THE FEASIBILITY ANALYSIS OF A PROTOTYPE

SEED DEVELOPMENT PROJECT

by

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INTRODUCTION

The first part of this study deals briefly with some theoretical aspects of project analysis in general and of agricultural projects analyses in particular. It concerns itself with mainly the economic and financial aspects of project appraisal. Some existing techniques of economic and financial analysis are discussed and the strengths and weaknesses of some of the techniques are pointed out where and when necessary.

In the second and analytical part, one of the techniques discussed is applied in the development and economic appraisal of a prototype seed development project. The method used involves discounted cash flow techniques. Only economic and social analyses have been used to determine the feasibility of the prototype project. Technical information and most of the data utilized have been borrowed from a seed project report recently prepared for one of the developing countries under the auspices of the United States AID.

CHAPTER I

BACKGROUND REVIEW OF THE PRINCIPLES EMPLOYED

The Meaning and Purpose of Project Analysis

One of the many definitions of "Project Analysis and Appraisal" says that it is the process by which all the major aspects of the project (technical, commercial, organizational, financial and economic) are assessed for the purpose of making a judgment on its worthiness.[1] Project in this context refers to a set of activities that can be separately planned, analyzed, implemented and operated. Gittinger[2] in more detail defines a project as an activity on which money is spent in expectation of future returns and which logically lends itself to planning, financing and implementation. It necessarily is specific in terms of starting point, ending point, objective, geographical location, clientele group to reach, and a defined time sequence of investment and production activities. It often has an independent administrative structure, a set of accounts, an economic justification and financial results. A number of projects, each preferably economically and technically sound, may constitite a program.

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[1] FAO, "General Guidelines to Analysis of Agricultural Production Projects," Agricultural Planning Studies No. 14, p. 101.

[2] Gittinger J. Price, Economic Analysis of Agricultural Projects (Baltimore and London, 1972), p. 1.

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The principal objective of the feasibility analysis of a project is to demonstrate that the project is (I) in conformity with the country's development objectives and immediate priorities, (II) technically sound and represents the best of the available alternatives under existing technical and other constraints, (III) administratively workable and (IV) economically and financially viable.[3] There are therefore economic, technical, managerial, organizational, financial, commercial and supervisional aspects to project appraisal. King[4] points out the implications of each of these aspects as follows: the economic aspect determines whether the project is in a priority sector, whether it effectively contributes to the development of the sector, and whether the contribution justifies the use of scarce resources. The technical aspect determines whether the project is technically sound from a technical and engineering viewpoint (i.e. with respect to scale, location, layout, method used, and to availability of necessary and related facilities). The managerial and organizational aspects are related and determine whether there are adequate qualified management personnel to operate the project and what suitable organization would be required for the project. The commercial aspect determines whether there are adequate arrangements for materials and services needed for construction, power, labor and raw materials, since these will affect the amount of working capital required. Finally, the financial aspect of project appraisal (which depends on whether or not the project is revenue-producing) determines whether the

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[3]FAO. op. cit., p. 72.

[4]John A. King, Jr., Economic Development Projects and Their Appraisal, (Baltimore, Maryland, 1967), pp. 3-15.

construction and operation of the project is financially sound, otherwise it determines if and how it can be made sound.

There exist some conventional and discounted cash flow tests used in economic and financial appraisal of investment projects. Payback Period and return on capital are two of the commonly used conventional methods of assessing investment projects. Helfert[5] defines payback or payoff period as the time the project will take to payback investment. It is obtained by dividing the net investment by the average annual operating cash flow. He defines rate of return on capital as the reciprocal of payback computed by dividing the average annual operating cash flow by the net investment. Operating cash flow refers to the economic benefits generated by the project and net investment refers to investment outlay.

The Use of Discounted Cash Flows

Some inherent weaknesses of conventional methods arise in that both the return on capital and payback period methods take no specific account of the earning life of the investment, and neither considers the fact that one dollar tomorrow is worth less than one dollar today.[6] They are, however, easy to calculate and are useful in ranking projects whose economic lives are equal or close and whose patterns of operating cash flows are uniform or similar.

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[5]Erich A. Helfert, _Techniques of Financial Analysis_ (April 1963), pp. 153-154.

[6]A. M. Alfred and J. B. Evans, _Appraisal of Investment Projects by Discounted Cash Flow Principles and Some Short Cut Techniques_, (Chapman and Hall Ltd., Third Edition, 1971), p. 2.

Discounted cash flow tests overcome these weaknesses of the traditional tests and are therefore preferable. They take into consideration the time value of money, the economic life of the project and the exact pattern of cash flows. They can be used in comparing investment projects of different sizes and different economic lives through the use of present value indices.[7] A present value index is the ratio of the present value of investment to the present value of the operating cash flows. The discounted cash flow approach forces attention to be paid on "cash" rather than on "profit after depreciation and before tax." For instance, in the internal rate of return computation, depreciation, interest payments and income taxes are excluded from operating costs. Depreciation is excluded because the capital investment schedule used already takes care of replacement of depreciable facilities. Inclusion of depreciation in operating costs would be double counting. Interest payments are excluded because the computed IRR has to be compared with the opportunity cost of capital. Such comparison would be meaningless if the interest payments are included in operating costs. Income taxes are transfer payments and not a true operating cost, their inclusion in operating costs would amount to double counting.

Wright[8] summarized the steps to be followed when using the present value and rate of return methods of discounted cash flow as follows:

1. Obtain a management decision fixing the criterion rate or rates of return.

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[7]Helfert, op. cit., pp. 159-163.

[8]H. G. Wright, _Discounted Cash Flow_, (London, New York, McGraw-Hill, 2nd edition, 1973), p. 69.

2. Determine net cash investment with expenditures in years other than the base year brought to base year value.

3. Estimate cash flows that will result from investment in each year of the project's life and allocate them to the years in which they will be received; i.e., estimate (a) earnings (excluding depreciation), (b) tax payable on the increase in earnings, (c) tax relief available through capital allowances, and (d) residual values at the end of the project's life adjusted for any tax consequences.

4. Discount future cash flows to present value at criterion rate of return.

5. Compute the sum of present values of future cash flows and compare with net cash investment. The project meets the criterion rate of return if the sum of present values of future cash flows exceeds the net cash investment. The criterion rate of return is not met if the discounted returns are less than the net investment.

6. When the criterion rate of return is met, calculate the profitability index which can then be used for ranking the project.

In order to apply the rate of return method, steps 2 and 3 above are used to obtain net cash investment and annual cash flows. The discounting rate is sought which will reduce the value of the future cash flows to the value of the net investment. Such a discounting rate is the rate of return on the project. The exact rate of return is ascertained by interpolation.

Important Concepts Employed in Economic and Financial Analysis of Projects

It appears appropriate and useful at this point to discuss some of the important terminology and concepts that have been used in this

study. The concept of investment appears to be a good starting point.
Investment in a project as defined by Helfert[9] is the cost of capital
assets (including installation, start-up-costs, and similar outlays),
plus increase in working capital required. Investment analysis he points
out is the evaluation of investment outlay, matching the economic gains
it provides against the cost of the funds used. Investment outlay
represents net investment while the recurring cash inflows generated
by the investment are called operating cash flows and they represent
economic benefits. Working capital as used above is the difference
between current assets and current liabilities. It represents the value
of circulating capital used to meet the payments for inputs and other
expenses necessary for the operation and maintenance of the project.

There are direct, indirect and secondary costs and benefits involved
in project investment analysis. These have been defined as follows:[10]
The direct costs and benefits relate to the goods and services directly
connected with the project. Indirect costs refer to the costs of the
goods and services incurred as a result of the projects output. It
applies to such costs as transportation, storage, processing and
distribution. Indirect benefits are the values of the goods and ser-
vices arising from primary productive activities associated with a pro-
ject. For instance, in a wheat project, the value of bread less the value
of its wheat content is an indirect benefit. Indirect costs and benefits
stem from the forward and backward linkages of the project. Direct and
indirect costs and benefits constitute primary costs and benefits.

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[9]Helfert, op. cit., pp. 145-170.

[10]FAO, op. cit., p. 100.

Secondary costs and benefits arise from income effects produced by
the direct and indirect activities of the project. According to
Gittinger[11] direct benefits from agricultural projects are derived in
several forms. They can be derived in form of increased value of out-
put, increased physical production, improvement in quality of product,
increased marketing efficiency through storage and transportation
improvement, changes in form of product through processing, reduction
of costs, avoidance of losses in product, saving time, and reducing
accidents. The direct benefit of an agricultural project is the value
of the increase in output less the associated increase in costs to the
farmers involved. It is recommended[12] that indirect and secondary
costs and benefits be included in economic justification of projects
especially in developing countries. When secondary costs are excluded,
the project's social rate of return on capital is overstated. On
the other hand, the social rate of return is understated if the secondary
benefits of the project are excluded.

Prices constitute one of the very important factors that determine
the economic and financial feasibility of a project. The importance of
prices stems from the fact that they reflect values or can be adjusted
to do so. It is a well known economic concept that the true value of any
good or service is best approximated by its market price. But in practice,
perfect markets usually do not exist so market prices do not usually reflect
true economic values. Other types of prices need therefore be sought
for use. The choice of what prices to use therefore constitutes a problem

[11]Gittinger, op. cit., pp. 20-30.

[12]FAO, op. cit., p. 101.

in project investment analysis. This is where the important concept
of shadow prices steps in. "Shadow price," sometimes called "accounting
price" has been defined as "that price which would prevail in the economy
if it were in perfect equilibrium under perfect competition."[13] The
shadow price of a resource is its opportunity cost, it is a hypothetical
value used as a device for correcting price distortion in an imperfect
market situation.[14] Shadow prices are used in three situations in
agricultural projects--foreign exchange, unskilled agricultural labor
and commodities important in world market. Gittinger[15] recommends
that for foreign exchange the government rate of exchange should be
used to value the import content of the project; for unskilled agri-
cultural labor, a zero, half, and full money wage rate should be used
for the first, second and third thirds respectively of the projects
life-span; and for important products in the world market, world
market prices should be used instead of domestic prices.

Along with the role of prices goes the role of inflation in project
analysis. Grants and other capital allowances are said to be related to
historical costs and their benefits fall with inflation while their real
return on a project is slightly depressed.[16] Inflation has even greater
effects when payments or receipts are fixed in money terms. In order to
cope with the problems of inflation in project analysis, Gittinger[17]

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[13]Gittinger, op. cit., p. 39.

[14]FAO, op. cit., p. 101.

[15]Gittinger, op. cit., p. 39.

[16]A. M. Alfred and J. B. Evans, op. cit., p. 12.

[17]Gittinger, op. cit., p. 37.

suggests that all costs and returns be inflated by the expected average
rate of inflation. This being a cumbersome solution, he further recommends
the use of today's (current) prices, based on the assumption that prices
will rise uniformly and that relative values of inputs and outputs will
therefore be unchanged.

Another important factor that bears a strong relevance to the
profitability of a project is that of taxation. The time differential
between the earnings of a project and the payment of tax on them is
taken into account in project appraisal because a substantial portion
of the earnings is subject to taxation.[18] Since the system of taxation
greatly influences investment decisions, government sometimes gives
incentives to encourage capital investment. Such incentives are usually
in the form of investment allowances, and cash grants.

Lastly, the rate of interest plays a major role in prospective
project's investment analysis. It is essential to first differentiate
between the uses of interest rate and discount rate. Whereas an interest
rate is used to measure the future value of a present worth, a discount
rate is used to measure the present worth of a future value. It has been
pointed out that[19] the desire to postpone future benefits tends to be
exaggerated when a low discount rate is used in cash flow analysis. This
results in undue preference being given to long gestation projects as
opposed to quick yielding projects. High discount rates do just the
reverse. Low discount rates tend to make marginal projects look unpro-
fitable while high discount rates would tend to reject sound projects.

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[18] M. G. Wright, op. cit., p. 35.

[19] FAO, op. cit., p. 105.

The FAO[20], therefore, advises that in developing countries the social discount rate should be fixed such that it admits just enough projects to absorb the available funds over a given period.

Apart from affecting the project as a cost arising from borrowed capital the rate of interest plays another important role in drawing a line of demarcation between the feasibility and unfeasibility of a project when the rate of return criterion is the basis of the analysis. The rate of interest in this case is the relevant opportunity cost of capital above which the computed rate of return must fall before the project is considered feasible. The relevant opportunity cost of capital has been defined[21] as the net earning power of capital in alternative investment. The opportunity cost of equity capital is the earning power of venture capital if placed in alternatives available to the owners of the enterprise or project, while the opportunity cost of total capital is the net earning power in alternative investments in the society. The opportunity cost of total capital is approximated by the prevailing market rate of interest on risk-free capital loans after adjusting for the anticipated rate of inflation in the economy.

Economic and Financial Analysis Principles

Economic Analysis Principles

In project analysis, according to Gittinger[22], attention could be focused on the social and economic returns (i.e., total returns, productivity or profitability to the whole society or economy), of the

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[20]Ibid.

[21]Richard Phillips, Leonard W. Schruben and Joe M. Tiao, Users' Guide to Computerized System for Feasible Agribusiness Development (Manhattan, Kansas, Vol. One, 1975), pp. 2-12.

[22]Gittinger, op. cit., pp. 7-8.

resources committed to the project regardless of who contributes to or receives the benefits. Economic analysis is therefore used to determine the social and economic returns. On the other hand when attention is centered on the returns to equity capital of those participating in the project, financial analysis is employed. Gittinger also identifies three major distinctions between economic and financial analysis. The first is that in economic analysis "shadow" or "accounting" prices may be used to better reflect the true social and economic values, whereas in financial analysis market prices including taxes and subsidies are always used. The second major difference is that in economic analysis taxes and subsidies are treated as transfer payments. This means that taxes are considered part of the total "benefit" of the project transfered to the society and subsidies on the other hand are "costs" to the society since it is an expenditure of resources incurred by the economy to operate the project. In financial analysis taxes are costs and subsidies are returns. The third distinction is that in economic analysis no interest is deducted from gross returns since interest is part of the total returns to capital. In financial analysis on the other hand, interest paid to outside suppliers of money is a cost and repayment of money borrowed is deducted before arriving at the benefit stream. The main differences therefore are in the definition of costs and benefits.

Briefly summarized below is a comprehensive feasibility analysis computerized program, useful for both economic and financial analysis, and developed by Phillips, et. al.[23] It is used to measure the economic soundness of a project by computing a potential annual rate of return on

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[23]Phillips, et. al., op. cit., pp. 2-10 to 2-12.

investment based on the time flow of money into and out of the project. The desired rate of return is computed by solving for "σ" in the formula:

$$I_o + \frac{I_1}{(1+\sigma)} + \frac{I_2}{(1+\sigma)^2} + \ldots \frac{I_n}{(1+\sigma)^n} = B_o + \frac{B_1}{1+\sigma} + \frac{B_2}{(1+\sigma)^2} + \ldots \frac{B_n}{(1+\sigma)^n}$$

where I = Net investment each period

            B = Net benefit each period

$0, 1, 2, \ldots .n$ = Periods starting with present as 0

            σ = Annual rate of return independent of the length of the accounting periods used.

This computerized program has been used in this study to analyze the prototype seed project.

