BIBLIOGRAPHIC DATA SHEET

1. CONTROL NUMBER: PN-AAJ-086

2. SUBJECT CLASSIFICATION (695): AE10-0000-G358

3. TITLE AND SUBTITLE (240)

Enterprise budgets: a multiple use data base for agricultural banks in developing countries

4. PERSONAL AUTHORS (100)

Parks, L. L.; Rockeman, K. A.; Walker, O. L.

5. CORPORATE AUTHORS (101)

Oklahoma State Univ. Dept. of Agr. Economics

6. DOCUMENT DATE (110): 1980

7. NUMBER OF PAGES (120): 74p.

8. ARC NUMBER (170): HO332.71.P252b

9. REFERENCE ORGANIZATION (130): Okla. State

10. SUPPLEMENTARY NOTES (500)

(In Int. development series no. 80-1)
(Funded by AID under Cooperative Agreement AID/ta-CA-1)

11. ABSTRACT (950)

12. DESCRIPTORS (920)

Honduras
Agricultural credit
Data collection
Budgeting
Agricultural banks
Agricultural production

13. PROJECT NUMBER (150): 931113400

14. CONTRACT NO.(140): AID/ta-PMA-2

15. CONTRACT TYPE (140)

16. TYPE OF DOCUMENT (160)

AID 590-7 (10-79)

HO
33271
12526

PN-AAJ-086

Enterprise Budgets: A Multiple Use Data Base For Agricultural Banks In Developing Countries

Loren L. Parks
Kurt A. Rockeman
Odell L. Walker

AID/ta - CA - 1
Project No. 931-1134-02

Cooperative Agreement Between
USAID, Oklahoma State University and
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IDS No. 80-6 Enterprise Budgets For Grains in Honduras: 1980

Preface

This report is one of a series emanating from the joint Oklahoma State University - Colorado State University cooperative agreements on Small Farmer Credit with the Agency for International Development. The overall objective of the project was to carry out small farm data collection analysis activities to improve credit use. The specific objectives of the cooperative effort between the two Universities and the agricultural development banks in Honduras and the Dominican Republic are to: (a) develop data collection and analysis approaches for use by credit institutions; (b) test these approaches in developing countries; and, (c) disseminate the results.

The approach envisioned and implemented was to evaluate alternative methodologies for farm level data collection and farm management analyses. These steps led to recommendations for improving credit allocation to small farmers in developing countries. Another major part of the project involved training of counterpart personnel and Bank loan personnel in credit policies and farm management approaches for solving small farmer credit problems.

The in-field phase of the project began in Honduras with the Banco Nacional de Fomento, now the Banco Nacional de Desarrollo Agricola (BANADESA), on July 1, 1978, and in the Dominican Republic with the Banco Agricola on July 1, 1979. Dr. Lore. Parks, faculty member in the Department of Agricultural Economics at Oklahoma State University (OSU), was the field staff professional in Honduras for two years. Dr. Tom Dickey, faculty member in the Department of Economics at Colorado State University (CSU), is the field staff professional in the Dominican Republic.

The OSU part of this three year cooperative project was funded by AID under Cooperative Agreement AID/ta-CA-1, Project No. 931-1134-02, Basic

Memorandum of Agreement No. AID/ta-BMA-2; CSU operated under AID/ta-Ca-3 and AID/ta-BMA-6. The Credit Project began in 1977.

Dr. William Merrill, former chief of the Economics and Sector Planning Division, Bureau of Development Support, Agriculture, AID, provided early encouragement and leadership in implementing this project; Ms. Anne Grace-Ferguson, Agricultural Economist in ESP/DSB/AGR/AID helped develop the contractual agreements; and, Mr. Erhard Rupprecht and Ms. Karen Wiese, AID served as project managers and provided guidance and support during the past three years. Many in-country AID personnel provided suggestions and support for the project. Strong support of all AID personnel is greatly appreciated. Special recognition is due Mr. René Cruz, President of the Banco Nacional de Fomento in Honduras, Mr. Roberto Valladares, Vice-President of BNF and BANADESA, and Mr. Alfonso Bonilla, former head of the Technical Division where the OSU project was located. Honduran conterparts on the project were Reynerio Barahona, Ricardo Arias and Rolando Medrano.

Faculty involved in the cooperative agreement, included James Osborn, Odell Walker, Harry Mapp, Michael Hardin, and Joe Williams of the OSU faculty, and Kenneth Nobe of the CSU faculty. In addition, J. D. Longwell, CSU Graduate Research Assistant was stationed in the Dominican Republic, and Kurt Rockeman, OSU Research Associate, was stationed in Honduras.

Ronald Tinnermeier
CSU Project Coordinator, and
Overall Project Coordinator
Small Farmer Credit Project

Daniel D. Badger
OSU Project Coordinator
Small Farmer Credit Project

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ENTERPRISE BUDGETS: A MULTIPLE USE DATA BASE FOR AGRICULTURAL BANKS IN DEVELOPING COUNTRIES

INTRODUCTION

An enterprise budget is a statement of the particular set of physical and financial production inputs required to obtain a specified quantity of production. It also includes the expected revenues and expenses associated with production of a particular product. Enterprise budgets for crop and livestock products provide the basic information required for economic analyses such as estimation of a farmer's loan repayment capacity, determination of cash flow, estimation of the need for borrowed capital over time, and determination of the most profitable investments in production capacity and alternative technologies. Although not emphasized in this report, enterprise budgets have major uses in more aggregate analyses such as for policy and development programs.

Enterprise budgets play an important role in institutions that finance agricultural production. Both the lender and the borrower need an ex ante estimate of production costs and returns to justify the planned activity and the financial transaction. The lending institution generally has a standard budget for each production enterprise which is compared to the client's actual estimated budget. In this manner a judgment can be made as to whether the client's production techniques, costs and returns are reasonable compared to the standard.

The principal focus of this report is the development and use of standard enterprise budgets in an agricultural bank. Although the emphasis is on the use of budgets in loan evaluation, additional uses such as whole farm analysis and training programs are discussed. The methodologies and applications of enterprise budgets were designed for the National Agricultural Development Bank of Honduras (Banco Nacional de Desarrollo Agricola) but the experience permits generalizations pertinent to agricultural development banks in other developing countries.

Before describing the new enterprise budgeting system designed for the Bank, it is useful to describe the system that existed prior. Identification of prior problems and technical deficiencies played an important role in the design of the new system.

THE PREVIOUS ENTERPRISE BUDGET SYSTEM

The Agricultural Development Bank in Honduras (referred to herein as the Bank) had previously used enterprise budgets to set upper limits on the amounts of money loaned per unit of land. An administrative procedure required the loan officer to prepare an estimate of production costs, enterprise by enterprise, for each loan applicant by means of a personal interview. This procedure helped establish the client's technical farming knowledge in addition to providing an estimate of enterprise costs and returns. The Bank would not finance production costs per unit of land in excess of the standard budget limit either by enterprise or in total for the farm, but a contingency allowance of 10% could be added to the total loan amount authorized. An example of the previous budget format is shown in Table 1.

TABLE I: OLD STANDARD BUDGET FOR ONE MANZANA OF BEANS[a]
High Technology Level

	Lempiras[b]
Soil Preparation	
Plowing	40
Disking	20
Cultivation Practices	
Seeding and fertilizing	23
Cultivating	36
Fumigating	6
Harvesting and transportation expenses	50
Materials	
Improved seed	36
Fertilizer (2 quintals)	40
Insecticides and fungicides	30
Contingencies	15
Direct Costs	296
Interest on loan (11%)	17
Administration expenses	15
Total	328

a) Estimated production = 20 quintals, and estimated gross revenue is 20 quintals x L. 24.00/qq = L. 480.00

b) One Lempira = $.50 US

In practice there were problems, discrepancies and deficiencies in this system, some of which are summarized in the following.

1. Standard budgets were not synthesized according to any uniform methodology. Sometimes they simply represented the best guess of an agronomist, sometimes they were recommended production practices obtained from other government agencies, sometimes they were the result of ad hoc farmer surveys, and usually they were combinations of all the above.

2. Standard budgets excluded fixed costs such as interest on investment or depreciation, and excluded some variable costs such as equipment maintenance.

3. Typically, only one standard budget was prepared for the entire country, thereby ignoring the differences in technology, crop yields and input costs. Standard budgets were prepared based on the highest production costs in the country so that the limit would be high enough for all regions. This resulted in unreasonably high loan authorizations and precluded use of the standard budgets as realistic references.

4. Standard budgets did not include information about the calendar of production operations, the physical amounts of inputs used, or the price per unit of input (Table 1). Only the operations or inputs and their costs per unit of land were listed. That practice precluded making simple changes in physical input-output coefficients or input prices.

5. There was no standard form or procedure for preparing a client's estimated production budget. At best the loan officer made a detailed budget including all physical input quantities and unit prices; at worst he simply copied the standard budget without interviewing the client.

6. There were no standard budgets for livestock or livestock products.

7. Since the budgets were neither representative nor complete, every time a special study or project had to be done the Bank personal had to go to the field to estimate new budgets.

Some of the items described were "problems" only in the sense that Bank procedures were not followed. For example, detailed elaboration of each client's production activities and costs is inefficient.

Loan evaluation would be more efficient if a good set of standard budgets were used as a reference in lieu of individual client budgets. Lack of a budget synthesis methodology and exclusion of fixed costs were not perceived as problems by the Bank, but are important for achieving caparability among budgets and providing Farm Management Training to loan officers. After assessing the problems and technical deficiencies in the existing system, the Bank's needs, and the technical level of Bank personnel, the following objectives and performance criteria associated with a new system were established.

THE NEW CROP BUDGETING SYSTEM

Objectives

The objectives of the budgeting system designed for the National Agricultural Development Bank are:

1. Provide information for loan evaluation, including estimation of credit needs for each enterprise and the whole farm, estimation of loan repayment capacity, determination of the timing of credit delivery and repayment, and identification of the managerial and technical levels of the client;

2. Provide information for training bank personnel in the loan evaluation topics mentioned in (1), and for analysis of investments in production inputs such as fertilizer, irrigation systems, and machinery;

3. Provide information which can be used to analyze credit policies, growth and survival of the farm firm, and the profitability of alternative production technologies.

Performance Criteria

The performance criteria established for the enterprise budgeting system are:

1. The methodology used to synthesize standard budgets must be simple enough for Bank personnel to understand and use,

2. The methodology must yield reasonably accurate, complete and reproducible results at low cost;

3. The budget processing mechanism must be rapid and flexible.

Budget Regions

Due to the great diversity in ecology, production technology and production costs in Honduras it was necessary to establish regional categories for crop budgets. The country was divided into 13 regions (excluding the eastern state of Gracias a Dios) according to ecological homogeneity and service areas of Bank branch offices. The areas are listed in Table 2, and the locations of the principal valleys in the various regions are shown in Figure 1. Even this level of regionalization is inadequate to cover the diversity of microclimates found in Honduras, but further partitioning would be more difficult and costly to manage. When significant differences in yields, practices or costs are found within a region, additional budgets can be synthesized to handle them.

