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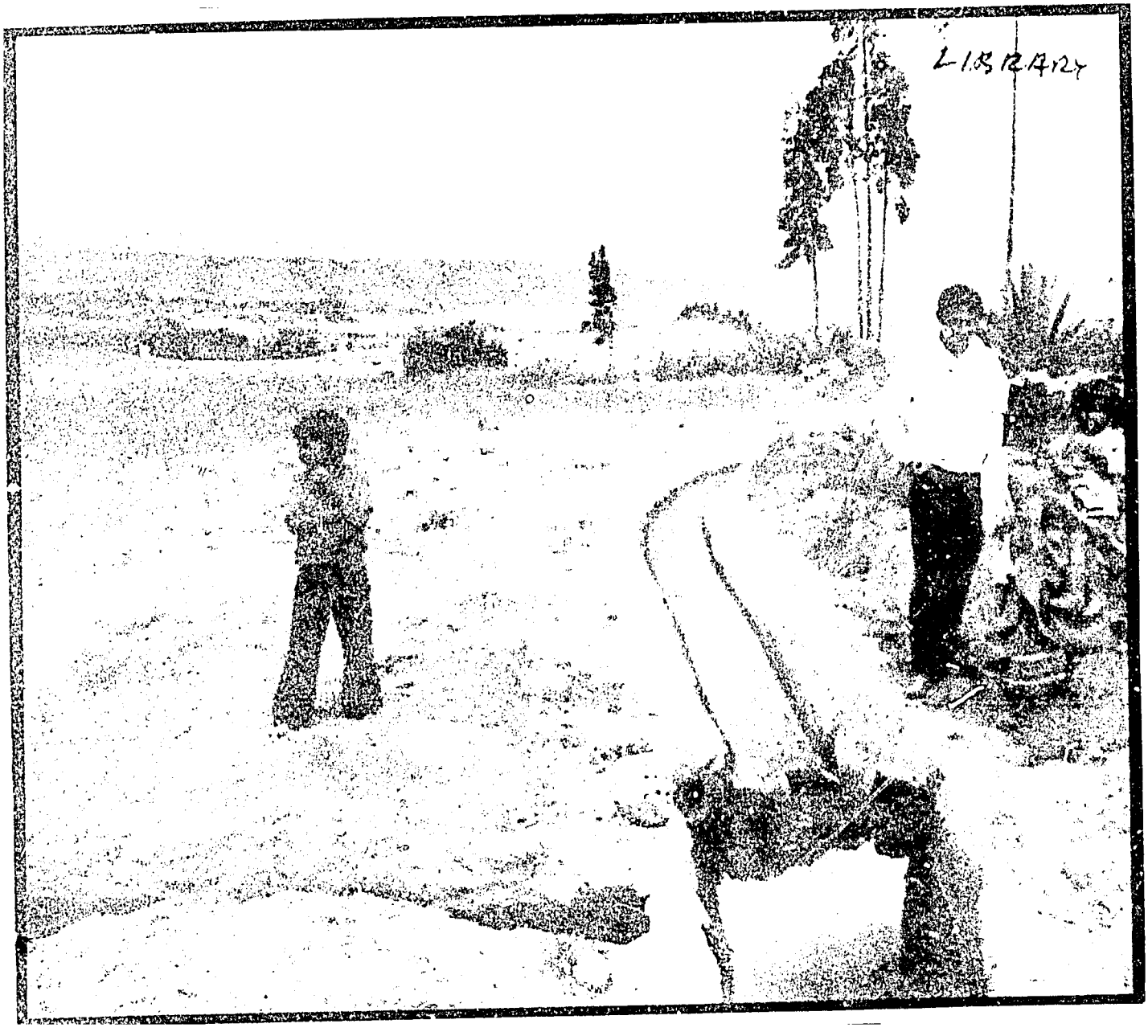

June, 1980

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Washington, D.C.

For:

The Agency For International Development

Mission to Ecuador

With data and assistance f
Salcedo IRD Project Team
Ministry of Agriculture
and
Interamerican Institute of Agricultural Sciences

PN-AAK-484

CREDIT DEMAND AND
REPRESENTATIVE SMALL FARM ANALYSIS
SALCEDO, ECUADOR INTEGRATED RURAL DEVELOPMENT PROJECT

by

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June 1980

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I.

DEMAND FOR CREDIT IN SALCEDO IRD PROJECT

A. Results of PCI Team 1980 Survey

B. PCI Representative Crop Budget Analysis

C. Final Demand Projections for Salcedo IRD Project Credit

A. RESULTS OF PCI TEAM 1980 SURVEY

In order to form a better impression of the role farm level credit might play as a factor in integrated rural development, PCI's design team incorporated several questions about credit, production enhancement and related problems in the questionnaire administered to a sample of small farmers within boundaries of the Salcedo Project.*

Credit Supply

The target group farmers who utilize credit or who are able to obtain credit do not constitute a large proportion of total Salcedo project farmers (Table 1.). Generally under 20% of those working the lands in smaller strata receive credit, yet 70 to 80 percent would like to receive it. Two main factors explain the discrepancy. Current credit mechanisms are not conducive to greater credit use. From the standpoint of the Banco de Fomento, the loan amounts are too small and expensive to administer. The farmers, of course, feel the paperwork, necessary engineer visits are too onerous. As is the case with marginal farmers everywhere, they worry about how they can repay production credit if someone "shuts off the water" or bad weather leads to a poor harvest.

Farmer Priorities

It is easy for farmers to state that they would "like" sure credit--but is this "demand" vague and general or does it appear to have

*A full description of the survey design, procedures, survey instrument and subsequent data reduction efforts, refer to Section IV of the comparison Annex, Small Scale Irrigation Improvement in Salcedo, Ecuador.

Table 1. Estimated share of project area farmers who have received credit in recent years

Category or Size	Percent Who Received Credit		Percent Who Would "Like" Credit This Year
	Last 3 Years	Last Year	
All Farms	17	12	77
0-1	22	13	70
1-5	13	13	79
5+	50	0	100
Irrigated	18	14	82
Nonirrigated	12	6	69

purpose and direction? Small farmers inside the Salcedo project appear to have definite long and short term priorities that are credit related. When asked what types of needs, actions or goals have to be met or satisfied to improve incomes, 80 to 100 percent stated that more water and credit for production inputs were key elements. The results are shown in Table 2.

As might be expected, whether or not farmers have access to irrrigation seems to affect individual perceptions or actions. If desire for credit is taken to be one proxy for entreprenurial intensity, farmers with water rights offer more scope for management; all things equal, irrigated lands get the most credit, and want more (especially to obtain

Table 2. Higher priority needs to increase income

Need	Irrigated	Nonirrigated
Get More Water	97	89
Make Better Roads	32	24
Credit From Inputs	82	94
Potatoes	38	18
Grain	27	5
Vegetables	11	6
Fruit	5	0
Marketing	29	0

*Individuals were able to state that one or a dozen needs were high priority

more water or increase efficiency of use). Those who don't have water want it, and in its absence, almost 100 percent place high priority on the next best thing--yield enhancing inputs.

Survey Estimate of Credit Demand

In Table 3, an attempt has been made to translate small farmers' statements about credit demand into money totals. Most of the results

Table 3. Average Proposed Disposition and Quantity of Current Credit Desired, Salcedo Project

Credit Use	Percent Requesting	Ave. Amount/ Farm $	Est. Total Value $
Long and Medium Term			
On-Farm Irrigation	16	122.09	90,992
Buy Animals	31	120.21	467,496
(Subtotal)			(558,488)
Other	6	294.57	120,464
Production			
Buy Inputs	77	136.15	560,356
Potatoes	48	107.17	290,686
Vegetables	11	80.34	39,140
Fruit	10	39.53	16,392
(Subtotal)			(906,574)

are self-explanatory. Some of the items captured in the "other" category include small cottages, industry uses, etc. This explains to some degree the higher per hectare credit need. Most farmers surveyed as yet know little of fruit tree production but state that they are interested and willing to learn or experiment if they can be supported by appropriate technical assistance.

We interpret the sums shown as subtotals to be a representation of what would be desired under favorable credit conditions. Given the relationships between actual credit use and "desire" in the past (Table 1), the subtotals shown are hardly likely to materialize under current conditions. However, the proposed Salcedo IRD Project is partially designed to increase credit availability and flexibility and

convert needs and desires into reality.

In view of this argument, the subtotals estimated from PCI's survey results compare quite favorably with the credit need estimates calculated in the next section.

B. PCI's Representative Crop Budget Analysis

Production credit demand based on more intensive use of modern inputs is forecast directly from the final per hectare crop budgets employed in the comparison, Salcedo IRD, benefit/cost annex. These budgets, in turn, are based upon three data sets contained in the project documents.[1/] (a) MAG cost of production summaries, (Source A) Table 23; (b) 15 crop budgets featuring improved technology, (Source A) Annex 3; and (c) nondetailed cost/returns crop budgets making up 19 model farm examples (Source A), pp. 177-269, et PASSIM. Part III of this document, Data Appendix contains the crop budgets and basic model farm data.

Description of Calculation Method

The system for calculating credit needs is as follows. Only the projected yield increases are financed for crops that are expected to be reduced in area or at least not to be increased in area. Referring to Table 8, it will be observed this criterion would include barley, wheat, and existing fruit orchards, for example. In the case of crops such as potatoes, production credit is allowed for yield increases on the original amount of land (Year zero-1976) and, in addition,

[1/] Direccion Agropecuaria No. 6, MAG, Proyecto Integrado de Desarrollo Agropecuario, PIDA Salcedo 1978-1984, IICA Serie Pub. Misc. #188, Quito, June 1978.

production credit is allowed on the full cost of production on any "new" areas. Referring again to the case of potatoes, this production credit allowance is made (by the third year of benefits) for about 625 "new hectares."

The sum of necessary production credit, by crop, is then financed for a full year at 12% (the farmers' borrowing cost in the project area) and the result (interest on production credit) is added to the "modern technology" costs per hectare. This creates an "adjusted" production cost which in turn is subtracted from expected per hectare returns in order to obtain net annual returns per crop. By this means, the project design team have created a realistic basis for setting the size of a necessary production credit fund to be included in overall Project financing.

Since production credit is a revolving fund not subject to depreciation in the manner of wasting assets, the production credit fund(s) is not treated as an investment item that must be "covered" by expected increments in project benefits. The social cost of utilizing production credit is automatically taken into account by an appropriate allowance in the individual, per hectare, crop budgets, as described.

Our assumption is that only certain lands need production credit to move to improved technology during the first benefit year. The remainder will either not require such credit or, will need it in stages, as more and more hectarage is brought under the umbrella of improved technology.

1. In Table 4, an estimate is made of the share of "expected land area" (cf. Table 8 of companion Benefit Cost Annex) that will be brought under higher technology (need credit). This estimate is made

for the first two years in which the project generates financial benefits (that is to say, years 2 and 3 of the proposed IRD project). During the fourth year of the project (3rd year of benefits), it is assumed that 100% of such lands will experience improved technology. Crops for which experience inputs do not appear to be cost effective such as barley, or wheat or, in contrast other crops that need 100% new technology the first year, do not need to be included in this table. Table 4 also shows calculation of the net income value per hectare of the share of lands that do not move to higher technology until the second, third, or fourth project year. These income estimates are carried to Tables 12a and 12b. in the companion annex, Benefit/Cost.