The computer program is designed to compute and print-out different kinds of return rates "σ" based on the same formula but different measures of investment (I) and benefits (B). The return rate "σ" is interpreted according to how (I) and (B) are defined. From the program, it is possible to compute six different types of return rates, namely:

(1) The Internal Rate of Return (IRR) which is a measure of the earning power of the total capital investment, regardless of how the enterprise is financed and how the earnings are distributed. For the IRR, the investment (I) is defined as "the schedule of total investment, including replacement of depreciable assets as needed." Benefits (B) are defined as "the schedule of net earnings before depreciation, interest payments and income tax."

(2) The Direct Rate of Return (DRR) which is a measure of the earning power of total capital investment in public projects which do

not produce a direct income. For the DRR, investment (I) is defined as in IRR, but benefits (B) are defined as "the schedule of net savings accruing to the direct beneficiaries of the public project."

(3) The Associated Rate of Return (ARR) is a measure of the additional earnings to total capital investment in the project resulting from the benefits it contributes to the economy of the area. For the ARR, investment (I) is defined as in IRR but benefits (B) are defined as "the schedule of net associated benefits to the economy contributed by the project, measured either as added earnings (or savings), or as capital gains on existing assets."

(4) The Social Rate of Return (SRR) is a measure of the combined direct and associated earnings to total capital investment in the project. For the SRR, investment is also defined as in IRR but benefits are defined as "the schedule of combined direct net benefits and net associated benefits."

(5) The Comparative Rate of Return (CRR) is a measure of the differential rate of return to total capital investment in an alternative project compared to a base case enterprise. Investment (I) in this case is defined as "the schedule of additional capital for the alternative compared to that of the base case," and benefits (B) are defined as "the schedule of additional net earnings (or savings) for the alternative compared to that for the base case."

(6) The Financial Rate of Return (FRR) is a measure of the earning power of equity capital in the project after the payment of all depreciation, interest, and income tax expenses. Investment in this case is defined as "the schedule of total equity capital (both paid-in and earned) placed in the enterprise," and benefits (B) are defined as the

"schedule of net profits after payment of all operating expense,
including depreciation, interest and income tax."

The feasibility of the project is determined by comparing any of
the above rates of return by the relevant opportunity cost of capital.
When the computed rate of return exceeds the relevant opportunity cost
of capital, the project or enterprise is considered feasible. If the
computed rate of return is lower than the relevant opportunity cost
of capital then the project is feasible. Only three of the above rates
of return analysis (IRR, DRR and SRR) will be used for this project.

<div align="center">Financial Analysis Principles</div>

When economic analysis indicates that the total returns of a
project to the society are favorable, a further analysis could be carried
out to determine if the receipts will cover all the costs incurred.
Such an analysis is important in that it helps to determine whether
or not there is enough incentive and cash flow for farmers, private
firms, government corporation and other would be participants to enable
them to participate in the project.[24] With specific reference to agri-
cultural projects, Gittinger[25] lists five main objectives for financial
analysis. The first is to ensure that there are adequate incentives
for farmers and other project participants. The second is to assess
the participants' current financial position and to project their future
positions as the project is implemented. The third is to provide for
the project a sound financing plan. The fourth is to determine whether
the financial requirements of the participants are properly coordinated
and the fifth is to assess the financial management competence of the

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[24]Gittinger, op. cit., p. 130.

[25]Ibid., p. 130.

project. Such objectives are usually achieved by (I) assessing the project's ability to meet its current obligations, (II) determining the true worth of its various assets, (III) determining the extent and character of its liabilities, (IV) determining its resourcefulness and ability to earn a fair return on its investments, and (V) determining the projects ability to raise new funds when needed.[26] Several analytical methods are available for financial analysis. Very often financial data are related to each other and ratios or index numbers are obtained for comparative purposes and for answering specific questions. Helfert[27] states that ratio analysis provide guides and clues in spotting trends towards better or poorer performance and finding significant deviations form averages or applicable standards.

Following is a synopsis of the various types of ratios associated with financial analysis as described by Helfert.[28] The ratios are in three sets, the first set measures liquidity and indebtedness. They consist of (I) the current ratio, which is a ratio of current assets to current liabilities. It is considered a crude index showing financial strength. Usually a 2:1 ratio is used as a rule of thumb. (II) The liquidity ratio or acid test; this is the ratio of cash, marketable securities, and receivables to current liabilities. It measures the business's ability to meet its current obligations with the readily convertible funds at hand. It does not consider future funds flow. Usually, a 1:1

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[26]Helfert, op. cit., p. 51.

[27]Ibid., p. 52.

[28]Ibid., p. 54-66.

ratio is used as a rule of thumb. (III) Debt ratios; these test the
ability of the business to meet its long and short term obligations.
The following three are in common use: total debt ÷ total assets,
long term debt ÷ capitalization, and total debt ÷ net worth. They
show selective relative positions of owners and creditors.

The second set of ratios are used to appraise fund management.
They consist of (I) the ratio of accounts receivable to sales per day,
which gives the promptness with which accounts are collected, as a
measure of managerial effectiveness, (II) the ratio of accounts payable
to purchases for the period, which is a less reliable measure of
management effectiveness, (III) ratios appraising the value of
inventories: (a) cost of sales ÷ average inventories (i.e., half the
sum of beginning and opening inventories), (b) sales ÷ ending inventory,
and (c) ending or average inventory ÷ sales. The higher the ratio the
better the performance, except for (c) which is the reverse.

The third set of ratios measure profitability. They are sub-
divided into two groups which measure profitability related to invest-
ment and profitability related to sales. The first sub-group consists
of (I) the ratio of earnings before interest and taxes to total assets,
(II) the ratio of net profit (after taxes and interest) to total assets,
and (III) the ratio of net profit to net worth (net worth being average
net worth during the year). The second sub-group consists of (I) the
ratio of earnings before interest and taxes to sales, (II) the ratio of
net profit to sales, (III) the ratio of cost of sales to sales, and
(IV) gross margin or ratio of sales less cost of sales to sales.

The use of the above ratios as tools for financial analysis has
limitations arising from two main facts.[29] Firstly, it is not possible

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[29]Ibid., p. 52

to compare many situations since accounting methods of recording, valuing assets, write offs, costs, expenses, etc. vary with customs, policies, and nature of project or company. Secondly, financial statements are based on past performances on whose projections valuations are made which can be used only as guidelines. A more reliable way of assessing current and future financial positions is through the use of three principal financial statements: income and expenditure statements, sources and applications of funds statements, and balance sheet statements.[30] These three statements have been treated in detail by Phillips, et. al.[31] who have also made it clear that such pro forma statements are worked out after the economic feasibility of the project has been determined and that they are used for working out and testing a sound and practical financing plan for the project and indicating the outcome of the plan to potential lending institutions, equity investment and development planners. In this context, income and expenditure statements (or operating statement) refers to the flow accounts of income, expenses and net income over a series of specific periods in the future. The sources and applications of funds statements show the period by period flow of cash funds, matching the periods in the operating statement and indicating the net changes in the balance sheet accounts from the end of one period to the end of the next. Finally, balance sheet statements show the fund accounts of assets, liabilities and net worth at specific points in time.

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[30]Gittinger, op. cit., p. 133.

[31]Phillips, et. al., op. cit., pp. 8-14.

CHAPTER II

PROBLEM DESCRIPTION AND METHOD OF ANALYSIS

Background Description of the Project

In recent years the government of the United Republic of Cameroon
has placed emphasis on the urgent need to develop and increase the
production of food crops, which hitherto received relatively little
attention compared to cash crops, which are mostly tree crops produced
for export. Cameroon's principal food crops include corn, rice, coco-
yams, yams, sorghum and plantains. Peanuts are important as a food
as well as an export crop. The productivity of these crops on per
hectare basis is low due to a number of factors. Some of the factors
are the use of traditional farming methods; the use of relatively
poor quality, low yielding and improperly stored seeds; and losses
to disease and pests. Of the food crops listed above, the grain crops
are known to play an important role because they constitute a principal
diet item of three of the country's seven provinces whose total popula-
tion is about half of the nation's population. The provinces in question
are the North, the Northwest and the Western Provinces. The grain
demand has been increasing in these and the other four provinces due
partly to the steady growth of the livestock and brewery industries in
the country. Government statistics have been indicating that more than
half of the rice consumed in the country is imported. Research and
recent projects have proven that there is a high potential for rice

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production in parts of the three grain producing provinces named above. Corn, rice and peanuts are also grown and consumed in parts of the remaining four provinces of Cameroon.

No seed production, processing, packaging and distribution program exists in the country. Such a program would serve as an important means of utilizing for the benefit of the farmers some of the research results currently available from research institutes. It is common knowledge that improvement in the quality of seeds and/or the replacement of low yielding seed varieties with high yielding ones will significantly increase yields even without the application of fertilizers and/or other improved production methods.

The above facts seem to justify a proposal to the Cameroon authorities to consider a seed development program as one of their development projects. The prototype program about to be developed here can serve as a useful model for Cameroon and other similar African countries. For Cameroon, a suitable location for such a project would be in the Western province. This province is centrally located with respect to the three provinces considered the would-be principal participants in the project. Other factors that favor the choice of this province include the fact that its population is generally known to be active and to possess inherent entrepreneural qualities for agricultural and other businesses. Also important is the fact that there already exist in this province some vital institutions and infrastructure necessary for a successful execution of such a project. A notable example is the presence in the province of the headquarters and experimental stations of the Cameroon Institute

for Food Crops and Textiles. Figure 1 illustrates the positions of the
three provinces involved.

The proposed prototype project involves the production, processing
and marketing of four grain seeds; namely, corn, rice, sorghum and
peanuts. The project is designed to produce 500 metric tons of corn
seeds, 600 tons of rice seeds, 400 tons of peanut seeds and 200 tons
of grain sorghum seeds annually, when in full production. There are
three functional units constituting the program. These are the Contract
Seed Production Unit, the Processing and Packaging Unit, and the
Marketing and Distribution Unit. Under a contract arrangement, the
Production Unit supplies a number of selected farmers with selected
foundation seeds on credit. The farmers multiply the foundation
seeds under the technical supervision of the staff of the Production
Unit. The multiplied foundation seeds are bought by the Production
Unit. The value of the foundation seeds loaned to the contract farmers
is recovered when the multiplied foundation seeds are harvested and
sold back to the Production Unit. The Production Unit sells to the
Processing Unit all the unprocessed seed purchased from the
contract farmers. The seeds are then processed, packaged and sold
to the third unit, the Marketing and Distribution Unit. The Marketing
Unit distributes and sells to local farmers at the distribution centers.

The plan of this project, its technical specifications and most
of the data to be used are taken and modified where necessary from a
similar project developed for Thailand.[1] It will therefore be assumed
that the plants, buildings, equipment and other technical requirements

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[1] Contained in an unclassified AID-DLC/p-2115 Project Paper, Proposal
and Recommendations for the Review of the Development Loan Committee.
The Thailand Seed Development Loan. June 1975.

NORTH

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NORTHWEST

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WESTERN

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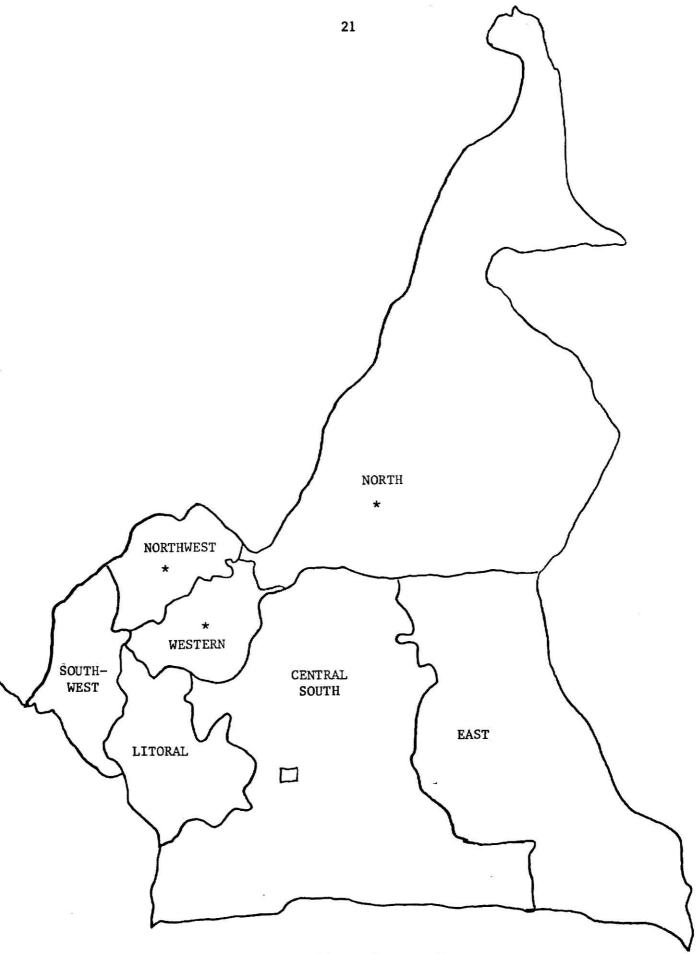SOUTH-
WEST

CENTRAL
SOUTH

LITORAL

EAST

Figure 1. Map of Cameroon Showing
the Seven Provinces.

and data are applicable to Cameroon as they are in Thailand. Labor requirements and technical assistant personnel requirements to be used will also closely follow the pattern in the Thailand Project.

Objectives to be Achieved

The overall objective will be the development of projected cash flow schedules of (a) the total capital outlay, (b) operating income and (c) operating expenses, which will be used to measure the economic potential of a prototype seed production, processing and marketing project suitable for adaption for use by the Republic of Cameroon. The major analyses to be done for this purpose shall be the Internal Rate of Return (IRR), the Direct Rate of Return (DRR), and the Social Rate of Return (SRR). Several intermediate goals will be achieved in the process and these will include:

(1) Development of combined capital outlay and replacement schedules for each unit of the project using capital cost estimates.

(2) The development of the projected schedules of labor requirements and costs.

(3) The development of projected fixed and variable operating costs of all the functional units of the project including administration.

(4) The development of projected working capital and other non-facility capital requirements.

(5) The development of a projected procurement potential and cost of foundation seeds for the project.

(6) The projection of realistic net sales prices of finished products i.e. processed and packaged seeds.

(7) Development of schedules of projected added net incomes and of total operating costs to the direct beneficiaries of the project.

(8) Development of a schedule of projected total net benefits from the project.

Methodology Used Including Assumptions

The IRR Analysis

Here will be given a synopsis of the procedural steps for attaining the principal and intermediate goals stated above. Since the principal and ultimate purpose is to compute three rates of return (IRR, DRR, and SRR) and to use them to determine the feasibility of the prototype project, it will be logically proper to show first how the intermediate objectives that lead to the final objective are achieved. The intermediate goals lead to a logical achievement of each aspect of the overall goal.

1. Review of capital cost estimates and development of capital outlay and replacement schedules for each functional unit.

A general equipment and facilities list for the project based on the general engineering design and set-up of the plant is first assembled together with their prices at source, their useful life-spans, their installation costs and their delivery costs. The list used for this project is identical to that used for the Khon Kaen location of the Thailand seed project. From that list, combined costs of capital outlay schedules were worked out for each functional unit to include appropriate allowances for replacements at the end of their useful lives. The list of equipment and facilities is presented in Tables 1(A) to 1(E) and the schedule of buildings and equipment costs for the entire project is shown on Table 2 of the Appendix.

2. <u>Development of projected schedules of labor requirements</u>
<u>and costs</u>.