Budgets are to be prepared for all crops financed by the Bank. One budget per crop per region is usually inadequate because production technology is highly diverse, ranging from the most rudimentary hillside agriculture to modern, mechanized production. Due to insufficient data, however, the effects of differences in input quality and quantity on crop yields among farms could not be established with precision. Furthermore, a specific set of inputs often results in very different crop yields because of uncontrolled locational variables such as soil and rainfall. For these reasons the budgets are not classified according to the level of production technology--i.e., from the input side. Instead, budgets are classified

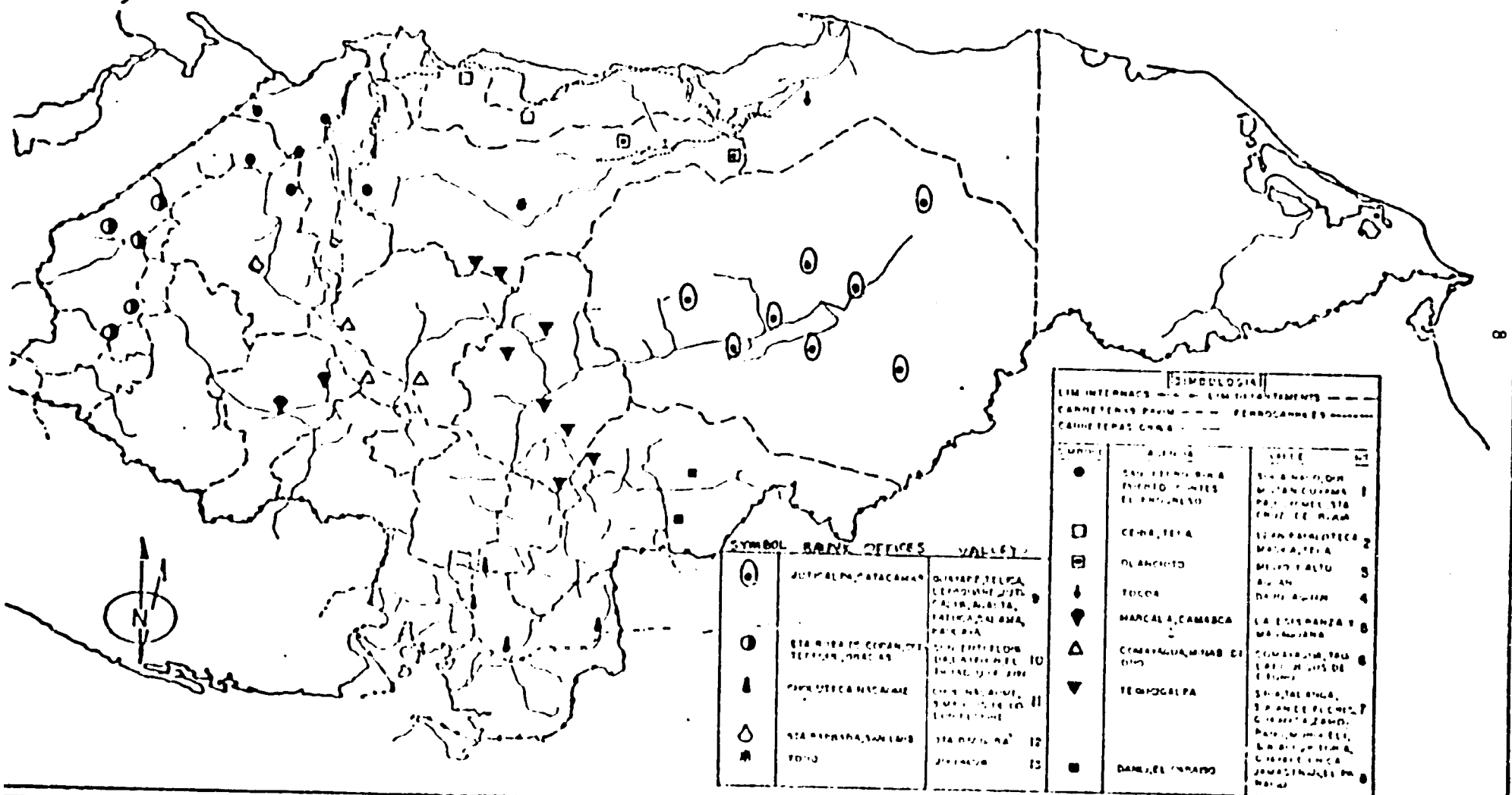
TABLE 2: GEOGRAPHIC REGIONS FOR PREPARATION OF CROP BUDGETS in Honduras

Region No.	Branch Offices	Principal Valleys
1	San Pedro Sula	Sula, Quimistán, Naco, Cuyamel
	Puerto Cortés	Santa Cruz de Yojoa
	El Progreso	
2	Tela and La Ceiba	Lean, Papaloteca, Masica, Tela
3	Olanchito	Olanchito (Medio and Alto Aguán)
4	Tocoa	Bajo Aguán
5	Marcala and Camasca	La Esperanza, Macaguara
6	Comayagua and Minas de Oro	Comayagua, Jesus de Otoro, Taulabé
7	Tegucigalpa	Siria, Talanga, Guaimaca, San Juan de Flores, Zamorano
8	Danlí and El Paraíso	Jamastrán, El Paraíso
9	Juticalpa and Catacamas	Guayape, Lenaguare, Juticalpa, Telica, Agalta Patuca, Salamá, Paulaya
10	Sta Rosa de Copán and Gualcupe	Sonsetí La Unión, La Entrada, Florida, Cerquín, El Paraíso
11	Choluteca and Nacaome	Choluteca, Nacaome, Pespire, San Marcos de Colón
12	Santa Bárbara and San Luís	Santa Bárbara
13	Yoro	Locomapa

Figure 1: Map of Budget Areas and principal Valleys in Honduras

PROYECTO DE CREDITO AL PEQUEÑO PRODUCTOR

ZONAS SELECCIONADAS PARA RECOPILACION DE INFORMACION BASICA.



according to yield per unit of land--i.e., from the output side. The inputs are representative of those used by farmers to achieve the given yield level in each region. Low, medium, and high yield categories for selected crops are shown in Table 3.

Yield categories were subjectively determined in a meeting with Bank loan officers (agronomists) from all 13 regions. The categories represent a compromise among the participants as to what comprised "average, low, and high" yields for the crops during the previous three years. Since the categories pertain to the entire country, all three yield levels are not necessarily found in a particular region. For example, high yield corn is not found in Santa Rosa de Copan, and low yield rice is not found in the Choluteca region.

Synthesis of Budget Coefficients

Information on the physical quantities of inputs required to produce a certain amount of product on one manzana of land (0.7 hectares) is obtained from interviews with farmers. A Bank loan officer selects five farmers in the region who recently obtained similar yields within a yield category. Each farmer is questioned about all of the practices, hired services and materials he uses. The final input-output coefficient is the arithmetic mean of five reported numbers, rounded off to the nearest tenth. The sample size of five farmers is arbitrary, but the five farmers are carefully selected from among Bank clients. Those selected must be known to be "average" with respect to the predetermined yield categories and associated production practices, and must be reliable sources of information. When a farmer reports a number which is unbelievable or which

TABLE 3: YIELD CATEGORIES FOR SELECTED CROPS IN HONDURAS[a]

(Quintals per manzana)

Crop	Low	Medium	High
Corn	<30	30-60	>60
Sorghum			
Native	<15	15-30	>30
Improved	<30	30-60	>60
Beans	<12	12-25	>25
Rice			
Irrigated	<50	50-80	>80
Dryland	<30	30-60	>60

[a]Clearly, the budget user must select an appropriate yield within the category if he wants to estimate receipts. For example, 30, 45, and 60 might be used for corn as representative yields for low, medium and high, respectively.

represents a situation unique to his farm, the loan officer omits that particular farmer from the sample and interviews another.

Each farmer interviewed also reports input prices for labor, contracted services and materials. These reported prices are verified using a separate program for collection of input prices [1]. Since input prices are generally uniform within a region, it is not usually necessary to compute the average of prices reported by the five farmers.

Fixed costs and variable costs not otherwise covered under the categories "labor, contracted services and materials" are designated "other costs." These "other costs" include (1) interest on operating capital used for variable inputs, and (2) ownership costs of equipment.

Interest on operating capital is calculated assuming that the producer must have all the operating capital required for a given month on the first day of that month. Interest is accumulated until harvest, at which time the product is assumed to be sold.

Ownership cost include interest on investment capital, depreciation and maintenance costs. The equipment required to produce a particular crop is determined by the loan officer from experience and from farmer interviews. The loan officer determines from the interviews which practices require farmers to supply their own tools and equipment, and which practices involve hiring equipment. For example, a typical producer of corn and beans medium-level yields in the Damastran Valley contracts plowing and does not own bullocks or a tractor. He owns a backpack insecticide sprayer for which he is charged depreciation, interest and maintenance. Sprayer ownership costs are estimated using the loan officer's knowledge and the information he obtains from the farmers. Assuptions

are made with respect to the type and cost of equipment, length of useful life, scrap value and other parameters. Assumptions and estimates are made following accepted farm management techniques. A detailed example of calculations appears in Appendix A.

Budget Format

The crop budget format has seven principal sections--labor, contracted services, materials, other costs, total cost, detailed other costs, and profitability analysis. Table 4 is a Spanish language example of the computer printout, and Table 5 is an English version of another budget. The first five sections almost always fit on one side of a page when computer-printed, and the last two sections always appear on the back of the page. The budget heading and subsequent sections are described in order.

The budget number is a five digit code. The first two digits identify the region, the second two identify the crop, and the last identifies the yield category (low, medium, high). The code key is in Table 6.

The budget title indicates the crop, yield level, expected average yield for one manzana of land, region, name of the loan officer who prepared the budget and the date of completion.

The labor section. This section begins with a footnote indicating the number of hours in a man-day in the region. A man-day varies from four to eight hours a day depending on the region. Each farming activity is listed in chronological order, with the month in which it occurs indicated in the left column. All labor required to perform a particular

TABLE 4: EXAMPLE OF A NEW CROP ENTERPRISE BUDGET

BANCO NACIONAL DE DESARROLLO AGRICOLA
PLAN DE INVERSION NO. 08021

RUBRO- FRIJOL BAJO MAIZ RENO BAJO 1200/MZ
REGION- CANJI EL PARAISO
PREPARADO POR- JOSE ROBERTO SIERRA

NO.MANZANAS _____

MANO DE OBRA -JORNALES A*	TOTAL UNID.	L/ UNID.	COSTO TOTAL	COSTO PROYECTO
AGT CHAPIA	1.5	3.50	5.25	
ACARREO DE AGUA	6.2	3.50	21.70	
AGT APLICACION DE HERBICIDAS	2.0	3.50	7.00	
SEPT COBLE Y DESHOJE DEL MAIZ	3.5	3.50	12.25	
SEPT SIEMBRA A BOROON	6.7	3.50	23.45	
OCT APLICACION INSECTICIDAS	7.2	3.50	25.20	
OCT 1A LIMPIA CON AZADON	8.2	3.50	28.70	
NOV 2A LIMPIA CON AZADON	7.1	3.50	24.85	
NOV APLICACION INSECTICIDA	1.8	3.50	6.30	
DIC ARRANCA	7.2	3.50	25.20	
DIC APORREO	5.0	6.00	30.00	
DIC ACARREO	0.4	3.50	1.40	
OTROS SERVICIOS CONTRATADOS				
AGT ACARREO DE AGUA BUEYES	0.2	12.00	3.00	
DIC ACARREO BUEYES	0.5	12.00	6.00	
MATERIALES				
AGT HERBICIDA	2.0 LT	14.50	29.00	
AGT HERBICIDA	2.0 LT	5.65	11.30	
SEPT SEMILLA CRIOLLA SELECCION	60.0 LB	0.40	24.00	
OCT INSECTICIDA	25.0 LB	0.80	20.00	
NOV INSECTICIDA	12.0 OZ	2.13	25.50	
SUB-TOTAL			330.10	
OTROS COSTOS				
INTERESES SOBRE CAPITAL ANUAL DE INVERSION 12%			10.61	
DE PROPIEDADES- INTERESES 12%			4.96	
DEPRECIACION			13.05	
MANTENIMIENTO			6.33	
COSTO TOTAL DE PRODUCCION			365.05	