2. Next the share of land assumed to adopt new technology in benefit years 1 and 2 is assessed for production credit needs. The results are shown in Tables 5 and 6. Both tables share the same features so an explanation of Table 5 will suffice.

The calculations or required data are shown at the top of each column. The land areas for benefit years 1, 2, and 3 are obtained from Table 4. If a reduction in crop hectarage is projected, the only production credit necessary is for higher technology. The calculated amount is shown in Column 7. The annual per hectare cost (interest) of the credit is shown in column 10 and the corrected or "adjusted" per hectare production cost for modern technique is shown in column 11.

The land area for corn-beans is expected to fall during the life of the project. The fall on 30 percent of the land will be -18 (629 to 611). The 611 ha remainder are assumed to require production credit equal to the difference between the costs of traditional and modern technology, $84.16. The total need is $51,422. The cost to

Table 4 DIVISION OF ORIGINAL LAND TO ALLOW FOR CALCULATION OF NECESSARY PRODUCTION CREDIT ON SELECTED CROPS

	Orig. land area	30% ORIG.	60% ORIG.	Expected area: YEAR 1 EXP. TOT.	YEAR 1 30%	YEAR 1 70%	YEAR 2 EXP. TOTAL	YEAR 2 60%	YEAR 2 40%	Value of production on lands that are not subject to modern technology "immedately": YEAR 1 NET RET/HA	YEAR 1 # HA.	YEAR 1 VALUE PRODUCT	YEAR 2 NET RET/HA	YEAR 2 # HA.	YEAR 2 VALUE PRODUCT.
Corn/Beans	2097.5	629	1259	2037.65	611	1426	1957.07	1174	783	162.4	1426	231582	162.4	783	127159
Potatoes	1019.38	306	612	1141	342	799	1268.9	761	508	400.0	799	319600	400.0	508	203200
Pasture	1649			1681			1701								
Potrero	(801)	240	487	(777)	233	544	(750)	450	300	49.00	544	26656	49.0	300	14700
Alfalfa	(736)	221	442	(760)	228	532	(779)	467	312	16.50	532	8778	16.50	312	5148
Forage	(0)	0	0	(32)	9.6	22.4	(60)	36	24	12.00	22.4	269	12.00	24	288
Highlands	(112)			(112)			(112)								

Table 5 CALCULATION OF PRODUCTION CREDIT FUNDS NEEDED IN THE FIRST BENEFIT YEAR of PROJECT

	Per Ha. Cost: Traditional	Modern	Diff.	30% Exist. HA	30% New HA	Diff.	Land area: Decrease 5 X 3	Decrease 4 X 3	Increase 6 X 2	3(12)	Cost Adjm 10 + 2	3(12)	12(4)	2(12)	14(6)	13 +15 / 5	Weighted Adjm. Cost
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Corn/Beans	131.20	215.36	84.16	629	611	- 18	51422			10.10	225.46						
Potatoes	600.9	830.56	230.56	306	342	36		70551	29900			27.67	8466	99.67	3588	35.25	865.81
Peas	8[illegible].00	153.00	69.00	162.95	175.0	12.05		11243	1844			8.28	1349	18.34	221	8.97	161.94
Broad beans	77.00	180.80	103.80	188.8	200.0	11.20		19594	2025			12.46	2352	21.70	243	12.97	193.77
Onions	425.0	623.72	198.72	12.0	25	13.00		2389	8108			23.85	286	74.85	973	50.37	674.09
Garlic	870.0	1480.00	660.00	1.4	5	3.6		924	5328			79.70	111	177.60	639	150.05	1630.05
Pears	288.0	432	144	22	-	0	3168			17.28	449.28						
Peaches	304.0	456	152	30	-	0	5560			18.24	474.24						
Apples	240.0	360	120	54	-	0	6480			14.40	374.40						
Potrero	177.24	318.36	141.12	240	233	- 7	32881			16.93	335.29						
Alfalfa	300.56	500.96	200.46	221	228	7		44288	3507			24.05	314.6	60.12	420.81	25.15	526.12
Oat hay	188.0	241.28	53.28	0	9.6	9.6		0	2316			6.39	0	28.95	277.95	28.95	270.23

Table 6 CALCULATION OF PRODUCTION CREDIT FUNDS NEEDED IN THE SECOND BENDFIT YEAR OF THE PROJECT

	Per Ha. Cost			60%			Land area				Cost						
				Exist.	New		Decrease		Increase		Adjm.					13 + 15	Weighted Adjm.
	Traditional	Modern	Diff.	Ha	Ha	Diff.	5 X 3	4 X 3	6 X 2	3(12)	10 + 2	3(12)	12(4)	2(12)	14(6)	5	Cost
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Corn/Beans	131.20	215.36	84.16	1259	1174	-85	98804			10.10	225.46						
Potatoes	600.0	830.56	230.56	6.2	761	149		141103	123753			27.67	16932	99.67	14850	41.76	872.32
Peas	84.0	153.00	69.0	162.95	190	27.05		11244	4139			8.28	1349	18.36	497	4.72	162.72
Broad beans	77.0	180.8	103.80	188.8	210	85.02		16890	15372			19.53	2027	21.70	1845	20.50	201.30
Onions	425.0	623.72	198.72	12	50	38.0		2385	23701			23.85	286	74.85	2844	62.61	686.33
Garlic	820.0	1480.0	660.0	1.4	10	8.60		924	12728			79.20	111	177.60	1527	163.82	1643.82
Pears	288.0	576	288	22	-	0	6336			34.56	610.56						
Peaches	304.0	608	304	30	-	0	9120			36.48	644.48						
Apples	240.0	480	240	54	-	0	12960			28.80	508.80						
Potrero	177.24	191.00	13.76	481	450	-31	6192			1.65	192.65						
Alfalfa	300.50	463.60	163.10	442	467	25		72090	11590			19.57	8651	55.63	1391	21.50	485.10
Oat hay	188.0	241.28	53.28	0	36	1918				6.39	247.67						

Table 7 CALCULATION OF PRODUCTION CREDIT FUNDS NEEDED IN THE THIRD YEAR OF THE PROJECT

	Per Ha. Cost			100%			Land area				Cost						
				Exist.	New		Decrease		Increase		Adjm.					13 + 15	Weighted Adjm.
	Traditional	Modern	Diff.	Ha	Ha	Diff.	5 X 3	4 X 3	6 X 2	3(.12)	10 + 2	3(.12)	12(4)	2(.12)	14(6)	5	Cost
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Corn/Beans	131.20	215.36	84.16	2097.5	1748.03	-349.47	147114			10.10	225.46						
Potatoes	600.00	830.56	230.56	1019.38	1687.0	667.6		235028	554498				28203	99.67	66540	56.16	886.72
Peas	84.0	153.00	69.00	162.95	200	37.05		11344	5669			8.28	1349	18,36	680	10.15	163.15
Broad beans	77.0	180.80	103.8	188.8	220	31.20		19597	5641			12.46	2352	21.70	677	13.77	194.57
Onion	425.0	623.72	198.72	12	(22)	70		2384	43659			23.84	286	74.84	5239	67.38	691.06
Garlic	820.0	1480.00	660	1.4	(18)	16.60		924	24568			79.20	111	177.60	2948	169.95	1649.94
Pears	288.0	720	432	22	-	0	9504			51.84	771.84						
Peaches	304.0	760	456	30	-	0	13680			54.72	814.72						
Apples	240.0	600	360	54	-	0	19440			43.20	643.20						
Potrero	177.24	191.00	13.76	801	725	-76	9976			1.65	192.65						
Alfalfa	300.50	463.60	163.1	736	824	88		120042	40797			19.57	14405	55.63	4896	23.42	487.02
Oat hay	188.0	241.28	53.28	0	90	90		0	21715			6.39	0	28.95	2606	28.95	270.23

individual farmers is $10.10/year/ha (84.16 (.12)) and the total modern cost is raised to $225.46/ha (215.36 + 10.10). This latter figure is shown in column 11 and is carried to Table 12a, 12b and 12c of the companion Annex, Salcedo Benefit/cost.

If crop land area increases, as in the case of potatoes, some credit is needed for financing higher technology on existing land. This amount is calculated by multiplying 4 x 3 (not 5 x 3 as for corn/beans). The result, $70,551, is shown in Column 8. An additional amount of credit is needed for financing all the modern production cost per acre on the difference in land area (36 ha), or, 36 ($830.56) = $29,900). Thus column 9 shows the credit needs due to crop mix. The two columns 7 and 8 showing the need for production credit separate the needs on diminishing land from the needs an expanding lands simply for convenience.

Costs of financing credit per ha., (when areas are expected to expand) due to better inputs (column 12) and due to crop mix (column 14) are shown next. These values are weighted, averaged, and added to the basic crop production cost and the result (column 17) is carried foward to Tables 10 and 12 in the Companion Annex (Salcedo Benefit/Cost) to estimate target group income for project years 2, 3, and 4. Note that Table 7 does not depend on target groups for any intermediate adjustments for staging land areas into higher technology. The total increases or decreases in land area (cf. Table 8, Companion Annex, Salcedo, Benefit/Cost) are utilized to obtain the same type results just described.

Sum of Production Credit Required

The total production credit required in benefit year 1 is shown

by summing the columns 7, 8, and 9. A total of $248,498 will be needed to finance output increases due to improved technology. Changes in crop mix will require $53,028. The total equals $301,526, or $56,48 per family. The total production credit need for year 2 is $571,424 or $107 per family. Total production credit need by the time the project stages into benefit year 3 (4th project year) is $1,285,480 or $240,777 per family (see Table 8). All of these sums are slightly exaggerated (by about 10%) because the calculations are based on "full" production costs which include the value of family labor as a cost. Strictly speaking only cash costs would need to be the object of production credit.

Production credit is also needed for 400 has. of new fruit trees but the amount is relatively small. Some initial production is assumed to begin in the fifth year after planting (6th year of the project), but "normal" production cost outlays are not assumed to be incurred until about the 6th to 7th years. At that time the production credit need will be about $200,000 per year (finance out-of-pocket costs only). Ignoring the fact that some allowance should be made for bad debts and that the fruit need begins <u>after</u> the end of the 4 year disbursement life of the planned IRD project, the total production credit need for the Salcedo IRD as of year 6-7 is about $1.5 million.

In addition to new fruit tree plantings, milk production is expected to increase. In this study no direct account is taken of need for production credit to manage more animals. However, the production credit necessary to help generate the necessary increases in forage production <u>are</u> included as shown above in Tables 5, 6, and 7.

Table 8. Forecast Production Credit Demand - Salcedo, IRD

Year		Land Area			
		Down	Up		
Project	Benefit	Technological		Crop Mix	Total
1	0				
2	1	99,511	148,987	53,028	301,526
3	2	133,412	244,636	199,969	578,017
4	3	193,568	389,219	670,285	1,253,072

C. Final Demand Projections for Salcedo IRD Project Credit

In addition to production credit, target group farmers in the Salcedo project are expected to need long or intermediate term credit for on-farm investments in small-scale irrigation management structures or devices and to establish new fruit tree orchards. Not all farmers will be able to take advantage of this type of credit due to terrain, location or other reasons, so larger amounts of such credit are not scheduled for loan. Details of the amounts and possible timing of disbursement are given in Table 19.

