

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY <i>Batch 28</i>
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1. SUBJECT CLASSIFICATION	A. PRIMARY Serials	Y-AE10-0000-0000
	B. SECONDARY Agriculture--Agricultural economics	

2. TITLE AND SUBTITLE
 Analysis of programs for the development and improvement of agricultural credit institutions and services; terminal report

3. AUTHOR(S)
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4. DOCUMENT DATE 1968	5. NUMBER OF PAGES 22p.	6. ARC NUMBER ASC 332.71.037g
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7. REFERENCE ORGANIZATION NAME AND ADDRESS
 Ohio State

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publisher, Availability*)
 (Research summary)

9. ABSTRACT

10. CONTROL NUMBER PN-RAB-529	11. PRICE OF DOCUMENT
12. DESCRIPTORS Credit Latin America	13. PROJECT NUMBER
	14. CONTRACT NUMBER CSD-463 Res.
	15. TYPE OF DOCUMENT

332 71
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227
O.A. 525

TERMINAL REPORT
ON AGRICULTURAL CREDIT RESEARCH PROJECT

for an

**ANALYSIS OF PROGRAMS FOR THE DEVELOPMENT
AND IMPROVEMENT OF AGRICULTURAL
CREDIT INSTITUTIONS AND SERVICES**

May, 1968

**Agricultural Finance Center
Department of Agricultural Economics and Rural Sociology
The Ohio State University**

Under Research Contract **AID/csd-463**
between
The United States Agency for International Development
and
The Research Foundation, The Ohio State University
Columbus, Ohio

A.I.D.
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TERMINAL REPORT

Agricultural Credit Research Contract
No. AID/csd-463

between

The United States Agency for International Development
and

The Research Foundation of The Ohio State University

INTRODUCTION

Background

The Ohio State University entered into the subject contract to analyze programs for the development and improvement of agricultural credit institutions and services on July 1, 1964. The project was designed as a three-year effort, to terminate June 30, 1967. It was subsequently extended, within the original budget, to November 30, 1967 and terminated on that date.

The project had as its primary objectives: (1) the development of guidelines for the establishment and operation of permanent and effective institutions and systems for providing agricultural credit in developing countries, and (2) the development of guidelines for technical and economic assistance programs in agricultural credit.

Following a one-year first phase devoted to secondary data assembly, second phase field studies were carried out in Brazil, Colombia, Ecuador and Peru, terminating in October, 1966. The final year was devoted to analysis and publication of results.

Reports Submitted

In compliance with the major terms and objectives of the contract the reports listed in Appendix I, attached, have previously been submitted. These include (a) substantive results of the research, including their implications for agricultural credit policies and programs, (b) detailed descriptions of the individual field studies, including agencies, personnel and procedures and (c) administrative reports of the conduct of the project.

An additional report, "Adaptation of Benefit-Cost Analysis to the Measurement of Performance of Agricultural Development Banks," is submitted herewith. This is the final detailed report on a specific segment of the project and (a) includes an application of the technique to the National Development Bank of Ecuador with conclusions relative to that institution's performance in promoting agricultural growth and (b) recommends that this analytical tool be employed to supplement evaluations of other development banks.

General Summary of Results

In addition to providing the guidelines to the organization and operation of credit institutions set forth in the series of reports, the project just completed also produced confirmation of certain basic points relevant to agricultural credit programs and the agricultural development process.

Numerous factors, individual and composite, at various levels, were identified as being associated with variations in the productivity of agriculture and the performance of agricultural credit programs.

The general economic situation, political conditions, social structure, cultural attitudes, population and other basic characteristics of a country were all recognized as interrelated variables conditioning the environment within which the agricultural sector must operate. Structural problems were noted, particularly in disparity of availability of education, political power and economic activity for the rural populations. Infrastructural deficiencies in markets, transportation and communications were noted as both directly and indirectly limiting agricultural sector performance.

Additional factors influencing performance (in terms of productivity, income, credit utilization and repayment, and related criteria) within limits set by the national environment and infrastructure, were observed at the individual farm level. Level of managerial ability, adequacy of the input resource package, local market facilities and availability of credit were all identified as components of the composite factors related to performance.

