, as the village progresses, indigenous mutual aid societies assume more economic importance. This is perhaps best exemplified in the urban areas where rotating credit associations have adapted to the exigencies of modern economic life by developing procedures for obtaining loans based primarily upon economic rather than social criteria. According to Soen and deComarmond, urban ndjangehs are characterized by two features not generally found in rural associations:

1. Each member that cooks must have a "responsible witness" who is a guarantor. In the event that the member receiving the ndjangeh funds does not fulfill his obligations at later sessions, the witness is obliged to make the necessary payments for him. Thus, the witness acts as a surety or comaker against default.

2. The order in which members cook in the urban ndjangeh is not usually predetermined but rather depends upon the highest bidder for the loan. In such instances, allocation is left to impersonal market forces—the price or interest of the loan being determined by the law of demand.

The economic returns to society of implementing a program designed to promote additional flows of credit for employing labor are excellent. In the previous chapter, it has been demonstrated empirically that the

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23 Geertz, p. 245-246.  
24 Soen and deComarmond, p. 1176.
output and income effects of additional hired labor usage is positive to
the point that there is an incentive to employ more labor. On the basis
of this analysis, it is possible to conclude that making more money
available through the provision of additional credit would increase the
quantity of labor employed.

Admittedly, there is some uncertainty (because the nature of the
supply curve for labor is not known) about the amount of increased labor
which would be actually hired in response to more credit availability.
A detailed study of the labor market is needed to clarify complex
interrelationships between product prices, wage rates, quantity of family
and hired labor supplied, age and sexual labor division, peak labor
requirements and constraints, temporary migration flows between the farm
and urban areas, and the effects of alternative competitive activities.

A cursory examination, however, does indicate that the labor supply
confronting rice producers is probably not so inelastic as might be
expected. Producers who do not operate rice farms can be employed by
rice farmers. In all of the producing regions, with the possible
exception of Tingoh, there are many nonrice farmers whose labor
constraints do not conform with the peak labor periods for rice. This
is especially true for male farmers tending cash crop estates of coffee,
cocoa, and palm oil. Other sources of labor are neighbors in nonrice
producing villages, relatives, and school children who can be called
upon to assist rice farmers during periods of labor shortage.

Thus, if the analysis is correct, the most obvious effects of an
expanded labor credit program would be an expansion of employment and
an increase in production. It would be very important, however, to
determine the actual effects on production of making more credit
available for the purchase of labor. An increase in hired labor credit
which is not associated with an adequate growth in output would be
inflationary. It would be advisable, therefore, to monitor several
small pilot projects to ascertain whether or not and to what extent the
effects are positive before launching a large credit campaign promoting
additional labor employment.

In addition to the direct employment and production effects, there
should be other social benefits to a labor credit program. To the extent
that a labor credit program would provide more profitable opportunities
to earn cash incomes, young farmers who represent the most productive
segment of the rural population are less likely to migrate out of
agriculture. And city dwellers may be encouraged to return to the farms.
A slow down or reversal of migration patterns would contribute to the
overall welfare of society because of the high social costs associated
with (1) urban unemployment, and (2) loss of production in the
agricultural sector.

Furthermore, a labor credit program is likely to promote more
commercial transactions by virtue of increased monetization in rural
areas. Commercialization can be a powerful force in the transformation
of a traditional economy. Heilbroner attributes the expiration of
feudalism in Europe to this force:

25 There may be flaws in the analysis because of data limitations,
ministerpretation of the findings, or an incapability of assessing the
effects of structural changes in a static framework.
[The] subversive influence was the gradual infiltration of commercial relationships and cash exchanges into the everyday round of feudal existence, each act of marketing binding men more fully into cash nexus and weakening by the degree the traditional duties and relationships on which feudalism was based. 26

Another indirect economic benefit which is likely to accompany a labor credit program is a decline in disguised unemployment within the rice producing sector. Generally speaking, men represent an under-utilized factor of production. 27 They often restrict their agricultural pursuits to areas in which money can be earned. Thus most male farmers tend coffee, cocoa, palm and/or kola tree estates. And these estates demand relatively little attention. Rice farming (which in the case of swamp areas is highly labor intensive) is an activity through which male labor can be harnessed. Rice production attracts men because of its income earning capacity. And in those instances where females have their own rice fields, they make arrangements to have men clear, dig, and develop the land as initial soil preparation is male specific.

The Prospects for Reinforcing Credit Labor Exchanges Utilizing the Traditional Society Framework

From a theoretical point of view, it would appear appropriate for development planners to work with ndjangehs and meetings. Field change


agents could obtain an entrée into the native culture by becoming members of these societies. They could exercise influence (perhaps best informally) to promote technological change. Furthermore, these societies could be used as a forum for the extension of credit originating from external sources.

It would seem particularly suitable to utilize traditional credit institutions as clearing houses for credit-labor exchanges for the following reasons: (1) considerable concentration of the labor market is already centered in these societies; (2) traditional sanctions are operative which preclude problems of embezzlement, delinquency in payments, and corruption that are so frequently characteristic of credit systems; (3) utilization of ndjangehs and meetings would minimize administrative expenses in reach of the farming population; and (4) the individual producer would be actively involved. This increases the likelihood that whatever changes take place would become self-sustaining.

In the event a big effort was made to transform indigenous mutual aid societies into institutions having primarily an economic focus, it would be advisable to work with the more progressive organizations. To accomplish this end, a study could be made which would classify and rank societies according to modern characteristics. It could be useful to cast questions in the context of a framework developed by Cuypers.\(^\text{28}\)

Cuypers hypothesizes that indigenous associations can be distinguished from each other on the basis of three criteria:

\(^{28}\)Cuypers, pp. 12-13.
1. "Dans la mesure où le groupe de contribution est orienté vers l'investissement de promotion, il est moderne." In other words, societies in which members used funds to finance productive projects would be ranked higher (on the basis of this criterion) than those groups where loans went to satisfy consumption purposes. And societies characterized by ostentatious consumption would receive a ranking lower than in cases where consumption was used to meet emergencies and basic needs.

2. "Plus les activités d'un groupe de contribution sont liées à des relations et obligations non-économiques, moin il est moderne." Associations could be ranked, according to this criterion, on the basis of the proportion of time devoted to social activity such as dancing and drinking to the total time spent conducting business and engaging in celebration.