The limited account of on-farm irrigation infrastructure credit is scheduled to be disbursed in each of the four years of the project program. Orchard loans cannot be made before seedlings are available. At least one year will elapse before the loan program can get underway. Since payoffs to such investments (especially fruit trees) cannot begin until the 5-7th year of expected benefits, we assume that no long or intermediate loan repayments or carrying charges will be required in the initial years of the project.

Production credit will be repaid at the end of each year. Funds must be available at the start of each season (end of previous year). Some of these short term loans may never be repaid. Therefore the annual fund must be replenished for such failures and be increased to meet the growth in demand at the same time. The fund total is shown in column 6. These results are carried to table 6.2 of the main Ecuador, IRD project paper.

Table 9. Summary of Necessary Farm Level Credit Funding by Year, Salcedo IRD Project

Years		Short Term				Long Term		Total
Project	Benefits	Farm Demand	Non-Payment	Σ** N.P.	Credit fund at End of Year	On-Farm Irrig. Infra.	Orchard Estab.	Necessary Annual Fund
1	0					105,700	0	
					301,526			407,226
2	1	301,526				105,700	154,000	
			28960	28,960	606,962			866,682
3	2	578,017				105,700	21,000	
			55,530	84,490	1,337,508			1,464,208
4	3	1,253,072				105,700	35,000	
			120,420	204,910	1,457,982			1,598,682
5	4						35,000*	
	5	1,450,000					35,000*	
	6							
	7							
Dispersed during 4 year project life (000)					1,458.0	422.8	280.0	

*The total amount of this credit will be disbursed to Banco de Fomento before the end of the 4th year.

**Non-pay does not mean the loans will never be repaid. As a compromise between slow pay and no pay just under 10% has been used.

II. ANALYSIS OF THE ECONOMIC POTENTIAL OF CREDIT AND IMPROVED TECHNOLOGY ON REPRESENTATIVE SMALL FARMS IN SALCEDO, ECUADOR

A. Planificación de la Unidad de Producción Agropecuaria

B. Economic Analysis of Selected Model Farms

A. Planificación de la Unidad de Producción Agropecuaria

El propósito del PIDA-Salcedo el escoger Fincas Modelos para su desarrollo, es cuantificar y comparar los beneficios que obtendrán a través de este Proyecto, mediante el uso adecuado de recursos.

Este Proyecto puede ser aplicado a los diversos estratos pero se ha escogido de acuerdo a la política del MAG de trabajar con pequeños y medianos campesinos, siendo éstos los más numerosos y un nivel técnico bajo.

Criterios para determinar el tamaño de la Finca Modelo en el PIDA-Salcedo

El tamaño de la Finca Modelo ha sido determinado considerando los criterios, tamaño, altura, sistema de explotación y riego.

Tamaño. El diagnóstico determina que las Fincas Modelos escogidas son las más numerosas (1.50 Has.) con un porcentaje del 91%; y (7 ha.) con un porcentaje del 8%, que representan ingresos menores necesarios para la subsistencia, se toma también en cuenta que estas fincas tienen como recurso humano el trabajo familiar.

Altura. La altura considerada para el establecimiento de las Fincas Modelos va de 2.600 a 3.500 ms.n.m.

Sistema de Explotación. Se ha considerado los cultivos tradicionales de subsistencia, logrando ciertos cambios en lo referente a extensión e introducción de cultivos más rentables de

acuerdo a la vocación del suelo.

Riego. Se establecerán modelos de finca, tanto para las zonas de secano como el aprovechamiento de la actual infraestructura del riego.

Determinación de los Modelos de Finca

De acuerdo a la estructura agraria de la zona, la información de campo recogida por el grupo del PIDA-Salcedo y análisis de los anteriores ariterios se ha determinado el tamaño de la finca modelo de 1.50 x 7.00 ha. considerando las cotas de 2.600-3.500 en las tres zonas del PIDA-Salcedo.

Zona Central (2.600-2.800) m.s.n.m.

Finca Modelo 1.50 ha. con y sin riego

Finca Modelo 7.00 ha con y sin riego

Zona Occidental (2.800-3.000) (3.000-3.500) m.sn.n.m.

Finca Modelo 1.50 ha con y sin riego

Finca Modelo 7.00 ha con y sin riego

Zona Oriental: (2.800-3.000) m.s.n.m.

Finca Modelo 1.50 ha con y sin riego

Finca Modelo 7.00 ha con y sin riego

Zona Oriental: (3.000-3.500) m.s.n.m.

Finca Modelo: 1.50 ha sin riego

Finca Modelo: 7.00 ha sin riego

Detalles de los Modelos

Los planes de explotación agrícola diseñados para los dos modelos de finca de 1.50 y 7.00 ha. del Proyecto PIDA-Salcedo que presenta la descripción del desarrollo de las siguientes cotas de 2.600-3.500 m.s.n.m. con y sin riego.

Descripción del Desarrollo de la Finca Modelo de 1.50 ha. a 2.600-2.800 m.s.n.m.

1. En la zona central del PIDA se establecerán Fincas Modelos de 1.50 ha., procurando fomentar la explotación de cultivos rentables, como la formacióde frutales por la vocación ecológica que el área presenta.
2. En la zona con riego se reducirá el cultivo dedicado a maíz-fréjol y se incrementará la superficie de frutales; intercambiando cultivos de cebolla, pudiendo emplearse otras hortalizas o leguminosas anuales.
3. En la zona sin riego se establecerán huertos de duraznos por ser los más aconsejados, dado que esta área no justifica la introducción de otros cultivos, como se indica en el cuadro siguiente.

Los modelos de fina indicados cuantitativamente en la zona central, se ha considerado que para los cultivos anuales, en lo referente a costos de producción el Banco Nacional de Fomento prestará para ser pagados a fines de cosecha, para los cultivos perennes como ser la pera y el durazno, el crédito será a largo plazo, siendo éste con un período de gracia hasta que la producción sea comercial y tenga el agricultor capacidad de pago y ahoro, razón por la cual

se extiende la duración del proyecto a 5 y 10 años respectivamente.

Descripción de Desarrollo de la Finca Modelo
de 1.50 ha. de 2.800-3.000 m.s.n.m.

En la cota de 2.800 a 3.000 existen dos zonas la Oriental y la Occidental en las cuales se establecen fincas modelos de 1.50 ha. procurando fomentar la explotación de cultivos rentables y de acuerdo a su ecología, en la Zona Oriental existe el predominio de suelo Negro Andino, con pluviosidades constantes, mientras que en la Zona Occidental son suelos erosiona dos con pendientes y carencia de lluvias.

Los modelos establecidos en la Zona Occidental con riego son con cultivos anuales y frutales. En la Zona Occidental sin riego son de cultivos anuales y frutales.

El establecimiento de frutales en esta zona se manifiesta por la alta rentabilidad y por las condiciones ecológicas favorables para la explotación de las mismas.

En la Zona Oriental con riego y sin riego son con cultivos anuales.

Descripción del Desarrollo de la Finca Modelo
de 1.5 ha. a 3.000-3.500 m.s.n.m.

En la Zona Oriental se establecerá un solo plan, ya que por la altura (3.000-3.500 m.s.n.m.) el plan es el mismo con y sin riego, por la buena humedad que existe en el sector.

En la Zona Occidental se establecerá dos alternativas para el desarrollo de fincas modelos, la primera corresponde a las fincas con disponibilidad de riego y la segunda corresponde a fincas que no poseen el beneficio del riego.

El cuadro del Plan de Producción Cuantificado en el Modelo 1.5 ha. y que corresponde a la cota 3.000-3.500, demuestra el ingreso neto anual tanto para la Zona Oriental como para la Zona Occidental, de cuyo resultado se deduce que la utilidad sirve para la supervivencia de la familia beneficiaria, sin dar un margen para el ahorro.

Los cultivos seleccionados en los modelos, son los más aptos y rentables para las Zonas Oriental y Occidental; permitiendo al mismo tiempo un mayor manejo del suelo en cuanto se refiere a rotación. Ver Evaluación Financiera.

Descripción del Desarrollo de la Finca Modelo - de 7 ha. 2600-2800 m.s.n.m.

1. En las fincas modelos (UPAS) de 7 ha., en la zona central, se propenderá a reducir la superficie del cultivo dedicado a maíz-fréjol y se aumentará la superficie de frutales y hortalizas, tanto en la zona con riego como en la sin riego.
2. En la zona con riego se intercalará en los frutales--cultivos de arveja y cebolla. La experiencia ha demostrado que cultivar la alfalfa entre los frutales, esperjudicial para estos por cuanto la raíz de la alfalfa es profunda y compite los nutrientes en desmedro de la producción frutícola; además, el riego en frutaleses estacionario y en alfalfa es períodico y sistemático.
3. En la zona con riego se implantará huertos frutales, preferentemente con Pera. En las zonas que no disponen del servicio de riego se harán huertos de durazno.

Descripción del Desarrollo de la Finca Modelo de 7 ha. 2.800-3.000 m.s.n.m.

Los planes de producción han sido divididos de acuerdo a las características ecológicas de la zona. Cabe anotar que los rendimientos económicos en todos los modelos no son muy halagadores por cuanto, la proyección está dada para la explotación pecuaria. La repercusión económica vendrá dada por tanto en los ingresos que provengan de la comercialización de productos pecuarios.

--Existen diferencias de ingresos entre la zona oriental y occidental por presentar esta última inferiores condiciones ecológicas para la explotación agropecuaria.

--El factor riego se ha tomado como determinante para hacer los respectivos cálculos de ingreso, además de considerar al tipo de cultivo a implantar.

--En las Zonas Oriental sin riego, Occidental con riego y Occidental sin riego, se han hecho los respectivos reajustes de producción por condiciones anteriormente descritas.

--En las zonas sin riego se ha incluído el cultivo de arveja por ser más resistente a la sequía.

--En zonas con riego se toma en cuenta el cultivo de maíz-fréjol; el propósite de estos cultivos, en el futuro, es dar elasticidad para la instalación, renovación y rotación de potreros.

--El vultivo de avena se ha considerado por su gran capacidad de forraje a corto plazo, con el objeto de tener reserva suficiente en caso de condiciones climáticas desfavorables para el desarrollo agropecuario.

Descripción del Desarrollo de la Finca Modelo de 7 ha. 3.000-3.500 m.s.n.m.

Con respecto al desarrollo de las fincas modelos de 7 ha., entre las cotas de 3.000 a 3.500 se establecen dos zonas denominadas Oriental y Occidental, tomándose en cuenta para la Zona Oriental un modelo único debido a las características de humedad uniforme en el área.

Los cultivos tomados para el desarrollo de las fincas modelo de 7 ha. son los aptos, adecuados y rentables, para los suelos y altura comprendidos entre 3.000 y 3.500 m.s.n.m.

Para la Zona Oriental se prevee la introducción de cultivos de avena y ajo especialmente por tratarse de cultivos rentables por la producción de forraje y hortaliza de consumo popular.

En la zona Occidental, el modelo con riego se establece el cultivo del ajo por el buen ingreso que deja el cultivo; en tanto que en la misma zona pero sin riego se establecerá el cultivo de arveja.

En general los cultivos de los modelos de finca permiten un buen manejo del suelo por la rotación.

B. Economic Analysis of Selected Model Farms

The basic project documents discuss nineteen different "model farm" situations based on assumptions about location, size, irrigation and fruit potential. In this section, we analyze five of the examples which illustrate potentials for higher valued crops. The models which are assumed to depend heavily on barley are ignored because application of modern inputs to that crop does not appear to be cost effective.