Results of the research made it apparent that credit is only one of an intricate complex of factors necessary to the acceleration of agricultural productivity. Such acceleration demands much more than the provision of a loanable fund to a lending institution and subsequent disbursement of loans to farmers. The (growth) benefit/cost efficiency of such programs is typically extremely low, even in situations where the institutional facilities, the farm sector and infrastructural conditions are comparatively favorable.

A general conclusion of the research is that no credit institution nor any of its problems is ever completely isolated or unique. Rather, it is a part of the total country, and its problems reflect that country's problems. Any weakness in the total structure will restrict the institution's effectiveness and accent the country's problem.

Scope and Objectives of Terminal Report

This report presents conclusions and recommendations regarding key problems in the use of agricultural credit and in the design and operation of credit institutions and programs. It is based upon, but supplements rather than repeats, the work previously reported.

The policy followed in previous reports has restricted their content to objective findings of the research. Here, however, subjective value judgments of the researchers are deliberately included, and are reflected both in the content of the report and in the recommendations. The objective is to direct attention to considerations which are judged, on the one hand, as important and on the other as neglected, in the organization, operation and use of agricultural credit services.

CONCLUSIONS AND RECOMMENDATIONS

Institutional Operation

Institutional agricultural credit programs have not been notably successful, either in accomplishing developmental objectives or in meeting the minimum criteria of institutional viability. This research concludes that the major reasons for the lack of success are not primarily in the structure, management or operation of the institutions as such.

This is not to say that structural weaknesses, personnel inadequacies, operating inefficiencies and related malfunctions in performance do not exist. They obviously do exist and various of them were identified, measured and reported over the course of the research project. In the main, however, managerial and operational deficiencies are comparatively minor. Structures and tables of organization are typically top-heavy but not grossly unreasonable. Personnel are often imperfect but are far from incompetent and sometimes are outstanding. Operating procedures, while apparently inefficient at casual observation, are less obviously so when carefully examined in the context of their setting.

Corrections and improvements in these areas can and ideally should be made. Predictably, however, the pay off to such efforts will be far less than dramatic in terms of either development or institutional viability objectives. Replacement of the managerial group, promotion of reorganization of the institution, development of a new set of procedures for local branch operations--complete with revised credit forms; even the establishment of training programs for branch managers, staff and loan inspectors does not attack the real root of the problem.

A basic related point, repeatedly confirmed by the research, is that the capacity of an agricultural credit institution to serve as an instrument of development is functionally limited. In performing its credit function it can make, supervise and collect agricultural loans. Its capability to perform this function to the attainment of developmental objectives while meeting the minimum "profit and loss" criteria for institutional viability is severely restricted by the limitations of the environment within which it and its borrowers exist.

The conclusion here is that the apparent deficiencies of credit institutions in the performance of their assigned responsibilities and attainment of goals are, in major part, the mirror images of environmental deficiencies and assignment to the institution of excessive responsibilities and functionally unattainable goals.

Credit Policies and Institutional Objectives

The research established (a) that there are limits in agricultural sectors beyond which credit is not a feasible tool; (b) that there is wide variation in the effective demand for agricultural credit among farmers within the feasibility limits; (c) that policies, objectives and programs of institutions must be consistent with the limits to and variations in the effective demand for agricultural credit.

Additionally (d) the research was not successful in developing a methodology for "instant identification" of feasibility limits and effective demand variations. Hence it suggests very strongly (e) that more effective consideration should be given to determination of feasibility limits and demand variation as a necessary precondition to the setting of realistic institutional policies and objectives and to the initiation of workable agricultural credit programs.

The bases for the foregoing conclusions are detailed in various prior reports. Points a, b and c are treated comprehensively in Ted L. Jones' Agricultural Finance Paper, listed as item 18 in Appendix I, to which the interested reader is referred. A word of additional explanation, however, may clarify the conclusions.