To obtain these, period by period estimates of the various
categories of labor required by each unit of the project including
administration are drawn up based on the general engineering design and
layout of the plant and on the general plan of the project. The pro-
jected estimates could be in man-years, man-months or man-hours.
Appropriate wages are applied to each category to obtain the projected
labor costs. For this project, the categories and volumes of labor
used follow the Thailand project pattern with slight adjustments
but the wages applied on the various categories are Cameroon. The
figures are presented on Tables 6A, 6B, 6C and 6D of the Appendix.
A list of the categories of manpower requirements and the various wage
rates used is presented on Table 12 of the Appendix.

3. <u>Development of projected total fixed and variable operating</u>
<u>costs for all the functional units</u>.

The schedule of total fixed cost is obtained by projecting period
by period expenses on office items, administration, maintenance, contracts,
license fees, travels and other fixed costs for each of the functional
units. Variable operating expenses are projected for each functional
unit from expenses on items such as fuel, vehicles and parts repairs,
power supplies, hauling, selling, advertisements, and other variable
cost items estimated for each period of the project's expected life.
For the prototype project the projected figures used for the Khon
Kaen location of the Thailand project are used based on the assumption
that the total fixed costs and operating costs will not differ signifi-
cantly from what would be obtained in Cameroon if the same plant design

and seed production targets are used. The total fixed costs projections are shown on Tables 9A, 9B, and 9C while the operating costs projections are on Tables 8A, 8B and 8C of the Appendix.

4. <u>The development of projected working capital requirements.</u>

The schedule of working capital requirements to finance production supplies, products in process and finished products are developed using a projected operating plan and sales schedules for each functional unit of the project. To accomplish this the following period by period schedules are developed and used. (1) Schedules of seed inventory for each functional unit, (2) schedules of average monthly accounts receivable from seed sales for each unit, (3) schedules of supplies inventory, (4) schedules of cash requirements and (5) schedules of foundation seed requirements for the contract producers. The period by period summation of the above schedules gives the projected total working capital require-ments for each functional unit of the project. The figures used are presented on Tables 7A, 7B and 7C of the Appendix.

5. <u>The development of the projected procurement potential</u> <u>and cost of foundation seeds.</u>

The purpose here is to project for the 15 years life-span of the project, period by period volumes and costs of foundation seeds to be supplied from a reliable source for processing and packaging. Ideally, this is done by assembling historical information on yields, marketing patterns, and prices of grains and/or grain seeds, from local sources and published reports of the Ministry of Agriculture. From the yield information the number of acres to be cultivated by the contract farmers to give the required volume of foundation seeds for each period can be determined. The marketing and price information

help to determine the cost to the project of foundation seeds purchased
for processing. Owing to want of data from Cameroon for this purpose,
already projected volumes of seed projected for use in the Khon Kaen
location of the project designed for Thailand are used. Estimated prices
based on the writer's current knowledge of grain prices in Cameroon
are applied to the already projected volumes to obtain estimated costs
of producing foundation seeds for the prototype project. Tables 3A,
3B and 3C of the Appendix give the projected volumes and values of
seed stock purchases for each of the three units of the project. They
have been compiled using the above procedure.

6. The projection of realistic net sales prices of finished
products.

Both existing and new varieties are used in this project for each
type of seed involved. In order to obtain realistic prices for seeds
at each stage of production, certain mark-up factors used in the
Thailand seed project, are applied to the estimated market prices
for grains to obtain the desired mark-up prices for the seeds. Market
prices for grains are multiplied by 200 percent and 250 percent for
existing and new seed varieties, respectively, in order to obtain
the prices of the foundation seeds sold to contract farmers by the
Production Unit of the project. The mark-up factor used to obtain the
prices paid to contract farmers by the Production Unit is 115 percent
for both existing and new varieties of unprocessed seeds; 120 percent
and 125 percent are the mark-up factors used to obtain the prices
paid by the processing Centre to the Production Unit for unprocessed
seeds; 165 percent and 170 percent are the mark-up factors used to

obtain the prices of processed and packaged seeds (finished product) paid by the Marketing and Distribution Unit to the Processing Unit. Finally, to obtain the sales prices to farmers for the processed and packaged seeds, the mark-up factors used are 172 percent and 182 percent applied to market prices of grains to obtain respectively the prices for existing and new varieties of seeds. Tables I and II respectively give the market prices and mark-up factors used. Tables 4A, 4B, 4C and 4D give projected volumes and values of seed and by-product sales for each of the three functional units. The projected values are obtained by applying the appropriate prices to the projected volumes of seeds sold by each unit. There are differences in the volumes of seed purchased by the Processing Unit and the volumes sold out by them to the Marketing Unit. These differences reflect reductions due to shrinkage during processing and to the separation of low quality seeds which are sold out as grains (by-products) at 60 percent of the market prices of the various grains.

The accomplishment of these preceding steps furnishes enough data for drawing up for each functional unit and for the complete project, schedules of capital outlay, working capital, revenue, and of fixed and variable operating expenses as computer input data for the internal rate of return and other useful computations for determining the economic feasibility of the project. The input information is presented on Tables 10A, 10B, 10C and 10D of the Appendix. When the total investment and net revenue schedules generated from the above schedules are discounted period by period at various discount rates, the discount rate that equates the sum of the discounted total investment to the sum of the discounted net revenue is computed as the IRR.

Without using the computer, this rate of return could be roughly determined graphically by plotting the graphs of discount rates against the present values of the discounted total investment and of the discounted net revenue. The intersection of the two curves on the graph gives a rough estimate of the IRR. Figure 2 is an illustrative graphical determination of the IRR for the basic alternative of the complete seed project. The IRR thus determined is about 3.00 percent which compares favorably with 3.022 percent--the results obtained through the computer.

The DRR Analysis

The attainment of the seventh intermediate goal--the development of schedules of projected added net income and of projected total operating costs to the direct beneficiaries of the project, is a necessary requirement in the DRR analysis. From the two schedules, the schedule of net benefits to the direct beneficiaries is obtained by subtracting the total operating costs from the added net income. The small farmers who are the ultimate users of the seeds and the selected farmers who multiply the foundation seeds for the project under con- tract terms, constitute the direct beneficiaries of the project. Their added net income is a measure of the gross direct benefit of the project. In order to obtain the schedule of added net income to the small farmers, a schedule of projected increase in production resulting from the seed program is first developed. These figures were generated for the Thailand project by applying to the metric tons of each variety of seeds planted, production factors developed from local technical information. For this study the projections for the Khon Kaen location of the Thailand project have been used. The figures and the production factors used are shown in Table SA-I of the Appendix. Market prices for the various

TABLE I

MARKET PRICES OF GRAINS IN CAMEROON

Type of Grain	Market Price (Dollars/Ton)
Corn	100
Rice	250
G. Rice	208
Peanuts	100
Sorghum	167

TABLE II

MARK-UP FACTORS USED TO OBTAIN SEED PRICES

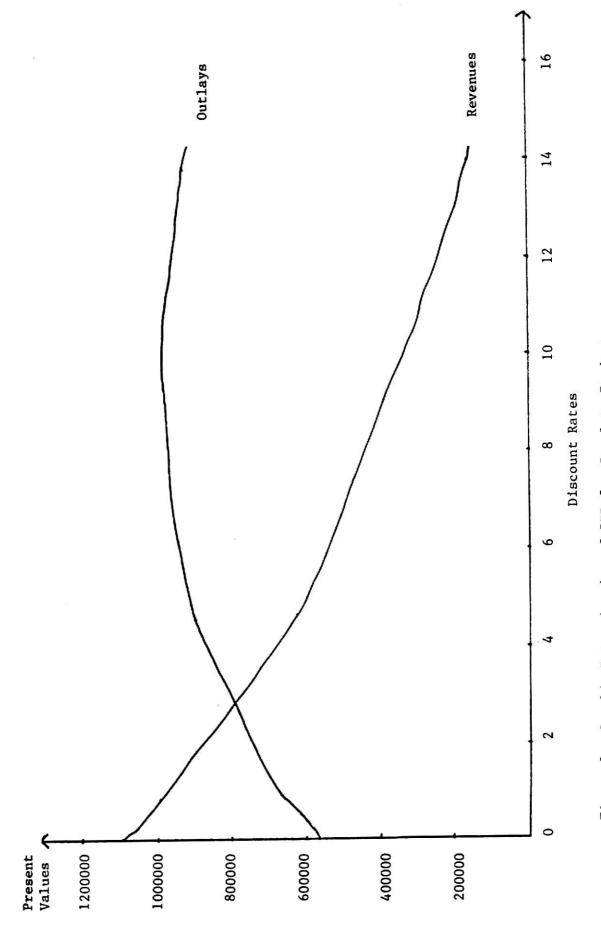| Type of Seeds	Mark-Up Factors (%)	
	Existing Varieties	New Varieties
1. Foundation seeds to contract farmers	200	250
2. Unprocessed seeds to production unit	115	115
3. Unprocessed seeds to processing unit	120	125
4. Processed seeds to marketing unit	165	170
5. Processed seeds to local farmers	172	182
6. By Products (grain)	60	60

Figure 2. Graphic Determination of IRR for Complete Project.

DISCOUNTED VALUES USED IN THE ABOVE GRAPHICAL DETERMINATION OF IRR

Discount Rate (%)	Present Value Outlay	Present Value Revenue
0	581693	1147757
2	735920	895000
4	834901	681310
8	930846	420900
10	945882	334500
15	942472	172202

types of grains are applied to projected volumes of increased production to obtain the schedules of projected direct impact of the seed project in dollars (Table SA-II). To these schedules are applied certain decimal factors to obtain the schedule of projected increase in farmers' net income resulting from the project. The decimal factors used are 0.8731 for corn, 0.8902 for rice, 0.7680 for peanuts and 0.8463 for sorghum. They were developed for the Thailand project from production cost and income studies. Figures obtained after applying the above factors are shown on Table SA-III of the Appendix.

The added net income to the contract farmers is obtained by multiplying the value to the contract farmers of the foundation seed bought from them by the Production Unit, by an added net income factor of 0.24. This factor was derived and used in the Thailand project and it reflects the added volume of production, the difference between market price for grain and the price paid by the project at 115 percent of market price, and the added costs to the contract farmers.

The operating costs used in the IRR analysis plus the directly associated costs to insure the direct benefits, constitute the total operating costs. For this project, the associated costs consist of (1) the cost of the agricultural extension program on the use of improved seeds, (2) the costs of developing new varieties of seeds for the project and (3) the costs of technical assistance and training for the program. Table SA-IV is a schedule of the technical assistance requirements projected for the project. The variety development costs are calculated as 10 percent of the total revenue from seed sales. Table SA-V gives the schedule of directly associated costs.

The rest of the data required for the direct rate of return analysis is available from that already compiled for the IRR analysis. Table SA-VII shows the listing of the computer input data for the computation of the DRR. The schedules of investment on buildings and equipment, working capital and direct costs are the same as for the IRR analysis and the computation procedure for the DRR is the same as for the IRR.

The SRR Analysis

The eighth intermediate goal--the development of the schedule of projected total net benefits from the project--has to be accomplished in the process of performing the SRR Analysis. The total net benefits of the project are composed of (a) the value at the farm gate of increased grain production resulting from the project, (b) the excess of value added through the marketing system over the added cost to the marketing system, (c) training benefits and (d) employment benefits arising from the pro-ject. The schedule of values of increased grain production had already

been developed (Table SA-II), the schedule of added values added through
the marketing system is estimated as 10 percent of the value of added
production due to want of concrete data for more accurate estimates.
Employment benefits are zero because they are considered insignificant
in this project. The training benefits schedule is obtained from the
estimates of the added earnings of those trained for the project.

The operating costs for the SRR computation consist of the
operating costs used in the DRR Analysis plus any additional associated
costs incurred to insure the impact benefits. The additional associated
costs have been estimated for this project as other costs and range
between $15,000 and $25,000 per period. The rest of the required
computer input data for the SRR computation have already been developed
and used for both the IRR and DRR computation. The input data consist
of investment schedules in buildings and equipment, schedule of working
capital, total net benefit schedules arising from production, marketing
system and training, and operating cost schedules. Table SA-VIII shows
the listing of the computer input data for the SRR computation following
the same procedure as for the IRR and DRR.

The Sensitivity Analysis

This is a process by which modifications are introduced to affect
the capital investment, working capital, operating revenue or the operating
cost of the prototype thereby creating alternatives and analyzing them.
The enterprise can thus be tested for sensitivity to changes in labor
costs, sales volume, machinery costs, etc. The procedure is to feed
the feasibility analysis program with the necessary information using
scale cards each of which calls for a different alternative analysis.

This proves to be a rather useful operation especially in the case of this study which is utilizing data from a distant country to construct a model for another of a not too similar nature. The information used in this model could easily be scaled up or down to suit the actual situation in Cameroon where and when Cameroon data are found to differ significantly from that used in the model. Sensitivity analyses have been performed for all the three rates of return analyses employed to test the economic feasibility of the prototype project.

It is important to note here, with reference to the above methodology, that at a late stage in the preparation of the final manuscript questions were raised concerning the definition and measurement of "working capital" in the analysis. It was argued that the way in which it is incorporated could conceivably result in double counting certain costs. For example, all seed purchases are counted as "operating costs" and then, to the extent that seed inventories are changed, as "working capital costs." It was believed that this apparent double counting of some costs would therefore result in a reduction in the rate of return to the project that is determined by the analysis, and may exaggerate the "financial requirement" of the project. However, the outcome of this issue has not yet been completely resolved. Also the same analytical method has been used in several other feasibility projects. This fact plus the advanced state of the manuscript, the ready availability of the computer program and the limited time available for the study, meant that it was not considered feasible to modify the study. The committee members agreed with this decision.

CHAPTER III

RESULTS AND CONCLUSION

The IRR Analysis Results

Tables R1(a) and (b) which follow give a summary of the computer

results obtained for the internal rate of return analysis for the

three functional units of the project and for the complete project.

Results for the sensitivity analysis are included in Table R1(a). The

internal rates of return for each basic alternative are -0.32 percent

for the production unit, 3.206 percent for the processing unit, 10.671

percent for the marketing and distribution unit and 3.022 percent for

the whole project. Assuming that the adjusted market rate of interest

(or opportunity cost of capital) is 12 percent it would be clear that

the whole project as well as all its constituting units are economically

unfeasible since all the computed rates of returns are below the 12

percent critical rate. The benefit/cost ratios and the present values

of revenue and investment shown on Table R1(b) for the complete project

show that the project is economically infeasible even at the low dis-

count rate of 5 percent. The differences between the discounted

revenues and investments are all negative and the benefit/cost ratio

at 5 percent discount rate is less than one, (only 0.715).

A sensitivity analysis was conducted by scaling by 10 percent some

of the key factors that would affect the commercial viability of the

project and its component units. The results for the complete project

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TABLE R1.(a)

SUMMARY OF IRR AND ITS SENSITIVITY ANALYSIS RESULTS

IRR and Differences from Basic Alternative

Scale Factor and Item Altered	Production Unit		Processing Unit		Marketing Unit		Complete Project	
	IRR(%)	Difference	IRR(%)	Difference	IRR(%)	Difference	IRR(%)	Difference
1. Basic alternative	-0.320	0	3.206	0	10.671	0	3.022	0
2. 10% increase in seed sales prices	10.352	+10.672	7.033	+ 3.827	57.673	+47.002		
3. 10% decrease in seed stock prices	9.142	+ 9.462	6.049	+ 2.843	50.881	+40.210	4.933	+ 1.911
4. 10% decrease in working capital							3.467	+ 0.445
5. 10% decrease in seed stock prices and 10% increase in seed sales prices							8.320	+ 5.298
6. 10% increase in facilities and seed prices and 10% decrease in seed stock prices							7.763	+ 4.741
7. 10% decrease in facilities							2.627	- 0.395
8. 30% increase in seed sales prices.							12.167	+ 9.145
9. 40% increase in seed sales prices							14.974	+11.952
10. 10% increase in fixed costs	-0.421	- 0.101	3.159	- 0.047	10.335	- 0.336		
11. 10% increase in facilities	-1.027	- 0.707	2.939	- 0.267	10.253	- 0.404		

SOURCE: Results from computer printout.