Generally, higher levels of technology simply have to pay for themselves because no particular new investments are assumed to be made by farmers. The only exception is in the case of new fruit tree plantings. In this case the costs of establishing small orchards and the waiting time until the tree mature must be amortized by future fruit sales.

What this means is that, as long as no new "on-farm" investment is necessary, all the inputs to achieve high yields such as fertilizer, better seeds, etc., are purchased and paid for within each individual crop cycle. If simple farm enterprise budget calculation show that net income is greater with the project than without, the better techniques "pay." About all that can be discovered beyond this is which crops are expected to pay the best and the overall expected increase in family net income due to the project.

Two of the model farms examples analyzed here do require fruit investments. In these cases only, it is necessary to calculate any discounted incremental increase streams in order to compare with discounted costs.

The basic information concerning each model farm enterprise does not include costs of annual production credit. This slight additional cost is calculated and added by crop, to the entire annual enterprise cost in the following way. If the hectarage devoted to the crop is assumed to be reduced, production credit is only calculated on the difference in costs per hectare without the project and the higher (modern input) costs with the project. If land devoted to a crop is scheduled to expand, the above procedure applies to the basic amount of land. However, the whole annual per hectare cost of working crop area additions is assumed to be financed by production credit.

Model Farm Example No. 1 (1.5 ha, irrigated, no fruit)

Table 10 provides the basic information. The basic situation without the project is shwon for year zero. Once the project is underway, the area devoted to maiz-frejol is assumed to drop. Potatoes are eliminated. Most of the crop mix adjustment is taken up by increasing the area devoted to cebolla. The basic financial data are shown in sucres.

In table 11 we show a detailed calculation of production credit needs for model No. 1. The most complicated calculation is in the case of alfalfa. Only production costs on 0.1 ha are fully financed; the basic 0.4 ha receives production credit only for the increases costs of modern inputs. A similar calculation is made for each of the other four examples.

Table 10 shows the full results for Example 1. All the increased production costs are well covered by expected revenues. The P.V.

Table 10

FINCA MODELO 1.5 ha. ZONA CENTRAL 2600-2800

Sin Frutales

AÑOS	MAIZ-FREJOL			ALFALFA			PAPA			CEBOLLA			COSTO
	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	TOTAL
0	0.90	2908	5250	0.40	3000	4000	0.2	2492	5000	--	---	---	8400
1	0.70	3769	7769	0.50	6262	6000	-	-	-	0.3	4678	9000	14709
2	0.40	2154	4440	0.50	5795	13801	-	-	-	0.6	9355	18000	17304
3-5	0.20	1077	2220	0.50	5795	13801	-	-	-	0.8	12474	24000	19346

FUENTE Y ELABORACION : FIDA-Salcedo.

Table 11. Example: How Production Credit is Calculated on Model Farms

	(Area Down) Maiz-Frejol				(Area Up) Alfalfa						(Area up) Cebolla						
	Per ha			Actual	Per ha.			Actual Credit Cost			Per ha			Actual Credit Cost			
Years	Prod. Cost	Δ Cost	Credit Cost	Credit Cost	Prod. Cost	Δ Cost	Credit Cost	0.4 ha	Δ 0.1 ha	Total	Prod. Cost	Δ Cost	Credit Cost	Δ 0.3 ha	Δ 0.6 ha	Δ 0.8	Total Credit Costs
0	3231			0	7500						0						
		2153	258.38	180.87		5024	603	241.20	150.29	391.49		15593	1871.20	561.36			1133.72
1	5384				12524						15593						
		2154	258.38	103.39		4090	491	196.40	139.08	335.48		15593	1871.20		1122.72		1569.69
2	5585				11590						15593					1496.96	
		2154	258.38	51.68		4090	491	196.40	139.08	335.48		15593	1871.20				1884.12
3-5	5585				11590						15593						

Table 12 Financial Analysis of Model Farm Example No. 1, Salcedo, Ecuador.

Items	Years 0	1	2	3	4	5
Sales	14250	27769	36241	40021	40021	40021
Costs						
Production	8400	14709	17304	19346	19346	19366
Credit	0	1133.7	1561.7	1884.1	1884.1	1884.1
Net Income s/.	5850	6926.3	17375.3	18390.9		
$	234	277.05	695.01	735.64		
Difference Due to Project $		43.05	461.01	501.64		
ΔIndex		1.18	2.97	3.14	3.14	3.14
PV @ 15% = $2123.48						
Net farm income per ha.				$ 490.43		

of the income difference due to the project is $2123.48 over a 15 year project time horizon. Annual family income increases by a factor of 3 within three years (net of family labor value).

Model Farm Example No. 2 (7.0 ha., with irrigation, no fruit)

This example illustrates what can be expected from larger farms. There is enough area for commercial potato production as well as for increases in forage output. The crop mix adjustment is made possible by assuming a reduction in area devoted to maize-frejol. Both improved pasture (Potrero) and alfalfa are assumed to be replanted in year 1. The annual costs drop somewhat in successive years. Table 13 shows the basic data as before.

Again it is necessary to calculate required production credit and adjust the annual production costs commensurately. Actual calculations are not shown, but the final results are included in Table 14.

Model Farm Example No. 3 (7.0 ha, no irrigation, no fruit)

This example is an estimate for a high zone, with fairly good production conditions. As if year zero there is 2.0 ha of fallow ground. Once the project is underway it is assumed that this land is mainly planted to alfalfa. A large area of potatoes is included along with a substantial planting of another high valued crop, garlic (Ajo). Table 15 shows the basic data as before. The required production credit finance charges are added to the basic production costs after calculation. The final results are shown in Table 16.

Table 13

PLAN DE PRODUCCION DE CULTIVOS FINCA MODELO 7 ha. CON RIEGO

ZONA ORIENTAL 2800-3000 m.s.n.m.

AÑOS	PAPA			MAIZ - FREJOL			POTRERO			ALFALFA			AVENA			TOTAL	
	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Costo	Ingreso
0	0.5	6230	10000	1.5	4845	7705	2	9550	11000	2	15000	20000	1	3620	6000	39245	54705
1	0.5	10382	21999	0.5	2692	5549	2.5	9897	24999	3	37572	39144	0.5	3016	8000	73559	99691
2	1	20765	44000	0.5	2692	5549	2.5	4975	28750	3	34767	82800	-	--	--	63199	161099
3-5	1	20765	44000	-	--	--	2.5	4975	28750	3	34767	82800	0.5	3016	8000	63523	163550

FUENTE Y ELABORACION : PIDA SALCEDO

Table 14 Financial Analysis of Model Farm Example No. 2, Salcedo, Ecuador.

Item	0	1	2	Years 3	4	5
Sales	54705	99691	161099	163550		
Costs						
Production	39245	73559	63199	63523		
Credit	0	8750	7050	7086		
Net Income s/.	15460	17382	90850	92941		
$	618.4	695.3	3634	3718		
Difference due to Project		76.9	3015.6	3099.2	3099.2	3099.2
Δ Index		1.12	5.88	6.01	6.01	6.01
PV @ 15% = $13,087						
Net Farm Income per ha.				$531.14		

Table 15

PLAN DE PRODUCCION DE CULTIVOS FINCA MODELO 7 ha.

ZONA ORIENTAL 3000 - 3500 m.s.n.m.

AÑOS	PAPA			HABA			AJO			AVENA			ALFALFA			TOTAL	
	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Costo	Ingreso
0	1.5	18690	25000	2	5416	14400	0.25	7764	13125	1	3620	6000	0.25	1875	2500	37365	61025
1	1.75	36338	76998	2	9036	25030	0.25	9075	21245	1	6032	16000	2	25048	24000	85529	163273
2	2	41530	88000	2	9036	25030	0.5	19410	43750	0.5	3016	8000	2	23178	52200	96170	219980
3	2.5	51912	109999	1.5	6777	18735	0.5	19410	43750	0.5	3016	8000	2	23178	52200	104293	235681
4	2.5	51912	109999	1.5	6777	18735	0.5	19410	43750	0.5	3016	8000	2	23178	52200	104293	235684
5	2.5	51912	109999	1.5	6777	18735	0.5	19410	43750	0.5	3016	8000	2	23178	52200	104293	235684

FUENTE Y ELABORACION. PIDA SALCEDO

Table 16 Financial Analysis of Model Farm No. 3, Salcedo, Ecuador.

Item	Years 0	1	2	3	4	5
Sales	61025	163273	219980	235684	235684	235684
Costs						
Production	37365	85529	96170	104293	104293	104293
Credit	0	9134	10271	11138	11138	11138
Net Income s/.	23660	68610	113539	120253		
$	946	2744	4542	4810		
Difference due to Project		1798	3595	3864	3864	3864
Δ Index		2.90	4.80	5.08	5.08	5.08
PV @ 15% = $17,495						
Net farm Income per Ha.				$687.14		

Model Farm Example No. 4 (1.5 ha, with irrigation, with fruit)

Examples 4 and 5 illustrate the economic effects of adding fruit production to average size small plots. In both cases the fruit orchard is interplanted with onions during the years the orchard is being formed; this practice ceases in the sixth year of project benefits.

In example 4, potatoes are replaced by commercial fruit production and the land devoted to the maiz-frejol subsistence combination is cut back. Alfalfa remains in the management system because of crop rotation considerations and for its forage value.

As mentioned, establishing a small orchard is the only on-farm act of investment considered in these model examples. In this type of investment the B/c analysis treated as a sub-calculation, outside the other specified farm enterprise activities because both costs and benefits are specific to fruit production. (If the investment under consideration were to be in land levelling, or a tractor, or in any other activity yielding joint benefits to the total enterprise, then the incremental benefits from the entire mix of expected farm outputs would have to be great enough to amortize the cost.)

Table 17 provides the basic financial comparisons for fruit as well as other crops. In this example, the fruit plantings are assumed to be staged during three years. (This assumption means that some of the carrying costs associated with the plantings of the second and third years are "buried" within the management and harvesting costs beginning in year 5. As long as there is income (s/.8869) to offset all or part of the outlays of any particular year, no harm is done by treating carrying costs of the fourth and fifth years as production costs.)

Table 17

FINCA MODELO 1.5 ha. ZONA CENTRAL 2600-2800 m.s.n.m.

Con Frutales

AÑOS	MAIZ-FREJOL			ALFALFA			PAPA			CEBOLLA 1/			COSTO	INGRESO
	Super	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	TOTAL	$
0	0.90	2908	5250	0.40	3000	4000	0.20	2942	5000	-	-	-	8400	14250
1	0.70	3769	7769	0.50	6262	6000	-	-		0.20	3118	5999	13149	19768
2	0.40	2154	4440	0.50	5795	13801	-	-		0.30	4677	8999	12626	27240
3-5	0.20	1077	2220	0.50	5795	13801	-	-		0.30	4677	8999	11549	25020

1/ A partir del 6to. año desaparece el cultivo de hortalizas dejando el huerto sin cultivo intercalado.

FUENTE Y ELABORACION : PIDA-Salcedo.

FRUTALES

Pera

AÑOS	Sup/ha.	COSTO	INGRESO BRUTO
1	0.30	6087	
2	0.60	7817	
3	0.80	8211	
4	0.80	5959	
5	0.80	6398	8869
6	0.80	8720	16050
7	0.80	9529	25703
8	0.80	10278	37652
9	0.80	10277	50451
10	0.80	12759	52933

FUENTE Y ELABORACION : PIDA -Salcedo.

