

PROJECT EVALUATION SUMMARY PAGE 1

1980-1981

1000-1000-1000

Category	Value	Value	Value
...	100,000,000
...	12,000,000

1000 1000 1000 1000 1000

APPENDIX A: SUMMARY OF DATA

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With Honorable A. M. ...
L. ... Project ... and ...

summary: As explained in the previous evaluation, and in July 1971, the evaluation of this project was complicated by a number of factors, these included:

- (1) The original project design had only a limited number of ... and ...
- (2) The ... was expected to ...
- (3) The ... of the Government ...

... the ... of the ...

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- (1) ...
- (2) ...
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1977-78

PERFORMANCE OF THE STATE

A. Paddy Production

The paddy production of the State for the year 1977-78 has been estimated at 4,00,000 metric tons, which is an increase of 26.3 per cent over the production of 3,16,000 metric tons in 1976-77. The increase in paddy production is mainly due to the expansion of the area under paddy cultivation and the increase in yield per hectare.

The total paddy production of 4,00,000 metric tons is equivalent to 100 per cent of the target of 4,00,000 metric tons. The increase in paddy production is mainly due to the expansion of the area under paddy cultivation and the increase in yield per hectare. The total paddy production of 4,00,000 metric tons is equivalent to 100 per cent of the target of 4,00,000 metric tons. The increase in paddy production is mainly due to the expansion of the area under paddy cultivation and the increase in yield per hectare.

The increase in paddy production has been supported by the expansion of the area under paddy cultivation and the increase in yield per hectare. The total paddy production of 4,00,000 metric tons is equivalent to 100 per cent of the target of 4,00,000 metric tons. The increase in paddy production is mainly due to the expansion of the area under paddy cultivation and the increase in yield per hectare. While overall paddy production increased at the yearly rate of 6.2 per cent, the production of approved varieties accelerated from a small base of 55,000 bags in 1970 to 4,00,000 bags in 1977, an annual expansion of 54.3 per cent. The vastly improved production of high yield, high value approved varieties has made a major contribution to the 26.3 per cent annual growth rate of the value of GRB paddy intake.

Table 1.1

Table 1.1: GDP, Price Index, and Inflation (1970-1977)

Year (1)	GDP Current \$ 1970=100 (2)	Rise over 1970 to \$ 1970=100 (3)	Total Supply 1970=100 (4)	Price Index 1970=100 (5)	Real GDP 1970=100 (6)	Inflation Rate (7)	Rate of Change (8)
1970	457.4	17.1	25.2	100	25.2	0	0
1971	498.4	16.3	25.2	97.7	25.2	2.3	2.3
1972	530.7	11.7	25.2	95.5	25.2	2.2	2.2
1973	575.4	12.7	25.2	93.0	25.2	2.5	2.5
1974	613.8	3.3	25.2	89.5	25.2	3.6	3.6
1975	1,093.3	42.2	25.2	83.0	25.2	7.3	7.3
1976	1,533.4	25.1	25.2	78.0	25.2	6.0	6.0
1977	1,811.5	25.1	25.2	73.0	25.2	6.4	6.4
Avg. Ann. % Increase: Current Units	16.8%	27.7%	25.2	25.2	25.2	4.7	4.7
Avg. Ann. % Increase: Constant \$	3.5%	14.7%	14.2%	25.2	25.2	4.7	4.7

Sources: Economic Survey of India, Ministry of Economic Affairs; Annual Statistical Abstract, Statistical Branch, Ministry of Economic Affairs.

1/ All accounting prices figures are in constant prices of 1970.