TABLE R1(b)

OTHER RESULTS BASED ON THE ECONOMIC ANALYSIS FOR THE
COMPLETE SEED PROJECT (BASIC ALTERNATIVE)

Interest	Benefit/Cost Ratio	Present Value in Dollars		
		Revenue	Outlay	Balance
5	0.715	620655	867659	-247004
10	0.353	334022	945739	-611717
15	0.183	172202	942472	-770269
25	0.025	21655	868082	-846427
35	-0.043	-33575	788192	-821767
50	-0.085	-58856	696320	-755176

SOURCE: Results from computer printout.

show that it is insensitive to changes in sales prices for processed
seeds and to changes in variable costs, fixed operating costs and
facilities. The largest changes in the IRR arose from increasing the
prices of processed seeds, reducing the prices of seed stock, or doing
both. A follow-up analysis involving drastic changes in the prices of
processed seed showed that the project could be feasible if these prices
were increased by 30 percent. Such an increase is considered undesirable
because very high prices for the processed seeds may scare away the
local farmers whose participation in the use of improved seeds is so
vital to the success of the program. On the other hand a decrease in
the prices of seed stock purchased would tend to discourage the con-
tract farmers from taking more production contracts.

The functional units of the project excepting the marketing unit,
were also insensitive to the alternative changes. The marketing unit

was insensitive to increases in fixed operating costs and in facilities

but was very sensitive to both changes in the prices of processed

seeds and seed stock purchases.

It is therefore very clear that this prototype project will not

be viable as a private commercial project. But as already pointed out,

this is a public project and it will therefore not be right to base

its worthwhileness on commercial basis or on the IRR analysis alone.

The more crucial test for economic feasibility should be the direct

impact or DRR analysis.

The DRR and SRR Results

Tables R2(a) and (b) and R3(a) and (b) which follow summarize the

results obtained from the direct rate of returns and social rate of

returns analyses including sensitivity analyses, for the complete

project. The results show that the DRR for the basic alternative is

62.591 percent and that the SRR is 66.971 percent. Both the Direct

Impact and total Economic Impact analyses therefore show that the

project is very feasible. The DRR of 62.591 percent and SRR of 66.971

percent both exceed by far the critical interest rate of 12 percent.

The benefit/cost ratios from DRR analysis and the social benefit ratios

from the SRR analysis confirm the feasibility of the project. They

indicate that even with a 50 percent discount rate the project in both

cases will still pass the feasibility test.

The sensitivity analysis conducted for the two cases show only

small changes in the rates of return when facilities, working capital,

and items of operating costs are increased by 10 percent in each case

and when income is decreased by 10 percent. The DRR drops by 9.8 percent

TABLE R2(a)

SUMMARY OF RESULTS FOR DRR AND ITS SENSITIVITY ANALYSIS

Scale Factors and Items Altered	DRR and Changes in DRR	
	DRR(%)	Change in DRR
1. Basic Alternative	62.591	0
2. 10% decrease in income and 10% increase in operating expenses	54.931	- 7.660
3. 10% decrease in income and 10% increase in all expenses	52.775	- 9.815
4. 10% decrease in income	57.332	- 5.259
5. 10% increase in costs of extension and feed development	62.205	- 0.336
6. 10% increase in facilities	60.762	- 1.829
7. 10% increase in working capital	61.884	- 0.707
8. 10% increase in direct costs	61.323	- 1.268
9. 10% increase in technical assistant	61.777	- 0.814
10. 30% decrease in income and 20% increase in all expenses	37.966	-24.625
11. 50% decrease in income	31.828	-30.763

SOURCE: Results from computer printout.

TABLE R2(b)

OTHER RESULTS BASED ON DIRECT IMPACT ANALYSIS OF THE COMPLETE
PROTOTYPE PROJECT (BASIC ALTERNATIVE)

Interest Rate (%)	Benefit/Cost Ratio	Present Value in Dollars		
		Benefits	Outlay	Balance
5	21.979	18765969	853801	17912169
10	13.154	12349096	938842	11410254
15	8.981	8432373	938931	7493442
25	4.965	4305347	867068	3438270
35	3.061	2411471	787872	1623599
50	1.629	1134338	696254	438084

SOURCE: Results from computer printout.

TABLE R3(a)

SUMMARY OF RESULTS FOR THE SRR AND ITS SENSITIVITY ANALYSIS

Scale Factors and Items Altered	SRR and Changes in SRR	
	SRR(%)	Change in SRR
1. Basic alternative	66.971	0
2. 10% increase in direct costs	64.589	- 2.382
3. 10% increase in facilities	65.217	- 1.754
4. 10% increase in working capital	66.332	- 0.639
5. 10% increase in training and other costs	66.640	- 0.331
6. 10% decrease in income and 10% increase in operating expenses	58.936	- 8.035
7. 10% decrease in income and 10% increase in all expenses	56.902	-10.069
8. 30% decrease in income and 20% increase in all expenses	41.564	-25.407
9. 50% decrease in income	35.210	-31.761

SOURCE: Results from computer printout.

TABLE R3(b)

OTHER RESULTS BASED ON THE ANALYSIS OF THE TOTAL ECONOMIC
IMPACT OF THE PROTOTYPE SEED PROJECT (BASIC ALTERNATIVE)

Interest Rate	Social Benefit Ratio	Present Value in Dollars		
		Benefits	Outlay	Balance
5	27.347	23348935	853801	22495134
10	16.342	15343002	938842	14404161
15	11.142	10461119	938931	9522188
25	6.139	5322907	867068	4455839
35	3.766	2967443	787872	2179571
50	1.981	1379149	696254	682895

SOURCE: Results from computer printout.

and SRR by 10.07 percent when income is reduced by 10 percent and all

other expenses increased by 10 percent at the same time. Both the DRR

and SRR exceed 30 percent when income in either case is reduced by

50 percent. This means that the project will still be feasible if

the estimated benefits are drastically reduced and costs increased.

The direct impact analysis has therefore given conclusive evidence

that the prototype project will be very beneficial to its direct

participants. The economic impact analysis has also confirmed the

profitability of the project to the society involved. The project

is therefore a worthwhile venture in its present set-up, as an .

economic development project.

Conclusion

The feasibility analysis procedure used to test the worthwhile-

ness of the prototype project has indicated that the model is feasible

for economic development purposes though not as a private commercial

enterprise. However, before this model can be used in Cameroon some

essential adjustments will be necessary in order to adapt it to suit

the Cameroon situation. More specifically, the production targets

have to be adjusted to meet the needs of Cameroon and perhaps its

neighboring French-speaking countries with which Cameroon has very

close economic ties. Careful studies are required to determine the

projected seed demand estimates taking into account the expected success

of the extension program to educate the farmers on the use of improved

seeds. Per hectare yield estimates have to be made taking into account

the mixed-cropping customs of the people. When these two aspects are

duly adjusted, the production targets and income as used in the proto-

type model may substantially drop. However the analysis has shown

that when these and other factors crucial to the feasibility of the project are varied even widely, the project remains viable. For instance, the sensitivity analysis of the project's Direct Impact and Total Economic Impact showed that a 30 percent decrease in income with a simultaneous 20 percent increase in all expenses still leave the DRR and SRR as high as 37.97 percent and 41.56 percent, respectively, and that a 50 percent drop in income holding all other factors constant leaves both the DRR and SRR above 30 percent.

The prototype project therefore has plenty of allowance for drastic changes to suit a variety of very different situations without a real danger of its losing its feasibility status. It therefore seems capable of serving as a useful model not only for Cameroon but for other similar developing countries.

APPENDIX

Most of the tables for this project provide data for 30 six
month periods numbered from 0 to 29. The tables in the Appendix
give only the first 15 of the 30 periods. From period 14 the figures
in the remaining even number periods are the same as in period 14
and those for the remaining odd number periods are the same as in
period 15. The last even number period therefore repeats itself
right to the 28th period while the last odd number period on each
table similarly repeats itself right to the 29th period. The
30th periods for the input tables--10A, 10B, 10C, 1CD, SA-VII, and
SA-VIII are similar to that of table 10A where the remains of the
capital investments in the project are taken out as indicated by
the negative signs.

TABLE 1A

GENERAL EQUIPMENT LIST FOR A SEED DEVELOPMENT PROJECT

Equipment by Function	SPECIFICATIONS						ESTIMATED COSTS (DOLLARS)				Useful Life (Years)
	Description	Capacity Size	No.	HP/hr	Total HP/hr	KV/hr	At Source	for Delivery	Installation	Total Cost	
A CONTRACT PRODUCTION											
I General Purpose											
1 Mechanic Tool Set			1				600	240		840	4
2 Calculator			1				500	200		700	4
3 Typewriters			2				1000	400		1400	
4 Mimeograph Machine with accessories			1				600	240		840	4
5 Slide Projector with accessories		35mm					400	160		560	4
6 Projection Screen	Portable		1				100	40		140	4
7 PA System	Portable, battery powered		1				100	40		140	4
8 Office furnishings			3				3000	1200		4200	4
9 Spare parts										8420	
										442	
									sub-total	9202	
II Seed Threshers	All purpose, plot size, portable		10				15000	3750	1500	20250	10
Spare parts										1011	10
									sub-total	21261	
III Transport & Vehicles											
1 Trucks	2 axle, 6 wheel, heavy duty	5mt	2				28000*	11200		39200	5
2 Tarpaulins	For trucks		2				300	120		420	5
3 Truck	Pick-up	3/4 ton	3				12000*	4800		12800	5
4 Driver's tool set			6				600	240		840	5
										53260	
5 Spare parts									1500	2663	5
									sub-total	55923	
								Contract Production Total		86448	

(Vehicle replacement with trade-in)

TABLE 1B

Equipment by Function	Description	Capacity	Size	No.	HP/hr	Total HP/hr	KW/hr	At Source	For Delivery	Installation	Total Cost	Useful Life (Years)
B												
I Seed Drying, Shelling & Bulk Storage												
1 Metal Drying bin	Flat perforated floor, with foundation ring & air intake bin hopper with unloading auger, vent & load part in roof, walkin side door, ladder	25 mt at 10'	18"D, 14', sidewall	2				6800	2720	680	10200	10
2 Heater fan drying Unit	Direct oil-fired, safety devices	300,000 Bth/hr		2				10000	4000	1000	15000	10
3 Conveyor	Inclined belt with flights, open trough, undercarriage drive	8-10mt/hr	8.5m	1				1200	480	120	1800	10
4 Conveyor	Like in 3 but without undercarriage	8-10mt/hr	5.0m	2				1400	560	140	2100	10
5 Corn Sheller	With aspirator and cob blower with starter and drive	7mt/hr		1				1700	680	170	2550	10
6 Perforated Metal Flooring	Panel-lock type	1m²		50				750	300	75	1025	10
7 Tubular belt conveyor	Up to 45° incline, all weather housing, with undercarriage, load hopper, discharge spout	40mt/hr		1				3000	1200	300	4500	10
8 Aeration fan	Centrifugal type, with starter	4000cfm/3"		1				1000	400		1400	10
9 Spare parts										2485 sub-total	28575 1929 40504	10
II Quality Control and Testing												
1 Moisture Tester	Electric							800	400		1120	10
2 Oven	Heated air							450	180	45	675	10

TABLE 1b Continued

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Equipment by Function	Description	Capacity	Size	No.	HP/hr	Total HP/hr	KW/hr	At Source	For Delivery	Installation	Total Cost	Useful Life (Years)
3 Seed Divider	Electric			1				300	120		420	10
4 Torsion Balance	with weights			1				300	120		420	10
5 Scale Balance	Gram, balance beam type	500 g		3				270	108		378	10
6 Flourescent lamp	Floating type, with magnifier			2				180	72		252	10
7 Volume/weight Tester	hand held type, metric			1				100	40		140	10
8 Refrigerator	Household type		med.	1				400	160		560	10
9 Germinator	Small, heating only			1				500	200		700	10
10 Seed triers	Probes for sampling			6				450	180		630	10
11 Screens	Hand testing, set of 24, Selected sizes		9"x 9"	1				300	120		420	10
12 Miscellaneous set	Forceps, purity boards, counting boards, pans, etc.			1				1000	400		1400	10
13 Set of references and handbooks				1				500	200		700	10
14 Spare parts	(exclude 500 for										7415	
											366	
										sub-total	8181	
III Seed Processing, Treating, Packaging												
1 Air-screen cleaner	4 screens, 2 air systems, 12 screens with drive, drive mounted & accessories			1				9000	3600		12600	10
2 Additional screens (for 1)				12				720	288		1008	10
3 Elevator	Belt-buck type, receiving, all weather housing, starter, hopper, 3 way spout	10-12 mt/hr		1				4200	1680		6300	10
4 Elevator	Belt-bucket type, indoor use, with drive and hopper	4-5 mt/hr		4				5600	2240	560	8400	10
5 Dust collector	Cyclone type, sized for air screen cleaner in 1, with mount.			1				1800	2720		2520	10

SPECIFICATIONS

ESTIMATED COSTS (DOLLARS)

TABLE 13 Continued

		SPECIFICATIONS						ESTIMATED COSTS (DOLLARS)				
Equipment by Function	Description	Capacity	Size	No.	HP/hr	Total HP/hr	KW/hr	At Source	For Delivery	Installation	Total Cost	Useful Life (Years)
6 Ducting	Metal, round, for dust collector in 5.		20m					400	160		560	10
7 Gravity table seed separator	With drive and 3 different decks	3mt/hr		1				4000	1600		5600	10
8 Width-thickness seed separator	Precision grader type, with drive and twin shells, 8 extra shells	3mt/hr		1				4200	1680		5880	10
9 Length seed separator	Indent cylinder type, with 3 extra cylinders, drive	3mt/hr		1				3000	1200		4200	10
10 Seed treater	Slurry type, with drive, mixing tand and agitator			1				2200	880		3080	10
11 Bagger-weigher	Semi-automatic, with bag closer (sewing head) bag conveyor, drives	5 bags/min		1				2800	1120		3920	10
12 Scale	Platform shallow pit type, metric	2 mt,		1				1500	600		2100	10
13 Scale	Platform portable type, with casters, metric	0.5 mt		2				1000	400		1400	10
14 Bag Conveyor	Belt type, with under-carriage		5m	1				1500	600		2100	10
15 Bag trucks	4 wheel platform type, bearing casters	1.5mt	3x6' (form)	4				1600	640		2240	10
16 Bag trucks	2 wheel type, bearing wheels			4				400	160		560	10
17 Vacuum cleaner	Heavy-duty industrial type, with attachment, portable			1				600	240		640	10
18 Blower	Electric, hand-held type, heavy duty, with nozzles			2				400	160		560	10
19 Bin	Metal, holding, hopper bottom, floor supported frame	5 mt		1				1000	400		1400	10
20 Bin	Holding, Metal, floor supported frame, hopper bottom	1.5mt		4				2400	960		3360	10
21 Angle iron frames	For equipment supports			4				1600	640		2240	10

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TABLE 1B Continued

SPECIFICATIONS   ESTIMATED COSTS (DOLLARS)

Equipment by Function	Description	Capacity	Size	No.	HP/hr	Total HP/hr	KW/hr	At Source	For Delivery	Installation	Total Cost	Useful Life (years)
22 Spouting	Metal, flexible, with flanges		6" dia.	15m				180	72		252	10
23 Spouting	Metal, rigid, with flanges		6" dia.	20m				160	64		224	10
24 Ventilator fan	Turret type, for roof mounting, with motor			4				2400	960		3360	10
25 Electric Motor starters	Safety type, on/off			12				600	240		640	10
26 Bag Holders	Universal type, metal			6				300	120		420	10
27 Auger Conveyor	Utility type, with hopper and electric motor	25mt/hr	6"	1				300	120	980	420	10
28 Spare Parts											75984	
											3799	
									sub-total		79783	
							Total for Processing				128,468	

Source: Annex B-10a to J of the Thailand Project Report.