A* JORNAL DE 6 HORAS

BANCO NACIONAL DE DESARROLLO AGRICOLA
PLAN DE INVERSION NO. 08021

RUBRO- FRIJOL BAJO MAIZ REND BAJO 1200/MZ
REGION- DANLI EL PARAISO
PREPARADO POR- JOSE ROBERTO SIERRA

COSTOS DE PROPIEDADES DETALLADOS

INFORMACION INICIAL

EQUIPOS	NO. UNID	COSTO INICIAL	VALOR RESIDUAL	VIDA UTIL	MZ/AÑO
MOCHILA	1.0	210.00	10.00	2.0 AÑ	60.0
SACOS -6-	1.0	9.00	0.00	2.0 AÑ	1.0
CERCA -4 MZ-	1.0	250.30	0.00	8.0 AÑ	4.0

COSTOS ANUALIZADOS

EQUIPOS	TOTALES INTER	TOTALES DEPREC	TOTALES MANTEN	POR MANZANA INTER	POR MANZANA DEPREC	POR MANZANA MANTEN
MOCHILA	13.20	100.00	5.00	0.22	1.67	0.08
SACOS -6-	0.54	4.50	0.00	0.54	4.50	0.00
CERCA -4 MZ-	16.80	27.50	25.00	4.20	6.88	6.25
TOTALES POR MANZANA				4.96	13.05	6.33

ANALISIS DE RENTABILIDAD DEL RUBRO

	PRECIO POSIBLE ESPERADO BAJO	MEDIO	ALTO	INGRESO CLIENTE
	32.00	43.50	55.00	
INGRESO BRUTO	384.00	522.00	660.00	
INGRESO NETO *	53.90	191.90	329.90	----------
INGRESO NETO **	15.56	157.56	295.56	----------

PRECIO NECESARIO PARA CUBRIR COSTOS VARIABLES 27.51
PRECIO NECESARIO PARA CUBRIR COSTOS TOTALES 30.37

* INGRESO BRUTO MENOS COSTOS VARIABLES
** INGRESO BRUTO MENOS COSTO TOTAL

TABLE 5: EXAMPLE OF A NEW ENTERPRISE BUDGET (IN ENGLISH)

BANCO NACIONAL DE DESARROLLO AGRICOLA
ENTERPRISE BUDGET NO. 11043

Enterprise: Rice, dryland, Medium yield 50 qq/mz
Region: Choluteca
Prepared by: Clemente Meras Cruz, 9/22/79

Labor (man-days) a/		Total Units	L/ Unit	Costs Total
Jun	clear brush	11.6.	3.00	34.80
Jul	seed/fertilizer	2.0	3.00	6.00
Aug	weed	11.6	3.00	34.80
Aug	Apply fertilizer	1.4	1.40	1.96
Aug	Apply fungicide and herbicide	2.2	2.20	4.84
Oct	Protect crop from birds	1.0	1.00	1.00
Other contracted services				
Jun	plow (1 time)	c	30.00	30.00
Jun	Disc (4 times)	c	12.00	48.00
Aug	Apply herbicide	c	7.50	7.50
Aug	Apply fungicide	c	7.50	7.50
Oct	Combine harvester	b	3.75	187.50
Materials				
Jun	Seed	2.0 qq	42.00	84.00
Jun	Fertilizer (formula)	2.0 qq	23.50	47.00
Jun	Urea	2.0 qq	23.50	47.00
Jun	Herbicide Stam LW-10	1.5 qq	32.50	48.75
Jun	Dipterex	1.1 qq	30.00	33.00
Jun	Lannate	1.0 qq	30.00	30.00
Jun	Benlate	1.0 lb	26.00	26.00
Sub Total				L. 679.65

TABLE 5 (continued)

ENTERPRISE BUDGET NO. 11043 (continued)

Other Costs

Interest on annual operating capital (12%)		23.35
Ownership costs:	Interest on investment (12%)	11.64
	Depreciation	38.07
	Maintenance	4.02
Total production cost/manzana		759.77

a Man-day = 6 hours
b Fixed cost per quintal
c Fixed cost per manzana

Detailed Ownership Costs

Initial Information

Equipment	No. Units	Initial Cost	Scrap Value	Useful Life	Manzanas/ Year
Backpack sprayer	1.0	225.0	15.00	2.0 years	120.0
Sacks (25)	1.0	60.0	0.00	2.0 years	1.0
Fence (4 manzanas)	1.0	480.0	48.00	15.0 years	4.0

Annualized Costs

Equipment	Totals			Per Manzana		
	Inter	Deprec	Maint	Inter	Deprec	Maint
Backpack sprayer	14.40	105.00	3.00	0.12	0.87	0.02
Sacks (25)	3.60	3.00	0.00	3.60	30.00	0.00
Fence (4 manzanas)	31.68	28.80	16.00	7.92	7.20	4.00
Totals per manzana				11.64	38.07	4.02

TABLE 5 (continued)

Profitability Analysis

	Possible price per unit			client's income
	low	medium	high	
	17.00	20.00	22.00	
Gross Revenue	850.00	1000.00	1100.00	
Net Income[d]	170.35	320.35	420.00	_____
Net Income[e]	91.27	241.27	341.27	_____
				_____

Price necessary to cover variable costs	13.59
Price necessary to cover total costs	15.17

[d] Gross revenue minus variable costs
[e] Gross revenue minus total cost

TABLE 6: CROP BUDGET CODES FOR THE NEW BUDGETING SYSTEM

	Grains
01	Corn
02	Beans
03	Sorghum
04	Rice
05	Soybeans
06	Sesame
07	Wheat
08	
09	Corn and Beans
10	Corn and Sorghum

	Vegetable Crops
11	Tomato
12	Potato
13	Onion
14	Cabbage
15	Yucca
16	Cucumber
17	Cantaloupe
18	Watermelon
19	Peppers
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	

	Specialty Crops
31	Cotton
32	Coffee
33	Sugar Cane
34	Tobacco
35	Castor Bean
36	African Palm
37	
38	
39	
40	

	Fruit Crops
41	Orange
42	Grapefruit
43	Tangerine
44	Lemon
45	Lime
46	Mango
47	Avocado
48	Cashew
49	Papaya
50	Banana - Plantain
51	Pineapple
52	Cocoa
53	
54	
55	

Yield Code
1 - Low Yield
2 - Intermediate Yield
3 - High Yield
4 -
5 - Irrigated
6 -
7 -
8 -
9 - Establishment

task is listed regarless of whether it is family or hired labor.[1] An exception is labor that accompanies certain contracted services such as tractor plowing, in which case the equipment owner provides the driver. The column heading "total unidades" is for the physical input-output coefficients, i.e., the number of man-days required to perform a certain task on one manzana of land.

The column heading "L/unidad" is the cost per unit of input expressed in Honduran currency (Lempira), where L1.00 = US $0.50. "Costo Total" is the total cost per manzana for the activity mentioned, or unit cost multiplied by the number of units required. The column headed "costo del cliente" is for writing in the actual estimated cost of the client when it differs from the standard budget (use of the budget is discussed subsequently).

The "other contracted services" section. This section includes rental of any service except labor unaccompanied by equipment or animals. Usually the equipment rental cost includes the operator. If the farmer supplies additional labor (family or hired) to accompany a contracted service, this labor would be listed in the labor section. It is therefore common to find the same operation listed in both sections. An example is planting, whereby the farmer or his hired hand accompanies the rented bullock team/driver through the field dropping seed into furrows as the soil is turned.

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[1]This procedure differs from that followed in budgets in commercial agriculture in developed countries. In that case residual returns (gross profits) are to operator labor and other owned resources. On small, low income farms, subsistence is critical and loans often cover family labor. In effect, the loan pays operator and family wages currently and allows for family living needs.

There are three common methods of charging for contracted services---by time, by the manzana of land, and by the unit of production. Tractor services are sometimes charged by the hour and sometimes by the manzana. Machine shelling of grain is usually priced on a weight unit basis (quintal). A footnote in the budget indicates the basis for the charge.

The materials section. Materials include seed, fertilizer, chemicals and some other direct production inputs. Lubricants, fuels and other materials that would classify as variable inputs are usually excluded because the Bank does not include them in a production loan. There is no rule for deciding which materials belong in the materials section and which do not. The proper names (brand names) of materials do not appear on the budget because the Bank thinks that people will interpret the budgets as recommendations, and brand favoritism is to be avoided by a public institution. The published budget book [2] contains a separate table identifying the materials by brand name for each budget.

The "other costs" section. The "other costs" section on the front of the budget page is a summary of the detailed section on the back side. Detailed information on the back side includes the ownership costs of interest, depreciation, and maintenance of equipment, but detailed calculation of interest on invested capital is excluded.

A required set of equipment, supplies and infrastructure is listed for the crop. In the case of corn the set might include a backpack sprayer, sacks for grain and a fence around the property. Using the calculation procedures described in Appendix A, the end result is cost on a one-manzana and one-crop basis.

The profitability analysis section. The last section indicates the net revenue per manzana of land that would result from selling the specified quantity of product at each of three hypothetical prices. High, low and medium historical prices for each region represent the combined judgments of the loan officers who work there; no historical price data are available for farm level transactions. Net revenue is calculated both including and excluding "other costs."

The second part of this section indicates the sale price per unit of product that would be required for the producer to exactly cover (1) only his variable costs (labor, contracted services and materials), and (2) his total cost. The latter is called a "breakeven price" because it corresponds to a net profit of zero after family and operator labor is paid.

Budget Processing

The Bank loan officer fills in a variable cost form (Table 7) during his interview with a client selected for inclusion in the sample. Then calculates the average coefficients from the five forms and sends the results to the central Bank office. He calculates ownership costs using the format in Appendix A, page 56, and sends it to the central office also. Interest on invested capital is calculated in the central office.

At the central office the budgets are reviewed to check for errors, omissions and any other problems. If there are problems or questions the loan officer is contacted for clarification. Once the budget is correct it is written on computer coding sheets for entering on a computer diskette. A sample coding sheet and budget are shown in Appendix B.

TABLE 7: COMPLETED VARIABLE COST QUESTIONNAIRE

BANCO NACIONAL DE DESAROLLO AGRICOLA

Enterprise Budget No. 18022

Enterprise: Beans, yield: Medium, 16 qq/Mz

Region: Olancho Producer: Roberto Sierra Area Planted: 7 manzanas

Prepared by: Ricardo Arias Date: 7/15/79

MONTH	LABOR (MAN-days)a/	Total Units	L/ Unit	Total Cost 7 mzs
August	Plant	12	3.00	36.00
August	Apply Fertilizer	12	3.00	36.00
Sept.	Apply Insecticide	7	3.00	21.00
Sept.	Weed	84	3.00	252.00
Oct.	Harvest	42	3.00	126.00
Nov	Haul	22	3.00	66.00

OTHER CONTRACTED SERVICES

July	Plow	tractor-hours	15	16.00	240.00
August	Disc	tractor-hours	7	14.00	98.00
August	Plant	bullock days b/	7	10.00	70.00

MATERIALS

August	Improved Seed	350 lbs.	0.50	175.00
August	Fertilizer (formula)	14 qq	23.50	164.50
Sept	Tamaron (insecticide)	5 liters	32.00	160.00

SUBTOTAL (Labor and Contracted Services and Materials) 1,444.50

OTHER COSTS

TOTAL COST OF PRODUCTION

a/ Man-day = 6 hours

The computer program is currently used primarily for budget storage and printing. The only computations it does are (1) multiplying cost per unit times total input used to obtain total cost, and (2) addition of costs to obtain the subtotal and total. Budgets are schedule to be revised and published manually.