"Credit feasibility" implies the existence of an effective demand for credit, which in turn stipulates that the use of credit will, as a minimum, generate its own repayment. If this condition cannot be met, the loan in question falls outside the feasible range. Certain conditions, identifiable by inspection, prohibit feasibility. Absence of a product for sale; absence of an accessible market and therefore of a price for products; absence of essential factor inputs are clearly in this category. Farms in, and remaining in, the non-market, non-monetary, subsistence group obviously are outside the feasible range. Removal of these constraints is an absolute precondition to credit feasibility.

A major problem in formulating credit policy consistent with feasibility limits arises from the fact that the existence of a market, a price and an input supply are far less than sufficient to guarantee profitable operation and credit repayment capacity. Further, that the additional factors necessary for repayment capacity, hence credit feasibility, vary widely, are often difficult to quantify and therefore do not lend themselves to classification and the specification of generalized feasibility standards.

For example, the research confirmed that some minimum size of operation (quantity of productive assets) is required. Similarly, some minimum level of technical quality of assets is required, as is some minimum of human technical and managerial competence.

Various of these minimum levels were quantified for specific, local situations. It is an entirely different matter to specify what the minimum levels are in terms that are applicable to the range of widely varying conditions in which the credit institution must operate. Many criteria were tested (acreage for size of operation; years of education for human competence) and found to be unreliable. The investigations leave little room for doubt, however, that the feasible range within which agricultural credit can be productively employed, paid for and repaid is narrower than commonly assumed.

In summary, relative to policy formulation, it is recommended that:

1. Sufficient analysis be conducted to provide realistic estimates of (a) credit feasibility limits and (b) the costs of and returns to credit services within the credit feasibility range.
2. If the decision is made that the credit program will operate outside the feasible range, that provision be made to identify and finance it as a social investment program.

Measurement of Performance

With economic growth as a common objective--either explicitly or implicitly stated--of development banks and similar institutional forms, objective measurement of their performance in terms of economic growth stimulation is of obvious importance to economic planners, to national and international suppliers of funds and to all concerned with technical assistance programs involving such institutions. Measurement of this aspect of their performance is not included in the customary evaluations of development banks, which are effectively limited to analysis of the profit and loss and financial statements of the bank; to institutional profitability, growth and soundness.

A methodology for measuring development bank performance in terms of increased agricultural output, and relating this performance to total bank costs was developed by Roth^{1/}, as illustrated in Appendix II, Figure 1 and Tables 1 and 2.

The adapted cost-benefit methodology was then applied to the 1965 operations of the Sierra branches of the National Development Bank of Ecuador as summarized in Appendix II, Figure 2 and projected as a ten-year growth estimate in Appendix II, Table 3. Data limitations and the necessity of assumptions and estimates of certain data were recognized. Despite these limitations the high cost-benefit ratio (1.20) raises serious questions regarding the effectiveness of the development bank as an instrument for fostering agricultural development in a traditional environment.

^{1/} H. J. Roth, Adaptation of Benefit-Cost Analysis to the Measurement of Performance of Agricultural Development Banks, Agricultural Finance Center, AFC Research Publication 119, The Ohio State University, Columbus, Ohio.

If the conclusion is valid that the provision of capital through this development bank did not result in net agricultural growth, either or both of two inferences may be drawn. Either (1) net investment in agriculture was not productive or (2) net investment was (potentially) productive, but did not take place.

Other work by the Ecuador research team confirms that some investments were, in fact, unproductive and suggests the desirability of more selective lending, perhaps through closer integration of development bank credit activities with programs produced by national development planning groups. In other cases, however, actual additions of capital to agriculture were productive. Relating this to the performance of the development bank reinforces the suspicion that leakages and displacement of capital occurred; that the actual increase in agricultural investment was smaller than the amount disbursed in loans.

It would be surprising if displacement did not occur through substitution of low cost development bank loans for borrower equity or for former borrowings from sources lending at higher market rates. Such substitution, along with both direct and indirect diversion of loan proceeds, is difficult and costly to control, even with strict supervision and policing of loans. Either leakages or high control costs appear to be necessary costs of the maintenance of differential interest rates for agricultural development loans.