Table 18 Financial Analysis of Model Farm No. 4, Salcedo, Ecuador.

Item	0	1	2	3	4	5	6	7	8	9	10
Sales	14250	19768	27240	25020	25020	33863	32071	41724	53673	66472	68954
Costs											
Production	8400	19236	20443	19769	17508	17947	15592	16401	17150	17144	19631
Credit	0	790	758	763	763	1780	1824	1922	2017	2017	2246
Net Income s/.	5850	-258	6039	4488	6749	14136	14655	23401	34506	47311	47077
$	234	-10.32	241.56	179.52	269.96	565.44	586.20	936.04	1380	1690	1883
Difference Due to Project		-244.32	7.56	-54.48	35.96	331.44	352.20	702.04	1146	1456	1649
Δ Index		- .04	1.03	0.77	1.15	2.42	2.51	4.00	5.90	7.22	8.05
PV, 15 years @ 15% = $2364											
Income per hectare						$377					$1255

The discounted costs for the first four years are s/.23854 @ 12 percent. The discounted net benefits for a 10 year farm family investment horizon are s/.57019. In dollar terms B/c $\frac{\$2281}{\$954}$ = 2.39 and IRR = 29.6 percent. Individual farmers should find pear production attractive.

The net income data in Table 18 is net of the value of family labor, but even if that value is taken into account, the early years of establishing orchards on small plots will probably be difficult. The only credit costs included in Table 18 are for production purposes. None of the costs of financing the credit necessary to establish the orchard is included. Even the scheme to plant onions in the years while the trees are growing does not offset the general income loss as land is taken out of traditional patterns to be planted with trees. No doubt pressures for continued off-farm employment would remain high for several years. And, indeed the income per person never surpasses moderate levels, even though projected family incomes rise by 700 percent by the 10th year.

Model Farm Example No. 5 (1.5 ha, non-irrigated, with fruit)

This example is similar to that of model No. 4, and the analysis of potential benefits is approached in the same fashion. Table 19 contains the required basic data.

The discounted investment costs to establish the trees are considerably higher than in the case of pears because a denser planting pattern is assumed (cf. crop budgets in Appendix). Yields, per tree of peaches are assumed generally lower than for pears and apples and this has an effect on gross incomes. In addition, there is lack of irrigation.

Table 19

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.

ZONA CENTRAL SIN RIEGO 2600-2800 m.s.n.m.

AÑOS	MAIZ-FREJOL			ALFALFA			ARVEJA			TOTAL	
	Superf. HA.	Costo $	Ingreso $	Superf. ha.	Costo $	Ingreso $	Superf. ha.	Costo $	Ingreso $	Costo $	Ingreso $
0	1	3231	4833	0.30	2250	2500	0.20	460	900	5941	8233
1	0.75	4030	8325	0.25	3131	3000	0.20	795	3200	7964	14525
2	0.50	2693	5550	0.25	2897	6900	0.40	1590	6399	7180	18849
3	0.50	2693	5550	0.25	2897	6900	0.40	1590	6399	7180	18849
4	0.50	2693	5550	0.25	2897	6900	0.40	1590	6399	7180	18849
5	0.50	2693	5550	0.25	2897	6900	0.0	-	-	5590	12450

DURAZNO

AÑOS	SUPERF.	COSTO	INGRESO
1	0.50	19286	
2	0.75	14888	
3	0.75	11116	
4	0.75	14713	
5	0.75	16099	19899
6	0.75	16374	27074
7	0.75	16374	34574
8	0.75	16374	42074
9	0.75	16374	44574
10	0.75	16374	44574

FUENTE Y ELABORACION: PIDA-SALCEDO

Table 20 Financial Analysis of Model Farm #5, Salcedo, Ecuador.

Item	0	1	2	3	4	5	6	7	8	9	10
Sales	8233	14525	18845	18849	18849	32341	39524	47024	63849	69474	69474
Costs											
Production	5941	7964	7180	7180	7180	21689	23554	23554	23554	23554	23554
Credit	0	287	259	259	259	1825	1978	1978	1978	1978	1978
Net Income	s/.2292	6274	11410	11410	11410	8827	13992	21492	38317	43942	43942
	$91.68	251	456	456	456	353	560	860	1533	1758	1758
Difference due to Project		159	365	365	365	261	468	768	1441	16[illegible]	1666
Index		2.74	4.97	4.97	4.97	3.85	6.1	9.4	16.7	19.1	19.1
PV, 15 years @ 15% = $3,492											
Income per hectare						$235.3					$1172

PV of investment @ 12% = s/.51913 ($2076.5)

PV of net benefits @ 12% = s/.56841 ($2273.6)

B/c = 1.09 IRR= 13.5%

In this model the investment does not appear attractive.

This example shows the effects of not reducing farm income so drastically during the years trees are being matured. Even though the tree crop itself does not appear to be as attractive an investment as in Example No. 4, the overall benefits during a 15 year period shows a considerably higher present value of the incremental income stream due to the IRD project.

III. DATA ANNEX

A. Crop Budgets, Pida-Salcedo

B. Representative Farm Models, Pida-Salcedo

A. Crop Budgets, PIDA-Salcedo

Annex Table A.1

COSTOS DE PRODUCCION POR HECTARE DE LOS PRINCIPALES CULTIVOS EN EL AREA PIDA SALCEDO. 1976
(En Sucres)

CULTIVO	TOTAL	%	MANO DE OBRA	%	INSUMOS	%	EQUIPO	%	RENDIMIENTO qq/ha
Cebada	1.943	100	840	43	700	36	403	21	13
Papas	15.000	100	4.068	27	8.722	58	2.210	15	250
Maíz	1.888	100	1.270	67	268	14	350	19	8
Fréjol	1.392	100	750	54	374	27	268	19	5
Habas	1.925	100	675	35	600	31	650	34	10
Trigo	3.000	100	960	32	1.260	42	780	26	18
Arveja	2.100	100	1.600	76	340	16	160	8	10
Pastos	4.431	100	1.108	25	1.772	40	1.551	35	1.680 Litros

FUENTE: INVESTIGACION DIRECTA
ELABORACION: PIDA SALCEDO

Annex Table A.2

COSTOS DE PRODUCCION POR HECTAREA DE LOS PRINCIPALES CULTIVOS RECOMENDADOS POR EL M.A.G., 1976
(En Sucres)

CULTIVOS	TOTAL	%	MANO DE OBRA	%	INSUMOS	%	EQUIPO	%	RENDIMIENTO qq/ha
Cebada	8.276	100	573	7	5.828	70	1.875	23	50
Papas	21.287	100	5.228	25	15.159	71	900	4	263
Maíz	6.770	100	938	14	4.792	71	1.040	15	16
Fréjol	8.069	100	4.660	58	2.489	31	920	11	15
Habas	5.235	100	1.750	33	2.565	49	920	18	25
Trigo	6.338	100	264	4	4.454	70	1.620	26	45
Arveja	5.042	100	1.890	37	2.462	49	690	14	25

FUENTE : M.A.G., 1976
ELABORACION: PIDA SALCEDO

Annex Table A.3

COSTOS DE PRODUCCION DE 1 ha. DE CEBADA

PIDA-SALCEDO

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPOS				COSTO
	Nº Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	Nº	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Desinfección semilla, siembra y tape	3	90	Tilex	Kg.	0.18	45					
			Semilla	Kg.	81.8	360	Yunta	día	1	100	595
Fertilización	1	30	18-46-0	Kg.	200	1496					
			0-0-60	Kg.	50	194					1.720
Control malezas	3	90	2-4-D	lt.		180	Bomba	día	3	30	300
Cosecha	6	180									180
Trilla							Trillad.	qq	35	700	700
											$ 4.015
							Imprevistos		5%		201
							TOTAL				$ 4.216

El rendimiento aproximado por ha. es de 1.593 Kg. $ 7.000,oo

NOTA: Los costos de equipos corresponden a alquiler.

Annex Table A.4

COSTOS DE PRODUCCION DE 1 ha. DE MAIZ-FREJOL

PIDA-SALCEDO

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPO				COSTO
	NºJornales	Valor	NOMBRE	U.M.	Cantid.	VALOR	NOMBRE	U.M.	Nº	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Surcada	1	30					Yunta	día	1	100	130
Desinfección suelo	1	30	Desinfect.	Kg.	3.6	320	Bomba	día	1	10	360
Fertilización y tape	2	60	10-30-10	Kg.	300	2160					2.220
Desinfección, siembra y tape	6	180	Desinfect.	Kg.	0.27	45					
			Semilla Fréjol	Kg.	22.7	400					
			Semilla Maíz	Kg.	22.7	200					825
Deshierba	3	90					Azadón	día	6	6	96
Aporque	5	150					Azadón	día	8	8	158
Control Fitosanitario	3	90	Varios	--	--	400	Bomba	día	3	30	520
Cosecha	10	300									300
											$ 5,129
							Imprevistos		5%		256
							TOTAL				$ 5.385

Rendimiento estimado por ha. 819 Kg. maíz $ 6.300
273 Kg. fréjol 4.800

$ 11.100

NOTA:
Los costos de herramientas corresponden a alquiler y desgaste.

Annex Table A.5

COSTOS DE PRODUCCION DE 1 ha. DE PAPA

PIDA-SALCEDO

ACTIVIDADES	MANO DE OBRA Jornal	MANO DE OBRA Valor	INSUMOS NOMBRE	INSUMOS U.M.	INSUMOS Cantidad	INSUMOS Valor	EQUIPO NOMBRE	EQUIPO U.M.	EQUIPO Nº	EQUIPO Valor	COSTO TOTAL
Arada	2	60					Yunta	día	2	200	250
Cruza	2	60					Yunta	día	2	200	260
Surcada	1	30					Yunta	día	1	100	130
Desinfección suelo	2	60	Desinfect.	Kg.	18	720	Bomba	día	2	20	800
Desinfección semilla	1	30	Desinfect.	Kg.	0.45	160					190
Fertilización y tape	2	60	Fertilizant.	Kg.	900	7200					7260
Siembra y tape	5	150	Semilla	Kg.	1365	6000	Yunta	día	1	100	6250
Deshierba	4	120					Azadón	día	4	4	124
Medio Aporque	4	120					Azadón	día	4	4	124
Aporque	8	240					Azadón	día	3	8	240
Control Fitosanitario	23	690	Fungicida	Kg.	6.8	600	Bomba	día	23	230	
			Insecticida	Kg.	10.4	690					
			Fijador	lt.	1.8	320					2530
Cosecha	40	1.200									1200
Alquiler costales											400
											$ 19776
							Imprevistos 5%				989
							TOTAL				$ 20765

Rendimiento estimado por ha. 18.200 Kg. $ 44.000,oo

NOTA:

1 qq semilla = 45.5 Kg.
1 qq fertilizante = 50.0 Kg.
Producción 1 qq = 45.5 Kg.