Selection And Training Of Field Personnel

One loan officer in each of the 13 regions was initially selected to receive training and gather the information required to synthesize budgets. A four-day training session on budgets and budget program coordination was held, followed by numerous personal visits by project team members to the branch offices where the work was being done. The loan officers selected were among the best in the Bank, which greatly facilitated the work.

Additional training sessions were held for Bank loan officers, agronomists and credit analysts to teach them fundamentals of budgeting and to institutionalize the new budgeting system [3]. An outline of the enterprise budget section of the training course entitled "Economic Analysis of the Farm Firm" is in Appendix A, along with sample materials from that course. A second course entitled "Analysis of Agricultural Investments" built on the material taught in the first course; it included partial budgeting and livestock budgeting. A total of 112 Bank employees took the first course, and 53 of those also took the second course. Nine of the best students participated in teaching after taking the earlier sessions.

TABLE 8: LIST OF LIVESTOCK BUDGET REGIONS AND BUDGET CATEGORY CODES

GEOGRAPHIC REGIONS		PRODUCTS	OPERATION
Region	Branch Offices	Cattle	Size
01	San Pedro Sula	01 Dairy	1 Small
	Puerto Cortés	02 Beef	2 Medium
	El Progreso	03 Dual Purpose	3 Large
	Tela	04	4
	La Ceiba	05 Feeder	5
02	Olanchito	06	
	Tocoa	07	
	Yoro	08	
03	Comayagua	09 Purebred	
	Minas de Oro	HOGS	
	Tegucigalpa	11 Breeding	
04	Juticalpa	12 Feeders	
	Catacamas	13	
	Danlí	14	
	El Paraíso	15	
05	Choluteca	POULTRY	
	Nacaome	21 Chickens-Eggs	
06	Santa Rosa de Copán	22 Chickens-Broilers	
	Santa Bárbara	23 Chickens-Combinations	
	Ocotepeque	24	
	Gracias a Dios	25 Turkeys	
	San Luis	26	
	Marcala	27	
	Camasca	28	
		29	
		OTHER	
		31 Bees-Honey	
		32	
		33	
		34	
		35	

THE LIVESTOCK BUDGETING SYSTEM

Livestock budgets are synthesized using the same basic organizational structure and personnel used to prepare crop budgets, although fewer regions are identified (Table 3). A training course was held to instruct field personnel in livestock budgeting techniques. Selected loan officers were then asked to interview clients to obtain the information required for budget synthesis. Unlike crop budgets, livestock budgets were an entirely new concept for both Bank employees and for any agency in Honduras. Neither project nor bank employees knew what kind of results to expect, hence the program has been more difficult to implement than for crops. The following discussion concentrates on cattle and milk production.

Livestock Coefficients--Special Considerations

Livestock operations normally produce a variety of products (i.e. milk, calves, and cull cows) which must first be identified. Certain parameters must then be determined to identify the amount of production. These include the number of mature animals in the herd, birth, and death rates, the replacement rate of mature cows, the number of bulls and their useful life in the herd, average daily milk production per cow, and the average number of days a cow is milked during lactation.

Production costs consist of both variable and fixed costs. Variable costs include hired labor and the materials used up during one year, including materials use for maintenance of equipment and structures. Fixed costs include interest on investment capital and depreciation of equipment and structures utilized. Special care must

be taken to estimate the percentage of time that a particular structure or piece of equipment is used in the livestock operation when its use is divided among various enterprises. An example would be a tractor used for both crop production and pasture maintenance.

Methodology and Format

Budgets are classified according to the size of the operation. This classification implicitly includes both differences in technology and economies of scale. A listing of livestock budget classifications appears in Table 8.

Livestock budgets are identified with a five digit code similar to that used for crop budgets (Tables 9 and 10). The budget title includes the type and size of the operation, the region, the budget author and the date of preparation.

The first portion of the budget contains estimated annual production by product type, and estimated annual income from the sale of these products. The same items are also presented on a per-cow basis to facilitate estimation of costs and returns for various herd sizes.

Annual production costs are separated into labor, materials (including maintenance costs) and "other costs." Labor in terms of man-months is specified by type--milkers, common laborers, and managers. Materials include such items as salt and minerals, veterinary products (vaccines, medicines, and insecticides), supplemental feed, and maintenance materials.

"Other costs" include interest on annual operating capital, livestock investment capital, and capital invested in equipment and structures. Interest on annual operating capital for livestock was calculated by

TABLE 9: DUAL PURPOSE CATTLE BUDGET

BANCO NACIONAL DE DESARROLLO AGRICOLA
LIVESTOCK BUDGET NO. 05032

Enterprise: 100 Cow Dual Purpose
Region: Choluteca and Valley
Prepared by: Clemente Meraz Cruz

ANNUAL PRODUCTION

Product	Units Sold	Detail	Price Lps.	Total Income	Income per cow
Milk	83,160	Bottle	.31	25,779.60	257.80
Bull Calves	33	380 lbs	.53	6,646.20	66.46
Heifer Calves	20	340 lbs	.53	3,604.00	36.04
Cull Cows	11	900 lbs	.74	7,326.00	73.26
Herd Bull	.6	1280 lbs	.74	568.32	5.68
	Estimated Total Income			43,924.12	439.24

PRODUCTION COSTS

Labor (man months)	Total Units	L/ Unit	Total Cost	Cost per cow
Milkers	36	135.00	4,860.00	48.60
Common Labor	12	120.00	1,440.00	14.40
Manager	12	300.00	3,600.00	36.00
MATERIALS				
Salt and Minerals	a*	4.50	450.00	4.50
Veterinary Products and Medicine	a*	6.70	670.00	6.70
Supplemental Feed (sugar cane)	180 m.t.	1.20	216.00	2.16
Maintenance of Equipment and Improvements	-	-	1,747.00	17.47
OTHER COSTS				
Interest: 14% Annual Operating Capital			778.98	7.79
14% Livestock Investment Capital			11,396.00	113.96
14% Investment in Equipment and Improvements			2,879.10	28.79
Depreciation: Equipment and Improvements			1,836.00	18.36
TOTAL PRODUCTION COSTS			29,873.08	298.73
NET INCOME			14,051.04	140.51

TABLE 9: (CONTINUED)

BANCO NACIONAL DE DESARROLLO AGRICOLA
LIVESTOCK BUDGET NO. 05032

Enterprise: 100 Cow Dual Purpose
Region: Choluteca and Valley
Prepared by: Clemente Meraz Cruz

LIVESTOCK INVESTMENT

Type of Animal	No. Units	Value/ Unit	Total Investment	Investment per cow
Cows	100	700	70,000	700
Replacement Heifers	13	300	3,900	39
Herd Bulls	3	2,500	7,500	75
TOTAL LIVESTOCK INVESTMENT			L 81,400	L 814

EQUIPMENT AND IMPROVEMENTS FOR 100 COW UNIT

Detail	No. Units	Initial Cost	Salvage Value	Useful Life	Interest	Depre-ciation	Maintenance
Materials and Tools b*	-	800		10 years	56.00	80	-
Backpack Sprayer	1	210	20	5 years	16.10	38	5
Water Tank	1	500	50	15 years	38.50	30	10
Horses	3	1,200	150	5 years	94.50	210	108
Improved Pasture	-	20,000	5,000	20 years	1,750.00	750	1,000
Well	1	2,000	500	20 years	175.00	75	-
Milk House	1	1,200	240	20 years	100.80	48	24
Fences and Corrals c*	-	8,260	1,000	12 years	648.20	605	600
			TOTALS		2,879.10	1,836	1,747
		100 =	TOTAL/COW		28.79	18.36	17.47

Annual Rates

Weaning	66%	Mortality	2%
Replacement	13%	Bull/Cow	1/33

NOTES: Milk: 6 bottles/day for 210 days
Supplemental Feed: 3 lbs/day/cow - 60 days

a* Cost per cow
b* Includes all small tools
c* 70 Hectares with 14 pastures

TABLE 10: FEEDER CATTLE BUDGET

BANCO NACIONAL DE DESARROLLO AGRICOLA
LIVESTOCK BUDGET NO. 05053

Enterprise: 1000 Feeders - 6 months
Region: Choluteca and Valley
Prepared by: Clemente Meraz Cruz

PRODUCTION

Product	Units Sold	Detail	Price Lps.	Total Income	Income per animal
Feeders	980	666 lbs.	.64	417,715.20	417.72

PRODUCTION COSTS

Labor (man-months)	Total Units	Lps/ Unit	Total Cost	Cost per animal
Common Laborers	36	120.00	4,320.00	4.32
Foreman	6	150.00	900.00	.90
Manager	6	500.00	3,000.00	3.00
MATERIALS				
Purchase of feeders - a*	1,000	247.50	247,500.00	247.50
Salt and Minerals	-	-	1,300.00	1.30
Vaccine (2)	-	-	1,000.00	1.00
Insecticide	-	-	720.00	.72
Vitamins	-	-	490.00	.49
Urea	358 cwt.	29.75	10,650.00	10.65
Molasses	2220 barrels	20.62	45,830.00	45.83
Fuel and Lube	-	-	2,280.00	2.28
Maintenance of Equipment and Improvements	-	-	3,115.00	3.12
OTHER COSTS				
Interest: Operating Capital - 14%		2.58	2,576.53	2.58
Investment in feeders - 18%		22.27	22,274.00	22.27
Investment in Equipment and Improvements		5.54	5,536.76	5.54
Depreciation: Equipment and Improvements		4.36	4,364.45	4.36
TOTAL PRODUCTION COSTS			355,866.74	355.87
NET INCOME			61,848.46	61.85

TABLE 10: (CONTINUED)

BANCO NACIONAL DE DESARROLLO AGRICOLA
LIVESTOCK BUDGET NO. 05053

Enterprise: 1000 Feeders - 6 months
Region: Choluteca and Valley
Prepared by: Clemente Meraz Cruz

EQUIPMENT AND IMPROVEMENTS FOR 1000 FEEDER UNIT

Detail	No. Units	Initial Cost	Salvage Value	Useful Life	Interest	Depreciation	Maintenance
Materials	-	100	-	3 years	7.00	33.33	-
Tools	-	500	-	10 years	35.00	50.00	-
Feed Bunks	10	3,500	500	15 years	280.00	200.00	50
Tractor	.5	16,100	1,611	10 years	1,280.73	1,448.90	650
Pickup	.5	6,200	620	5 years	4,477.40	1,116.00	400
Improved Pasture	-	20,000	20,000	20 years	7,700.00	3,500.00	4,000
Horses	4	1,500	200	6 years	119.00	216.66	120
Corrals	-	200	-	6 years	14.00	20.00	10
Fences b*	-	13,720	3,000	5 years	1,170.40	2,144.00	1,000
		Annual Total			11,073.53	8,728.89	6,230
	÷ 2 = 6 Month Total				5,536.76	4,364.45	3,115
		Total/Animal			5.54	4.36	3.12

NOTES:

a* 280 Hectares of land with 14,000 meters of fence.

b* Each feeder weighs 450 lbs. at L.54/lb.

summing the costs of labor and materials, dividing by two to determine the average annual operating capital during the production period, and multiplying by the current rate of interest charged on livestock loans (14% in the examples).