The Private Moneylender

Study of non-institutional lenders of agricultural credit in Ecuador indicates that this is an excessively maligned group which has a legitimate place in the system: particularly in servicing the small, high-risk, operating credit needs of farmers in the lower strata of the "feasible credit" range. Their interest charges--as variously expressed and levied--are by conventional standards high, but generally consistent with risks and costs attendant to the extension of credit at their level of operation. It is suggested that, at this level, they may well be better equipped than institutional lenders to service credit needs of farmers.

For comprehensive treatment of this probably controversial subject the reader is referred to Stitzlein's work, listed as item 14 in Appendix I.

Final Comments

At the termination of the project, these researchers are left with a profound respect for the magnitude and complexity of the problem of effectively utilizing agricultural credit as a development tool. They are left with a comparable respect, on balance, for the performance in dealing with these problems of the hundreds--perhaps thousands--of people with whom they have worked and come in contact.

They are left, too, with certain subjective concerns relative to assistance programs in agricultural credit to which specific reference has not previously been made. They are concerned that what might be described as a body of agricultural credit mythology has somehow been established. That its powers and relevance are exaggerated.

That "supervised credit" is too readily and too generally propounded. That the absolutely low interest rate, "because poor farmers cannot pay more", has virtually become dogma. That despite admonitions to the contrary direct transplantation of domestic programs and standards still occurs. That credit policy decisions are too frequently made under pressures which preclude objective appraisal of their feasibility. These concerns have been implicit in the content and thrust of this terminal report.

APPENDIX I

REPORTS SUBMITTED IN FULFILLMENT OF AGRICULTURAL CREDIT RESEARCH CONTRACT

Agricultural Finance Center Research Reports

1. AFC 101--"First Semi-Annual Report on Research Contract Between The Agency For International Development and The Research Foundation of The Ohio State University For an Analysis of Programs For The Development and Improvement of Agricultural Credit Institutions and Services," December, 1964.
2. AFC 102--"An Outline of The Field of Agricultural Finance: A Framework For Research," February, 1965.
3. AFC 103--"Abstracts of Dissertations on Agricultural Credit and Related Subjects in Developing Countries--1964 to 1965," June, 1965.
4. AFC 104--"Bibliography of Agricultural Credit," July, 1965.
5. AFC 105--"Second Semi-Annual Administrative Report on Research Contract Between The United States Agency For International Development and The Research Foundation of The Ohio State University For an Analysis of Programs For The Development and Improvement of Agricultural Credit Institutions and Services," July, 1965.
6. AFC 106--"Function and Scope of Agricultural Credit in Developing Countries--Volume I of A Review and Appraisal of Recommendations For Agricultural Credit Systems in Developing Countries," November, 1965.
7. AFC 106--"Some Environmental Considerations Influencing Agricultural Credit in Developing Countries," May, 1967.
8. AFC 109--"Agricultural Credit in Taiwan," August, 1965.
9. AFC 110--"Colombian Agricultural Credit--1965, The Caja Agraria, INCORA, and The Banking System," August, 1966.
10. AFC 111--"Bibliography of Agricultural Credit and Related Data," November, 1966.
11. AFC 113--"Structure and Productivity of Capital in The Agriculture of Taiwan and Their Policy Implications to Agricultural Finance," June, 1967.
12. AFC 115--"Factors Limiting Credit System Success and Affecting Delinquency in Peru," November, 1967.
13. AFC 116--"An Analysis of Agricultural Credit Operations of Selected Branches of The Caja de Credito Agrario, Industrial y Minero in Colombia," December, 1967.

14. AFC 117--"The Characteristics and Significance of The Non-Institutional Credit Market in Rural Ecuador," December, 1967.
15. AFC 118--"An Evaluation of The CNCR Fertilizer Loan Program in Brazil," December, 1967.