TABLE 1B Continued

Equipment by Function	SPECIFICATIONS					ESTIMATED COSTS (DOLLARS)					
	Description	Capacity	Size No.	HP/hr	Total HP/hr	KW/hr	At Source	For Delivery	Installation	Total Cost	Useful Life (years)
C SEED STORAGE											
I Seed Storage											
1 Dehumidifier	Desiccant type	10 gal/ day (water removal)	2				5000	2000		7000	10
2 Hygrothermographs	Drum type, 7 day clock, recordings, with 500 charts		2				800	320		1120	10
3 Spare Parts										8120 / 406	
							sub-total			8526	
II Special Condition Storage											
1 Air Conditioner	With high dehumidifica-	18,000 btu	4				4000	1600		5600	10
2 Spare parts										280	10
							sub-total			5880	
						Seed Storage Total				14406	

TABLE 1C

D MARKETING											
1 Equipment for Marketing Function, Market Organization for Farmers											
1 Car	Utility		1				4000*	1600		5600	4
2 Spare Parts										280	4
						Total Marketing -				5880	

Vehicle replacement with trade in.

TABLE 1D   COST OF FACILITIES NEEDED

Processing Item	Description	Specifications Capacity Size	No	Cost/ Unit	Cost/ Item	Site, Site Preparation, Util. Hookup	Total Cost	Useful Life
1. Offices & Lab	Quality Control Laboratory	120m²	1	110/m²	13200	2,625	15825	40
2. Seed Processing Building		400m²	1	130/m²	52000	10,334	62334	40
3. Sacked Seed Dryer	Open sides with roof	300m²	1	45/m²	13500	2,684	16184	40
4. Drying Floor	Concrete	600m²	1	10.65/m²	6390	1,271	7661	40
5. Equipment Shed		100m²	1	48.9/m²	4890	978	5868	40
							107872	
Seed Storage								
1. Storehouse	Ventilated	1600m²	1	70/m²	112000	22,270	134270	40
2. Storehouse	Air Conditioned, with Insulated Ceiling	100m²	1	130/m²	13000	2,585	15585	40
							149855	

Source   Taken from Annex B-9b of the Thailand Project Report.

TABLE 1E

SPECIFICATIONS   ESTIMATED COSTS (DOLLARS)

General Equipment	Description	Capacity	Size	No.	HP/hr	Total HP/hr	KW/hr	At Source	For Delivery	Installation	Total Cost	Useful Life (years)
I Equipment for Marketing Function, Market Organization for Farmers												
1 Calculator				2				1000	400		1400	4
2 Typewriter				2				1000	400		1400	4
3 Mimeograph Office				1				600	240		840	4
4 Office Furnishings				2				2000	800		2800	4
5 Car	Utility			1				5000	2000		7000	4
											13440	
										sub-total	672 / 14112	
II General Purpose												
1 Calculator				2				1000	400		1400	4
2 Typewriters				2				1000	400		1400	4
3 Mimeograph Machine	With accessories			1				600	240		840	4
4 Projector	Slide, with accessories		35mm	1				400	160		560	4
5 Projection Screen	Portable			1				100	40		140	4
6 PA System	Portable, battery powered			1				100	40		140	4
7 Office Furnishings				3				3000	1200		4200	4
											8660	
8 Spare Parts											454	
										sub-total	9114	4
III Transport & Vehicles												
1 Truck	Pick-up	3 tons		3				12000	4800		16800	5
2 Mini-bus				1				8000	3200		11200	4
											28000	
3 Spare parts											1400	4
										sub-total	29400	
										Total General Equipment	52626	

TABLE 2

ESTIMATED BUILDINGS AND EQUIPMENT COSTS BY PERIOD

Period	TOTAL OPERATION		PRODUCTION CENTER		PROCESSING CENTER		MARKETING	
	Buildings	Equipment	Buildings	Equipment	Buildings	Equipment	Buildings	Equipment
0	283500	0	102491	0	180908	0	0	0
1	0	103316	0	94882	0	0	0	8434
2	0	157188	0	0	0	151308	0	5880
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	20904	0	12470	0	0	0	8434
11	0	11448	0	0	0	5580	0	5880
12	0	44740	0	44740	0	0	0	0
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0

Source: Computed from Table of list of equipment and facilities (Table 1A, B, C, D, & E).

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TABLE 3A   PROJECTED VOLUMES AND VALUES OF SEED STOCK PURCHASES FOR THE PRODUCTION CENTER

Period	CORN Tons	Value @ $115/t	RICE Tons	Value @ $287/t	G. RICE Tons	Value @ $239/t	PEANUTS Tons	Value @ $192/t	SORGHUM Tons	Value @ $109/t	Total Value	Value of Foundation Seed	Net Value of Seed Stock Purchases
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	200	23000	150	43050	40	9560	200	38400	50	5450	119460	12350	128666
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	200	23000	225	64575	75	17925	300	57600	100	10900	173000	13805	182805
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	300	34500	300	86100	100	23900	400	76800	150	16350	237650	14110	241370
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	400	46000	375	107625	125	29875	400	76800	200	21800	282100	13487	275931
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	500	57500	450	129150	150	35850	400	76800	200	21800	321100	16570	307810
13	0	0	0	0	0	0	0	0	0	0	0	0	0
14	500	57500	450	129150	150	35850	400	76800	200	21800	321100	16085	306175
15	0	0	0	0	0	0	0	0	0	0	0	0	0
16	500	57500	450	127150	150	35850	400	76800	200	21800	321100	17030	304070

Source: Projected volumes are taken from Table OP-1-F of the Thailand Project Report; prices are computed at 115% of estimated market prices for grains in Cameroon.

PROJECTED VOLUME AND VALUE OF FOUNDATION SEED PURCHASES (10 Kgs & Dollars)

CONTRACT SEED PRODUCTION

EXISTING SEED

Period	CORN .01 Tons	CORN Value @ $200/t	RICE .01 Tons	RICE Value @ $500/t	G. RICE .01 Tons	G. RICE Value @ $416/t	PEANUTS .01 Tons	PEANUTS Value @ $334/t	SORGHUM .01 Tons	SORGHUM Value @ $190/t
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	94	188	435	2175	109	453	2190	7310	80	152
4	0	0	0	0	0	0	0	0	0	0
5	63	126	660	3300	110	458	2200	7350	101	191
6	0	0	0	0	0	0	0	0	0	0
7	0	0	765	3825	0	0	1460	4880	108	205
8	0	0	0	0	0	0	0	0	0	0
9	0	0	684	3420	0	0	0	0	73	139
10	0	0	0	0	0	0	0	0	0	0
11	0	0	328	1640	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	164	820	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0

NEW SEED

Period	CORN .01 Tons	CORN Value @ $250/t	RICE .01 Tons	RICE Value @ $625/t	G. RICE .01 Tons	G. RICE Value @ $520/t	PEANUTS .01 Tons	PEANUTS Value @ $418/t	SORGHUM .01 Tons	SORGHUM Value @ $238/t	Combined Total
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	156	390	0	0	36	187	73	305	80	190	11350
4	0	0	0	0	0	0	0	0	0	0	0
5	187	468	0	0	110	572	219	915	19	425	13805
6	0	0	0	0	0	0	0	0	0	0	0
7	380	950	110	688	292	1518	440	1839	82	195	14100
8	0	0	0	0	0	0	0	0	0	0	0
9	510	1275	411	2569	365	1898	878	3670	217	516	14487 1/
10	0	0	0	0	0	0	0	0	0	0	0
11	610	1525	985	6156	437	2274	1025	4285	290	690	11570
12	0	0	0	0	0	0	0	0	0	0	0
13	630	1575	1149	7181	437	2274	1025	4285	290	690	16080
14	0	0	0	0	0	0	0	0	0	0	0
15	630	1575	1313	8206	437	2274	1025	4285	290	690	17030

Source: Projected Volumes are taken from Table OP-3-F of the Thailand Project Report. Projected prices per ton are Computed at 200% and 250% of estimated Cameroon market prices for grains.

TABLE 3C

PROJECTED VOLUMES AND VALUES OF SEED STOCK PURCHASES (M. tons & dollars)

SEED PROCESSING PLANT

EXISTING SEED

Period	CORN Tons	Value @ $120/t	RICE Tons	Value @ $300/t	G. RICE Tons	Value @ $250/t	PEANUTS Tons	Value @ $200/t	SORGHUM Tons	Value @ $114/t
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	75	9000	150	45000	37	9250	0	0	44	5016
5	0	0	0	0	0	0	0	0	0	0
6	50	6000	197	59100	37	9250	0	0	62	7068
7	0	0	0	0	0	0	0	0	0	0
8	0	0	187	56100	0	0	0	0	37	4218
9	0	0	0	0	0	0	0	0	0	0
10	0	0	94	28200	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	56	16800	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0

NEW SEED

Period	CORN Tons	Value @ $125/t	RICE Tons	Value @ $325/t	G. RICE Tons	Value @ $295/t	PEANUTS Tons	Value @ $210/t	SORGHUM Tons	Value @ $118/t	Com- bined Total
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	125	15625	0	0	13	3835	200	42000	6	708	130494
5	0	0	0	0	0	0	0	0	0	0	0
6	150	18750	28	9100	38	11210	300	63000	38	4484	187962
7	0	0	0	0	0	0	0	0	0	0	0
8	300	37500	113	36725	100	29500	400	84000	113	13334	261377
9	0	0	0	0	0	0	0	0	0	0	0
10	400	50000	281	91325	125	36875	400	84000	200	23600	314000
11	0	0	0	0	0	0	0	0	0	0	0
12	500	62500	394	128050	150	44250	400	84000	200	23600	359200
13	0	0	0	0	0	0	0	0	0	0	0
14	500	62500	450	146250	150	44250	400	84000	200	23600	360600
15	0	0	0	0	0	0	0	0	0	0	0

Source: Projected Volumes are taken from Table OP-3-B of the Thailand Project Report; Projected Prices per ton are computed at 120% and 125% of estimated Cameroon market prices for grains.

TABLE 4A

PROJECTED VOLUMES AND VALUES OF SEED SALES (M. tons and dollars)

SEED PRODUCTION CENTER

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	EXISTING SEED VARIETIES										NEW SEED VARIETIES											
	CORN Value @ $120/t		RICE Value @ R300/t		G. RICE Value @ $250/t		PEANUTS Value @ $200/t		SORGHUM Value @ $114/t		CORN Value @ $125/t		RICE Value @ $325/t		G. RICE Value @ $295/t		PEANUTS Value @ $210/t		SORGHUM Value @ $118/t		Combined Total
Period	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	Tons	Value	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	75	9000	150	45000	37	9250	0	0	44	5016	125	15625	0	0	13	3835	200	42000	6	708	130434
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	50	6000	197	59100	37	9250	0	0	62	7068	150	18750	28	9100	38	11210	300	63000	38	4484	187962
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	187	56100	0	0	0	0	37	4218	300	37500	113	36725	100	29500	400	84000	113	13334	261377
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	94	28200	0	0	0	0	0	0	400	50000	281	91325	125	36875	400	84000	200	23600	313000
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	56	16500	0	0	0	0	0	0	500	62500	394	128050	150	44250	400	84000	200	23600	359200
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	500	62500	450	145250	150	44250	400	84000	200	23600	360600
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Projected Volumes of Seed per period are taken from Table OP-1-F of the Thailand Project; Prices are computed at 120% and 125% respectively of estimated market prices of existing and new grain varieties in Cameroon.

TABLE 43

PROJECTED VOLUMES AND VALUES OF BY-PRODUCT SALES (M. Tons and Dollars)

SEED PROCESSING PLANT

EXISTING SEED VARIETIES

Period	CORN Tons	CORN Value @ $60/t	RICE Tons	RICE Value @ $150/t	G. RICE Tons	G. RICE Value $125/t	PEANUTS Tons	PEANUTS Value $100/t	SORGHUM Tons	SORGHUM Value @ $68/t
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	4	240	8	1200	2	250	0	0	2	156
5	0	0	0	0	0	0	0	0	0	0
6	3	180	11	1650	2	250	0	0	3	204
7	0	0	0	0	0	0	0	0	0	0
8	0	0	10	1500	0	0	0	0	2	156
9	0	0	0	0	0	0	0	0	0	0
10	0	0	5	750	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	3	450	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0

NEW SEED VARIETIES

Period	CORN Tons	CORN Value @ $60/t	RICE Tons	RICE Value R150/t	G. RICE Tons	G. RICE Value $125/t	PEANUTS Tons	PEANUTS Value $100/t	SORGHUM Tons	SORGHUM Value @ $68/t	Combined Total
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	7	420	0	0	1	125	11	1100	1	68	3559
5	0	0	0	0	0	0	0	0	0	0	0
6	8	480	0	300	2	250	17	1700	2	136	5150
7	0	0	0	0	0	0	0	0	0	0	0
8	17	1020	6	900	6	750	22	2200	6	408	6994
9	0	0	0	0	0	0	0	0	0	0	0
10	22	1320	16	2400	7	875	22	2200	11	748	8293
11	0	0	0	0	0	0	0	0	0	0	0
12	28	1680	22	3300	8	1000	22	2200	11	748	9378
13	0	0	0	0	0	0	0	0	0	0	0
14	28	1680	22	3750	8	1000	22	2200	11	748	9378
15	0	0	0	0	0	0	0	0	0	0	0

Source: Projected Volumes are taken from Table OP-2-B of the Thailand Project Report. Prices are computed at 60% of estimated market prices for grain in Cameroon.

TABLE 4C

PROJECTED VOLUMES AND VALUES OF SEED SALES (in M, tons and dollars)

SEED PROCESSING PLANT

| | EXISTING SEED VARIETIES | | | | | | | | | | NEW SEED VARIETIES | | | | | | | | | | | |
| | CORN | | RICE | | G. RICE | | PEANUTS | | SORGHUM | | CORN | | RICE | | G. RICE | | PEANUTS | | SORGHUM | | Combined |
Period	Tons	Value @ $165/t	Tons	Value @ $413/t	Tons	Value @ $343/t	Tons	Value @ $276/t	Tons	Value @ $157/t	Tons	Value @ $170/t	Tons	Value @ $425/t	Tons	Value @ $353/t	Tons	Value @ $284/t	Tons	Value @ $162/t	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	68	10220	135	55755	33	11319	0	0	40	6280	113	19210	0	0	12	4236	180	51120	5	810	158950
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	45	7425	177	73101	33	11319	0	0	56	8792	135	22950	25	10625	34	12002	270	76680	34	5508	228402
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	168	69384	0	0	0	0	33	5181	270	45900	102	43350	90	31770	360	102240	102	16524	314349
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	85	35105	0	0	0	0	0	0	360	61200	253	107525	113	39339	540	153360	180	29160	426239
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	50	20650	0	0	0	0	0	0	450	76500	355	150875	135	47655	630	178920	180	29160	503760
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	450	76500	405	172125	135	47655	630	178920	180	29160	504360

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Source: Projected Volumes are taken from Table OP-1-B of the Thailand Project Report; Price per ton of Existing and new seed varieties are computed respectively at 165% and 170% of estimated grain prices in Cameroon.