The back side of the budget shows the total livestock inventory, values, and total livestock investment. Interest on livestock investment capital is calculated by multiplying total livestock investment by the interest rate. An inventory of all equipment and structures used by the operation in the production process is also presented, with corresponding initial cost, salvage value, useful life, and annual interest, depreciation and maintenance costs. These costs are presented on the front page in summary form. Finally, the production parameters of the operation (annual rates) are presented for reference.

The livestock budget program was carried only through the methodological development and training stages. Completion of budgets on a nationwide basis and integration of budgets into the loan evaluation system are the responsibility of the Bank.

RESULTS AND UTILIZATION

The first round of enterprise budget preparation yielded 163 grain budgets which were published in a book entitled Planes de Inversion para Granos Basicos: 1980 [2]. Plans call for publication of this book annually by the Banco Nacional de Desarrollo Agricola. Similar publications for non-grain crops and livestock are planned for the future. This first book of enterprise budgets for Honduras was eagerly received by the Bank, government and educational groups.

The Use of Budgets in Loan Evaluation

Ultimately, the Bank's loan evaluation procedure will use standard budgets directly and eliminate (individual) custom-made budgets for each client. This might not be advisable for large loans, but the majority of the Bank's loans are small amounts which are relatively expensive to administer. Although revised procedures were not completed when the project ended, the expected system is described below.

The Bank loan officer will interview the prospective client to determine which standard budgets pertain to his situation. If there is reason to believe that the client's expected costs and returns are significantly different from the standard budgets, then some detailed questioning and adjustment of standard budget figures will be necessary. If differences are minor the loan office will simply use the standard budget numbers to calculate expected farm credit needs and loan repayment capacity. Bank policy concerning the relationship between loan amount and expected receipts would then have to be applied to decide whether the loan would be made or not.

An interim experiment with standard budgets was initiated in January, 1980 in the region of Choluteca. Each potential client was interviewed in detail about his production costs as the Bank had always done. However, in the experiment the loan officer wrote the name of the client on a copy of the standard budget, indicated the total amount of land to be planted, and entered cost totals in the right-hand column if the client's estimated cost for a particular operation differed from the standard. Using this procedure, interview time was reduced approximately 75%, and office typing of each budget was eliminated. Standard budgets for the region proved to be very accurate, with cost differences rarely exceeding 5% of the standard budget amounts.

Copies of the standard budgets are included in the Manual Pericial [4] -- a compendium of data used as a reference source in loan application processing. Each loan officer, credit analyst and supervisor has a copy of this looseleaf binder which includes copies of all the standard budgets in the region, a current list of input prices, a table of historical monthly product prices at the farm level, and various other information. The intent is that the Bank update this field manual regularly so that it can be used as a ready reference.

In January of 1980 the Bank's Board of Directors officially approved the new grain budgets for Bank use. Subsequently, Credit Division managers decided how the budgets would be used to establish upper limits on loan authorizations per unit of land. The decision was that the loan could exceed total (variable) cost indicated on the standard budget by up to 10%, with written justification by the loan officer. Routine adjustments in production costs due to input price changes will be authorized as they occur, leaving the 10%

difference to serve as a true contingency amount. Since all labor is included in the standard budgets at the prevailing wage, and since unpaid family labor is used on most farms, the loans are often substantially more than out-of-pocket cash expenses.

Other Budget Applications

The Standard budgets were used repeatedly in training courses for Bank and non-Bank personnel. Training topics that employ budgets include cash flow analysis, loan repayment capacity, and partial budgeting analysis of investments in production inputs. Training programs are discussed at length in a separate publication [3].

Bank personnel and other government institutions are beginning to use the budgets for various kinds of economic analysis and policy formulation. For example, the National Agricultural Marketing Institute used them to set national grain support prices in 1979 and 1980. The Central Bank requested livestock budgets to estimate the profitability and national impact of a World Bank project for cattle production.

Budgets are particularly useful for agricultural policy analysis. For example, the Bank can consult Table 11 to help estimate demand for corn production credit by region. Production costs are only part of the profitability equation, but Table 12 can be used to compare net revenue per manzana of land at different hypothetical price levels. For example, the Bank initially might be suspicious of lending L590 (variable cost) per manzana for high yield corn production in La Ceiba when the variable cost of production in Tocoa is only L377. Looking at net

incomes in Table 12, however, La Ceiba yields a greater net income per manzana (L530) than Tocoa (L462) at a product price of L14 per quintal of grain. The National Marketing Institute (IHMA) can compare breakeven prices in Table 13 to help determine an equitable government purchase price. A price of L8.00 per quintal would not even cover variable production costs of medium-yield corn in Danli, but producers in Santa Barbara would make a profit on that price. Furthermore, in many regions the high-yield technology is the most profitable, so a given price will help the relatively prosperous farmers more than the poorest farmers who use low level technology. These issues and many more can be studied using summary tables of budget information.

TABLE 11: SUMMARY OF CORN PRODUCTION COSTS BY REGION AND YIELD CATEGORY

SUMARIO DE COSTOS DE PRODUCCION DE MAIZ

Lempiras/Manzana

	Región	Low Yield		Medium Yield		High Yield	
		Variable Cost	Total Cost	Variable Cost	Total Cost	Variable Cost	Total Cost
1.	San Pedro Sula	231.30	314.07	368.00	438.92	373.00	446.29
	Puerto Cortés	231.20	285.62	317.00	368.25	429.00	485.64
	El Progreso	224.60	281.14	470.10	566.23	452.36	547.38
2.	La Ceiba	207.48	264.24	372.00	441.61	590.00	677.65
	Tela	186.00	236.93	421.00	521.94		
3.	Olanchito	246.00	316.45	341.60	415.87		
4.	Tocoa	220.00	297.96	261.00	341.81	377.50	470.41
5.	Marcala y Camasca						
6.	Comayagua y Minas de Oro	223.75	299.54	417.25	484.06	576.50	656.19
7.	Tegucigalpa	193.65	246.72	325.00	412.67	387.80	473.77
8.	Danlí y El Paraíso	210.08	249.35	383.80	436.85	492.35	552.13
9.	Juticalpa y Catacamas	273.92	338.29	293.40	382.02	403.20	489.90
10.	Sta.R. de Copán	257.00	355.05	365.50	477.19	461.00	583.35
	Ocotepeque	370.60	465.22	384.30	485.47		
11.	Choluteca y Valle	121.30	159.72	269.03	319.97		
12.	Sta. Bárbara y San Luis	270.00	316.04	258.00	306.74	396.00	445.75
13.	Yoro	263.15	357.14	388.20	494.85	569.00	704.15

TABLE 12: SUMMARY OF EXPECTED NET INCOME FROM CORN PRODUCTION BY REGION AND YIELD CATEGORY

SUMARIO DE LA RENTABILIDAD DE MAIZ

Net Income (Lempiras/manzana)

Región	Assumed Price L.40	Low Yield Excluding O/costs[a]	Low Yield Including O/costs	Medium Yield Excluding O/costs	Medium Yield Including O/costs	High Yield Excluding O/costs	High Yield Including O/costs
1. San Pedro Sula	14.00	104.70	21.93	245.06	150.53	459.20	385.81
	17.00	276.70	93.93	377.06	282.53	639.20	565.81
	20.00	348.70	165.93	509.06	414.53	819.20	745.81
Puerto Cortés	10.00	69.80	14.38	133.00	81.75	171.00	114.36
	15.00	216.80	164.38	358.00	306.75	471.00	414.36
	20.00	368.80	314.38	583.00	531.75	771.00	714.36
El Progreso	14.00	111.50	54.86	29.90	- 66.23	347.64	252.63
	17.00	183.50	126.86	229.90	133.77	667.64	572.63
	20.00	255.50	198.86	529.90	433.77	1147.64	1052.63
2. La Ceiba	10.00	48.52	- 8.24	79.00	9.39	210.00	122.35
	14.00	168.52	111.76	279.00	209.39	530.00	442.35
	20.00	348.52	291.76	579.00	509.39	1010.00	922.35
Tela	10.00	4.00	- 36.93	79.00	- 21.94		
	14.00	84.00	43.07	279.00	178.06		
	20.00	204.00	163.07	579.00	478.06		
3. Olanchito	11.00	69.00	- 1.45	318.40	259.73		
	14.00	159.00	88.55	498.40	439.73		
	17.00	249.00	178.55	678.40	619.73		
4. Tocoa	10.00	80.00	2.04	139.00	58.19	222.50	129.59
	14.00	200.00	122.04	299.00	218.18	462.50	369.59
	20.00	380.00	302.04	539.00	458.19	822.50	729.59
5. Marcala y Camasca							
6. Comayagua y Minas de Oro	10.00	26.25	- 49.54	82.75	15.94	223.50	133.81
	14.00	126.25	50.46	282.75	215.94	543.50	453.81
	20.00	276.25	200.54	582.75	515.94	1023.50	933.81

[a] O/costs refer to the "other costs" section of the enterprise budget.

TABLE 12: Continued

SUMARIO DE LA RENTABILIDAD DE MAIZ

Net Income (Lempiras/manzana)

Región	Assumed Price L./cc	Low Yield Excluding O/costs	Low Yield Including O/costs	Medium Yield Excluding O/costs	Medium Yield Including O/costs	High Yield Excluding O/costs	High Yield Including O/costs
7. Tegucigalpa	8.00	- 49.65	-102.72	27.00	-60.67	92.20	6.23
	12.00	22.35	-30.72	203.00	115.33	332.20	246.23
	16.00	94.35	41.28	379.00	291.33	572.20	486.23
8. Danlí y El Paraíso	12.00	65.92	26.65	156.20	103.15	237.65	176.87
	16.75	175.17	135.90	369.95	316.90	522.65	461.87
	21.50	284.42	245.15	583.70	530.65	807.65	746.87
9. Juticalpa y Catacamas	11.00	45.08	-19.29	201.60	112.98	256.80	170.10
	14.00	132.08	67.71	336.60	247.98	436.80	350.10
	18.00	248.08	183.71	516.60	427.98	676.80	590.10
10. Sta.R.de Copán	10.00	- 57.00	-155.05	-15.50	-127.29	139.00	16.35
	14.00	23.00	-75.05	124.50	12.81	379.00	256.35
	20.00	143.00	44.95	334.50	222.81	739.00	616.35
Ocotepeque	10.00	-140.60	-235.22	25.70	75.47		
	14.00	- 46.60	-143.22	189.70	88.53		
	20.00	29.40	-65.22	435.70	334.53		
11. Choluteca y Macaome	11.00	98.70	60.28	93.97	43.03		
	13.00	138.70	100.28	159.97	109.03		
	15.00	178.70	140.28	22..97	175.03		
12. Sta.Bárbara y San Luis	12.00	18.00	-28.04	282.00	233.26	324.00	274.25
	16.00	114.00	67.96	462.00	413.26	564.00	514.25
	20.00	210.00	163.96	642.00	593.26	804.00	754.25
13. Yoro	10.00	36.85	-57.14	11.80	-94 85	291.00	155.85
	14.00	156.85	62.86	171.80	65.15	635.00	499.85
	20.00	336.85	242.86	411.80	305.15	1151.00	1015.85

TABLE 13: BREAKEVEN PRICES FOR CORN PRODUCTION

PRECIO EQUILIBRIO PARA MAIZ
Lps./qq

	Región	Low Yield Excluding O/costs[a]	Low Yield Including O/costs	Medium Yield Excluding O/costs	Medium Yield Including O/costs	High Yield Excluding O/costs	High Yield Including O/costs
1.	San Pedro Sula	9.64	13.09	8.43	10.58	6.30	7.52
	Puerto Cortés	7.71	9.52	7.04	8.19	7.15	8.09
	El Progreso	9.35	11.71	9.40	11.32	5.65	6.84
2.	La Ceiba	8.38	10.27	8.42	9.81	7.38	9.47
	Tela	9.80	11.85	8.42	10.44		
3.	Olanchito	8.20	10.54	5.63	6.93		
4.	Tocoa	7.33	9.93	6.53	8.55	6.29	7.84
5.	Marcala y Camasca						
6.	Comayagua y Minas de Oro	8.95	11.98	8.35	9.68	7.21	8.12
7.	Tegucigalpa	10.75	13.70	7.38	9.37	6.46	7.90
8.	Danlí y El Paraíso	9.13	10.84	8.53	9.71	8.04	9.05
9.	Juticalpa y Catacamas	9.44	11.66	6.52	8.48	6.72	8.16
10.	Sta.R.Copán	12.85	17.75	10.44	13.63	7.68	9.72
	Ocotepeque	16.11	20.23	9.37	11.84		
11.	Choluteca y y Valle	6.06	7.98	8.15	9 69		
12.	Sta. Bárbara y San Luis	11.25	13.17	5.73	6.82	6.60	7.43
13.	Yoro	8.77	11.90	9.71	12.37	6.62	8.19

[a] O/costs refers to the "other costs" section of the enterprise budget.