Los Costos de herramientas y equipos corresponden a alquiler

Annex Table A.6

COSTOS DE PRODUCCION DE 1 ha. DE TRIGO

PIDA - SALCEDO

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPOS				COSTO
	Nº Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	Nº	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Desinfección semilla, siembra y tape	3	90	Tilex	Kg.	0.18	45					
			Semilla	Kg.	82	675	Yunta	día	1	100	910
Fertilización	1	30	18-46-0	Kg.	200	1496					
			0-0-60	Kg.	50	194					1.720
Control malezas	3	90	2-4-D	Lt.		160	Bomba	día	3	30	280
Aplicación URCA	1	30	UREA	Kg.	50	266					296
Aplicación insecticida	3	90	Antio KD	l.		198	Bomba	día	3	30	318
Cosecha	6	180									180
Trilla							Trillad.	qq	35	700	700
											$ 4.924
							Imprevistos			5%	246
							TOTAL				$ 5.170

El rendimiento aproximado es de 1.593 Kg/ha. $ 9.450,oo

NOTA: Los costos de equipos corresponden a alquiler.

Annex Table A.7

COSTOS DE PRODUCCION DE 1 ha. DE ARVEJA

PIDA-SALCEDO

A C T I V I D A D E S	MANO DE OBRA		INSUMOS				EQUIPO				COSTO
	Nº Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	u.m.	Nº	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Fertilización	2	60	0-46-0	Kg.	150	1026					
			0-0-60	Kg.	25	97					1.183
Desinfección, siembra y tape	4	120	Tilex	Kg.	0.18	45					
			Semilla	Kg.	45.5	800	Yunta	día	2	200	1.165
Control fitosanitario	4	120	Varios	--	---	400	Bomba	día	4	40	560
Cosecha	10	300					Acémila	día	6	60	360
											$ 3.788
							Imprevistos 5%				189
							Total.....				$ 3.977

El rendimiento estimado por ha. es de 910 Kg. $ 16.000,oo

NOTA: Los costos de equipos comprenden a alquiler.

Annex Table A.8

COSTOS DE PRODUCCION DE 1 ha. DE HABA

PIDA-SALCEDO

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPOS				COSTO
	NºJornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	Nº	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Surcada	1	30					Yunta	día	1	100	130
Desinfección suelo	1	30	Desinfect.	Kg.	4.5	400	Bomba	día	1	10	440
Fertilización	2	60	0-46-0	Kg.	150	1026					1.183
			0-0-60	Kg.	25	97					
Desinfección y siembra	4	120	Tilex	Kg.	0.18	45	Yunta	día	2	200	1.115
			Semilla	Kg.	60	750					
Aporque	5	150					Azadón	día	5	5	155
Control fitosanitario	4	120	Varios	--	--	300	Bomba	día	4	40	460
Cosecha	10	300									300
										$	4.303
							Imprevistos 5%				215
							TOTAL				$ 4.518

Rendimiento arpoximado por ha. 1138 Kg. $ 12.500,oo

NOTA: Los costos de herramientas y equipos corresponden a alquiler

Annex Table A.9

COSTOS DE PRODUCCION DE 1 ha. DE CEBOLLA BLANCA

PIDA-SALCEDO

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPOS				COSTO
	Nº Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	Nº	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Surcada	1	30					Yunta	día	1	100	130
Desinfección suelo	1	30	Varios	--	--	500					530
Fertilización	6	180	Abono Org.	Kg.	20000	4800					
			10-30-10	Kg.	500	3600					8.580
Semillero	2	60	Semilla	Kg.	200	900					960
Transplante	15	450									450
Labores culturales	40	1200					Azadón	día	40	40	1.240
Control fitosanitario	6	180	Varios	--	---	1000	Bomba	día	6	60	1.240
Cosecha	40	1200									1.200
											$ 14.850
							Imprevistos 5%				742
							TOTAL				$ 15.592

Rendimiento estimado 6.825 Kg/ha. $ 30.000,oo

NOTA: Los costos de herramientas corresponden a alquiler y desgaste.

Annex Table A.10

COSTOS DE PRODUCCION DE 1 ha. DE AJO

PIDA - SALCEDO

A C T I V I D A D E S	MANO DE OBRA		INSUMOS				EQUIPO				COSTO
	N°Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	N°	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Surcada	2	60					Yunta	día	2	200	260
Desinfección suelo	2	60	Varios	--	--	500	Bomba	día	2	20	580
Desinfaccion semilla	2	60	TR-PCNB	Kg.	1.8	200					260
Siembra y tape	15	450	Semilla	Kg.	1138	25000					25.450
Fertilización	5	150	Ab.Orgán.	Kg.	15000	3600					
			10-30-10	Kg.	500	3600					7.350
Deshierba	12	360					Azadón	día	12	12	372
Control fitosanitario	6	180	Varios	--	---	800					980
Cosecha	40	1200									1.200
											$36.972
							Imprevistos	5%			1.848
							TOTAL				$ 38.820

Rendimiento estimado por ha. 5.688 Kg. $ 87.500

NOTA:
Los costos de herramientas corresponden a alquiler y desgaste

Annex Table A.11

COSTOS DE PRODUCCION DE 1 ha. DE POTRERO

PIDA-SALCEDO

(Ray Grass,trébol,pasto azul)

C T I V I D A D E S	MANO DE OBRA		INSUMOS				EQUIPOS				COSTO
	Nº Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	Nº	Valor	TOTAL
Arada	2	60					Yunta	día	2	200	260
Cruza	2	60					Yunta	día	2	200	260
Rastra	2	60					Yunta	día	2	200	260
Desinfección semilla	1	30	Desinfect.	--	--	150					180
Siembra y tape	2	60	Semilla	Kg.	91	2800	Yunta	día	1	100	2.960
Fertilización	1	30	10-30-10	Kg.	250	1800					1.830
Cosecha	60	1800					Hoz	día	60	30	1.830
											$ 7.580
						Imprevistos 5%					379
						T O T A L					$ 7.959

Rendimiento estimado por ha. 20 T.M. $ 10.000

NOTA: Los costos de herramientas y equipos corresponden a alquiler.

Annex Table A.12

COSTOS DE PRODUCCION DE 1 ha. DE ALFALFA

PIDA-SALCEDO

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPOS				AÑO 1 COSTO TOTAL
	Nº Jornal	Valor	NOMBRE	U.M.	Cantíd.	Valor	NOMBRE	U.M.	Nº	Valor	
Arada							Tractor	día	1	500	500
Rastra							Tractor	día	1	300	300
Cruza							Tractor	día	1	300	300
Desinfección suelo	2	60	Desinfect.	gr.	500	270					330
			0-46-0	Kg.	250	1.705					
			0-0-60	Kg.	50	192					1.897
Siembra	10	300	Semilla	Kg.	32	6.400					6.740
			Desinfect.	gr.	120	40					600
Deshierba	20	600									1.260
Corte	42	1.260									
											$ 11.927
							Imprevistos 5%				597
							T O T A L				$ 12.524

Rendimiento aproximado por ha 240 cargas $ 12.000,oo

NOTA: Los costos de equipo corresponden a alquiler

Annex Table A.13

COSTOS DE PRODUCCION - CULTIVO DE ALFALFA

PIDA-SALCEDO

AÑO 2

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPO				COSTO
	Nº Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	Nº	Valor	TOTAL
Fertilización	5	150	10-3-10	Kg.	500	3.668					3.818
Deshierbas	50	1.500									1.500
Controles fitosanitarios	3	90	Plaguicidas		5	500	Bomba	día	3	30	620
Corte	170	5.100									5.100
										$	11.038
							Imprevistos 5%				552
							TOTAL			$	11.590

Rendimiento aproximado 552 cargas $ 27.600,oo

Annex Table A.14

COSTOS DE PRODUCCION DE 1 ha DE AVENA

PIDA-SALCEDO

ACTIVIDADES	MANO DE OBRA		INSUMOS				EQUIPOS				COSTO
	Nº Jornal	Valor	NOMBRE	U.M.	Cantid.	Valor	NOMBRE	U.M.	Nº	Valor	TOTAL
Arada							Tractor	día	1	400	400
Cruza							Tractor	día	1	400	400
Rastra							Tractor	día	1	200	200
Desinfección de semilla	1	30	Desinfec.	gr.	300	187					217
Fertilización	1	30	10-30-10	Kg.	200	1468					1.498
Siembra y tape	1	30	Semilla	Kg.	80	1600	Tractor	día	1	200	1.830
Corte	40	1200									1.200
											$ 5.745
							Imprevistos 5%				287
							TOTAL				$ 6.032

Rendimiento aproximado 400 cargas a $ 40,oo c/u = $ 16.000,oo

NOTA: Los Costos de Equipos corresponden a alquiler.

Annex Table A.15

COSTOS DE PRODUCCION

SISTEMA TECNIFICADO

CULTIVO: PERALES SITIO: PIDA-SALCEDO SUPERFICIE ha. 1 Nº PLANTAS: 200

ACTIVIDADES	MANO DE OBRA Nº Jornal (a)	Valor Unitario (b)	Valor Total (c)	INSUMOS NOMBRE (a)	U. M. (b)	Cantidad (c)	Valor Unit. (d)	Valor Total (e)	EQUIPO NOMBRE (a)	N. (b)	Valor Unit. (c)	Valor Total (d)	VARIOS Valor Total (a)	TOTAL
Nivelación	20	30	600						Palas	3	90	270		870
P.Suelo	6	30	180						Yunta	2	80	160		340
Aper.Canales.	10	30	300						Azadón	4	90	360		360
									Carretilla	1	900	900		1.200
Elaborac.Hoyo	20	30	600						Pico	3	70	210		810
Delimiación	1	30	30	Estacas tutores	estaca	100	2	200						230
Abonadura	7	30	210	Abono animal	Kg	200	2000	4.000						4.210
Fertilización	1	30	30	Fertilizantes	Kg.	50	8	400						430
Plantación	5	30	150	Plantas	Planta	200	10	2.000	Barras	2	200	400		2.550
C.Fitosanitario	1	30	30	Fungicidas	Kg.	0.75	100	75	Bombas Mochila	1	3000	3000		3.105
				Coadyuvantes	Litro	0.15	100	15	Rec.Plástico	1	25	20		40
				Insecticida	Litro	0.3	300	90	Tanque	1	200	200		290
Deshierba	3	30	90											90
Despunte-Poda	1	50	50											50
Riego Lim.canal	6	30	180						Arr.Agua		200	200		380
Cercada	10	30	300	Alambre Púa	Kg.	60	20	1.200						1.500
				Postes	Poste	80	10	800						800
SUB TOTAL	90		2.750					8.780				5725		17.255
5% Imprevistos														862
TOTAL													$	18.117

NOTA: En los costos de PERALES las herramientas son compradas a excepción de la Yunta

Annex Table A.16

COSTOS DE PRODUCCION

CULTIVO: DURAZNO SITIO: PIDA-SALCIDO SUPERFICIE: 1 ha. N°DE PLANTAS: 400

ACTIVIDADES	MANO DE OBRA Nº de Jornal (a)	Valor Unitario (b)	Valor Total (c)	INSUMOS NOMBRE (a)	U.M. (b)	Cantidad (c)	Valor Unit. (d)	Valor Total (e)	EQUIPO NOMBRE (a)	Nº (b)	Valor Unit. (c)	Valor Total (d)	VARIOS Valor TOTAL (a)	TOTA
Nivelación	20	30	600											
P. Suelo	6	30	180						Pala	3	90	270		87
Apert. Canal	10	30	300						Yunta	2	80	160		34
Elab.Hoyos	30	30	900						Carretilla	1	100	900		1.20
									Azadón	4	90	360		1.26
Deliniación	2	30	60	Estaca Tutores	Estaca	400	2	800	Picos	3	70	210		21
Fertilización	3	30	90	Fertilizantes	Kg.	200	8	1.600						86
Abonadura	7	30	210	Abono Animal	Kg.	200	2000	4.000						1.69
Plantación	8	30	240	Plantas	Planta	400	20	8.000						4.21
C.Fitosanitario	6	30	90	Fungicida	Kg.	3	100	300	Barras	2	200	400		8.64
				Insecticida	Lts.	21	300	6.300	Bomba	1	3000	3000		3.39
				Coadyuvantes	Lts.	0.3	100	30	Tanque	1	200	200		6.50
Deshierba	4	30	120						Rec.Plástico	2	100	200		23
Despunte Poda	2	50	100											12
Riego lim.canal	6	30	180	Arriendo agua				200	Tijeras chica	2	250	500		60
Cercada	10	30	300	Alambre Púa	Kg.	60	20	1.200						38
				Postes		80	10	800						1.50
SUB TOTAL	111		3.370					23.230						80
5% Imprevistos												6200	32.80	
													1.64	
									TOTAL			$	34.40	

NOTA: En los Costos de Durazno las herramientas son compradas a excepción de la Yunta.