The shift in demand towards higher quality rice has been a major factor in the increase in the price of rice. The demand for higher quality rice has increased significantly since the early 1960s. This has led to a corresponding increase in the price of rice. The price of rice has increased from about G\$10 per bag in 1967 to about G\$30 per bag in 1977. This increase in price has been a result of the increase in the demand for higher quality rice. The price of rice has also increased due to the increase in the cost of production. The cost of production has increased due to the increase in the price of fertilizer and other inputs. The price of rice has also increased due to the increase in the cost of transport. The cost of transport has increased due to the increase in the price of fuel and other inputs. The price of rice has also increased due to the increase in the cost of marketing. The cost of marketing has increased due to the increase in the price of advertising and other inputs. The price of rice has also increased due to the increase in the cost of distribution. The cost of distribution has increased due to the increase in the price of warehousing and other inputs. The price of rice has also increased due to the increase in the cost of retail. The cost of retail has increased due to the increase in the price of rent and other inputs. The price of rice has also increased due to the increase in the cost of taxes. The cost of taxes has increased due to the increase in the rate of tax. The price of rice has also increased due to the increase in the cost of inflation. The cost of inflation has increased due to the increase in the rate of inflation. The price of rice has also increased due to the increase in the cost of exchange rate. The cost of exchange rate has increased due to the increase in the rate of exchange. The price of rice has also increased due to the increase in the cost of interest. The cost of interest has increased due to the increase in the rate of interest. The price of rice has also increased due to the increase in the cost of depreciation. The cost of depreciation has increased due to the increase in the rate of depreciation. The price of rice has also increased due to the increase in the cost of amortization. The cost of amortization has increased due to the increase in the rate of amortization. The price of rice has also increased due to the increase in the cost of depletion. The cost of depletion has increased due to the increase in the rate of depletion. The price of rice has also increased due to the increase in the cost of depletion. The cost of depletion has increased due to the increase in the rate of depletion. The price of rice has also increased due to the increase in the cost of depletion. The cost of depletion has increased due to the increase in the rate of depletion.

An improved quality of paddy has also possibly led to production of better quality, higher value rice, as shown in Exhibit IV A 3.

EXHIBIT IV A 3

IMPROVEMENT OF EXPORT RICE GRADES OVER PERIOD 1967-77 (In constant G\$)

Rank	Name of Domestic Grade	Corresponding Export Rice Price per 100 kg	Change in Export Price, in constant G\$ per 100 kg (1967-77)
White Rice Grades			
0	Extra White A	38.00	
1	White A	27.00	81.16 (1977)
2	White B	26.00	
3	White C	21.00	71.43 (1967)
4	White A Broken	33.27	

The price improvement of about G\$10 per bag between 1967 and 1977 (in constant G\$) is equivalent to a one-and-one-third grade improvement in the quality of rice exported over the period.

Source: Guyana Rice Board, Marketing Division.

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The first part of the report is devoted to a general survey of the situation in the country. It is followed by a detailed analysis of the economic and social conditions. The report concludes with a number of recommendations for the improvement of the country's economy and social structure.

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By Rice Industry market in 1962

Since the late 1950's, rice production in Guyana has exceeded local demands creating an industry heavily dependent on export sales for the disposal of its product. The growing export demand in the early 1960's supported in large part by Guyana's access to the Cuban rice market, encouraged the expansion of paddy production. This expansion was accomplished by an increase in the size of the spring crop. Yields, on the other hand, remained practically stagnant as a result of structural and technological deficiencies in the industry. By the mid-1960's the need was apparent for more carefully controlled water conditions, use of improved seed varieties, and large-scale investment in machinery, fertilizers, pesticides, and other capital intensive inputs if high paddy yields were ever to be achieved.

The low level of capital investment in the industry also produced major difficulties in the processing and storage aspects of the business. Of particular importance was the lack of adequate storage facilities to properly store harvested paddy. As a result, the milling of paddy into rice as quickly as possible became the practice. Milled rice, however, deteriorates more rapidly in storage than paddy and creates a dependence on rapid marketing to obtain maximum value. Any bottleneck in the marketing system soon produced a situation in which deteriorating rice earned a progressively lower return when sold on the export market. Thus, the inadequate storage capacity helped to create a processing technique detrimental to Guyana's best interest in the international rice trade.

Furthermore, the losses which also could have been avoided by the present alternative harvest, storage and distribution practices were probably due to mold and insect damage, deterioration caused by heat build-up due to lack of proper ventilation, damage caused by insects and rodents, and pilferage. An additional difficulty was the lack of mechanical drying capability associated with the storage bonds. This situation meant that paddy drying was entirely dependent on sun power in a tropical environment subject to the possibility of heavy rainfall during the harvest and post-harvest periods.

Constraints and problems were also present in the milling and parboiling sectors of the industry in the mid-1960's. The prevalence of single stage mills prevented an improvement in milling yields. The common practice of utilizing drainage water in the parboiling process produced a low quality product with poor color and a strong odor. These processing constraints created limitations on Guyana's ability to produce large amounts of high quality rice for an increasingly sophisticated international market.