3. "Mieux un groupe est adaptable à des exigences et possibilités économiques nouvelles, plus il est moderne." Societies that were organized in such a way that there was some flexibility concerning who would be beneficiary of loans would receive high ratings. Should an unforeseen need or opportunity arise for instance, it is possible in some ndjangehs for members to engage in private and public negotiations in order to alter the order as to who will cook when, even though a rotational schedule had earlier been established. Another example of relatively progressive societies are those in which productive services, in addition to the primary economic activity of saving and loan procurement, are performed. Examples of additional services would be
the provision of collective labor and the purchase in bulk and later redistribution to members of such items as palm oil, salt, zinc roofing, rare seeds, etc.

Even if the relative progressiveness of indigenous savings and credit societies could be identified, it is problematical whether a link could be made between modern and traditional institutions. A primary obstacle is the atmosphere of negative attitudes concerning the possibilities of forging such a union. The success of the endeavor to establish viable working relationships would hinge critically upon being able to create a favorable climate of trust between farmers and development authorities. In the name of national unity, the government has adopted a position of de-emphasizing ethnicity. Perhaps reflecting this position, government officials in strategic positions affecting national credit policy have expressed to the author an antitribalism bias. And at the village level, many local spokesmen are xenophobic. There is a belief that revealing too much information about financial affairs in the community would lead to higher taxation.

Irrespective of the problem of negative attitudes, Gosselin doubts whether it is possible for traditional mutual aid societies to incorporate new social and economic responsibilities due to lack of structural compatibility:

La solidarité traditionnelle est forte, mais elle n'est en général efficace que pour des objectives traditionnelles à l'intérieur de cadres sociaux traditionnels, et selon des mécanismes également éprouvés par le temps et la coutume.  

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29 Gosselin, pp. 87-88.
Gosselin does admit that indigenous savings associations possess structures which are adaptable to the semimodern context. But he does not believe that the mechanisms are suitable for managing modern credit cooperatives.

Assuming that the conflicts between traditional and modern loyalty can be resolved, how might indigenous mutual aid societies be integrated into the development infrastructure? There are fundamental structural difficulties. The flow of productive credit must occur on a timely basis. In the ndjangeh system, however, no more than one person cooks at each session. For the majority of members, therefore, funds are not obtained during intervals that conform to periods in the agricultural cycle when credit is needed for productive investment. And although the timing of loan acquisitions is flexible in the meeting system, the volume of credit which goes to any one individual is quite small. Do these attributes indicate that traditional societies are not capable of rendering additional productive credit assistance?

The central fund is the pivotal point on which both ndjangehs and meetings stand. It probably would be a mistake to tamper with the fundamental functions of this fund. Any attempts to alter the purposes for which and the timing at which loans are secured from the central fund would likely rob these societies of their identity and would most assuredly be met with opposition.

It does seem feasible, however, to transform the trouble and security funds. These funds are not of primary importance to either meetings or ndjangehs. The need for a trouble fund is likely to
diminish over time as individuals obtain higher incomes and consequently are better able to satisfy basic needs. And dispensing with the security fund would probably enhance society's social welfare function by making it more difficult for an individual to obtain cash to engage in conspicuous ceremonial expenditures.

A collective growth trust could be established which would provide a basis from which additional funds from outside sources could be obtained by the group. This trust could either be a transformation of the trouble or security pool or it could be created as an additional fund.

In essence, the collective growth trust would serve as a common fund against individual member default. Loans obtained from the proceeds of the collective growth trust should be restricted to production purposes. To encourage productive borrowing, credit from outside sources could be made available only at periods prior to critical production processes when, for instance, planting and harvesting labor peaks occur. An added inducement fostering productive borrowing would be for the government to provide additional repayment guarantees for loans made to purchase inputs. These additional guarantees would augment the credit carrying capacity of the society. The volume of credit extended to the group would be determined, of course, by guidelines established by the lending agency based upon the amount of money in the collective growth trust and supplementary government guarantee.

For security reasons, contributions made to the trust should be deposited on a regular basis into an account with an established modern
institution. The liaison between the Catholic Mission and ndjangehs and meetings in Banso provides an example of how a linkage can become operational. The Mission has assumed the role of an intermediate financial institution. As of April 1975, twenty-five traditional mutual aid societies had deposited savings with the Mission. The Mission kept financial records and issued account booklets to the secretary-treasurers of these societies. The money collected by the Mission was, in turn, deposited into a special bank account. Local credit unions and rural banks could provide similar services to those ndjangehs and meetings with collective growth trusts. Interest could be obtained on the deposits which would augment the value of funds entrusted by these societies to the modern financial institutions.

It might be worthwhile to issue stamps in exchange for money deposited by farmers in the collective growth trust. These stamps could be pasted into individual account leaflets recording the amount contributed. The idea of using saving stamps is appealing because they have visual attractiveness, are easy to comprehend, provide challenges, and can be redeemed at a later date either for cash or credit.

A set of rules could be established governing the right to use the credit generated from the collective growth trust. Some societies might want to set fixed minimum regular contributions. Others may choose to

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make the amount of the contributions voluntary. But whatever the case, the amount of money an individual can borrow should be in direct proportion to that which he places in the common trust for two reasons: (1) such a policy would foster the mobilization of traditional savings into productive investment; (2) it would provide an assurance of loan repayments because of tangible commitments made by participants. Members make the decision to put savings into the collective growth trust. And they assume the risk of having these funds forfeited in the event of default by others in the group.

The Credit Union League could become the primary lending agency. According to the director of Cooperation and Mutuality, a substantial volume of share capital has been accumulated which remains idle. There is a need to expand the League's investment portfolio. Making loans to ndjangehs and meetings would appear to be a worthwhile undertaking from a financial point of view. The profit potential is good. High rates of interest which are common to traditional societies could be levied. Risks could be minimized due to repayment guarantees in the form of collective growth trust funds and possibly government support. And field workers employed by the League could monitor operations linking the modern credit union system with the traditional society institution.

Should the government adopt a policy to establish working relationships between modern institutions such as the Credit Union

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League and the ndjangeh or meeting societies, it would be important to
design the program in such a way as to mitigate possible loyalty clashes
experienced by individuals affiliated more closely with one institution
than the other. Conflicts would not arise because of structural
weaknesses inherent in either the modern or traditional systems. Rather,
they are likely to emerge due to a lack of understanding of the
indigenous societies and an absence of a well articulated authoritative
system linking the two structures together.