Annex Table A,17

COSTOS DE PRODUCCION

SISTEMA TECNIFICADO

CULTIVO: Manzana SITIO: PIDA-Salcedo Nº PLANTAS: 3 00

ACTIVIDADES	MANO DE OBRA Nº Jornal (a)	Valor Unitario (b)	Valor Total (c)	INSUMOS NOMBRE (a)	U.M. (b)	Cantidad (c)	Valor Unit. (d)	Valor Total (e)	EQUIPO NOMBRE (a)	NU (b)	Valor Unit. (c)	VARIOS Valor Total (d)	Valor Total (a)	TOTAL
Nivelación	20	30	600											
Prepar.Suelo	6	30	180						Pala	3	90	270		870
									Yunta	2	80	160		340
Apert.Canales	10	30	300						Azadón	4	90	360		360
Elabor.Hoyos	20	30	600						Carretilla	1	900	900		1.200
Deliniación	1	30	30	Estaca-Tutores		200	2	400	Picos	3	70	210		810
Fertilización	2	30	60	Fertilizantes	Kg.	100	8	800						430
Abonadura	7	30	210	Abono animal	Kg.	200	2000	4.000						860
Plantación	6	30	180	Plantas	plant	300	20	6.000						4.210
C.Fitosanitario	2	30	60	Fungicidas	Kg.	2	120	240						6.180
				Insecticidas	Lts.	0.4	300	120	Bomba mochila	1	3000	3000		3.300
				Coadyuvantes	Lts.	0.2	100	20	Tanque	1	300	300		420
Deshierba	4	30	120						Recip.plástic	1	25	25		45
Despunta poda	1	50	50											120
Riego limpieza	6	30	180	Arriendo Agua			200	200	Tijera chica	1	250	250		300
Cercada	10	30	300	Alambre Púa	Kg.	60	20	1.200						380
				Postes	Poste	80	10	800						1.500
SUB TOTAL	95		2.870					13.780			5475			800
Administración e Imprevistos			5%											— 22.125
														1.106
TOTAL														$ 23.231

NOTA: En los costos de Manzana las herramientas a excepción de la Yunta son comprados.

B. Representative Farm Models, PIDA-Salcedo

Annex Table B.1

FINCA MODELO 1.5 ha. ZONA CENTRAL 2600-2800 m.s.n.m.

Con Frutales

AÑOS	MAIZ-FREJOL			ALFALFA			PAPA			CEBOLLA 1/			COSTO TOTAL	INGRESO $
	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso		
0	0.90	2908	5250	0.40	3000	4000	0.20	2942	5000	-		-	8400	14250
1	0.70	3769	7769	0.50	6262	6000	-	-		0.20	3118	5999	13149	19768
2	0.40	2154	4440	0.50	5795	13801		-		0.30	4677	8999	12626	27240
3-5	0.20	1077	2220	0.50	5795	13801	-	..	--	0.30	4677	8999	11549	25020

1/ A partir del 6to. año desaparece el cultivo de hortalizas dejando el huerto sin cultivo intercalado.

FUENTE Y ELABORACION : PIDA-Salcedo.

FRUTALES

Pera

AÑOS	Sup/ha.	COSTO	INGRESO BRUTO
1	0.30	6087	
2	0.60	7817	
3	0.80	8211	
4	0.80	5959	
5	0.80	5398	8869
6	0.80	8720	16050
7	0.80	9529	25703
8	0.80	10278	37652
9	0.80	10277	50451
10	0.80	12759	52933

FUENTE Y ELABORACION : PIDA -Salcedo.

Annex Table B.2

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.

ZONA CENTRAL SIN RIEGO 2600-2800 m.s.n.m.

AÑOS	MAIZ-FREJOL			ALFALFA			ARVEJA			TOTAL	
	Superf. HA.	Costo $	Ingreso $	Superf. ha.	Costo $	Ingreso $	Superf. ha.	Costo $	Ingreso $	Costo $	Ingreso $
0	1	3231	4833	0.30	2250	2500	0.20	460	900	5941	8233
1	0.75	4030	8325	0.25	3131	3000	0.20	795	3200	7964	14525
2	0.50	2093	5550	0.25	2897	6900	0.40	1590	6399	7180	18849
3	0.50	2093	5550	0.25	2897	6900	0.40	1590	6399	7180	18849
4	0.50	2093	5550	0.25	2897	6900	0.40	1590	6399	7180	18849
5	0.50	2093	5550	0.25	2893	6900	-	-	-	5590	12450

DURAZNO

AÑOS	SUPERF.	COSTO	INGRESO
1	0.50	19286	
2	0.75	14888	
3	0.75	11116	
4	0.75	14713	
5	0.75	16099	19899
6	0.75	16374	27074
7	0.75	16374	34574
8	0.75	16374	42074
9	0.75	16374	544574
10	0.75	16374	44574

FUENTE Y ELABORACION: PIDA-SALCEDO

Annex Table B.3

FINCA MODELO . 7.0 ha. ZONA CENTRAL 2600-2800 m.s.n.m.

Cultivos

AÑOS	MAIZ-FREJOL			ALFALFA			CEBOLLA			ARVEJA			COSTO	$
	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	TOTAL	INGRESO
0	6.0	19386	35000	-	-	---	-	--	---	1	2300	7000	21686	42000
1	5.4	29079	59140	1.0	12524	12000	0.3	4678	9000	(0.3)	1193	4800	47474	84940
2	3.5	18848	36851	1.5	17851	35738	1.1	17151	33000	(1)	3977	16000	57827	123589
3-5	1.7	9155	18871	2.0	23646	47738	1.3	20270	39000	(2)	7954	32000	61025	137609

FUENTE Y ELABORACION : PIDA-Salcedo

Frutales

PERA

AÑO	Sup/ha	COSTO	INGRESO $
1	0.30	6087	
2	1.0	15934	
3	2.0	26751	
4	2.0	28328	
5	2.0	28252	34114
6	2.0	30621	48946
7	2.0	34527	74962
8	2.0	31679	100114
9	2.0	33671	134106
10	2.0	36059	136494

FUENTE Y ELABORACION : PIDA-Salcedo.

Annex Table B.4.

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 7 ha.

ZONA CENTRAL SIN RIEGO 2600-2800 m.s.n.m.

AÑOS	MAIZ-FREJOL			ALFALFA			ARVEJA			T O T A L	
	Superf. ha.	Costo $	Ingreso $	Superf. ha.	Costo $	Ingreso $	Superf. ha.	Costo $	Ingreso $	COSTO $	INGRESO (I.B.)
0	5.5	17771	36331	1	7514	7200	0.5	1193	4800	26478	48631
1	5.5	29618	61051	1	12524	12000	0.5	1989	8001	44131	81052
2	4.0	21540	44400	2	23641	47739	1	3977	16000	49158	108139
3	3.5	18848	38851	2	23178	48000	1.5	5966	24001	47992	110852
4	3.5	18848	38851	2	23178	48000	1.5	5966	24001	47992	110852
5	3.5	18848	38851	2	23178	48000	1.5	5966	24001	47992	110852

DURAZNO

AÑOS	SUPERFICIE	COSTO	INGRESO
1	0.5	19286	
2	1	24531	
3	1.5	33025	
4	1.5	24105	
5	1.5	29776	3800
6	1.5	32198	54148
7	1.5	32748	69148
8	1.5	32748	84148
9	1.5	32748	89148
10	1.5	32748	89148

FUENTE Y ELABORACION: PIDA-SALCEDO

Annex Table B.5

FINCA MODELO 1.5 ha. ZONA CENTRAL 2600-2900 m.s.n.

Sin Frutales

AÑOS	MAIZ-FREJOL			ALFALFA			PAPA			CEBOLLA			COSTO	S/.
	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	Sup/ha	Costo	Ingreso	TOTAL	INGRESO
0	0.90	2908	5250	0.40	3000	4000	0.2	2492	5000	--	---	---	8400	14250
1	0.70	3769	7769	0.50	6262	6000	-	-	-	0.3	4678	9000	14709	22769
2	0.40	2154	4440	0.50	5795	13801	-	-	-	0.6	9355	18000	17304	36241
3-5	0.20	1977	2220	0.50	5795	13801	-	-	-	0.8	12474	24000	19346	40.021

FUENTE Y ELABORACION : PIDA-Salcedo.

Annex Table B.6

PLAN DE PRODUCCION DE CULTIVOS FINCA MODELO 1.5 ha SIN RIEGO

ZONA ORIENTAL 2800-3000 m.s.n.m.

AÑOS	MAIZ-FREJOL			PAPA			HABA			ARVEJA			CEBADA			TOTAL		
	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso
0	0.5	1615	2916	0.25	3115	6250	0.3	813	2250				0.45	1138	1890	1.5	6681	13300
1	0.5	2692	5549	0.5	10382	22000	0.3	1355	3750	0.2	795	3200				1.5	15224	34499
2	0.4	2153	4440	0.5	10382	22000	0.2	903	2500	0.4	1590	6400				1.5	15028	35340
3-5	0.3	1615	3330	0.6	12459	26400	0.2	903	2500	0.4	1590	6400				1.5	16567	38630

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.7

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 7 ha.

ZONA ORIENTAL SIN RIEGO 2800-3000 m.s.n.m.

AÑOS	PAPA		ARVEJA		POTRERO		ALFALFA		AVENA		CEBADA		TOTAL	
	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso
0			15900	3200	4775	5000			3620	4000	7581	9810	17566	22010
1	20765	42900	1988	7200	15918	18000	25048	28496	9048	21600			72767	118196
2	20765	42900	1988	7200	3980	20000	29440	47138	6032	14400			62205	131638
3	20765	42900			3980	20000	35234	59138	6032	14400			66011	136438
4	20765	42900			3980	20000	35234		6032	14400			66011	136438
5	20765	42900			3980	20000	35234		6032	14400			66011	136438

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.8

PLAN DE PRODUCCION DE CULTIVOS FINCA MODELO 7 ha. CON RIEGO

ZONA ORIENTAL 2800-3000 m.s.n.m.