Indicative of Guyana's difficulty in the rice export trade was the collapse of the Cuban market in 1964. The loss of this large export outlet created a number of structural problems in the industry. Despite the decline in external demand for Guyana's rice, the Rice Marketing Board continued to pay the same high prices for rice even though the export boom had passed. These high prices maintained the impetus to high levels of production and soon resulted in a serious oversupply of finished rice. The Marketing Board was unable to sell

this surplus of inadequately stored rice and consequently suffered large financial losses.

The managements of the Rice Marketing Board and the Rice Development Corporation were also faced with other difficulties. Payrolls remained high despite the curtailment of exports. Farmers were paid by the RMB's system of paying farmers for paddy received only after the sale of the final milled product. The RDC's operation was hampered by unstandardized grading practices and a limited amount of grade testing equipment. Lack of facilities to develop a source of pure-line foundation seed placed limitations on the ability to provide a product of uniform type and quality.

In spite of these problems, the rice industry remained one of the largest employers of labor in the Guyanese economy of the mid-1960's and an important source of foreign exchange. The need for an infusion of capital to make necessary improvements had become apparent, particularly after the loss of the Cuban market. This background forms the setting in which groundwork was laid for the first U.S.-supported Rice Modernization Project.

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time, the premium price paid for their rice in 1977 stands four times as high as the Guyana dollar in 1972 to 2.66 Guyana dollars in 1977. Actual income to a given farmer depends of course on the individual farm size and the production achieved, which overall has increased at a rate three times as fast as the population.

Private Miller Income

The number of operating rice mills has declined from 208 in 1967 to 141 in 1977. The attrition has taken place in inefficient single-stage mills, which declined from 135 to 61 during the same period. Conversely, multi-stage mills increased from 73 to 80. Income to the private millers who have survived the attrition has undoubtedly increased. Those who have shut down their mills have lost this portion of their former incomes. The loss was made up by concentrating on raising approved rice varieties, in other forms of employment, or was absorbed. This phenomenon is one of the inescapable costs of technological modernization.

GRB Net Surplus

The GRB net surplus is a matter of definition. Operating surpluses, that is, rice sales less cost of rice sold and all expenses, have been generated every year since 1973. Grants and aids to the rice sector have been disbursed from these surpluses and give the so-called net surplus, which is an addition or deduction to reserves for bad years.

EXHIBIT IV.C-1

GRB NET SURPLUS POSITION

<u>Year Ending 30 Sep.</u>	<u>Sales Income</u>	<u>Operating Surplus</u>	<u>Grants and Aids</u>	<u>Additions or Deductions to Reserve</u>
1973	28,909	3,811	3,334	477
1974	47,152	16,329	9,462	6,867
1975	88,934	26,897	20,305	6,592
1976	92,173	18,387	11,228	7,159
1977	89,656	12,954	14,225	(1,271)

Clearly, the GRB operates as a financially viable unit. It is the independent policy affecting Grants and Aids that determines the so-called net surplus. It is not unlike corporate policy that leads to paying dividends out of reserves.

Handling Rate Costs

The drying/storage centers in operation over the past three years, including one poor and one good crop year, have been operated at an average intake to capacity ratio of 1.44 (total throughput), the large second crop in each year gives a higher ratio exceeding a 2.0 level. Average total operating costs of the five facilities with a three-year intake record compare favorably with those in the United States. The comparative average costs are 113 US cents per bag in Guyana and 123 cents per bag in the United States.

Paddy Production, Storage, and Flows

Paddy production and annual yields have increased as better rice varieties have been introduced that respond well when second cropped in

areas with fair to good drainage and irrigation works. Average arable acres in rice cultivation as measured by the largest seasonal crop harvested have been in a flat trend since 1970. At the same time, annual yield and production data give a compounded growth rate of about seven percent over the period. In comparison, export shipments have been growing annually at the much slower rate of 1.4 percent. The slower rate reflects a rapid increase in domestic consumption, growing since 1970 at an annual rate of 9.3 percent. This consumer appreciation of rice in food budgets is a reflection of bargain prices in the local market where rice has been selling over the past four years at 37 percent below its purchase cost by the GRB.^{1/} Meanwhile, the export price to the CARICOM group has remained high and other supplier nations have been penetrating this traditional Guyanese market.