A theoretical solution to the problem of authority, related to
credit extension in rural Africa, has been suggested by Belloncle and
associates who present the following formula:

En définitive, ce que nous proposons c'est de faire jouer la
responsabilité à trois niveaux différents; au niveau personnel
d'abord, ensuite au niveau du village, enfin au niveau de la
coopérative, chacune de ces responsabilités n'intervenant que
si la précédente est insuffisante.33

It certainly would be feasible to devise a regulatory code that
would clearly define areas of responsibility to be delegated to all
parties involved in a joint Credit Union League/ndjangeh or meeting
credit program. Once the individual farmer is made aware of the
purposes of such a credit program and the conditions for participation,
moral suasion and social opprobrium could be used as powerful disciplinary
forces regulating behavior of those who made the decision to obtain
loans. In the event of delinquent accounts by an individual within

33 G. Belloncle, "Problèmes du Crédit Coopératif a l'Agriculture
Africaine Traditionnelle," Archives Internationales de Sociologie et de
la Coopération, No. 19 (Paris: Bureau d'Etudes Coopératives et
society, the president and member opinion leaders could beseech the borrower to honor his debt obligations. Should this fail the loan would be recuperated, at the expense of the group's welfare, by drawing down the balance of the collective growth trust.

Credit union field workers could act as overseers exercising discretion before interfering into the internal operations of those traditional societies using the League's funds. Field workers should establish a working relationship with leaders of the traditional groups. They should also legitimize themselves with village authority figures who may be able to exercise influence in obtaining cooperation with members belonging to the native societies associated with the program in the event problems arise.

Cooperation and Mutuality (Coop/Mut) officials could promote the joint Credit Union League/ndjangeh or meeting program by publicizing success stories. This is likely to create considerable interest. The author was frequently interrogated by leaders in one village about what was happening in another. Villages vie for recognition and prestige and would want to be a part of a viable credit program especially if it had official authorization. To create additional interest, Coop/Mut

34"Opinion leadership" is defined by Everett M. Rogers and Floyd F. Shoemaker in Communication of Innovations: A Cross Cultural Approach (New York: The Free Press, 1971), p. 35, as "... the degree to which an individual is able to informally influence other individual's attitudes or overt behavior in a desired way with relative frequency. It is a type of informal leadership, rather than being a function of the individual's formal position or status in the system. Opinion leadership is earned and maintained by the individual's technical competence, social accessibility, and conformity to the system's norms."
officials could arrange to grant lottery tickets to traditional societies in proportion to the volume of savings deposited in the collective growth trust. Drawings could be held once or twice a year and the winners receiving monetary rewards could be given special recognition.

It would be advisable for change agents, be they Coop/Mut officials or credit union field workers, to join a traditional mutual aid society. As insiders, they could obtain intimate knowledge of the internal operations of such organizations as well as the extent to which exceptions to established rules and procedures take place. This information could provide valuable insight with regard to how these institutions may be modified further to incorporate additional modern economic functions. For instance, it is possible that the gains from

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35 A "change agent" is defined in Rogers and Shoemaker, p. 227, as ". . . a professional who influences innovation-decisions in a direction deemed desirable by a change agency. In most cases he seeks to secure the adoption of new ideas, but he may also attempt to slow the diffusion and prevent the adoption of certain innovations."

36 Conversely, knowledge of the ndjangeh system could be useful in designing a more effective extension organization. In the mid 1960's an agricultural agent, familiar with the functioning of traditional credit societies called bams among the Tiv in Nigeria, suggested to the local tribal leadership that broadly based farmers' association based upon the bam structure be created and used as a vehicle to improve extension coverage and to promote increased production; see, Elliott R. Morss, John K. Hatch, Donald R. Mickelwait, Charles F. Sweet, Strategies for Small Farmer Development: An Empirical Study of Rural Development Projects in the Gambia, Ghana, Kenya Lesotho, Nigeria, Bolivia, Colombia, Mexico, Paraguay, and Peru, Vol. II: Case Studies (Prepared by Development Alternatives, Inc. for Agency for International Development; Boulder Colorado: Westview Press, 1976), p. 227. According to Morss et al., pp. 228-229, both the Tiv bams and the Farmers Association contributed greatly to the movement from subsistence farming to the production of yams and rice for other markets in Africa.
interest charges, accumulated over the course of a year, be distributed at a particular point in time when cash is needed to make investments in agriculture. Or it may be possible to offer incentives, such as free packages of fertilizer, to those who make regular and large contributions to the collective growth trust. Then, there is the possibility of creating internal committees which could be given the responsibility of evaluating members seeking credit and recuperating loans extended.

Concluding Remark

To a great extent, the beneficiaries of development assistance are determined by the institutions directly receiving assistance. The field study revealed that many rice farmers are affiliated with traditional mutual aid societies and that considerable amounts of money flow through informal channels in rural areas. It would seem wise to make use of this situation by establishing linkages between modern and traditional credit institutions. The creation of a symbiotic system would give the farmer additional incentives to save, provide a means whereby external funds could be effectively extended to the rural sector, and facilitate agricultural investment in general.
The focus of this study has been two fold: An emphasis has been placed upon determining the need for credit among Cameroonian farmers. In addition, attention has been directed toward identifying ways in which credit can be channeled to rural areas and the small farmer by examining modern and traditional lending institutions.

The rice subsector within the Northwest Province was selected as the target area of this study because the preconditions for successful credit extension appeared to be satisfied in this task setting:

1. The potential for increasing output was excellent. Rice framing seemed to be a profitable activity judging from the increased number of farmers cultivating it in the Province.

2. Improved technologies were known to exist. High yielding varieties of seed and fertilizers were being introduced in most of the rice producing areas.

3. The infrastructure required to promote the commercialization of agriculture was adequate. Throughout the Province, cadres of extension personnel were available to supervise farm operations. In addition, cooperatives as well as a development authority had been created to provide processing services. In certain instances, the role of these organizations also included marketing and input procurement.

4. Finally, there were mechanisms through which credit could be recovered. Most rice farmers were affiliated with both modern and
indigenous institution whose structure was suitable, or could have been modified, to enable credit to be extended and to provide assurance of loan repayment.

A socioeconomic survey was conducted in nine villages throughout the Province. Farmers in the sample were classified in one of four strata groupings depending upon the geographical location of their homesteads and whether they were growing swampland or upland rice. The results of this survey provided the informational base for determining the economics of rice farming and identifying credit needs of smallholder producers.