NB   The Projected Volumes and Values of Sales for the Processing Function are volumes and values for seed stock purchases for the Marketing Function.

PROJECTED VOLUME AND VALUE OF SEED SALES (M. tons & dollars)

MARKETING FUNCTION

EXISTING SEED VARIETIES

Period	CORN Tons	Value @ $172/t	RICE Tons	Value @ $430/t	G. RICE Tons	Value @ $358/t	PEANUTS Tons	Value @ $287/t	SORGHUM Tons	Value @ $163/t
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	68	11696	135	58050	33	11814	0	0	40	6520
6	0	0	0	0	0	0	0	0	0	0
7	45	7740	177	76110	33	11814	0	0	56	9128
8	0	0	0	0	0	0	0	0	0	0
9	0	0	168	72240	0	0	0	0	33	5379
10	0	0	0	0	0	0	0	0	0	0
11	0	0	85	36550	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	50	21500	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0

NEW SEED VARIETIES

Period	CORN Tons	Value @ $182/t	RICE Tons	Value @ $455/t	G. RICE Tons	Value @ $379/t	PEANUTS Tons	Value @ $304/t	SORGHUM Tons	Value @ $173/t	Combined Total
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	113	20566	0	0	12	4548	180	54720	5	865	168779
6	0	0	0	0	0	0	0	0	0	0	0
7	135	24570	25	11375	34	12886	270	82080	34	5882	241585
8	0	0	0	0	0	0	0	0	0	0	0
9	270	49140	102	46410	90	34110	360	109440	102	17646	334365
10	0	0	0	0	0	0	0	0	0	0	0
11	360	65520	253	115115	113	42827	540	164160	180	31140	455312
12	0	0	0	0	0	0	0	0	0	0	0
13	450	81900	355	161525	135	51165	630	191520	180	31140	538750
14	0	0	0	0	0	0	0	0	0	0	0
15	450	81900	405	184275	135	51165	630	191520	180	31140	540000

Source: Projected volumes are taken from Table OF-1J of the Thailand Seed Project Report; projected prices per ton are computed at 172% and 182% of estimated Cameroon Prices for grains.

TABLE 5A   PROJECTED AVERAGE MONTHLY ACCOUNTS RECEIVABLE FROM SEED SALES (M. tons & Dollars)

CONTRACT SEED PRODUCTION

EXISTING SEED VARIETIES

Period	CORN Tons	Value @ $120/t	RICE Tons	Value @ $300/t	G. RICE Tons	Value @ $250/t	PEANUTS Tons	Value @ $200/t	SORGHUM Tons	Value @ $114/t
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	6	1500	0	0	7	798
5	0	0	0	0	0	0	0	0	0	0
6	8	960	31.5	9450	6	1500	0	0	10	1140
7	0	0	0	0	0	0	0	0	0	0
8	0	0	30	9000	0	0	0	0	6	684
9	0	0	0	0	0	0	0	0	0	0
10	0	0	15	4500	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0
12	0	0	9	2700	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0

NEW SEED VARIETIES

Period	CORN Tons	Value @ $125/t	RICE Tons	Value @ $325/t	G. RICE Tons	Value @ $295/t	PEANUTS Tons	Value @ $210/t	SORGHUM Tons	Value @ $118/t	Combined Total
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	20	2500	0	0	2	590	32	6720	1	118	12226
5	0	0	0	0	0	0	0	0	0	0	0
6	24	3000	4.4	1430	6	1770	48	10080	6	708	30038
7	0	0	0	0	0	0	0	0	0	0	0
8	48	6000	18	5850	16	4720	64	13440	18	2124	41818
9	0	0	0	0	0	0	0	0	0	0	0 [60]
10	64	8000	45	14625	20	5900	64	13440	32	3776	50241
11	0	0	0	0	0	0	0	0	0	0	0
12	80	10000	63	20475	23	6785	64	13440	32	3776	57126
13	0	0	0	0	0	0	0	0	0	0	0
14	80	10000	72	23400	23	6785	64	13440	32	3776	57401
15	0	0	0	0	0	0	0	0	0	0	0

Source: Volumes calculated from Table VC-3-F of the Thailand Project Report; Prices are as in 5B.

TABLE 5D   PROJECTED AVERAGE MONTHLY ACCOUNTS RECEIVABLE FROM SEED SALES (M. tons & Dollars)

SEED PROCESSING PLANT

	EXISTING SEED VARIETIES										NEW SEED VARIETIES										
	CORN		RICE		G. RICE		PEANUTS		SORGHUM		CORN		RICE		G. RICE		PEANUTS		SORGHUM		Combined
Period	Tons	Value @ $172/t	Tons	Value @ $430/t	Tons	Value @ $358/t	Tons	Value @ $287/t	Tons	Value @ $163/t	Tons	Value @ $182/t	Tons	Value @ $455/t	Tons	Value @ $379/t	Tons	Value @ $304/t	Tons	Value @ $173/t	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	9	3222	0	0	5	815	14	2548	0	0	1.5	568.5	23	6992	.7	121.1	70513
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	56	963	22	9460	9	3222	0	0	7	1141	16	2912	3	1365	4	1516	33.5	10184	4	692	31455
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	21	9030	0	0	0	0	4	652	335	6097	12.5	5687.5	11	4169	44.5	13528	12.5	2162.5	41326
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	10.5	4515	0	0	0	0	0	0	45	8190	31.5	14332.5	14	5306	67	20368	22.5	3892.5	56604
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	6	2580	0	0	0	0	0	0	56	10192	44	20020	17	6443	78	23712	22.5	3892.5	66840
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	56	10192	50	22750	17	6443	78	23712	22.5	3892.5	66890

Source: Projected volumes are calculated from Table WG-3-B of the Thailand Project Report; Prices per ton of existing and new seeds are computed respectively at 160% and 170% of estimated market prices for grains in Cameroon.

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TABLE 5C

PROJECTED AVERAGE MONTHLY ACCOUNTS RECEIVABLE FROM SEED SALES (M. tons & Dollars)

MARKETING FUNCTION

EXISTING SEED VARIETIES

Period	CORN Tons	CORN Value @ $172/t	RICE Tons	RICE Value @ $430/t	G. RICE Tons	G. RICE Value $358/t	PEANUTS Tons	PEANUTS Value @ $287/t	SORGHUM Tons	SORGHUM Value @ $163/t
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	37.5	6450	75	32250	18.5	6623	0	0	22	3585
6	0	0	0	0	0	0	0	0	0	0
7	25	4300	98.5	42355	18.5	6623	0	0	31	5053
8	0	0	0	0	0	0	0	0	0	0
9	0	0	93.5	40205	0	0	0	0	18.5	3015.5
10	0	0	0	0	0	0	0	0	0	0
11	0	0	47	20210	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0
13	0	0	38	12040	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0

NEW SEED VARIETIES

Period	CORN Tons	CORN Value @ $182/t	RICE Tons	RICE Value @ $455/t	G. RICE Tons	G. RICE Value @ $379/t	PEANUTS Tons	PEANUTS Value @ $304/t	SORGHUM Tons	SORGHUM Value @ $173/t	Combined Total
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	62.5	11375	0	0	6.5	2463.5	100	30400	3	519	93666
6	0	0	0	0	0	0	0	0	0	0	0
7	75	13650	14	6370	19	7201	150	45600	19	3287	134439
8	0	0	0	0	0	0	0	0	0	0	0
9	150	27300	56.5	25707.5	100	37900	200	60800	56.5	9774.5	204703 [62]
10	0	0	0	0	0	0	0	0	0	0	0
11	200	36400	140.5	63927.5	62.5	23687.5	300	91200	100	17300	299300
12	0	0	0	0	0	0	0	0	0	0	0
13	250	45500	197	89635	75	28425	350	106400	100	17300	300000
14	0	0	0	0	0	0	0	0	0	0	0
15	250	45500	225	102375	75	28425	350	106400	100	17300	300000

Source: Projected Volumes are calculated from Table VC-2-J of the Thailand Project report; prices per ton of existing and new seed varieties are computed respectively at 172% and 182% of estimated grain market prices for Cameroon.

TABLE 6A

PROJECTED LABOR REQUIREMENTS AND COSTS

SEED PRODUCTION CENTER

Categories and Rates per month

Period	Category I		Category II		Category III		Category IV		Category V		Category VI		Category VII		Category VIII		Category IX		Total Cost
	m.m	Cost @ $400/m	m.m	Cost @ $350/m	m.m	Cost @ $300/m	m.m	Cost @ $225/m	m.m	Cost @ $175/m	m.m	Cost @ $130/m	m.m	Cost @ $75/m	m.m	Cost @ $60/m	m.m	Cost @ $45/m	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	270	270
2	0	0	0	0	0	0	0	0	6	1050	0	0	0	0	0	0	12	540	1590
3	0	0	0	0	0	0	6	1350	6	1050	0	0	0	0	6	360	12	540	3300
4	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
5	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
6	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
7	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
8	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
9	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
10	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
11	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
12	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
13	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
14	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750
15	0	0	0	0	0	0	6	1350	6	1050	0	0	6	450	6	360	12	540	3750

Source: Projected labor requirements are taken from Table L-1-F of the Thailand Project Report and converted from man-days to man-months; wages are approximated Cameroon wages on monthly basis.

TABLE 6B   PROJECTED LABOR REQUIREMENTS IN MAN-MONTHS (m.m) AND COSTS IN DOLLARS

SEED PROCESSING PLANT

Categories and Rates per month

Period	Category I m.m	cost @ $400/m	Category II m.m	cost @ $350/m	Category III m.m	cost @ $300/m	Category IV m.m	cost @ $225/m	Category V m.m	cost @ $175/m	Category VI m.m	cost @ $130/m	Category VII m.m	cost @ $75/m	Category VIII m.m	cost @ $60/m	Category IX m.m	cost @ $45/m	Total
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	6	1800	0	0	0	0	6	780	0	0	0	0	0	0	2580
3	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	0	0	13	585	5565
4	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	0	0	14	630	5610
5	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	24	1080	6420
6	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	24	1080	6420
7	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	26	1170	6510
8	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	26	1170	6510
9	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	29	1305	6645
10	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	32	1440	6780
11	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	32	1440	6780
12	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	32	1440	6780
13	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	32	1440	6780
14	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	32	1440	6780
15	0	0	0	0	6	1800	6	1350	6	1050	6	780	0	0	6	360	32	1440	6780

Source: Projected Requirements are taken from Table L-1-B of the Thailand Project Report; Wages are approximated Cameroon wages on a monthly basis.

TABLE 6c

LABOR REQUIREMENTS AND COSTS

ADMINISTRATION

Period	Category I m.m	Cost @ $400/m	Category II m.m	Cost @ $350/m	Category III m.m	Cost @ $300/m	Category IV m.m	Cost @ $225/m	Category V m.m	Cost @ $175/m	Category VI m.m	Cost @ $130/m	Category VII m.m	Cost @ $75/m	Category VIII m.m	Cost @ $60/m	Category IX m.m	Cost @ $45/m	Other	Total
0	1	400	7	2450	6	1800	0	0	6	1050	0	0	0	0	0	0	6	270	0	5970
1	1	400	8	2800	12	3600	0	0	6	1050	0	0	0	0	0	0	6	270	0	8120
2	2	900	8	2800	12	3600	0	0	6	1050	0	0	0	0	0	0	6	270	0	8620
3	3	1200	9	3150	12	3600	0	0	6	1050	0	0	0	0	0	0	6	270	0	9270
4	3	1200	9	3150	12	3600	0	0	6	1050	0	0	0	0	0	0	6	270	0	9270
5	3	1200	9	3150	12	3600	0	0	6	1050	0	0	0	0	0	0	6	270	0	9270
6	3	1200	9	3150	12	3600	0	0	6	1050	0	0	0	0	0	0	6	270	0	9270
7	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
8	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
9	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
10	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
11	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
12	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
13	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
14	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470
15	3	1200	9	3150	16	4800	0	0	6	1050	0	0	0	0	0	0	6	270	0	10470

Source: Projected Labor requirements are from Table L-1-P of the Thailand Project Report; wage like in 6a.

TABLE 6D

LABOR REQUIREMENTS AND COSTS MARKETING FUNCTION

Period	Cat I m.m	Cat II m.m	Cat III m.m	Cost @ $300/m	Cat IV m.m	Cat V m.m	Cat VI m.m	Cost @ $130/m	Cat VII m.m	Cat VIII m.m	Cat IX m.m	Admin Cost	Total
0	0	0	0	0	0	0	0	0	0	0	0	1990	1990
1	0	0	0	0	0	0	0	0	0	0	0	2707	2707
2	0	0	0	0	0	0	0	0	0	0	0	2586	2586
3	0	0	0	0	0	0	0	0	0	0	0	3090	3090
4	0	0	6	1800	0	0	6	780	0	0	0	3090	5670
5	0	0	6	1800	0	0	6	780	0	0	0	3090	5670
6	0	0	6	1800	0	0	6	780	0	0	0	3090	5670
7	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
8	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
9	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
10	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
11	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
12	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
13	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
14	0	0	6	1800	0	0	6	780	0	0	0	3490	6070
15	0	0	6	1800	0	0	6	780	0	0	0	3490	6070

Source: Labor requirements from Table L-7 of the Thailand Project Report

TABLE 7A   PROJECTED WORKING CAPITAL REQUIREMENTS (DOLLARS)

CONTRACT SEED PRODUCTION

1 Period	2 Seed Inventory	3 Accounts Receivable	4 Supply/Inventory	5 Cash	6 Other	7 Total
0	0	0	0	1990	0	1990
1	0	0	0	2707	0	2707
2	0	0	0	4193	0	4193
3	0	0	7150	10649	1072	18871
4	0	12226	6006	1000	0	19232
5	0	0	9900	10904	2000	22804
6	0	30038	8060	1000	0	39098
7	0	0	13750	11900	5190	30840
8	0	41818	10964	1000	0	53782
9	0	0	18700	13418	9928	42046
10	0	50241	13917	1000	0	65158
11	0	0	22000	13264	14930	50194
12	0	57176	14740	1000	0	72916
13	0	0	22000	13269	16005	51274
14	0	57401	14740	1000	0	73141
15	0	0	22000	13264	17030	52294

Source: Column 3 is taken from Table 5A; Column 4 from Table WC-4-F of the Thailand Project Report; Column 5 is computed from Tables 4A, 6A, 9A, 8A and 3A &B, and Column 6 from Table 3B.