Special Papers and Reports

16. "An Appraisal of The Banco Nacional de Fomento Relative to Agricultural Credit in Ecuador," September, 1966.
17. "Agricultural Credit Situation and Delinquency Level in Peru," 1966.
18. "The Influence of Agricultural Credit Institutions Upon Agricultural Development," November, 1967.
19. "The Use of The Capital-Output Ratio in Planning Agricultural Sector Investment," August, 1967.
20. "Projeto Piloto--Aumento da Productividade Agricola Atraves do Credito," Brazil, 1966.
21. "Preliminary Investigation--CNCR Fertilizer Loan Program," Brazil, 1966.
22. "Preliminary Report, Ohio State University Agricultural Credit Research Project in Colombia," March, 1966.
23. "Activity Reports--Agricultural Credit Research in Ecuador," Numbers 1 through 11, October, 1965 through November, 1966.
24. "Economic Analysis of The Ecuadorian Development Banking System," Unpublished M.S. Thesis, Gentil Rojas, 1965.
25. "An Analysis of Factors Inhibiting Performance of Agricultural Credit Programs in Developing Countries," Unpublished M.S. Thesis, Abdallah Abu-Hammad, 1965.

APPENDIX II

**BENEFIT-COST ANALYSIS OF PERFORMANCE
OF THE NATIONAL DEVELOPMENT BANK
OF ECUADOR**

FIGURE 1

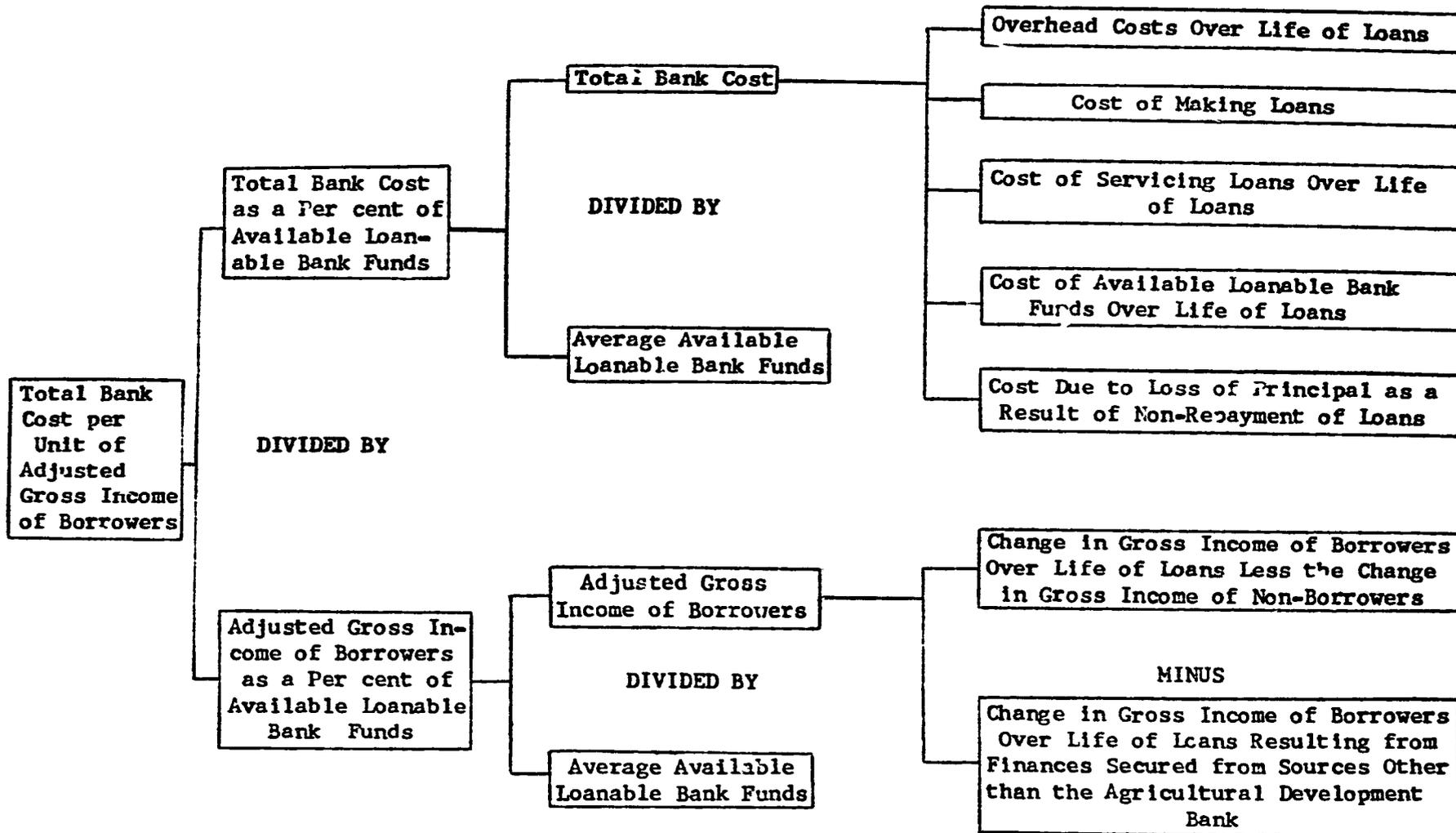


TABLE 1
Increase in Agricultural Output Resulting Over a Ten-Year Period from \$1,000,000 of
Development Funds Channeled Through an Agricultural Development Bank

Year	Average Available Loanable Funds ^a	Productivity Factor	Gross Output Response of Borrowers as Measured by Gross Income	Additional Investment Cost of Borrowers ^b	Adjusted Gross Output as Measured by Gross Income	Discount Factor (10%)	Present Value of Adjusted Gross Output Measured by Gross Income
1	\$950,000	130	\$1,235,000	\$237,500	\$ 988,000	.9091	\$ 898,191
2	902,500	130	1,173,250	225,625	938,600	.8264	775,659
3	857,375	130	1,114,587	214,344	891,670	.7513	669,911
4	814,507	130	1,058,8 ^r 9	203,627	847,088	.6830	578,561
5	773,782	130	1,005,917	193,445	804,734	.6209	499,659
6	735,093	130	955,620	183,773	764,496	.5645	431,558