^{1/} On 1 January 1978, the subsidy on domestic rice sales was removed by the Government of Guyana. Local sales prices are now roughly equal to purchase costs.

D. Rates of Return

1. Methodology

The rate of return computation requires the following types of summarized data: capital inputs including fixed assets and working capital, recipient benefits, project revenues, and operating expenses. In the formulation shown in Exhibits IV.D-2 through IV.D-4, the basic data has been arranged as follows:

Fixed Assets + Working Capital = Total Investment
(Column 3) (4) (5)

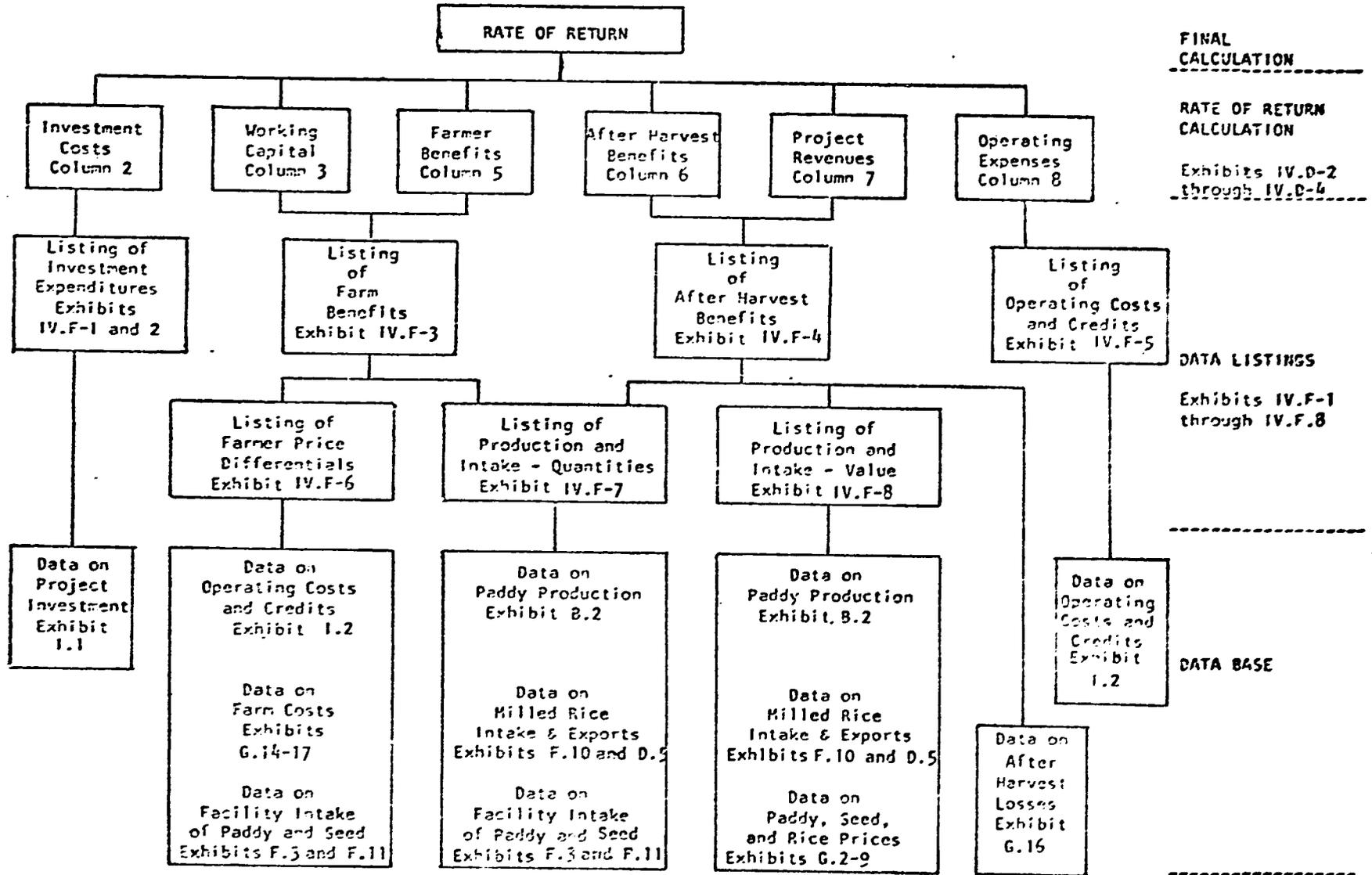
Farmer + After Harvest + Project - Operating = Net Operating
Benefits + Benefits + Revenues - Expenses + Outputs
(Column 6) (7) (8) (9) (10)

The flow chart on the following page provides a graphic description of the derivation of the numerical information contained in these columns.