The investigation was cast into a production function framework in which cost and revenue relationships were examined that characterized the major rice producing regions and the two levels of technology being used. The following implications were derived from the empirical analysis:

1. The extension of productive credit for the acquisition of additional inputs would have a greater impact on small farmer output and income in swampland areas than in black forest or mountain grassland upland areas. This was indicated by differentials in productivity levels between swampland and upland production. Swampland technology was associated with higher revenues per unit of input and lower costs per unit of output than upland technology.

2. With respect to swampland regions, productive credit extension is likely to have a greater impact on output at Mbaw Nsaw than in Ndop or Tingoh. This may be explained by the fact that hired labor, which makes
up the major portion of total costs, is less costly on the Mbaw plain than in the other two swamp regions where alternative economic activities exist because of the relatively close proximity of these latter regions to urban centers.

3. There are few, if any, differential effects of extending credit to small or large rice farmers using the swampland technology. This suggests that there are negligible economies of scale and that the technological requirements for swamp production are within the reach of most farmers regardless of the size of their operation.

4. Given existing farm practices, it is more profitable for a farmer utilizing credit to hire labor than to purchase fertilizer. An inspection of the relative revenue elasticities with respect to fertilizer and hired labor shows that income is more responsive to additional hired labor than fertilizer usage. This suggests either that the recommended fertilizer dosages need to be revised to suit better the conditions under which the small farmer operates or that more extension efforts are needed to educate the farmer how and under what conditions fertilizer should be applied.

5. Farmers contend that labor is the primary constraint to increased production. The empirical analysis confirmed this contention. The analysis of costs indicated that, for the majority of farmers, the employment of additional labor would generate increasing output per unit of additional expenditures. This provides strong justification for the extension of credit to enable more labor to be hired. It also suggests that farmers may not, as yet, be fully aware of the manpower
requirements of rice production. Unlike other grains, rice is a labor intensive crop. It is likely to take several years following the decision by a farmer to grow rice before he learns how to cultivate it properly. A well trained and motivated extension staff could accelerate the educational process.

6. The empirical results pointed out that the responsiveness of output to increased factor usage was considerably greater than the responsiveness of revenue to changes in the use of inputs. Improvements in data collection procedures are required to ferret out the precise causes of the divergence in the output and revenue elasticities. The apparent inconsistency in the empirical findings may be explained, however, by variations in both degrees of specialization and status rankings which affects the price the farmer obtains for his output. Some farmers engage exclusively in production and sell their produce in bulk to intermediaries at relatively low prices. Others assume marketing functions and therefore obtain higher prices for their rice. In addition, there are aspiring producers, wishing to establish their own farms rather than work for their neighbors, who sell their rice in advance of the harvest at low prices in order to obtain cash enabling them to purchase the necessary inputs for production.

7. The high percentage of gross returns accruing to family labor suggest that rice farmers, in general, have a large credit-carrying capacity. Hence, there appears to be little risk, provided that adequate institutional arrangements for loan recovery exist, in extending credit to groups of rice farmers.
The empirical analyses suggest that the efficiency of traditional rice production can be improved resulting in an augmentation of small farmer income and regional output.¹ A fundamental assumption made in this study is that credit is a tool to be used to facilitate these improvements. Credit can stimulate development by acting as a catalyst —

¹The researcher advises the reader to remain somewhat skeptical of the empirical findings of this study despite the existence of high degrees of statistical significance. He also advises planners in Cameroon to exercise caution and to utilize informed judgement before implementing programs based upon interpretation of the econometric results.

The reason that the policy implications derived from the empirical analyses may be somewhat off-target is because of limitations in the data. There are inherent problems in obtaining reliable information of farm management practices using the single interrogation visit technique. It is likely, for instance, that some land area figures, which are critical to the analyses, are misleading because of reporting errors. Time constraints made it imperative for the researcher to rely upon farmers' memories in obtaining responses to some important question. Farmers were asked, for instance, to estimate the size of their rice farms in 1974—on which production figures were obtained—in comparison to plots measured in 1975.

Inaccurate estimations of land area could have biased the empirical results. Inspection of the sample data suggests that there might have been a tendency for farmers to underestimate the size of their 1974 rice farms in relation to their current farm in 1975. To the extent that 1974 rice farms were in fact underestimated, the returns to hired labor would have been exaggerated because a smaller than actual portion of the output would have been attributed to the land factor. And the very high returns to hired labor (reported in the analysis of costs) indicated that there very well may have been a substantial bias in the estimates of land area.

Moreover, the reliability of the measures for both hired and family labor are somewhat tenuous. In order to understand the labor component in traditional agriculture, itemized flow profiles are required that identify the sequence of labor operations, the labor requirements per task, and the incidence of family versus hired labor throughout the course of the agricultural season. This kind of detailed information would lead to a better understanding of the gap between the needs and availability of family labor as well as the possibility of hiring nonfamily labor during peaks in the rice season. But such knowledge can be obtained only through documentation of farming behavior over time using the frequent visitation technique.
in the adoption of modern inputs and by inducing employment of underutilized land and labor resources.

Aside from the profitability issue, there remains the question how credit can be channeled to farmers in rural areas. An examination was made of both governmental and indigenous institutions capable of extending credit in order to assess the possibilities of more effectively utilizing existing structures.

An attempt was made to clarify the type of loan assistance which the Rural National Development Fund (FONADER) could provide traditional rice farmers in the Northwest Province on the basis of its governing rules, procedures, and authorized form of interference. In addition, the role and socioeconomic functions of indigenous mutual aid societies, known as ndjangehs and meetings, were analyzed and described. A large number of farmers subscribe to these traditional institutions. Ndjangehs and meetings provide a forum for both private discussions and social activities. They represent centers where savings are invested, consumption and production credit is obtained, labor is exchanged, and insurance to meet emergencies can be secured.

It was recommended that linkages be established between modern and traditional institutions. Institutional collaboration would render more effective the flow of credit. It could facilitate the transfer of external funds to rural areas and should provide additional incentives for small farmer saving and investment. A number of suggestions were made as to how integration could be initiated:

1. Collective growth trusts could be created which would provide the basis for loan extension to traditional societies by outside
agencies such as market cooperatives, the Credit Union League, banks, and aid donor organizations. Members of ndjangehs and meetings would make contributions to the collective growth trust fund established in their societies. Social sanctions, characteristic of these traditional groups, as well as the threat of foreclosure on contributions made by individual members to the trust fund would mitigate risks of default at the grass root level.