AÑOS	PAPA			MAIZ - FREJOL			POTRERO			ALFALFA			AVENA			TOTAL	
	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Costo	Ingreso
0	0.5	6230	10000	1.5	4845	7705	2	9550	11000	2	15000	20000	1	3620	6000	39245	54705
1	0.5	10382	21999	0.5	2692	5549	2.5	9897	24999	3	37572	39144	0.5	3016	8000	73559	99691
2	1	20765	44000	0.5	2692	5549	2.5	4975	28750	3	34767	82800	-	--	--	63199	161099
3-5	1	20765	44000	-	--	--	2.5	4975	28750	3	34767	82800	0.5	3016	8000	63523	163550

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B. 9

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.
ZONA ORIENTAL 3000-3500 m.s.n.m.

AÑOS	PAPA			HABA			CEBADA			TOTAL		
	Superf	Costo	Ingreso	Superf	Costo	Ingreso	Superf	Costo	Ingreso	Superf.	Costo	Ingreso
0	0.40	4984	10000	0.70	1897	5250	0.40	1011	1680	1.5	7892	16930
1	0.5	10382	21999	0.5	2259	6245	0.5	2108	3500	1.5	14749	31744
2	0.75	15573	32998	0.5	2259	6245	0.25	1054	1750	1.5	18886	40993
3	1.0	20765	44000	0.5	2259	6245				1.5	23024	50245
4	1.0	20765	44000	0.5	2259	6245				1.5	23024	50245
5	1.0	20765	44000	0.5	2259	6245				1.5	23024	50245

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.10

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.
ZONA ORIENTAL CON RIEGO 2800-3000 m.s.n.m.

AÑOS	PAPA			HABA			MAIZ-FREJOL			CEBADA			AJO			TOTAL	
	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Sup	Costo	Ingreso	Costo	Ingreso
0	0.4	4984	10000	0.3	813	2250	0.4	1292	2332	0.4	1011	1680				8100	16262
1	0.4	8306	17600	0.3	1555	3950	0.5	2685	5580	0.2	843	1400	0.1	3882	8720	17271	37250
2	0.6	12459	26400	0.2	904	2500	0.4	2154	4440	0.1	422	700	0.2	7774	17510	23713	51550
3	0.7	14535	30800	0.10	452	1250	0.2	1077	2220				0.5	19410	43800	35474	78070
4	0.7	14535	30800	0.1	452	1250	0.2	1077	2220				0.5	19410	43800	35474	78070
5	0.7	14535	30800	0.1	452	1250	0.2	1077	2220				0.5	19410	43800	35474	78070

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.11

PLAN DE PRODUCCION DE CULTIVOS FINCA MODELO 7 ha.

ZONA ORIENTAL 3000 - 3500 m.s.n.m.

AÑOS	PAPA			HABA			AJO			AVENA			ALFALFA			TOTAL	
	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Costo	Ingreso
0	1.5	18690	25000	2	5416	14400	0.25	7764	13125	1	3620	6000	0.25	1875	2500	37365	61025
1	1.75	36338	76998	2	9036	25030	0.25	9075	21245	1	6032	16000	2	25048	24000	85529	163273
2	2	41530	88000	2	9036	25030	0.5	19410	43750	0.5	3016	8000	2	23178	52200	96170	219980
3	2.5	51912	109999	1.5	6777	18735	0.5	19410	43750	0.5	3016	8000	2	23178	52200	104293	235684
4	2.5	51912	109999	1.5	6777	18735	0.5	19410	43750	0.5	3016	8000	2	23178	52200	104293	235684
5	2.5	51912	109999	1.5	6777	18735	0.5	19410	43750	0.5	3016	8000	2	23178	52200	104293	235684

FUENTE Y ELABORACION. PIDA SALCEDO

Annex Table B.12

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.

ZONA OCCIDENTAL 3000-3500 m.s.n.m.

AÑOS	PAPA			ARVEJA			CEBADA			TOTAL	
	Super.	Costo	Ingreso	Super.	Costo	Ingreso	Super	Costo	Ingreso	Costo	Ingreso
0				0.25	944	3150	1.25	5270	8750	6214	11900
1	0.25	5191	10450	0.25	944	3150	1.00	4216	7000	10351	20600
2	0.50	10382	20900	0.50	1988	6300	0.5	2108	3500	14478	30700
3-5	0.75	15573	31350	0.50	1988	6300	0.25	1054	1750	18615	39400

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.13

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.

ZONA OCCIDENTAL SIN RIEGO 2800-3000 m.s.n.m.

AÑOS	MAIZ-FREJOL			CEBADA			TRIGO			ARVEJA			TOTAL	
	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso	Sup.	Costo	Ingreso
0	0.80	2445	5328	0.40	1349	1680	0.25	1034	1417	0.05	150	480		5991	8905
1	0.80	4308	8880	0.40	1686	2800	0.25	1292	2362	0.05	199	800		7489	14842
2	0.70	3769	7770	0.30	1225	2060	0.20	1034	1800	0.30	1193	4800		7221	16520
3	0.50	2692	5550	0.10	422	700	0.40	2068	3780	0.50	1988	8000		7170	18030
4	0.50	2692	5550	0.10	422	700	0.40	2068	3780	0.50	1988	8000		7170	18030
5	0.50	2692	5550	0.10	422	700	0.40	2068	3780	0.50	1988	8000		7170	18030

MANZANA

AÑOS	SUPERFICIE	COSTO	INGRESO
1	0.05	1301	
2	0.30	6874	
3	0.50	7594	
4	0.50	4849	
5	0.50	6133	- 5000
6	0.50	6919	10934
7	0.50	7612	14682
8	0.50	7994	20446
9	0.50	7994	27594
10-	0.50	7994	30976

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.14

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 7 ha.

ZONA OCCIDENTAL SIN RIEGO 2800-3000 m.s.n.m.

AÑOS	PAPA		CEBADA		ARVEJA		POTERERO		ALFALFA		AVENA		TOTAL	
	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso
o	6230	6300	5052	5144	1590	1620	7662	7730	7500	7550	5430	5500	33464	33844
1	10382	19250			1988	4800	15918	21000	37572	25200	6032	11200	71892	81450
2	10382	19250			1988	4800	3980	17000	41029	59138	3016	5600	60385	105788
3	10382	19250			1988	4800	3980	17000	40561	71400	3016	5600	59927	118050
4	10382	19250			1988	4800	3980	17000	40561	71400	3016	5600	59927	118050
5	10382	19250			1988	4800	3980	17000	40561	71400	3016	5600	59927	118050

FUENTE Y ELABORACION: PIDA SALCEDO

Annex Table B.15

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.

ZONA OCCIDENTAL SIN RIEGO 3000-3500 m.s.n.m.

AÑOS	CEBADA			HABA			PAPA			TOTAL		
	Super	Costo	Ingreso	Super.	Costo	Ingreso	Super.	Costo	Ingreso	Superf.	Costo	Ingreso
0	1	2527	4200	0.25	677	1875	0.25	3115	6250	1.5	6319	12325
1	0.75	3162	5250	0.5	2259	6750	0.25	5191	9625	1.5	10612	21625
2	0.5	2108	3500	0.5	2259	6750	0.5	10382	19250	1.5	14749	29500
3	0.25	1054	1750	0.5	2259	6750	0.75	15573	28875	1.5	18886	37375
4	0.25	1054	1750	0.5	2259	6750	0.75	15573	28875	1.5	18886	37375
5	0.25	1054	1750	0.5	2259	6750	0.75	15573	28875	1.5	18886	37375

FUENTE YE ELABORACION : PIDA SALCEDO

Annex Table B 16

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 1.5 ha.

ZONA OCCIDENTAL CON RIEGO 2800-3000 m.s.n.m.

AÑOS	MAIZ-FREJOL			CEBADA			ALFALFA			CEBOLLA-AJO			TOTAL	
	Superf.	Costo	Ingreso	Superf.	Costo	Ingreso	Superf.	Costo	Ingreso	Superf.	Costo	Ingreso	COSTO	INGRESO
0	0.00	3000	5400	0.60	1950	2630	0.10	800	900				5750	8930
1	0.00	4306	8980	0.55	2319	3850	0.10	1253	1200	0.05	780	1500	8660	15530
2	0.50	2675	5500	0.20	843	1409	0.50	5794	13800	0.30	4677	9000	13990	29709
3	0.10	533	1110	0.10	421	1110	0.80	9271	22080	0.50	7796	15000	18026	39300
4	0.10	538	1110	0.10	421	1110	0.80	9271	22080	0.50	7796	15000	18026	39300
5	0.10	538	1110	0.10	421	1110	0.80	9271	22080	0.50	7796	15000	18026	39300

MANZANA

AÑOS	SUPERFICIE	COSTO	INGRESO
1	0.05	1301	
2	0.30	6874	
3	0.50	7594	
4	0.50	4849	
5	0.50	6133	6638
6	0.50	6919	10349
7	0.50	7612	15862
8	0.50	7994	22644
9	0.50	7994	30504
10	0.50	7994	37844

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.17

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 7 ha.

ZONA OCCIDENTAL CON RIEGO 2800-3000 m.s.n.m.

AÑOS	PAPA		CEBADA		MAIZ-FREJOL		POTRERO		ALFALFA		AVENA		TOTAL		
	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Sup	Costo	Ingreso
0			1263	1786	3230	4137	11937	13000			3620	4000	7	20050	22923
1	10382	20900			2692	5549	19897	20000	31310	24000	6032	12800	7	70133	83249
2	10382	20900			2692	5549	8955	22520	28972	57000	3016	11384	7	54017	117353
3	10382	20900			2692	5549	5970	27000	28972	57000	3016	11384	7	59499	121835
4	10382	20900			2692	5549	5970	27000	28972	57000	3016	11384	7	59400	121835
5	10382	20900			2692	5549	5970	27000	28972	57000	3016	11384	7	59400	121835

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.18

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 7 ha.

ZONA OCCIDENTAL CON RIEGO 3000-3500 m.s.n.m.

AÑOS	PAPA		CEBADA		HABA		AJO		ALFALFA		DESCANSO	TOTAL	
	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Superficie	Costo	Ingreso
0	18090	23000	8432	10400	5416	12400			2750	5000	1.0	35288	50800
1	36338	75151	6324	10500	9036	22000	9705	20125	18786	18000	–	80189	145776
2	41530	83602	4216	7000	9036	22000	19410	40250	17383	41399	–	91575	194251
3	51912	104502	2108	3500	9036	22000	19410	40250	17383	41399	–	99849	211591
4	51912	104502	2108	3500	9036	22000	19410	40250	17383	41399	–	99849	211591
5	51912	104502	2108	3500	9036	22000	19410	40250	17383	41399	–	99849	211591

FUENTE Y ELABORACION : PIDA SALCEDO

Annex Table B.19

PLAN DE PRODUCCION DE CULTIVOS ANUALES FINCA MODELO 7 ha.

ZONA OCCIDENTAL SIN RIEGO 3000-3500 m.s.n.m.

AÑOS	PAPA		CEBADA		HABA		ARVEJA		ALFALFA		TOTAL	
	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso	Costo	Ingreso
0	6230	7600	10540	13000	5416	12400	1500	2340	2750	5000	26526	40340
1	31146	57746	8432	14000	9036	20000	1988	7990	12584	10000	63126	111747
2	41530	77000	4216	7000	9036	20000	2983	12000	14720	30000	72485	146600
3	41530	77000	2108	3500	11295	25000	2983	12000	14486	34500	72402	152000
4	41530	77000	2108	3500	11295	25000	2983	12000	14486	34500	72402	152000
5	41530	77000	2108	3500	11295	25000	2983	12000	14486	34500	72402	152000

FUENTE Y ELABORACION : PIDA SALCEDO