Exhibits IV.D-2 through IV.D-4 display data for the first 12 years of the life of the project through 1981. After the year 1980, capital inputs cease while operating inputs and outputs continue as listed in 1981 through the complete cycle of 30 years used to calculate the rate of return. The 30th year is shown to indicate the values obtained at the end of the 30 year cycle, while the 31st year is displayed to indicate the residual value of the project. Although the entire listing is not shown in the exhibit, data for the full period is generated and utilized to perform the machine calculated analysis.

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EXHIBIT IV.D-1



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With the full set of data for total investment and net outputs generated, it is possible to calculate the rate of return by means of mini-computer programming techniques. An initial estimate of the rate of return is determined producing an associated set of present value factors which are values of total investment and net outputs. These preliminary results are then refined through machine calculation until the present values of the total investment and net outputs are equated. The final set of present value factors, the present value of the total investment, and the present value of the net outputs are shown in the three right hand columns in Exhibits IV.D-2 through IV.D-4. The final rate of return is shown above the main body of data.

Sensitivity of the costs and benefits of the project to various rates of interest is demonstrated in columns 14 through 17. A series of interest rates is shown in column 14 which are utilized to determine, again with the aid of machine calculation, the associated present value of investment (15) and outputs (17). The resultant series of benefit to cost ratios is displayed in column 16.

2. Analysis

Four rates of return analyses have been performed: for the total project, Exhibit IV.D-2; for the project without the Georgetown milled rice and Somerset-Berks facilities, Exhibit IV.D-3; for the five operating drying/storage centers only, Exhibit IV.D-4; and for the economic return to the total project, Exhibit IV.D-5. A brief explanation of format changes required for the economic rate of return analysis precedes Exhibit IV.D-5.

EXHIBIT IV.D-2

TOTAL PROJECT: 1970-77
FIRST GUYANA RICE MODERNIZATION PROJECT

(Return on Total Investment: 13.5758 Percent)

Year (1)	Period (2)	Capital Inputs (1000 US\$)			Operations (1000 G\$)			Operating Input Expenses ^{1/} (9)	Net Operating Outputs (10)	Present Value Factor (11)	Present Value	
		Fixed Assets (3)	Working Capital (4)	Total (5)	Operating Outputs						Total Capital (12)	Net Outputs (13)
					Farmer Benefits (6)	After Harvest Benefits (7)	Revenue & Credits (8)					
1970	0	2614	10	2624	10	0.	0.	0.	10	1.0000	2624	10
1971	1	6162	19	6181	0.	0.	15	14	31	.8805	5442	77
1972	2	9420	127	9547	161	0.	84	79	166	.7752	7401	129
1973	3	4356	414	4770	503	213	634	488	852	.6876	3256	588
1974	4	2407	2438	4845	2939	464	1125	730	3798	.6010	2912	2283
1975	5	3897	2537	6434	3343	2149	1771	1824	5439	.5291	3405	2818
1976	6	5680	-356	5324	2953	1941	1783	2078	4599	.4659	2480	2142
1977	7	3093	2307	5400	4650	2493	2221	2574	6790	.4102	2215	2785
1978	8	214	0.	214	4650	2493	2221	2574	6790	.3612	77	2452
1979	9	0	0.	0.	4650	2493	2221	2574	6790	.3180	0	2159
1980	10	2063 ^{2/}	0.	2063	4650	2493	2221	2574	6790	.2800	578	1901
1981	11	0.	0.	0.	4650	2493	2221	2574	6790	.2465	0.	1674
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2000	30	0. ^{3/}	0.	0.	4650	2493	2221	2574	6790	.0249	0.	168
2031	31	-5031 ^{3/}	-7496 ^{3/}	-12527	0.	0.	0.	0.	0.	.0219	-275	0.
Total		34875	0.	34875	121539	64599	58716	66989	177865		30114	30114

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Interest Percent (14)	Present Value Capital (15)	Benefit /Cost Ratio (16)	Present Value Outputs (17)
5.00	36641	2.19	
10.00	32975	1.32	
15.00	29045	.91	80097
20.00	25708	.68	43438
			26377
			17406

Source: As shown in Exhibit IV.D-1.