2. An added insurance measure could be provided by FONADER. Under the provisions outline in its charter, FONADER is permitted to guarantee reimbursement of credit extended to groups of farmers by lending agencies.

3. Loan repayment (in-kind or in-cash) should coincide with the harvest or milling of rice where control is possible.

4. Deposits made by outside agencies as well as individual farmers should be put into special accounts established in rural credit unions or regional banks. Farmer records could be kept by using stamp passbooks.

5. Local change agents could perform basic supervisory services. They should be given the responsibility to report any irregularities causing bottlenecks in the credit extension process. They could also provide technical information to farmers on how best to use the inputs acquired on credit.

The author is aware that the recommendations regarding institutional change may not be feasible because of sociopolitical forces which were not recognized. He is also sensitive to the possibility that the policy
implications derived from the empirical analyses may be incorrect because of shortcomings in the data base. He would certainly be in favor of creating a dialogue between policy decision makers and change agents in the field before implementing the suggestions contained in this report. Perhaps this study can form the basis for such discussions. Hopefully, some of what was said will encourage additional inquiries.
BIBLIOGRAPHY
Academy of Sciences, 1974.

Anschel, Kurt R.; Brannon, Russell H.; and Smith, Eldon D. (ed.).
Agricultural Cooperatives and Markets in Developing Countries. New

Ardener, Shirley. "Comparative Survey of Rotating Credit Associations."
Royal Anthropological Institute of Great Britain and Ireland,

Atkinson, L. Jay and Kunkel, David E. High-Yielding Varieties of Rice
in the Philippines: Progress of the Feed-Fertilizer Revolution.

Bauer, Paul T. West African Trade: A Study of Competition, Oligopoly,

Bohlen, Joe M. and Beal, George M. "Sociological and Social Psychologi-

Brewster, John M. "Traditional Social Structures as Barriers to


---


**B. Cameroon Specific**


"FONADER," Cameroun Tribune, (November 9, 1974).


National Fund for Rural Development, "Some Points which Influence the Granting of FONADER Loans." Yaoundé: Loans Department, No date.


APPENDIX
SOCIOECONOMIC QUESTIONNAIRE FOR RICE FARMING FAMILIES IN THE NORTH-WEST PROVINCE

<table>
<thead>
<tr>
<th>No.</th>
<th>Factors</th>
<th>Sources</th>
<th>Question</th>
<th>Response</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>Code name of family</td>
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<td>C</td>
<td>Code name of village</td>
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<td>C</td>
<td>Code name of quarter</td>
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<tr>
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<td>M</td>
<td>Number of (M) in family</td>
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<td>5</td>
<td>M</td>
<td>Number of (F) in family</td>
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<tr>
<td>6</td>
<td>M</td>
<td>Number of (m) in family</td>
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<td>7</td>
<td>M</td>
<td>Number of (f) in family</td>
<td></td>
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<tr>
<td>8</td>
<td>M</td>
<td>Number of (c) in family (children under 12 years)</td>
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</tr>
<tr>
<td>9</td>
<td>M</td>
<td>Number of (m = f) who have gone to school or who are going to school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>M</td>
<td>Family members who have their own rice fields</td>
<td>(M)</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>M-O</td>
<td>Distance of primary rice field from homestead (in terms of trekking time)</td>
<td>(F)</td>
<td></td>
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</table>