TABLE 7B

WORKING CAPITAL REQUIREMENTS (DOLLARS)

SEED PROCESSING PLANT

1 Period	2 Seed Inventory	3 Accounts Receivable	4 Supply/Inventory	5 Cash	6 Other	7 Total
0	0	0	0	1990	0	1990
1	0	0	0	2707	0	2707
2	0	0	0	5379	0	5379
3	0	0	0	8926	0	8926
4	100463	0	2475	150428	0	253466
5	86867	70513	143	1000	0	158523
6	170372	0	3665	210628	0	384665
7	98122	31455	143	1000	0	142555
8	234708	0	4948	288505	0	528161
9	133741	41326	178	1000	0	176245
10	309756	0	6699	347649	0	664104
11	186278	56604	178	1000	0	244060
12	365305	0	7839	398417	0	771561
13	217128	66840	178	1000	0	285146
14	365305	0	7839	398417	0	771561
15	217128	66890	178	1000	0	285196

Source: Column 2 comes from Table 5-11; Column 3 comes from Table ; Column 4 comes from Table WC-4-B of the Thailand Project Report; and Column 5 is computed from 4C, 6B, 9B, 8B, and 3C.

TABLE 7C   PROJECTED WORKING CAPITAL REQUIREMENTS (DOLLARS)

MARKETING FUNCTION

1 Period	2 Seed Inventory	3 Accounts Receivable	4 Supply/Inventory	5 Cash	6 Other	7 Total
0	0	0	0	1990	0	1990
1	0	0	0	4265	0	4265
2	0	0	0	5894	0	5894
3	0	0	0	5639	0	5639
4	0	0	0	8397	0	8397
5	0	93666	0	1000	0	94666
6	0	0	0	9252	0	9234
7	0	13449	0	1000	0	141120
8	0	0	0	10237	0	10237
9	0	204704	0	1000	0	214770
10	0	0	0	10273	0	10273
11	0	252725	0	1000	0	263079
12	0	0	0	10461	0	10461
13	0	299300	0	1000	0	300300
14	0	0	0	10461	0	10461
15	0	300000	0	1000	0	201000

Source: Column 3 comes from Table 5C and Column 5 is computed from Tables 4C, 6C, 9C, RC, and 3D.

TABLE 8A

PROJECTED VARIABLE OPERATING COSTS (DOLLARS)

CONTRACT SEED PRODUCTION

Period	Energy	Supplies	P. Repairs	V. Repairs	Gas & Oil	Hauling	Selling	Adverts.	Order Proc.	Travel	Other	Total
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	3575	25	53	315	0	0	0	0	91	100	4159
4	0	0	110	348	435	0	0	0	0	75	100	1068
5	0	1947	100	53	315	0	0	0	0	91	100	2615
6	0	0	110	482	603	0	0	0	0	97	100	1401
7	0	2845	100	53	315	0	0	0	0	152	116	3581
8	0	0	110	602	752	339	0	0	0	123	116	2042
9	0	3868	435	79	315	0	0	0	0	152	130	4979
10	0	0	445	847	847	1014	0	0	0	157	130	3440
11	0	3667	435	79	315	0	0	0	0	152	150	4798
12	0	0	445	866	866	1666	0	0	0	180	150	4173
13	0	3667	435	79	315	0	0	0	0	152	150	4798
14	0	0	445	866	866	1666	0	0	0	180	150	4173
15	0	3667	435	79	315	0	0	0	0	152	150	4798

Source: Table VC-2-F of the Thailand Project Report.

TABLE 8B

PROJECTED VARIABLE OPERATING COSTS (DOLLARS)

SEED PROCESSING PLANT

Period	Energy	Supplies	P. Repairs	V. Repairs	Gas & Oil	Hauling	Selling	Adverts.	Order Proc.	Travel	Other	Total
1	0	0	0	0	125	0	0	0	0	0	0	0
2	0	0	0	37	125	0	0	0	0	56	20	213
3	0	0	0	75	250	0	0	0	0	56	40	271
4	1048	9945	143	75	250	0	0	0	32	56	75	11574
5	0	23	143	75	250	0	0	0	32	56	75	604
6	1389	13739	198	75	250	0	0	0	45	56	75	15777
7	0	32	198	75	250	0	0	0	45	56	75	681
8	1935	19104	275	75	250	0	0	0	62	112	75	21838
9	0	44	275	75	250	0	0	0	62	56	75	787
10	2635	25574	374	75	250	0	0	0	85	112	75	29130
11	0	60	374	75	250	0	0	0	85	56	75	925
12	3121	30153	440	75	250	0	0	0	100	168	75	34332
13	0	60	440	75	250	0	0	0	100	56	75	1006
14	3121	30153	440	75	250	0	0	0	100	168	75	34332
15	0	60	440	75	250	0	0	0	100	56	75	1006

Source: Table VC-2-B of the Thailand Project Report.

TABLE 8C

PROJECTED VARIABLE OPERATING COSTS (DOLLARS)

MARKETING FUNCTION

Period	Energy	Supplies	P. Repairs	V. Repairs	Gas & Oil	Hauling	Selling	Adverts.	Order Proc.	Travel	Other	Total
0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	150	400	0	76	0	0	88	4	718
2	0	0	0	150	400	0	76	375	500	88	12	1601
3	0	0	0	150	400	0	76	375	500	88	19	1233
4	0	0	0	150	400	0	95	375	300	276	25	1421
5	0	0	0	150	400	0	116	375	564	160	12	1777
6	0	0	0	150	500	0	224	625	300	364	12	2175
7	0	0	0	150	400	0	116	375	805	364	18	1828
8	0	0	0	150	800	0	224	750	456	364	12	2756
9	0	0	0	150	400	0	116	375	1123	364	18	2546
10	0	0	0	150	800	0	224	940	300	364	12	2790
11	0	0	0	150	400	0	116	375	1400	364	25	2830
12	0	0	0	150	800	0	224	1125	300	364	15	2978
13	0	0	0	150	400	0	116	375	1862	364	25	3292
14	0	0	0	150	800	0	224	1125	300	364	15	2978
15	0	0	0	150	400	0	116	375	1862	364	25	3292
16	0	0	0	150	800	0	224	1125	300	364	15	2978
17	0	0	0	150	400	0	116	375	1862	364	25	3292

Source: Adjusted from table VC-2-I of the Thailand Project Report.

TABLE 9A

PROJECTED TOTAL FIXED COST (DOLLARS)

CONTRACT SEED PRODUCTION

Period	Admin.	Maintenance	Travel	Office	L.A. Fees	Utilities	Contracts	Others	Total
0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	1400	0	10	40	0	0	0	0	1450
4	1757	50	10	40	30	45	25	2	1959
5	1277	50	10	40	0	45	25	2	1449
6	1108	50	10	40	30	45	25	2	1310
7	907	50	10	40	0	45	25	2	1079
8	907	50	10	40	30	45	25	2	1109
9	1027	50	10	40	0	45	25	2	1199
10	1027	50	10	40	30	45	25	2	1229
11	1054	50	10	40	0	45	25	2	1226
12	1054	50	10	40	30	45	25	2	1256
13	1054	50	10	40	0	45	25	2	1226
14	1054	50	10	40	30	45	25	2	1256
15	1054	50	10	40	0	45	25	2	1226

Source: Table FC-1-F of the Thailand Project Report.

TABLE 9B

PROJECTED TOTAL FIXED COSTS (DOLLARS)

SEED PROCESSING PLANT

Period	Admin.	Maintenance	Travel	Office	L.A. Fees	Utilities	Contracts	Others	Total
1	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	2229	485	10	40	30	550	25	10	3379
5	1594	485	10	40	0	450	25	10	2614
6	1379	485	10	40	30	550	25	10	2529
7	1134	485	10	40	0	450	25	10	2154
8	1134	485	10	40	30	550	25	10	2284
9	1278	485	10	40	0	450	25	10	2298
10	1278	600	10	40	30	550	25	10	2543
11	1328	600	10	40	0	450	25	10	2463
12	1328	600	10	40	30	550	25	10	2593
13	1328	600	10	40	0	450	25	10	2463
14	1328	600	10	40	30	550	25	10	2593
15	1328	600	10	40	0	450	25	10	2464
16	1328	600	10	40	30	550	25	10	2593

Source: Table FC-1-B of the Thailand Project Report.

TABLE 9C

PROJECTED TOTAL FIXED COST

MARKETING FUNCTION

Period	Admin.	Maintenance	Travel	Office	L.A. Fees	Utilities	Contracts	Other	Total
0	0	0	0	0	0	0	0	0	0
1	0	0	0	160	0	180	100	400	840
2	540	0	0	80	240	60	100	400	1420
3	476	0	0	160	0	180	100	400	1316
4	346	0	0	160	240	60	100	400	1306
5	441	0	0	100	0	180	100	400	1101
6	494	0	0	80	240	60	100	400	1374
7	567	0	0	160	0	180	100	400	1407
8	567	0	0	80	240	60	100	400	1447
9	571	0	0	160	0	180	100	400	1411
10	571	0	0	80	240	60	100	400	1451
11	573	0	0	160	0	180	100	400	1413
12	573	0	0	80	240	60	100	400	1453
13	573	0	0	160	0	180	100	400	1413
14	573	0	0	80	240	60	100	400	1453
15	573	0	0	160	0	180	100	400	1413
16	573	0	0	80	240	60	100	400	1453

Source: Computed table FC-1-I of the Thailand Project Report.

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TABLE 10A

A LISTING OF THE DATA
COMBINED CASH FLOW FOR THE COMPLETE SEED PROJECT

Period	Buildings	Equipment	Working Capital	Existing Seed	New Seed	Fixed Cost	Labor Cost	Variable Cost	Seed Stock
0	283500	0	5970	0	0	0	5970	0	0
1	0	103316	3709	0	0	8400	8121	718	0
2	0	157188	5787	0	0	1420	12520	1814	0
3	0	0	17970	0	0	2766	16785	5663	0
4	0	0	247659	0	0	6644	23310	14063	128666
5	0	0	-4102	188080	80699	5437	24120	4996	0
6	0	0	157022	0	0	5246	24120	19353	182805
7	0	0	-124181	104792	136793	4680	25410	6090	0
8	0	0	283346	0	0	4804	25410	26635	241370
9	0	0	-168186	77619	256746	4948	25545	8312	0
10	0	20904	315541	0	0	5185	25680	35360	275731
11	0	11448	-191556	36550	418762	5142	25680	8553	0
12	0	44740	307139	0	0	5262	25680	41483	307810
13	0	0	-218398	21500	517250	5242	25680	9096	0
14	0	0	218623	0	0	5262	25680	41483	306175
15	0	0	-216553	0	540000	5242	25680	9096	0
16	0	0	216553	0	0	5262	25680	41483	304070
17	0	0	-216553	0	540000	5242	25680	9096	0
18	0	0	216553	0	0	5262	25680	41483	304070
19	0	20904	-216553	0	540000	5242	25680	9096	0
20	0	11448	216553	0	0	5262	25680	41483	304070
21	0	0	-216553	0	540000	5242	25680	9096	0
22	0	30138	216553	0	0	5262	25680	41483	304070
23	0	161332	-216553	0	540000	5242	25680	9096	0
24	0	0	216553	0	0	5262	25680	41483	304070
25	0	0	-216553	0	540000	5242	25680	9096	0
26	0	0	216553	0	0	5262	25680	41483	304070
27	0	0	-216553	0	540000	5242	25630	9096	0
28	0	20904	216553	0	0	5262	25680	41483	304070
29	0	11448	-216553	0	540000	5242	25680	9096	0
30	-119070	-176507	-638790	0	0	0	0	0	0

SOURCE: Columns 2 and 3 are taken from Table 2; Column 4 is sum of Columns 4 of Tables 10B, C, D; Columns 5 & 6 taken from Table 4D; Column 7 taken from Tables 9A, B, & C; Column 8 from Tables 6A, B, C, and D; Column 9 from Tables 8A, B, & C; and Column 10 is computed from Tables 3A and B.

TABLE 10B

LISTING OF THE DATA - DOLLARS

SEED PROCESSING PLANT

1	2	3	4	5	6	7	8	9	10
Period	Buildings	Equipment	Working Capital	Existing Seed	New Seed	Fixed Cost	Labor Cost	Variable Cost	Seed Stock
0	180908	0	1990	0	0	0	1990	0	0
1	0	0	717	0	0	0	2707	0	0
2	0	151308	2672	0	0	0	5454	213	0
3	0	0	3547	0	0	0	8655	271	0
4	0	0	244540	0	0	3379	8700	11574	126845
5	0	0	-94943	83574	75376	2614	9510	604	0
6	0	0	226142	0	0	2529	9510	15777	182612
7	0	0	-242110	100637	127765	2154	10000	681	0
8	0	0	385606	0	0	2284	10000	21838	254383
9	0	0	-351916	74565	239784	2298	101035	787	0
10	0	0	487859	0	0	2543	10270	29130	305707
11	0	5580	-420044	35105	391134	2463	10270	925	0
12	0	0	527501	0	0	2593	10270	34332	349822
13	0	0	-486415	20650	483110	2463	10270	1006	0
14	0	0	486415	0	0	2593	10270	34332	351222
15	0	0	-486365	0	504360	2463	10270	1006	0

Source: Columns 2 and 3 are taken from Table 2; Column 4 is computed from Table 7B; Columns 5 and 6 from Table 4C; Column 7 taken from Table 9B, Column 8 from Table 6B; Column 9 from Table 8B, and Column 10 from Table 3C.

TABLE 10C

LISTING OF THE DATA

1 Period	2 Buildings	3 Equipment	4 Working Capital	CONTRACT SEED PRODUCTION		7 Fixed Cost	8 Labor Cost	9 Variable Cost	10 Seed Stock
				5 Existing Seed	6 New Seed				
0	102491	0	1990	0	0	0	1990	0	0
1	0	94882	717	0	0	0	2707	0	0
2	0	0	1486	0	0	0	4193	0	0
3	0	0	14678	0	0	1450	5040	4159	0
4	0	0	361	68266	62168	1959	6840	1068	128666
5	0	0	3572	0	0	1449	6840	2615	0
6	0	0	16294	81418	106544	1310	6840	1401	182805
7	0	0	-8258	0	0	1079	7240	3581	0
8	0	0	22942	60318	201059	1109	7240	2042	241370
9	0	0	-11736	0	0	1199	7240	4979	0
10	0	12470	23112	28200	285800	1229	7240	3440	275931
11	0	0	-17696	0	0	1226	7240	4798	0
12	0	44740	22722	16800	342400	1256	7240	4173	307810
13	0	0	-21642	0	0	1226	7240	4798	0
14	0	0	21867	0	360600	1256	7240	4173	306175
15	0	0	-20847	0	0	1226	7240	4798	0
16	0	0	20847	0	360600	1226	7240	4173	304070

Source: Columns 2 and 3 are taken from Table 2; Column 4 computed from Table 7A; Columns 5 and 6 from Table 4A; Column 7 from Table 9A, Column 8 from Table 6A, Column 9 from Table 9A and Column 10 computed from Tables 3A and B.