EVALUATION OF THE BUDGET WORK IN HONDURAS

Development and implementation of the new enterprise budgeting system in the Bank was greatly facilitated by the approach selected. First, project personnel worked intensively with several loan officers from a branch office. Experimentation on a limited scale allowed development of methodologies while gaining experience and confining errors before taking the system to other regions. Additional benefits were that excellent rapport and cooperation were established with field personnel; their support made it easier to convince higher Bank administrators of the value of the new system. Working up from the bottom of the organizational chart also helped avoid designing a system which would appear to be theoretically sound but which might have failed in practice. In general, the approach used in this project is recommended as a model which other technical assistance efforts should consider.

Personnel Requirements

The educational level of Bank loan officers was a three-year course in general agriculture following completion of high school. Training courses revealed that the loan officers were satisfactorily trained in agronomy, somewhat lacking in mathematics and untrained in economic principles. Mathematical ability was particularly indicative of prior training; in one memorable practical exercise 15 of 17 participants multiplied three numbers in series and obtained a positive product, even though one of the numbers was zero.

Bank employees typically showed eagerness to learn the topics included in training sessions. The common response in course evalua-

tions was that (1) the courses were too short, and (2) the courses were the most useful they had ever had in the Bank. The reasons for such positive response were that the courses included topics directly applicable to their work, they did numerous practical exercises, and participation in discussions was emphasized. In general, training courses proved to be a vital part of getting cooperation and assistance, improving the skills of Bank employees and institutionalizing the budgets.

The principal personnel difficulty was getting the loan officers' time. Branch offices were typically short of loan officers, resulting in a heavy client load per man. Preparation of budgets was often delayed, training courses were postponed, and work was not thoroughly done in some cases due to lack of time. The only long term solutions are more loan officers, more efficient use of loan officers and commitment to data collection efforts which make overall Bank operations more efficient. Pay scales and work incentives need managerial attention.

Data Quality

The quality of enterprise budget data varies from author to author. Critical points in budget synthesis are sample selection and the personal interview. If the loan officer does not properly handle these tasks, resulting budget inadequacies might not be discovered until someone challenges the resulting budget figures. It is important to know the key loan officers well, because knowing the man will eventually give an idea of the quality of his work.

Preliminary indications were that the enterprise budgets developed in Honduras were adequately prepared. Agronomists from other institutions criticized some of the input-output coefficients, but no one

was willing to provide alternative figures obtained using project methodology. The typical response was unquestioned acceptance either because of ignorance, confidence in our abilities, or politeness. There is little doubt that interest, depreciation and maintenance costs were unchallenged because few people knew how to calculate them.

The best method of budget verification used in the project was the expirement in Choluteca described earlier in which budgets were used in client interviews. Continued client interviews using the standard budget as a guide will quickly reveal deficiencies if they exist. This verification procedure is recommended before the standard budgets are widely distributed for reference.

Institutional Organization

The Agricultural Development Bank in Honduras was undergoing complete reorganization during the last three months of the SFC project, hence the ultimate location of responsibility for updating and improving the standard budgets was uncertain. Bank administrators agreed to establish a work unit called the "farm data analysis unit" which has other responsibilities in addition to budget preparation.

Some general recomendations were made with respect to the composition, organization and responsibilities of the Unit.

1. The Unit should have a director or head with economic training, and at least part of the team should have some background in agronomy.

2. The Unit should have some responsibilities associated with use of the budgets, in addition to preparation. These responsibilities could include training courses, policy analysis or special economic studies.

3. There should be periodic rotation of personnel in the Unit to train them in farm management techniques.

4. Organizationally, the Unit should be "staff" rather than "line". This recommendation is based only on experience in one Bank, but the general case in other institutions might be similar. Line departments such as Credit Operations tend to be completely immersed in routine functions, leaving little time for the kind of organization and long run objectives pursued in the budget generating process.

Budget Storage and Revision

Budgets in the Bank currently are stored on computer diskette and printed as needed. A commercial printer makes copies from the computer printout which are distributed to branch offices from the central office. Budgets are to be revised annually; the date of revision is linked to the time when loan applications are solicited for certain products.

There is great potential for computerization of storage, retrieval, revision and printing of budgets. Eventually it might be possible to develop a simplified version of the Oklahoma State University Budget Generator. Care must be taken not to generate an excess of information on each budget; the more complex the output the less it will be understood and used. The enterprise budgeting system is considered "appropriate technology" for the setting in which it is to be used.

Needed Work

Most of the problems associated with budget preparation in Honduras are similar to those in the United States, but some are unique to an economic underdevelopment situation. The principal topics in which additional work is needed in Honduras are described below.

1. Definition of terms. A variety of names exist for a given farming activity, resulting in some confusion to the reader unfamiliar with Honduran regional vocabulary. Standardization of terms and preparation of a glossary is needed.

2. Verification. A systematic scheme for budget verification should be implemented. The experiment described in Choluteca could be institutionalized in all regions to accomplish this task.

3. Determination of yields. Agricultural census data are inadequate to establish useful crop yield categories, and farmers often do not know or do not remember their historical yields. It is even difficult to define "yield" because of the leakage to handling losses, family and animal consumption, and other miscellaneous disappearance. Cooperation with the Ministry of Natural Resources (Agriculture) is needed to establish a scientific sampling procedure in each region.

4. Determination of labor wage. Wages for hired labor usually involved transfer of cash, but there are frequently complications for the economics. For example, the laborer is often provided lunch in addition to his cash wage, which usually consists of tortillas, beans and rice with a value of approximately U.S. $0.25. But the laborer must often supply his own hand tools such as machete and hoe. Net wage rates need to be studies more thoroughly.

5. Livestock value. The value of an animal varies widely depending on how one asks the question, the seller's reputation for animal quality, the number of animals sold, and the distance from the market. Except for a few packing plants that pay by weight, values are difficult to determine on a standard basis.

6. Non-commercial enterprises. Most farms have miscellaneous tree crops and animals which are not of commercial significance, but which add to a farm family's real income. Budgets were not prepared for these products because of the enormous task of preparing budgets for all the enterprises the Bank already finances, but an effort should be made to generate budgets for minor enterprises as well.

7. Rounding off numbers. There is a tendency for farmers and loan officers to round off numbers to the nearest whole unit. If rounding is from $26.43 to $26.00 for fertilizer it doesn't matter very much, but when man-days are rounded off from 1.3 to 1.0 the percentage error is large.

8. Farm records. A limited number of farm record books could be managed by Bank loan officers to help verify budget coefficients.

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APPENDIX A

ENTERPRISE BUDGET TRAINING PROGRAM:

OUTLINE AND SELECTED MATERIALS

OUTLINE
TRAINING COURSE ONE
ECONOMIC ANALYSIS OF THE FARM FIRM

1. INTRODUCTION

A. Objectives of the course

(1) Learn the theory of variable and fixed costs of production.

(2) Learn how to prepare and interpret crop budgets.

(3) Learn to use budgets in loan evaluation.

(4) Learn to prepare and interpret farm firm cash flow.

B. Review and discussion of the Bank's traditional enterprise budgeting system.

(1) Physical quantities of inputs used are not indicated, precluding simple adjustment for price or input quantity changes.

(2) Communications between loan officers and credit analysts are inefficient because of the absence of physical input information on the budgets.

(3) There is no existing standard for preparing individual client budgets, resulting in large differences in estimates of physical inputs, costs, and revenues among clients and among loan officers.

(4) Actual differences among regions and technologies are obscured by the fact that there is only one standard budget for each crop for the entire country.

C. Review of the advantages of the new budgeting system

(1) Budgets are classified by region and by yield level, resulting in greater accuracy.

(2) Budgets include all physical input quantities and unit prices, eliminating the problems of adjustments, communications and realism.

(3) Budgets are more accurate, permitting their direct use as a reference for loan evaluation and other economic studies.

D. Review of basic economic concepts

(1) Variable costs

(2) Fixed costs

(3) Opportunity cost

(4) Enterprise budget

2. VARIABLE COSTS OF PRODUCTION

A. Definition of variable costs in agricultural production

(1) Length of time during which the input is used

(2) Examples of veriable costs

(3) Examples of variable costs traditionally ignored in Bank loans

(4) Objectives of this lecture

(a) Learn theory of variable cost

(b) Learn to synthesize variable costs for an enterprise budget using the new methodology.

B. The New Methodology

(1) Budget Codes

Interpretation of enterprise budget codes (crops).

(2) Yield level categories

(a) How and why the yield level categories are determined.

(b) The link between yield level categories and production technology.

(c) Placement of a client in a yield level category.

(3) Definition of production.

How should we define "yield?"

(4) Components of variable costs

(a) Labor

(a-1) Definition of man-day.

(a-2) Activities included: planting, weeding, harvesting, etc.

(a-3) Estimation of labor requirements per unit of land using questionnaires.

(a-4) How to determine man-day equivalent of child labor.

(a-5) Identification of work calendar.

(a-6) Determination of labor wage, including non-cash remuneration.

(a-7) How to treat managerial time.

(a-8) How to handle labor that accompanies a contracted service.

(b) Contracted Services (other than labor)

(b-1) Definition of a "contracted service." Give examples of tractor or bullock plowing, grain dryer rental, transportation.

(b-2) Estimation of physical input-output coefficients.

(b-3) How to handle costs incurred per unit of land, per unit of product, and per unit of time.

(b-4) Valuation of services not paid for in cash.

(b-5) How to determine average cost in the region.

(c) Materials.

(c-1) Specification of generic names and trade names.

(c-2) Specification of units and costs per unit.

(c-3) Estimation of average input quantities.

(c-4) Valuation of materials not purchased (e.g., seed).

(5) Estimation of variable costs -- other issues.

(a) Selection of a sample of farmers for questioning, considering,

(a-1) reliability of information.

(a-2) "typicalness" of production activities.

(a-3) geographic dispersion.