SOURCES: (M) Married males living in the compound, (F) Married females, (m,f) Other males and females in the compound above 12 years old, (c) Collection and calculations, (O) Observation.
<table>
<thead>
<tr>
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<td>12</td>
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<td>M</td>
<td>Other major sources of family income other than rice and coffee</td>
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<td>1) Trade and commerce</td>
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<td></td>
<td>2) Fishing</td>
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<td>3) Mimbo sales</td>
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<td>4) Sugar Cane</td>
<td></td>
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<td>5) Other (specify)</td>
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<td>13</td>
<td>3</td>
<td></td>
<td>How much income is earned over an average six (6) month period of time</td>
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<td></td>
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<td>for such activities?</td>
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<td></td>
<td></td>
<td></td>
<td>1) 0-3000 (500)</td>
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<td></td>
<td></td>
<td></td>
<td>2) 3000-6000 (1000)</td>
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<td></td>
<td>3) 6000-12000 (2000)</td>
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<td>4) 12000-24000 (4000)</td>
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<td>5) above 24000</td>
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<td>14</td>
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<td>M</td>
<td>What kind of rice does (M) have in his fields?</td>
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<td></td>
<td></td>
<td></td>
<td>1) only long grain</td>
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<td></td>
<td>2) only short grain</td>
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<td>3) mixture of long and short grain in same field</td>
<td></td>
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<td>On what percentage of (M) rice holdings was rice transplanted?</td>
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<td>Does (M) obtain ndjangeh labor services for work on</td>
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<td>1) rice fields</td>
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<td>2) other farm fields</td>
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<td>Total size of (M) swampland rice holdings</td>
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<td>Total size of (M) rainfed rice holdings</td>
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<td>24</td>
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<td>How many times did (M) sell rice last year?</td>
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<td>25</td>
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<td>What was the price received per bag each of these times?</td>
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<td>How many bags did (M) sell at these times?</td>
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<td>27</td>
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<td>C-M</td>
<td>Last year's rice income for (M)</td>
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<tr>
<td>28</td>
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<td>M</td>
<td>When did (M) finish harvesting rice during the last growing season?</td>
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<tr>
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<td>How did (M) clean the rice?</td>
<td>1) wash</td>
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<td>2) wind</td>
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<td>3) winnower</td>
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<td>Total expenditures this season for</td>
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<td>1) clearing, digging, leveling</td>
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<td>30</td>
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<td>2) transplanting</td>
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<td>3) weeding</td>
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<td>4) harvesting</td>
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<td>Total spent by (M) on hired labor</td>
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<td>35</td>
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<td>C-M</td>
<td>How much of total labor activities were performed</td>
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<td></td>
<td>1) by own and family labor</td>
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<td>2) by paid workers</td>
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<td>3) by ndjangeh labor</td>
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<td>(N.B. this is for last season)</td>
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<td>M</td>
<td>Has (M) purchased improved seed?</td>
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<td>In the event (M) used self-stored seed, did he use insecticides?</td>
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<td>Number of (M) paddy bags harvested last year</td>
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<td>41</td>
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<td>Number of (M) clean rice harvested last year (converted in terms of kilos)</td>
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<td>42</td>
<td>5</td>
<td></td>
<td>Amount of (M) clean rice kept for family consumption (kilos)</td>
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<td>Amount of (M) clean rice given as gifts (kilos)</td>
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<td>Amount of (M) paddy rice kept for seed (kilos)</td>
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<td>45</td>
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<td>Would (M) be willing to buy herbicides for rice and pay for it in advance of usage, if it was made available for purchase?</td>
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<td>46</td>
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<td>How many times within the last one (1) month has (M) seen the R.D. concerning his rice farm?</td>
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<td>47</td>
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<td>Does (M) use fertilizer for rice?</td>
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<td>48</td>
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<td>Number of applications last growing cycle?</td>
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<td></td>
<td>Quantity of fertilizer used last growing cycle</td>
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<td>2</td>
<td></td>
<td>What kind of rice does (F) have in her fields?</td>
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<td></td>
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<td></td>
<td>1) only long grain</td>
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<td></td>
<td>2) only short grain</td>
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<td>3) mixture of long and short grain in same field</td>
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<td>51</td>
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<td>On what percentage of (F) rice holdings was rice transplanted?</td>
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<td>Does (F) obtain ndjangeh labor services for work on</td>
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<td>1) rice fields</td>
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<td>2) other farm fields</td>
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<td>Total size of (F) swampland rice holdings</td>
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<td>73__</td>
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<td>How many times did (F) sell rice last year?</td>
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<td>What was the price received per bag each of these times?</td>
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<td>How many bags did (F) sell at these times?</td>
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<td>C-F</td>
<td>Last year's rice income for (F)</td>
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<td>When did (F) finish harvesting rice during the last growing season?</td>
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<td>2</td>
<td></td>
<td>How did (F) clean the rice? 1) wash 2) wind 3) winnower</td>
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<td>66</td>
<td>4</td>
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<td>Total expenditures last season for 1) clearing 2) transplanting 3) weeding 4) harvesting</td>
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<td>Total spent by (F) on hired labor</td>
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<td>C-F</td>
<td>How much of total labor activities were performed by 1) own and family labor 2) paid workers 3) ndjangành labor</td>
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<tr>
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<td>(N.B. this is for last season)</td>
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<td>Response</td>
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<td>F</td>
<td>Has (F) purchased improved seed/</td>
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<td>75</td>
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<td>In the event (F) used self-stored seed, did she use insecticides?</td>
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<td>Number of (F) paddy bags harvested last year</td>
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<tr>
<td>77</td>
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<td>Number of (F) clean rice harvested last year (converted in terms of kilos)</td>
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<td>78</td>
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<td>Amount of (F) clean rice kept for family consumption (kilos)</td>
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<td>Amount of (F) clean rice given as gifts (kilos)</td>
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<td>Amount of (F) paddy rice kept for seed (kilos)</td>
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<td>81</td>
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<td>Would (F) be willing to buy herbicides for rice and pay for it in advance of usage if it was made available for purchase?</td>
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<td>82</td>
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<td>How many times within the last one (1) month has (F) seen the R.D. concerning her rice farm?</td>
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<td>Does (F) use fertilizer for rice?</td>
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<tr>
<td>84</td>
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<td></td>
<td>Number of applications last growing cycle</td>
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<td>85</td>
<td>2</td>
<td></td>
<td>Quantity of fertilizer used last growing cycle</td>
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<tr>
<td>86</td>
<td>4</td>
<td>M</td>
<td>Number of cutlasses in family</td>
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<td>86</td>
<td>4</td>
<td></td>
<td>Cement floor for drying</td>
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<td>88</td>
<td>4</td>
<td></td>
<td>Bicycle</td>
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<td>89</td>
<td>4</td>
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<td>Does anyone in the family unit use a pousse-pousse truck?</td>
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<td>Response</td>
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<td>--------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>90</td>
<td>4</td>
<td></td>
<td>Number of spades</td>
<td></td>
</tr>
<tr>
<td>91</td>
<td>4</td>
<td></td>
<td>Number of sickle-harvesting knives</td>
<td></td>
</tr>
<tr>
<td>92</td>
<td>4</td>
<td></td>
<td>Number of hand rakes</td>
<td></td>
</tr>
<tr>
<td>93</td>
<td>4</td>
<td></td>
<td>Does someone in the family use a machine thresher?</td>
<td></td>
</tr>
<tr>
<td>94</td>
<td>5</td>
<td></td>
<td>How many swine, goats, and sheep does the family have?</td>
<td></td>
</tr>
<tr>
<td>95</td>
<td>3</td>
<td></td>
<td>Number of adult coffee trees</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>3</td>
<td></td>
<td>Number of young coffee trees</td>
<td></td>
</tr>
<tr>
<td>97</td>
<td>2</td>
<td></td>
<td>Did you put fertilizer on coffee last year?</td>