7	698,339	130	907,840	174,585	726,272	.5132	372,723
8	663,422	130	862,449	165,856	689,960	.4665	321,866
9	630,251	130	819,326	157,563	655,461	.4241	277,981
10	598,739	130	778,360	147,184	622,688	.3855	240,046
Total					\$7,928,969		\$5,066,155

^aAll costs incurred by the agricultural development bank in lending this \$1,000,000 to farmers are subtracted from the million dollars. It is assumed that these costs are evenly distributed throughout the year and consequently one-half of the yearly expense can be loaned out during the year.

^bAdditional investment cost of borrowers is assumed to be 25 per cent of available loanable funds.

Source: Hypothetical data.

TABLE 2

Increase in Agricultural Output Resulting Over a Ten-Year Period from \$1,000,000 of Development Funds Channeled Through an Agricultural Development Bank

Year	Average Available Loanable Funds ^a	Productivity Factor	Gross Output Response of Borrowers as Measured by Gross Income	Additional Investment Cost of Borrowers ^b	Adjusted Gross Output as Measured by Gross Income	Discount Factor (10%)	Present Value of Adjusted Gross Output Measured by Gross Income
1	\$900,000	150	\$1,350,000	\$225,000	\$1,080,000	.9091	\$ 981,828
2	810,000	150	1,215,000	202,500	972,000	.8264	803,261
3	729,000	150	1,093,500	182,250	874,800	.7513	657,237
4	656,100	150	984,150	164,025	787,320	.6830	537,740
5	590,490	150	885,735	147,622	708,588	.6209	439,962
6	531,441	150	797,161	132,860	637,729	.5645	359,998
7	478,000	150	717,000	119,500	573,600	.5132	294,372
8	430,200	150	645,300	107,550	516,240	.4665	240,825
9	387,180	150	580,770	96,795	464,616	.4241	197,044
10	348,462	150	522,693	87,116	418,154	.3855	161,198
Total					\$7,033,047		\$4,673,465

^aAll costs incurred by the agricultural development bank in lending this \$1,000,000 to farmers is subtracted from the million dollars. It is assumed that these costs are evenly distributed throughout the year and consequently one-half of the yearly expense can be loaned out during the year.