(b) Calculation of the input-output coefficients.

(b-1) The arithmetic mean.

(b-2) Rounding off to the nearest 0.1.

(c) Determination of input costs.

(c-1) Labor costs that vary by season.

(c-2) Materials costs excluding transportation.

(c-3) Inputs that are not used when purchased.

(c-4) Verification of reported input costs.

(d) Alternatives for handling "outliers."

(d-1) What is an "outlier?"

(d-2) Making the decision to accept or reject the coefficient.

(d-3) Substitution of another producer.

(e) Interview techniques.

(e-1) The questionnaire.

(e-2) Explanation to the farmer.

(e-3) Determination of crop yield category.

(e-4) Phrasing questions to farmers.

(e-5) Double checking.

(e-6) Follow-up

(f) Review of the Budget Methodology handout (attached)

C. Practical exercise in estimation of variable costs

The participants gather in small work groups for the practical exercise. Each group receives five different completed questionnaire forms which supposedly came from farmer interviews. (An example of a completed questionnaire form is shown.) Each group calculates the arithmetic averages of the reported observations to obtain coefficients for a final enterprise budget.

The completed questionnaire forms intentionally contain some problems which must be solved by the group. These include:

1. One farmer reports very low labor use for harvesting relative to other farmers;

2. One farmer hires bullocks for plowing whereas the other four hire a tractor;

3. Two farmers purchase seed and three use their own stock;

4. The reported purchase price of fertilizer is different among farmers for the identical product.

3. OTHER COSTS OF PRODUCTION

A. Interest

(1) Interest is paid on operating capital up to the Bank's loan repayment deadline. (March 31 for grains). There are two methods of calculation.

(a) $\frac{\text{Total Cash Cost}}{2}$ x interest rate x $\frac{\text{No. months of production loan}}{12}$

This average investment is easy to use but inaccurate when the amounts invested differ from month-to-month.

(b) Cost per month x interest rate x $\frac{\text{No. months of production loan}}{12}$

This method is used by the Bank.

Example: Monthly costs of producing corn are indicated below. The annual rate of interest is 12%, and the loan is paid off March 31.

DATE	NUMBER OF MONTHS	COSTS	INTEREST
April	12	180.00	21.60
May	11	255.00	28.05
June	10	430.00	43.00
July	9	-	-
August	8	200.00	16.00
September	7	90.00	6.30
October	6	-	-
November	5	175.00	8.75
December	4	220.00	8.80
		1,550.00	132.50

Sample Calculations

April $180 \times 0.12 \times \frac{12}{12}$ months = 21.60

June $430 \times 0.12 \times \frac{10}{12}$ months = 43.00

Using the first method we would have obtained

$$\frac{1,550}{2} \times 0.12 \times \frac{12}{12} = 93.00$$

which understates actual interest costs in this case.

(2) Interest on Invested Capital

A producer has money invested in equipment and infrastructure such as bullocks, a plow, fences, irrigation pipe, storage buildings, etc. There is an opportunity cost associated with the money invested.

We will use the simplest method.

Interest on invested capital = ½ (initial cost + residual value) x interest rate

Examples	Initial Cost	Scrap Value	Average Value during life	Interest rate (10%)	Interest
1. Backpack sprayer	125.00	5.00	$\frac{125+5}{2} = 65$	x .10 =	6.50
2. Pair bullocks	1,000.00	800.00	$\frac{1000+800}{2} = 900$	x .10 =	90.00
3. Irrigation System					
Pump	2,000.00	200.00	1,000.00	.10	110.00
Pipe	500.00	10.00	255.00	.10	25.50
Permanent canals	1,000.00	-	500.00	.10	50.00
Land leveling	200.00	-	100.00	.10	10.00
			1,955.00		195.50

B. Other costs of ownership

The costs of owning and using tangible assets include depreciation and maintenance, in addition to the interest on invested capital (already discussed).

(1) Depreciation is calculated as the loss in value of the asset during one year of its useful life. The useful life of an asset is influenced by;

(a) Intensity of use of the item;

(b) Physical environment, such as weather and soils;

(c) The quality of maintenance of the item;

(d) The care or abuse of the item by the operator;

(e) Quality of the item at the outset;

(f) The amount of time it takes to become obsolete.

Straight line depreciation is the simplest form of depreciation to calculate. It assumes that the loss in value is equal for each year of useful life of the item.

$$\text{Annual depreciation} = \frac{\text{Initial cost} - \text{Residual Value}}{\text{No. of years of useful life}}$$

Example of Irrigation System

Equipment	Cost	Scrap	Years Life	Annual Depreciation	Annual Maintenance
Pump	2000	200	5	360	120
Pipe	500	10	10	49	40
Canals	1000	-	10	100	100
Land leveling	200	-	10	20	-

(2) Maintenance costs are the costs of replacement parts and maintenance labor used in one year. Technically, these are variable costs, but they are not included in the Bank's traditional enumeration of variable costs on the enterprise budgets.

C. Assignment of Costs to One Unit of Land

Enterprise budgets are prepared on the basis of one manzana of land, so use of equipment and other assets must be expressed on a per-manzana basis. This task is complicated by the fact that some kinds of equipment are used for a variety of different jobs (e.g. a tractor) or crops (e.g., sprayer).

Calculation of Costs Per Manzana

(1) Define the useful life of the item.

(2) Define how many units of land could be handled in one year with the equipment, given its useful life.

D. Example

Appendix Table A-1 provides an example of calculation of "other costs" for corn production budget.

APPENDIX TABLE A-1

CALCULATION OF "OTHER COSTS" OF CORN PRODUCTION

No. Units	Materials	1 Initial Cost	2 Scrap Value	3 Average Investment	4 Interest on Investment 12% Year	5 Useful life	6 Annual Deprec.	7 Maintenance cost	8 #/Mzn. Year	9 % assignment Mz.	10 Annual Interest Mz.	11 Depreciation Mz.	12 Maintenance Mz.
2	Hoe	9.00	-	4.50	.54	2	4.50	-	8	.125	.135	1.125	-
1	Machete	6.00	-	13.00	.36	2	3.00	-	6	.166	.179	1.494	-
1	Backpack sprayer	150.00	-	75.00	9.00	4	37.50	2	100	.01	.09	.375	.02
1	Sacks (25)	37.50	-	18.75	2.25	2	18.75	-	1	1.0	2.2[illegible]	18.75	-
1	Fence (5 Mzn)	600.00	50.00	325.00	39.00	20	27.50	50.00	5	.2	7.80	5.50	10.00
2	Bullock	600.00	500.00	550.00	66.00	5	20.00	100.00	80	.0125	1.65	.50	2.50
											12.10	27.74	12.52

COLUMN	FORMULAS
3	Average Investment = $\frac{\text{Col. 1} + \text{Col. 2}}{2}$
4	Annual Interest = Col. 1 x Rate of Interest
6	Annual Depreciation $\frac{\text{Col. 1} - \text{Col. 2}}{\text{Col. 5}}$
9	% Mz = $\frac{1.0^{**}}{\text{Col. 8}}$
10	Annual Interest/Mz = Col. 4 x Col. 9 x No. Units
11	Annual Deprec./Mz = Col. 6 x Col. 9 x No. Units
12	Annual Maint./Mz = Col. 7 x Col. 9 x No. Units

** 1 = Constant

Annual Interest/Mz	L. 12.10
Annual Depreciation/Mz	" 27.74
Annual Maintenance/Mz	" 12.52
TOTAL	L. 52.36

APPENDIX B

SAMPLE COMPUTER CODING SHEETS AND RESULTING CROP BUDGETS

INVESTIGACION TECNICA
PLANES DE INVERSION

FORMULARIO NO. 1
TITULO

NUMERO DE INVESTIGACION	NOMBRE	LOCALIDAD	PREPARADO POR
13013	MAIZ ALTO 86 QQ/MZ	YORO	JUAN SOLORZANO

[illegible]
DIVISION TECNICA
PLANES DE INVERSION

FORMULARIO NO. 2
DETAIL OF OPERATIONS AND MATERIALS; SUMMARY OF "OTHER COSTS"

	NUMERO INVERS	COD INV	NO. REL	DESCRIPCION	TOTAL UNIDADES	UNIDAD MEDIDA	TEMPIRAS POR UNIDAD	COSTO TOTAL
LABOR	13013	2	1	MAYO SIEMBRA	2.80		4.00	11.20
	13013	2	2	MAYO FERTILIZANTE	2.00		4.00	8.00
	13013	2	3	JUNIO PRIMERA LIMPIA	15.00		4.00	60.00
	13013	2	4	JUNIO APLIC. PESTICIDAS	2.00		4.00	8.00
	13013	2	5	JUNIO APLIC. UREA	2.00		4.00	8.00
	13013	2	6	JULIO SEGUNDA LIMPIA	10.00		4.00	40.00
	13013	2	7	JULIO SEGUNDA APLIC. PESTICIDA	2.00		4.00	8.00
	13013	2	8	SEPT DOBLA	7.20		4.00	28.80
	13013	2	9	NOV TAPIZCA Y ACARREO	10.00		4.00	40.00
OTHER CONTRACTED SERV.	13013	3	1	ABRIL ARADA Y RASTREO		c/	70.00	70.00
	13013	3	2	MAYO SURCADO CON BUEYES		c/	15.00	15.00
	13013	3	3	JUNIO APORQUE		c/	20.00	20.00
	13013	3	4	DIC DESGRANE MAQUINA		b/	1.50	129.00
MATERIALS	13013	4	1	MAYO SEMILLA MEJORADA	25.00	LB	0.40	10.00
	13013	4	2	MAYO FORMULA 12-24-12	2.00	QQ	32.00	64.00
	13013	4	3	JUNIO ALDRIN GRANULADO	0.30	LB	0.60	18.00
	13013	4	4	JUNIO UREA	1.00	QQ	31.00	31.00
OTHER COSTS	13013	5	1	INTERESES CAPITAL ANUAL				31.23
	13013	5	2	INTERESES DE PROPIEDADES				23.67
	13013	5	3	DEPRECIACION				50.25

BANCO NACIONAL DE FOMENTO
DIVISION TECNICA
PLANES DE INVERSION

FORMATO NO. 3
FOOTNOTES

NUMERO INVERS	CODIGO DE NOTA	OBSERVACIONES
13013	a*	7 HORAS DE TRABAJO
13013	b*	COSTO FIJO POR QUINTAL
13013	c*	COSTO FIJO POR MANZANA

BANCO NACIONAL DE FOMENTO
DIVISION TECNICA
PLANES DE INVERSION

FORMULARIO NO. 4
LIST OF EQUIPMENT AND COSTS

NUMERO INVERS	CCC IAP	NO. REL	DESCRIPCION	NO.UNID. INI.TOT.	CTO.UNIC. DEPREC.TOT.	VAL.RESID. MANT.TOTAL	VIDA UTIL INI/MZ.	MZ/AÑO DEPREC/MZ.	MANT/MZ.
13013	7	1	CERCAS	1.00	300.00	30.00	15.00	1.00	
13013	7	2	SACOS -43-	1.00	64.50	0.00	2.00	1.00	
13013	8	1	CERCAS	19.80	16.00	30.00	19.80	18.00	30.00
13013	8	2	SACOS	3.87	32.25	0.00	3.87	32.25	0.00