<td></td>
</tr>
<tr>
<td>98</td>
<td>2</td>
<td></td>
<td>Bags of coffee reaped last year</td>
<td></td>
</tr>
<tr>
<td>99</td>
<td>5</td>
<td></td>
<td>Income obtained from sale of coffee last year</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>6</td>
<td></td>
<td>Do you assume leadership roles in the village?</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1) chief or subchief</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) prince</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) counsellor</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>4) quarter head</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>5) cooperative leader</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>6) volunteer leader</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>7) other (specify)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Annual expenditures for school fees (specify amount)</td>
<td></td>
</tr>
<tr>
<td>101</td>
<td>5</td>
<td></td>
<td>Expenditures for extraordinary events within last year</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(specify amount, if possible)</td>
<td></td>
</tr>
<tr>
<td>102</td>
<td>5</td>
<td></td>
<td>1) marriages</td>
<td></td>
</tr>
<tr>
<td>103</td>
<td>5</td>
<td></td>
<td>2) deaths</td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>5</td>
<td></td>
<td>3) medical</td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>5</td>
<td></td>
<td>4) other</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Factors</td>
<td>Sources</td>
<td>Question</td>
<td>Response</td>
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<tr>
<td>106</td>
<td>6</td>
<td></td>
<td>Do you prefer to sell your coffee to traders or to cooperatives?</td>
<td></td>
</tr>
<tr>
<td>107</td>
<td>6</td>
<td></td>
<td>Do you prefer to sell your rice to traders or to cooperatives?</td>
<td></td>
</tr>
<tr>
<td>108</td>
<td>6</td>
<td></td>
<td>Are you a member of a rice cooperative or precoop?</td>
<td></td>
</tr>
<tr>
<td>109</td>
<td>6</td>
<td></td>
<td>Are you a member of a coffee cooperative?</td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>6</td>
<td></td>
<td>How many bags of fertilizer have you gotten from the coffee cooperative within the last year</td>
<td></td>
</tr>
<tr>
<td>111</td>
<td>6</td>
<td></td>
<td>Did you use some of this fertilizer on your rice?</td>
<td></td>
</tr>
<tr>
<td>112</td>
<td>5</td>
<td></td>
<td>Does someone in the family do farm work for money?</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td>5</td>
<td></td>
<td>If so, does he or she do so 1) often 2) on occasion 3) seldom</td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>6</td>
<td></td>
<td>How many times within the last two (2) months has (M) seen the agricultural field officer?</td>
<td></td>
</tr>
<tr>
<td>115</td>
<td>3</td>
<td></td>
<td>Landownership of rice fields 1) traditional communal 2) contract, traditional 3) legally bought with title 4) trusteeship</td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>3</td>
<td></td>
<td>Rent: (cash + rent-in-kind)</td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>3</td>
<td></td>
<td>Landownership of other farm lands 1) traditional communal 2) contract, traditional 3) legally bought with title 4) trusteeship</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Factors</td>
<td>Sources</td>
<td>Question</td>
<td>Response</td>
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<td>----------</td>
</tr>
<tr>
<td>118</td>
<td>3</td>
<td></td>
<td>Rent: (cash + rent-in-kind)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>For which of the following items has the family gone into debt over the last year? (Specify amount, if possible)</td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>5</td>
<td></td>
<td>1) school fees</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>5</td>
<td></td>
<td>2) farm labor</td>
<td></td>
</tr>
<tr>
<td>121</td>
<td>5</td>
<td></td>
<td>3) other farm improvement</td>
<td></td>
</tr>
<tr>
<td>122</td>
<td>5</td>
<td></td>
<td>4) medical needs</td>
<td></td>
</tr>
<tr>
<td>123</td>
<td>5</td>
<td></td>
<td>5) marriages and deaths</td>
<td></td>
</tr>
<tr>
<td>124</td>
<td>5</td>
<td></td>
<td>6) trade and commerce</td>
<td></td>
</tr>
<tr>
<td>125</td>
<td>5</td>
<td></td>
<td>7) building construction</td>
<td></td>
</tr>
<tr>
<td>126</td>
<td>6</td>
<td></td>
<td>From where have you obtained such loans (NB match response to previous question)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>1) credit union</td>
<td></td>
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<td></td>
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<td></td>
<td>2) ndjangeh</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>3) friends and relatives</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>4) rice cooperative</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>5) coffee cooperative</td>
<td></td>
</tr>
<tr>
<td>127</td>
<td>6</td>
<td></td>
<td>How do you save? (Specify amount and frequency)</td>
<td></td>
</tr>
<tr>
<td>128</td>
<td></td>
<td></td>
<td>1) subscriptions to ndjangehs</td>
<td></td>
</tr>
<tr>
<td>129</td>
<td>6</td>
<td></td>
<td>2) share savings in credit unions</td>
<td></td>
</tr>
<tr>
<td>130</td>
<td>6</td>
<td></td>
<td>3) bank deposits</td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>6</td>
<td></td>
<td>Maximum amount of money you keep in reserves at home</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1) 0-2500</td>
<td></td>
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<td></td>
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<td></td>
<td>2) 2500-5000</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>3) 5000-10000</td>
<td></td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>4) over 10000</td>
<td></td>
</tr>
<tr>
<td>131</td>
<td>6</td>
<td></td>
<td>How easy is it for you to obtain labor in your fields?</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1) very difficult</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2) difficult</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3) easy</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Factors</td>
<td>Sources</td>
<td>Question</td>
<td>Response</td>
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<td>-----------------------------------------------------------------------------------------------</td>
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<tr>
<td>132</td>
<td>6</td>
<td></td>
<td>In the event a plow with a pair of oxen or a horse was made available, would you till your fields and your women's field with it?</td>
<td></td>
</tr>
<tr>
<td>133</td>
<td>5</td>
<td></td>
<td>Would you prefer to purchase or rent such a plowing system?</td>
<td></td>
</tr>
<tr>
<td>134</td>
<td>6</td>
<td></td>
<td>If preference is to purchase would you be willing to 1) buy and train draft animals</td>
<td></td>
</tr>
<tr>
<td>135</td>
<td>6</td>
<td></td>
<td>2) make installed payments in kind with rice or coffee</td>
<td></td>
</tr>
<tr>
<td>136</td>
<td>5</td>
<td>M-F</td>
<td>How often do you buy fish and what is the quantity usually spent?</td>
<td></td>
</tr>
<tr>
<td>137</td>
<td>5</td>
<td>M-F</td>
<td>How often do you buy meat and what is the quantity usually spent?</td>
<td></td>
</tr>
<tr>
<td>138</td>
<td>5</td>
<td></td>
<td>How often do you buy kerosene and what is the quantity usually purchased?</td>
<td></td>
</tr>
<tr>
<td>139</td>
<td>5</td>
<td></td>
<td>How often do you buy cooking oil and what is the quantity usually purchased?</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>6</td>
<td></td>
<td>Do you presently use improved maize seed?</td>
<td></td>
</tr>
<tr>
<td>141</td>
<td>6</td>
<td></td>
<td>Have you ever used improved maize seed?</td>
<td></td>
</tr>
<tr>
<td>142</td>
<td>6</td>
<td></td>
<td>Would you buy insecticide for treating maize seed and pay for it in advance of usage, if it was made available for purchase?</td>
<td></td>
</tr>
<tr>
<td>143</td>
<td>5</td>
<td></td>
<td>How much income, if any, have you gotten whitin the last four (4) market days by selling foodstuffs?</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Factors</td>
<td>Sources</td>
<td>Question</td>
<td>Response</td>
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<tr>
<td>144</td>
<td>6</td>
<td></td>
<td>How do you save? (Specify amount and frequency)</td>
<td>1) subscriptions to ndjangehs 2) share savings in credit unions 3) bank deposits</td>
</tr>
<tr>
<td>147</td>
<td>6</td>
<td></td>
<td>Maximum amount of money you keep at home in reserves</td>
<td>1) 0-2,500 2) 2,500-5,000 3) 5,000-10,000 4) over 10,000</td>
</tr>
<tr>
<td>148</td>
<td>5</td>
<td></td>
<td>Have you gone into debt hiring farm labor within the last year? (specify amount)</td>
<td></td>
</tr>
<tr>
<td>149</td>
<td>6</td>
<td></td>
<td>How easy is it for you to obtain labor to work in your fields?</td>
<td>1) very difficult 2) difficult 3) easy</td>
</tr>
<tr>
<td>150</td>
<td>3</td>
<td>O-M</td>
<td>Number of banana plantains</td>
<td></td>
</tr>
<tr>
<td>151</td>
<td>3</td>
<td>O-C</td>
<td>Area devoted to maize</td>
<td></td>
</tr>
<tr>
<td>152</td>
<td>3</td>
<td>O-C</td>
<td>Area devoted to groundnuts</td>
<td></td>
</tr>
<tr>
<td>153</td>
<td>3</td>
<td></td>
<td>Area devoted to tubers</td>
<td></td>
</tr>
<tr>
<td>154</td>
<td>3</td>
<td></td>
<td>Area devoted to beans</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>3</td>
<td></td>
<td>Area devoted to other food crops (specify what)</td>
<td></td>
</tr>
<tr>
<td>156</td>
<td>3</td>
<td>C</td>
<td>Total area of foodcrop fields</td>
<td></td>
</tr>
<tr>
<td>157</td>
<td>3</td>
<td>O-M</td>
<td>Total area of male foodcrop field, if any</td>
<td></td>
</tr>
<tr>
<td>158</td>
<td>3</td>
<td>O-M</td>
<td>Distance of major foodcrop field from homestead</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Factors</td>
<td>Sources</td>
<td>Question</td>
<td>Response</td>
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<tr>
<td></td>
<td>159</td>
<td>5</td>
<td>0</td>
<td>Zinc roofing on compound housing</td>
</tr>
<tr>
<td></td>
<td>160</td>
<td>5</td>
<td>0</td>
<td>Cement floor in compound housing</td>
</tr>
<tr>
<td></td>
<td>161</td>
<td>1</td>
<td>C</td>
<td>Quantity of rainfall</td>
</tr>
<tr>
<td></td>
<td>162</td>
<td>1</td>
<td></td>
<td>Duration of rainfall</td>
</tr>
<tr>
<td></td>
<td>163</td>
<td>1</td>
<td></td>
<td>Elevation</td>
</tr>
<tr>
<td></td>
<td>164</td>
<td>1</td>
<td></td>
<td>Texture of primary family rice field</td>
</tr>
<tr>
<td></td>
<td>165</td>
<td>1</td>
<td></td>
<td>pH of primary family rice field</td>
</tr>
<tr>
<td></td>
<td>166</td>
<td>4</td>
<td></td>
<td>Total family size</td>
</tr>
<tr>
<td></td>
<td>167</td>
<td>4</td>
<td></td>
<td>Family adult labor force ((M + F + m + f))</td>
</tr>
<tr>
<td></td>
<td>168</td>
<td>4</td>
<td></td>
<td>Family adult labor force minus ((m + f)) who have gone to school</td>
</tr>
<tr>
<td></td>
<td>169</td>
<td>3</td>
<td></td>
<td>Number of family members having their own rice fields</td>
</tr>
<tr>
<td></td>
<td>170</td>
<td>3</td>
<td></td>
<td>Proportion of male rice growing members to total family rice growing members</td>
</tr>
<tr>
<td></td>
<td>171</td>
<td>3</td>
<td></td>
<td>Total size of family swampland rice holdings</td>
</tr>
<tr>
<td></td>
<td>172</td>
<td>3</td>
<td></td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>173</td>
<td>3</td>
<td></td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>174</td>
<td>3</td>
<td></td>
<td>Total size of family rainfed rice holdings</td>
</tr>
<tr>
<td></td>
<td>175</td>
<td>3</td>
<td></td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>176</td>
<td>3</td>
<td></td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>177</td>
<td>5</td>
<td></td>
<td>Volume of clean rice kept for family consumption</td>
</tr>
<tr>
<td></td>
<td>178</td>
<td>2</td>
<td></td>
<td>Total family unit rice income for last year</td>
</tr>
<tr>
<td>No.</td>
<td>Factors</td>
<td>Sources</td>
<td>Question</td>
<td>Response</td>
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<td>--------------------------------------------------------------------------</td>
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<tr>
<td>179</td>
<td>3</td>
<td></td>
<td>Ratio of rice field area to total foodcrop field area</td>
<td></td>
</tr>
<tr>
<td>180</td>
<td>5</td>
<td></td>
<td>Ratio of coffee to rice income</td>
<td></td>
</tr>
<tr>
<td>181</td>
<td>5</td>
<td></td>
<td>Total family (institutional) savings over last twelve (12) months</td>
<td></td>
</tr>
<tr>
<td>182</td>
<td>5</td>
<td></td>
<td>Ratio of productive borrowing to capitalization</td>
<td></td>
</tr>
</tbody>
</table>
VITA