^bAdditional investment cost of borrowers is assumed to be 25 per cent of available loanable funds.

Source: Hypothetical data.

Table 3 shows the amount of increased gross farm income that would be expected to occur over a ten-year period with \$1,000,000 of additional loanable funds. The calculations are based only upon the branches of the National Development Bank located in the Sierra, rather than the entire system. The projection is based upon the following assumptions:

1. \$1,000,000 of loanable funds are provided the branches of the National Development Bank located in the Sierra.
2. The period of time over which the amount of increased gross farm income generated will be computed is ten years.
3. The Branch Banks will loan 80 per cent of the cost of the investment.
4. The economies of scale of the Branch Banks will not be affected by the additional \$1,000,000.
5. All costs incurred by the Branch Banks in using this \$1,000,000 will be subtracted from the million dollars. These costs are evenly distributed throughout the year and thus the equivalent of one-half of the yearly expenses can be utilized during the year.
6. The productivity of the investments made by the borrowers of the Branch Banks is constant.
7. The social time preference as measured through a rate of discount is 10 per cent. This is an arbitrarily chosen rate with its only justification being the fact that it lies between the rates of interest charged by the commercial banks and the National Development Bank.

As shown in Table 3 the total increase in gross farm income generated as a result of the use of an additional \$1,000,000 by the Branch Banks over a ten-year period is \$326,913. Over the ten-year period, however, the Branch Banks expended only \$401,892 of the original \$1,000,000.^{1/} Based on these figures the total bank cost to adjusted gross farm income ratio is 1.23. The total increased gross farm income that could be expected to be generated if there were no time restriction would be \$813,008. It must be noted that the above figures are not in terms of present value. When this is done the \$326,913 figure is reduced to \$208,895. The \$813,008 figure would be reduced even more due to the greatly extended time period and consequently smaller present value.

The foregoing results were to be expected in that on Figure 2 the calculated ratio of bank cost to adjusted gross income of borrowers was in excess of one. Given a cost-benefit ratio greater than one the expending of funds will never be equaled by the benefits derived. The same is true for the adapted cost-benefit analysis as applied to agricultural development banks. If the ratio of bank cost to adjusted gross income of borrowers is greater than one, the increased gross farm income generated through the Bank loans will be less than the funds expended in the loan-making process.

^{1/} This figure is obtained by subtracting \$15,773 (one-half of the tenth year expenses) from \$613,881.