- Notes: ^{1/} Excludes depreciation, interest and taxes.
^{2/} Assumes retentions to be paid in order to more fully reflect cost of installing project facilities.
^{3/} Residual value in 31st period.

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EXHIBIT IV.D-3

LIMITED PROJECT: EXCLUDES SOMERSET/BERKS AND GEORGETOWN SITES
FIRST GUYANA RICE MODERNIZATION PROJECT

(Return on Limited Investment: 17.401 Percent)

Year (1)	Calculation Period (2)	Capital Inputs (1000 G\$)			Operations (1,000 G\$)			Operating Input Expenses ^{1/} (9)	Net Operating Outputs (10)	Present Value Factor (11)	Present Value	
		Fixed Assets (3)	Working Capital (4)	Total (5)	Farmer Benefits (6)	After Harvest Benefits (7)	Revenue & Credits (8)				Total Capital (12)	Net Output (13)
1970	0	2426	10	2496	10	0.	0.	0.	10	1.0000	2496	
71	1	5597	19	5616	30	0.	15	14	31	.8518	4724.	
72	2	8508	127	8635	161	0.	84	79	166	.7255	6265	
73	3	2816	414	3230	503	213	634	488	862	.6180	1936	533
74	4	1855	2438	4293	2939	464	1125	730	3798	.5264	2260	1999
75	5	1796	2537	4333	3343	2149	1771	1824	5439	.4484	1943	2439
76	6	1677	-356	1321	2953	1941	1783	2078	4599	.3819	505	1756
77	7	541	2307	2848	4650	2493	2221	2574	6790	.3253	927	2209
78	8	43	0.	43	4650	2493	2221	2574	6790	.2771	12	1882
79	9	0. ^{2/}	0.	0.	4650	2493	2221	2574	6790	.2360	0.	1603
1980	10	1577 ^{2/}	0.	1577	4650	2493	2221	2574	6790	.2010	317	1365
81	11	0.	0.	0.	4650	2493	2221	2574	6790	.1712	0.	1163
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..
2000	30	0.	0.	0.	4650	2493	2221	2574	6790	.0095	0.	65
2001	31	-3391 ^{2/}	-7496	-10887	0.	0.	0.	0.	0.	.0081	0.	0.
Total		23505	0.	23505	121539	64599	58716	66989	177865		21414	21414

Interest Percent (14)	Present Value of Capital (15)	Benefit / Cost Ratio (16)	Present Value of Outputs (17)
5.00	26882	2.98	80097
10.00	24998	1.74	43438
15.00	22523	1.17	26377
20.00	20309	.86	17406

Source: As shown in Exhibit IV.D-1.

- Notes: ^{1/} Excludes depreciation, interest, and taxes.
^{2/} Assumes retentions to be paid in order to more fully reflect cost of installing project facilities.
^{3/} Residual value in 31st period.

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EXHIBIT IV.D-4

**FIVE DRYING/STORAGE CENTERS
FIRST GUYANA RICE MODERNIZATION PROJECT**

(Return on Five-Center Investment: 6.911 Percent)

Year	Calculation Period	Capital Inputs (1000 G\$)			Operations (1000 G\$)			Operating Input Expenses	Net Operating Outputs	Present Value Factor	Present Value	
		Fixed Assets	Working Capital	Total	Farmer Benefits	After Harvest Benefits	Revenue & Credits				Total Capital	Net Outputs
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
1970	0	2037	0.	2037	0.	0.	0.	0.	0.	1.0000	2037	0.
71	1	5342	0	5342	0.	0.	0.	0.	0.	.9354	4997	0.
72	2	8268	0.	8268	0.	0.	0.	0.	0.	.8749	7234	0.
73	3	2269	0.	2269	0.	213	357	225	345	.8184	1857	282
74	4	852	493	1345	0.	464	737	363	838	.7655	1030	642
75	5	958	1325	2293	0.	2149	1373	1449	2073	.7160	1642	1484
76	6	565	-345	220	0.	1941	1496	1709	1728	.6697	147	1157
77	7	29	354	383	0.	2493	1766	2177	2082	.6264	240	1304
78	8	39	0.	39	0.	2493	1766	2177	2082	.5859	23	1720
79	9	0.	0.	0.	0.	2493	1766	2177	2082	.5481	0.	1141
1980	10	1577 ^{2/}	0.	1577	0.	2493	1766	2177	2082	.5126	808	1067
81	11	0.	0.	0.	0.	2493	1766	2177	2082	.4795	0.	998
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2000	30	0.	0.	0.	0.	2493	1766	2177	2082	.1440	0.	300
2001	31	-2767 ^{3/}	-1827	-4594	0.	0.	0.	0.	0.	.1347	-619	0.
Total		19179	0.	19179	0.	64599	46347	55994	54952		19400	19400