TABLE 10D

LISTING OF THE DATA (DOLLARS)

| 1 | 2 | 3 | 4 | MARKETING FUNCTION | | | | | |
| | | | | 5 | 6 | 7 | 8 | 9 | 10 |
Period	Buildings	Equipment	Working Capital	Existing Seed	New Seed	Fixed Cost	Labor Cost	Variable Cost	Seed Stock
0	0	0	1990	0	0	0	1990	0	0
1	0	8434	2275	0	0	840	2707	718	0
2	0	5880	1629	0	0	1420	2873	1601	0
3	0	0	-255	0	0	1316	3090	1233	0
4	0	0	2758	0	0	1306	5670	1421	0
5	0	0	86269	88080	80699	1374	5670	1777	158950
6	0	0	-85414	0	0	1407	5670	2175	0
7	0	0	126187	104792	136793	1447	6070	1828	228402
8	0	0	-125202	0	0	1411	6070	2756	0
9	0	0	195466	77619	256746	1451	6070	2546	314349
10	0	8434	-195430	0	0	1413	6070	2790	0
11	0	5880	243452	36550	418762	1453	6070	2830	426239
12	0	0	-243084	0	0	1413	6070	2978	0
13	0	0	289659	21500	51725	1453	6070	3292	503760
14	0	0	-289659	0	0	1413	6070	2978	0
15	0	0	290659	0	540000	1453	6070	3292	504360

Source: Columns 2 and 3 are taken from Table 2; Column 4 computed from Table 7C, Columns 5 and 6 from Table 4D; Column 7 from Table 9C; Column 8 from Table 6C, Column 9 from Table 9C and Column 10 from Table 4C.

TABLE 11

PROJECTED AVERAGE MONTHLY INVENTORIES OF SEED (M. tons and Dollars)

SEED PROCESSING PLANT

| | EXISTING SEED VARIETIES | | | | | | | | | | NEW SEED VARIETIES | | | | | | | | | | |
| | CORN | | RICE | | G. RICE | | PEANUTS | | SORGHUM | | CORN | | RICE | | G. RICE | | PEANUTS | | SORGHUM | | Com-bined |
Period	Tons	Value @ $160/t	Tons	Value @ $410/t	Tons	Value @ $333/t	Tons	Value @ $267/t	Tons	Value @ $152/t	Tons	Value @ $170/t	Tons	Value @ $425/t	Tons	Value @ $354/t	Tons	Value @ $284/t	Tons	Value @ $162/t	Total
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	1	333	4	1068	8	1216	75	12750	112	47600	38	13452	75	21300	17	2754	100463
5	4	640	0	0	0	0	0	0	0	0	50	8500	75	31875	25	8850	116	32944	29	4698	86867
6	0	0	3	1230	1	333	4	1068	17	2584	175	27750	169	71825	56	19824	133	37772	33	5346	170372
7	4	640	0	0	0	0	0	0	0	0	50	8500	56	23800	19	6726	175	49700	58	9396	98122
8	0	0	3	1230	1	333	4	1068	25	3800	267	45390	225	95625	75	26550	183	51972	50	8100	234708
9	4	640	0	0	0	0	0	0	0	0	75	12750	75	31875	25	8850	233	66172	87	14074	133741
10	6	960	3	1230	1	333	4	1068	33	5016	350	59500	281	119425	94	33270	275	78100	67	10854	309756
11	0	0	0	0	0	0	0	0	0	0	100	17000	94	39950	31	10974	350	99400	117	18954	186278
12	0	0	13	5330	5	1665	13	3471	33	5016	442	75140	325	138125	108	38232	308	87472	67	10854	365305
13	0	0	0	0	0	0	0	0	0	0	125	21250	112	47609	38	13452	408	115872	117	18954	217128
14	0	0	13	5330	5	1665	13	3471	33	5016	442	75140	325	138125	108	38232	308	87472	67	10854	365305
15	0	0	0	0	0	0	0	0	0	0	125	21250	112	47600	38	14232	408	115872	117	18954	217128

Source: Projected Volumes of seed are taken from Table WC-1-B of the Thailand Project Report; prices are computed at 160% and 170% of estimated market prices for grain in Cameroon.

TABLE 12

MANPOWER REQUIREMENTS FOR THE PROJECT

	No.	Office	Rank	Category	Rate/Month
1	1	Director	A.O.	I	$400
2	1	Chief of Center	A.O.	II	$350
3	1	Production Officer	T.O.	III	$300
4	1	Asst. Prod. Officer	T.O.	IV	$225
5	1	Accountant	A.O.	II	$350
6	1	Assistant Accountant	E.O.	IV	$225
7	1	Secretary	E.O.	IV	$225
8	2	Clerk-Typists	-	VI	$130
9	1	Processing Officer	T.O.	III	$300
10	1	Assistant Proc. Off.	T.O.	IV	$225
11	1	Secretary/Bookkeeper	-	V	$175
12	1	Mechanic	-	VII	$ 75
13	1	Salesman	A.O.	III	$300
14	?	Skilled Labor	-	VIII	$ 60
15	?	Unskilled Labor	-	IX	$ 45

Source: Developed from labor requirements of the Khon Kaen location of
the Thailand Project Report.

TABLE SA I

PROJECTED INCREASE IN PRODUCTION RESULTING FROM THE SEED PROGRAM (METRIC TONS)

	Existing Varieties					New Varieties				
	Corn	Rice	G. Rice	Peanuts	Sorghum	Corn	Rice	G. Rice	Peanuts	Sorghum
0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0
5	1350	1185	292	0	730	2825	0	155	340	149
6	0	0	0	0	0	0	0	0	0	0
7	900	1556	292	0	1029	3390	333	452	510	942
8	0	0	0	0	0	0	0	0	0	0
9	0	1477	0	0	614	6780	1345	1190	680	2802
10	0	0	0	0	0	0	0	0	0	0
11	0	743	0	0	0	9040	3344	1488	1020	4960
12	0	0	0	0	0	0	0	0	0	0
13	0	442	0	0	0	11300	4689	1785	1190	4960
14	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	11300	5355	1785	1190	4960

Figures in table are obtained by multiplying these factors by tons of each seed planted.

TABLE SA II

PROJECTED DIRECT IMPACT OF THE SEED PROJECT (DOLLARS)

	Existing Seed					New Seed					
	Corn	Rice	G. Rice	Peanuts	Sorghum	Corn	Rice	G. Rice	Peanuts	Sorghum	Total
0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	135000	296250	60736	0	83220	282500	0	32240	56780	16986	963712
6	0	0	0	0	0	0	0	0	0	0	0
7	90000	389000	60736	0	117306	339000	83250	94016	85170	107388	1365866
8	0	0	0	0	0	0	0	0	0	0	0
9	0	369250	0	0	69996	678000	336250	247520	113560	319428	2134004
10	0	0	0	0	0	0	0	0	0	0	0
11	0	185750	0	0	0	904000	836000	309504	170340	565440	3971034
12	0	0	0	0	0	0	0	0	0	0	0
13	0	110500	0	0	0	1130000	1172250	446250	198720	565440	3623170
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	1130000	1338750	446250	198730	575440	3679170

SOURCE: Production tonnage from table OR-II-J multiplied by market prices for the various grains in Cameroon.

TABLE SA III

PROJECTED INCREASE IN FARMERS NET INCOME RESULTING FROM THE SEED PROGRAM (DOLLARS)

	Existing Seed Varieties					New Seed Varieties					Total
	Corn	Rice	G. Rice	Peanuts	Sorghum	Corn	Rice	G. Rice	Peanuts	Sorghum	
0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	117869	263722	54067	0	70429	246651	0	28700	43607	14375	839420
6	0	0	0	0	0	0	0	0	0	0	0
7	78579	346288	54067	0	99276	295981	74109	83693	65411	90882	1188286
8	0	0	0	0	0	0	0	0	0	0	0
9	0	328706	0	0	59238	591962	299330	220342	87214	270332	1857124
10	0	0	0	0	0	0	0	0	0	0	0
11	0	165355	0	0	0	789282	744207	275551	130821	478532	2583748
12	0	0	0	0	0	0	0	0	0	0	0
13	0	98367	0	0	0	986603	1043537	397252	152625	478532	3156916
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	986603	1191755	397296	152625	478532	3206811

SOURCE: The following decimal factors were applied to the projected values of increased production.
Corn .8731, Rice .8902, Peanuts .7680, Sorghum .8463.

TABLE SA IV

PROJECTED TECHNICAL ASSISTANCE REQUIREMENTS

	Long-Term Specialists	Short-term Specialists	Housing	Childrens Education Allowance	In Country Travel Allowance	Secretary	Driver	Total
0	0	0	0	0	0	0	0	0
1	32500	6000	3000	2000	1050	1200	360	46110
2	32500	6000	3000	2000	1050	1200	360	46110
3	65000	5250	6000	4000	1700	1200	360	83510
4	65000	5250	6000	4000	1700	1200	360	83510
5	65000	2500	6000	4000	1800	1200	360	80860
6	65000	2500	6000	4000	1800	1200	360	80860
7	32500	0	3000	2000	750	1200	360	39810
8	32500	0	3000	2000	750	1200	360	39810
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0

SOURCE: Technical assistance personnel and requirements extracted from Annex B-20 of Thailand Seed Project Report. Salaries and costs are Cameroon.

TABLE SA-V

PROJECTED DIRECT ASSOCIATED COSTS

	Operating Cost	Agric. Extension	Varietal Development	Technical Assistant	Total
0	5970	0	0	0	5970
1	17239	25000	0	46110	88349
2	15754	20000	0	46110	81864
3	25214	20000	0	83510	128724
4	172683	15000	0	83510	276193
5	34553	15000	26878	80860	157291
6	231524	15000	0	80860	327384
7	36180	15000	24159	39810	115149
8	298219	15000	0	39810	353029
9	38805	15000	33437	0	87242
10	341956	15000	0	0	356956
11	39375	15000	45531	0	99906
12	380235	15000	0	0	395235
13	39918	15000	53875	0	108793
14	378600	15000	0	0	393600
15	39918	15000	54000	0	108918
16	376459	15000	0	0	391495

SOURCE: Information from Table 10A, SA-IV and estimates of Agricultural Extension costs.

TABLE SA VI

NET ADDED INCOME RESULTING FROM VALUE ADDED TO THE GRAIN IN THE MARKETING SYSTEM (DOLLARS)

	Corn	Rice	G. Rice	Peanuts	Sorghum	Corn	Rice	G. Rice	Peanuts	Sorghum	Total
0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	11787	26372	5407	0	7402	24665	0	2870	4361	1438	83942
6	0	0	0	0	0	0	0	0	0	0	0
7	7858	34629	5407	0	9928	29598	7411	83693	6541	9088	204153
8	0	0	0	0	0	0	0	0	0	0	0
9	0	32871	0	0	59238	59196	29933	22034	8721	27033	239026
10	0	0	0	0	0	0	0	0	0	0	0
11	0	16536	0	0	0	78928	74421	27555	13082	47853	258375
12	0	0	0	0	0	0	0	0	0	0	0
13	0	9837	0	0	0	98660	104354	39725	15263	47853	315692
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	98660	119176	39730	15263	47853	320682

SOURCE: Computed from Table SA III by obtaining 10 percent of value of added production as an estimate of net added income.

TABLE SA VII

LISTING OF DATA

PROJECTED DIRECT IMPACT OF COMPLETE SEED PROJECT

Period	Buildings	Equipment	Working Cap.	Farmer	Grower	Extension	Variety Dev.	Tech. Assistant	Direct Cost
0	283500	0	5970	0	0	0	0	0	5970
1	0	103316	3709	0	0	25000	0	46110	17239
2	0	157188	5787	0	0	20000	0	46110	15754
3	0	0	17970	0	0	20000	0	83510	25214
4	0	0	247659	0	31304	20000	0	83510	172683
5	0	0	- 5104	839420	0	15000	26878	80860	34553
6	0	0	157002	0	45111	15000	0	80860	231524
7	0	0	-124181	1188286	0	15000	24159	39810	36180
8	0	0	283346	0	62730	15000	0	39810	298219
9	0	26130	-168186	1857124	0	15000	33437	0	38805
10	20904	14314	315541	0	75360	15000	0	0	341956
11	11448	0	-191556	2583748	0	15000	45531	0	39375
12	44740	0	307139	0	86208	15000	0	0	380235
13	0	0	-218398	3156916	0	15000	53875	0	39918
14	0	0	218623	0	86544	15000	0	0	378600
15	0	0	-216553	3206811	0	15000	54000	0	39918
16	0	0	216553	0	86544	15000	0	0	376495

TABLE SA-VIII

A LISTING OF THE DATA

PROJECTED TOTAL ECONOMIC IMPACT OF THE SEED PROJECT

Period	Buildings	Equipment	Working Capital	Production	Marketing	Employment	Training	Direct Costs	Other Costs
0	283500	0	5970	0	0	0	0	52080	20000
1	0	103316	3709	0	0	0	0	86349	15000
2	0	157188	5787	0	0	0	1000	128260	15000
3	0	0	17970	0	0	0	1000	128724	20000
4	0	0	247659	0	0	0	1000	263265	25000
5	0	0	- 5102	963712	96371	0	2000	157291	25000
6	0	0	157022	0	0	0	2000	274529	25000
7	0	0	-124181	1365866	136587	0	3000	115149	25000
8	0	0	283346	0	0	0	4000	304309	25000
9	0	0	-168186	2134004	213400	0	4000	87242	25000
10	0	20904	315541	0	0	0	4000	353397	25000
11	0	11448	-191556	2971034	297103	0	4000	99906	25000
12	0	44740	307139	0	0	0	4000	393595	25000
13	0	0	-218398	3623170	362327	0	4000	393520	25000
14	0	0	218623	0	0	0	4000	393520	25000
15	0	0	-216553	3679170	367917	0	4000	108918	25000

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THE FEASIBILITY ANALYSIS OF A PROTOTYPE

SEED DEVELOPMENT PROJECT

by

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B.S., University of Ibadan, 1970

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AN ABSTRACT OF A MASTER'S THESIS

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This thesis gives a brief summary of some of the current methods, concepts and common terminology in project analysis in general and in agricultural project analysis in particular. It discusses some of the merits and demerits of some of the techniques in current use and goes on to apply one of these in the feasibility analysis of a prototype seed development project. Technical information on the project's plants, equipment, and design, as well as most of the data used have been taken from a recent report on a similar seed project developed for Thailand. The information was adjusted and used to develop a prototype seed development project suitable for the Cameroon Republic.

The technique utilized is a computerized system of analysis which makes use of discounted cash flow principles to compute rates of returns which are used to determine the feasibility of the project. For this purpose three different rates of returns--the Internal Rate of Return (IRR), the Direct Rate of Return (DRR), and the Social Rate of Return (SRR), have been computed and used. In addition to determining the feasibility of the prototype project some alternatives to the basic project are analyzed through a sensitivity analysis system for each of the three rates of return analyses. The sensitivity analyses test the sensitivity of the project to changes in some of the vital components of the project considered important in affecting the feasibility of the project.

The internal rate of return analysis conducted on the whole project and on each of the three component units of the project--the production unit, the processing and packaging unit, and the marketing and distribution unit, gave rates of return lower than the assumed critical rate of 12 percent. This indicated that the seed project is not profitable

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as a private commercial project. Sensitivity analyses showed the
project generally insensitive to changes in most of the influential
factors and that the project could be profitable on a private commer-
cial basis if the prices of the final product, i.e. the processed and
packaged seeds, were relatively very high. Such high prices were con-
sidered undesirable as they would militate against the desired rate
of participation of the farmers for whom the project is designed.

The direct rate of return as well as the social rate of return
analyses which considered and analyzed the project as a public project,
gave rates of return higher than 60 percent, clearly very much higher
than 12 percent, the assumed critical rate of return. These showed
that the project will be feasible as a regional development project.
Sensitivity analyses showed that the project retains its feasibility
even after key costs are drastically increased and revenues from the
project drastically reduced by up to 50 percent. This favorable
characteristic of the prototype project is considered to be of
significant importance because the project is thus able to lend itself
for use in many widely variable situations without the danger of losing
its feasibility.