BANCO NACIONAL DE FOMENTO
DIVISION TECNICA
PLANES DE INVERSION

FORMULARIO NO. 9
PROFITABILITY ANALYSIS

NUMERO DE INVERSION		PRECIO BAJO	PRECIO MEDIO	PRECIO ALTO	DESCRIPCION
13013	1	10.00	14.00	20.00	**********
13013	2	860.00	1,204.00	1720.00	INGRESO BRUTO **********
13013	3	271.00	635.00	1151.00	INGRESO BRUTO - COSTOS VARIABLES ****
13013	4	155.85	499.85	1015.85	INGRESO BRUTO - COSTOS TOTALES ******
13013	5	6.62			PRECIO PARA CUBRIR COSTOS VARIABLES *
13013	6	8.19			PRECIO PARA CUBRIR COSTOS TOTALES ***
	1				**********
	2				INGRESO BRUTO **********
	3				INGRESO BRUTO - COSTOS VARIABLES ****
	4				INGRESO BRUTO - COSTOS TOTALES ******
	5				PRECIO PARA CUBRIR COSTOS VARIABLES *
	6				PRECIO PARA CUBRIR COSTOS TOTALES ***
	1				**********
	2				INGRESO BRUTO **********
	3				INGRESO BRUTO - COSTOS VARIABLES ****
	4				INGRESO BRUTO - COSTOS TOTALES ******
	5				PRECIO PARA CUBRIR COSTOS VARIABLES *
	6				PRECIO PARA CUBRIR COSTOS TOTALES ***

BANCO NACIONAL DE DESARROLLO AGRICOLA
PLAN DE INVERSION NO. 13013

RUBRO- MAIZ RENDIMIENTO ALTO 86 QQ/MZ
REGION- YORO-YORO
PREPARADO POR- JUAN SOLORZANO

NO.MANZANAS

MANO DE OBRA -JORNALES A*	TOTAL UNID.	L/ UNID.	COSTO TOTAL	COSTO PROYECTO
MAYO SIEMBRA	2.8	4.00	11.20	
MAYO APLIC.FERTILIZANTE	2.0	4.00	8.00	
JUNIO PRIMERA LIMPIA	15.0	4.00	60.00	
JUNIO APLIC.PESTICIDAS	2.0	4.00	8.00	
JUNIO APLIC.UREA	2.0	4.00	8.00	
JULIO SEGUNDA LIMPIA	10.0	4.00	40.00	
JULIO SEGUNDA APLIC.PESTICIDAS	2.0	4.00	8.00	
SEPT.DOBLA	7.2	4.00	28.80	
NOV.TAPICA Y ACARREO	10.0	4.00	40.00	
OTROS SERVICIOS CONTRATADOS				
ABRIL ARADA Y RASTREO	C*	70.00	70.00	
MAYO SURCADA CON BUEYES	C*	15.00	15.00	
JUNIO APORQUE	C*	20.00	20.00	
DIC.DESGRANE MAQUINA	B*	1.50	129.00	
MATERIALES				
MAYO SEMILLA MEJORADA	25.0 LB	0.40	10.00	
MAYO FORMULA 12-24-12	2.0 QQ	32.00	64.00	
JUNIO ALCOLIN GRANULADO	0.3 LB	0.60	18.00	
JUNIO UREA	1.0 QQ	31.00	31.00	
SUB-TOTAL			569.00	
OTROS COSTOS				
INTERESES SOBRE CAPITAL ANUAL DE INVERSION 12%			31.23	
DE PROPIEDADES- INTERESES 12%			23.67	
DEPRECIACION			50.25	
MANTENIMIENTO			30.00	
COSTO TOTAL DE PRODUCCION			704.15	

A* 7 HORAS DE TRABAJO
B* COSTO FIJO POR QUINTAL
C* COSTO FIJO POR MANZANA

BANCO NACIONAL DE DESARROLLO AGRICOLA
PLAN DE INVERSION NO. 13013

RUBRO- MAIZ RENDIMIENTO ALTO 86 QQ/MZ
REGION- YORO-YORO
PREPARADO POR- JUAN SOLORZANO

COSTOS DE PROPIEDADES DETALLADOS

INFORMACION INICIAL

EQUIPOS	NO. UNID	COSTO INICIAL	VALOR RESIDUAL	VIDA UTIL	MZ/ AÑO
CERCAS	1.0	300.00	30.00	15.0 AÑ	1.0
SACOS -43-	1.0	64.50	0.00	2.0 AÑ	1.0

COSTOS ANUALIZADOS

EQUIPOS	TOTALES INTER	TOTALES DEPREC	TOTALES MANTEN	POR MANZANA INTER	POR MANZANA DEPREC	POR MANZANA MANTEN
CERCAS	19.80	18.00	30.00	19.80	18.00	30.00
SACOS	3.87	32.25	0.00	3.87	32.25	0.00
TOTALES POR MANZANA				23.67	50.25	30.00

ANALISIS DE RENTABILIDAD DEL RUBRO

	PRECIO POSIBLE ESPERADO BAJO	MEDIO	ALTO	INGRESO CLIENTE
	10.00	14.00	20.00	
INGRESO BRUTO	860.00	1204.00	1720.00	
INGRESO NETO *	291.00	635.00	1151.00	
INGRESO NETO **	155.85	499.85	1015.85	

PRECIO NECESARIO PARA CUBRIR COSTOS VARIABLES	6.62
PRECIO NECESARIO PARA CUBRIR COSTOS TOTALES	8.19

* INGRESO BRUTO MENOS COSTOS VARIABLES
** INGRESO BRUTO MENOS COSTO TOTAL

APPENDIX C

LIST OF GRAIN CROP BUDGETS

FOR HONDURAS

APPENDIX C

LIST OF GRAIN CROP BUDGETS

JUNE 30, 1980

Region	Crop	Yield Level	Budget Number
San Pedro Sula-Yojoa	corn	low	01011
" "	"	med	01012
" "	"	high	01013
" "	beans	low	01021
" "	"	med	01022
" "	rice	med	01042
" "	"	high	01043
San Pedro Sula-Macuelizo	corn	med	01012
" "	"	high	01013
" "	beans	med	01022
San Pedro Sula-Cholema	corn	med	01012
" "	corn	high	01013
" "	rice	high	01043
San Pedro Sula-Quimistan	corn	low	01011
Puerto Cortes	corn	low	01011
" "	corn	med	01012
" "	corn	high	01013
" "	beans	med	01022
" "	rice	low	01041
" "	rice	med	01042
" "	rice	high	01043
El Progreso	corn	low	01011
" "	corn	med	01012
" "	corn	high	01013
" "	rice	low	01041
" "	rice	med	01042
La Ceiba	corn	low	02011
" "	corn	med	02012
" "	corn	high	02013
" "	beans	med	02022
" "	rice	med	02042
" "	rice	high	02043
Tela	corn	low	02011
"	corn	med	02012
"	beans	low	02021
"	beans	med	02022
"	rice	med	02042
"	rice	high	02043
Olanchito	corn	low	03011
"	corn	med	03012
"	beans	med	03022
"	rice	low	03041
"	rice	med	03042

APPENDIX C (continued)

Region	Crop	Yield Level	Budget Number
Tocoa	corn	low	04011
"	corn	med	04012
"	corn	high	04013
"	beans	low	04021
"	rice	low	04041
Comayagua-Villa San Antonio-Lejamani	corn	med	06011
"	corn	med	06012
"	corn	high	06013
"	beans	low	06021
"	beans	med	06022
"	beans	high	06023
"	sorghum	low	06031
"	sorghum-improved	med	06032
"	sorghum-improved	high	06033
"	rice	low	06041
"	rice	med	06042
"	rice	high	06043
Comayagua-Ajuterique-Cane-LaPaz	corn	med	06012
"	corn	high	06013
"	beans	med	06022
"	beans	high	06023
"	rice	low	06041
"	rice	med	06042
"	rice	high	06043
Comayagua-Siguatepeque-Meambar-Jesus de Otoro	corn	low	06011
"	corn	med	06012
"	beans	low	06021
"	beans	med	06022
"	rice	low	06041
"	rice	med	06042
Comayagua-San Jeronimo-Esquias-Minas de Oro	corn	low	06011
"	corn	med	06012
"	beans	low	06021
"	beans	med	06022
"	rice	low	06041
"	rice	med	06042
Comayagua-La Libertad Ojo de Agua	corn	low	06011
" "	beans	med	06022
	rice	low	06041
Tegucigalpa	corn	low	07011
"	corn	med	07012
"	corn	high	07013
"	beans	low	07021
"	beans	med	07022
"	beans	high	07023
"	sorghum-unimproved	med	07032
"	rice-dryland	med	07042
Danli-El Pariso	corn-hillside	low	08011
" "	corn-plains	low	08011
" "	corn	med	08012
" "	corn-herbicide	high	08013

APPENDIX C (continued)

Region	Crop	Yield Level	Budget Number
Danli-El Pariso	corn-no herbicide	high	08013
" "	beans-first season	low	08021
" "	beans-second season	low	08021
" "	beans/corn mixed	low	08021
" "	beans	med	08022
" "	rice	high	08043
Juticalpa-Catacamas	corn	low	09011
" "	corn	med	09012
" "	corn-bullocks owned	med	09012
" "	corn	high	09013
" "	beans	low	09021
" "	beans	med	09022
" "	beans-bullock owned	med	09022
" "	sorghum	high	09033
" "	sorghum-tractor owned	high	09033
" "	rice	med	09042
Santa Rosa de Copan	corn-early	low	10011
" "	corn	med	10012
" "	corn	high	10013
" "	corn/beans mixed, hillside	N.A.	10081
" "	corn/beans mixed, plains	N.A.	10081
" "	corn/sorghum mixed, hillside		10090
" "	corn/sorghum mixed, plains		10090
" "	beans	low	10021
" "	beans	med	10022
" "	rice	low	10041
" "	rice	med	10042
" "	rice	high	10043
Ocotepeque	corn	low	10011
"	corn	med	10012
"	beans	low	10021
"	beans	med	10022
"	rice	low	10041
"	rice	med	10042
"	rice	high	10043
Gracias-Lempira	corn-first season	low	10011
" "	corn-second season	low	10011
Lempira-La Virtud	corn/sorghum mixed	N.A.	10090
Lempira-Mapulaca	corn/sorghum mixed	N.A.	10090
Lempira-Erandique	corn/sorghum mixed	N.A.	10090
Lempira-Candelaria	corn/sorghum mixed	N.A.	10090
Lempira-La Campa	corn/sorghum mixed	N.A.	10090
Lempira-Virginia	corn/sorghum mixed	N.A.	10090
Lempira-Mapulaca	corn/sorghum mixed	N.A.	10090
Gracias-Lempira	beans-first season	low	10021
" "	beans-second season	low	10021
" "	beans-first season	med	10022
" "	beans-second season	med	10022

APPENDIX C (continued)

Region	Crop	Yield Level	Budget Number
Gracias-Lempira	rice	low	10041
Choluteca-Nacaome	corn	low	11011
" "	corn	med	11012
" "	sorghum-unimproved	low	11031
" "	sorghum-unimproved	high	11032
" "	sorghum-improved	high	11033
" "	rice-dryland	high	11043
" "	rice-irrigated	high	11044
" "	sesame-November plant	N.A.	11062
" "	sesame-August plant	N.A.	11063
Santa Barbara	corn	low	12011
" "	corn	low	12011
" "	corn-30 qq/mz	med	12012
" "	corn-35 qq/mz	med	12012
" "	corn	high	12013
" "	beans-first season	med	12022
" "	beans-second season	med	12022
	rice	med	12042
Yoro	corn	low	13011
"	corn	med	13012
"	corn	high	13013
"	beans	low	13021
"	beans	med	13022