FIGURE 2

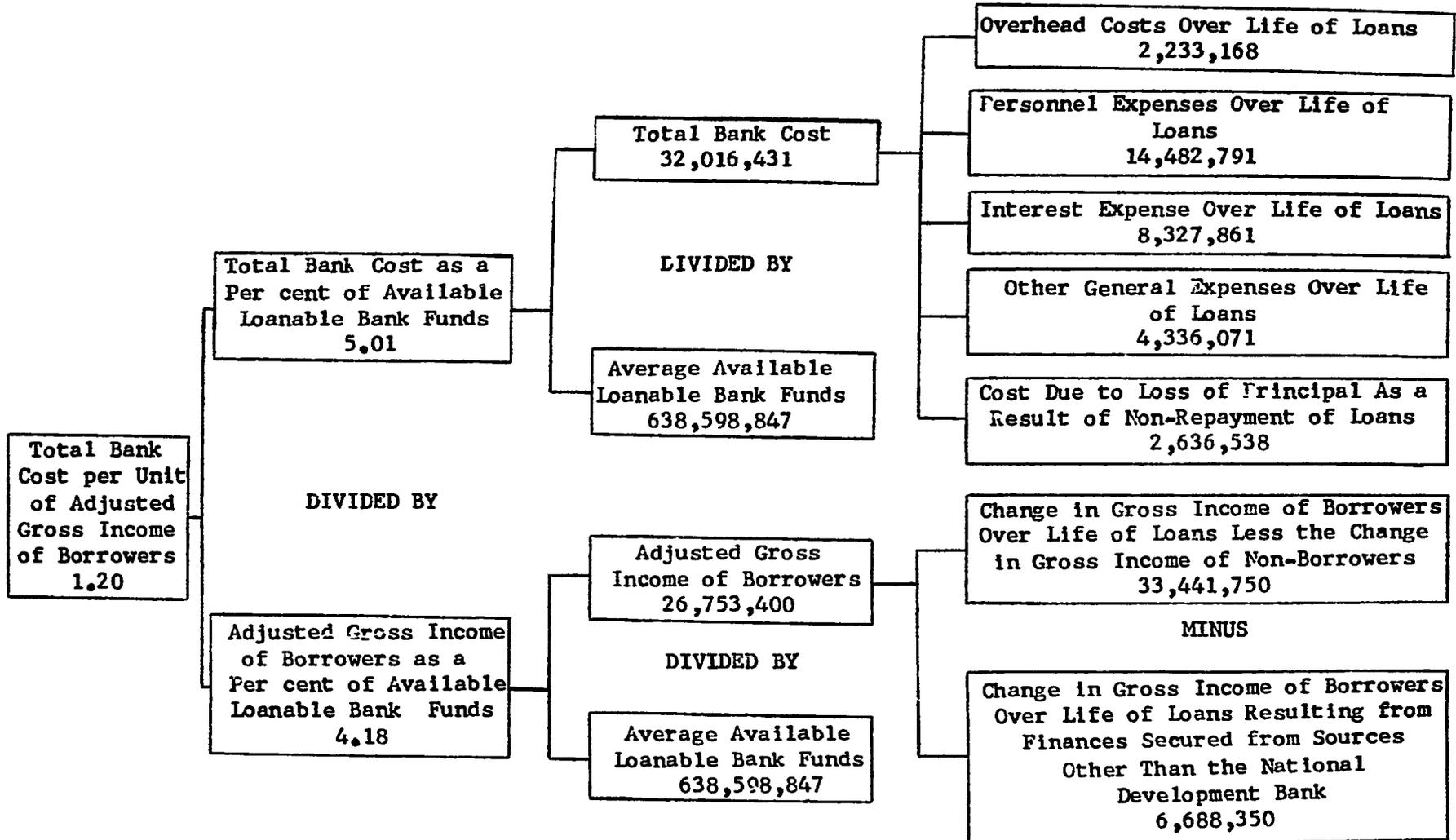


TABLE 3

Increase in Agricultural Output as Measured by Gross
Farm Sales Resulting from the Injection of
\$1,000,000 of Development Fund Into the
Sierra Branches of the National
Development Bank of Ecuador
(in dollars)

Year	Average Available Loanable Funds ^a	The Percentage Ratio of Adjusted Gross Income of Borrowers to Available Loanable Funds	Adjusted Gross Income of Borrowers	Discount Factor (10%)	Present Value of Adjusted Gross Income of Borrowers
1	974,950	x 4.18	40,753	x .9091	37,049
2	926,105	4.18	38,711	.8264	31,991
3	879,707	4.18	36,772	.7513	27,627
4	835,634	4.18	34,930	.6830	23,857
5	793,769	4.18	33,180	.6209	20,601
6	754,001	4.18	31,517	.5645	17,791
7	716,226	4.18	29,938	.5132	15,364
8	680,344	4.18	28,438	.4665	13,266
9	646,259	4.18	27,014	.4241	11,457
10	613,881	4.18	25,660	.3855	9,892
TOTAL			326,913		208,895

^aAll costs incurred by the Branch Bank in using this \$1,000,000 will be subtracted from the million dollars. It is assumed that these costs are evenly distributed throughout the year and consequently one-half of the yearly expense can be loaned out during the year.

Source: Calculated from the cost-benefit components indicated in Figure 2.