Thomas Lachlan Vollrath was born in Kansas City, Missouri, on May 22, 1944. He attended public schools in Kansas City, graduating from Southwest High School in 1963. In September of that year, Vollrath entered college at The University of the South, Sewanee, Tennessee. He took a liberal arts curriculum and received a Bachelor of Arts degree majoring in economics in 1967.

Following graduation, Vollrath entered the Peace Corps for three years. He was stationed in Upper Volta with the agricultural extension service. He provided assistance in the design and implementation of rural action programs involving village animation, promotion of modern technology, and community development projects.

Upon returning from the Peace Corps, Vollrath accepted a (211-d) Agency for International Development fellowship to study agricultural economics at The University of Tennessee. He was awarded membership in the Gamma Sigma Delta Honorary Society while participating in this program. In March 1973, he received his Master of Science Degree.

Vollrath was the recipient of a Southern University/United States Agency for International Development grant to engage in research in the United Republic of Cameroon between 1974 and 1975. Upon his return to the States, he was awarded, by the University of Tennessee, a McClure international fellowship enabling him to continue his studies.

In the fall of 1976, Vollrath was hired as a consultant by the World Bank to assist an appraisal mission in its evaluation of a rural
development project in the cotton producing areas of Togo. In early 1977, he accepted a faculty appointment in the Department of Agricultural Economics at Purdue University. And in March 1977, he received his Ph.D. degree from the University of Tennessee.