Interest Percent	Present Value of Capital	Benefit /Cost Ratio	Present Value of Outputs
(14)	(15)	(16)	(17)
5.00	19855	1.25	24857
10.00	18457	.73	13534
15.00	16907	.49	8243
20.00	15539	.35	5449

Source: As shown in Exhibit IV.D-1.

- Notes: 1/ Excludes depreciation, interest, and taxes.
 2/ Assumes retentions to be paid in order to more fully reflect cost of installing project facilities.
 3/ Residual value in 31st period.

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3. The Economic Rate of Return

The economic rate of return computation, Exhibit IV.D-5, follows the methodology established for the preceding rate of return analyses. However, a set of data inputs is required which differs in some respects from the set used in the foregoing computations. In cases where a new data formulation has been employed, an explanation of its derivation follows:

Inputs:

Column 3 - Total Capital Inputs: fixed assets plus working capital as shown in columns 3 and 4, Exhibit IV.D-2.

Column 4 - Direct Labor: basic data from column 3, Exhibit IV.F-1, times the accounting price adjustment factor of $-.3$ (negative three-tenths).

Column 5 - Foreign Exchange: basic data from column 4, Exhibit IV.F-1, times the appropriate accounting price factor (Data Base Exhibit A.11) minus 1.

Column 6 - Adjusted Capital Inputs: column 3 + 4 + 5 as shown in Exhibit IV.D-5.

Outputs:

Column 7 - Net Operating Outputs: as shown in column 10, Exhibit IV.D-2.

Column 8 - Direct Labor: basic data from column 7, Exhibit IV.F-5, times the accounting price adjustment factor .3 (three-tenths).

Column 9 - Foreign Exchange Expense: basic data from column 8, Exhibit IV.F-5, times 1 minus the accounting price factor for the year (see Data Base Exhibit A.11).

Column 10 - Project Portion Foreign Exchange Earnings: developed as shown in Exhibit IV.D-6.

With the data generated, as summarized in Exhibit IV.D-5, the computation then proceeds in the same manner as described earlier for the other rates of return.

EXHIBIT IV.D-5

ECONOMIC RATE OF RETURN
FIRST GUYANA RICE MODERNIZATION PROJECT

(Rate of Return on Investment: 18.500 Percent)

Year (1)	Calculation Period (2)	Total Capital Inputs (3)	Accounting Price Adjustments		Adjusted Capital Inputs (5)	Net Operating Outputs (7)	Accounting Price Adjustments		Project Portion of F-X Earnings (10)	Adjusted Net Oper. Outputs (11)	Present Value Factor (12)	Present Value	
			Direct Labor (1.75-1.00) (4)	Foreign Exchange (1-1.00) (5)			Direct Labor (1.00-.75) (8)	Foreign-X Expense (1.00-r) (9)				Total Capital (13)	Net Outputs (14)
1970	0	2524	-237	0	2287	10	0	0	0	0	1.0000	2287	10
71	1	6181	-135	404	6450	31	0	0	10	0	.8431	5438	21
72	2	9547	-257	558	9838	155	2	0	33	179	.7108	6953	22
73	3	4770	-90	653	5373	852	13	0	0	0	.5953	3220	910
74	4	4845	-114	254	4955	3758	64	-16	608	1518	.5053	2524	2505
75	5	6434	-180	334	6288	5439	93	-27	1055	4957	.4260	2606	4005
76	6	5324	-135	685	5874	6750	157	-94	3890	9402	.3531	2110	2791
77	7	5400	-121	355	5624	6750	206	-90	3056	7771	.2928	1715	2751
78	8	214	-11	26	229	6750	243	-155	2251	9119	.2553	59	2328
79	9	0	0	0	0	6750	243	-155	2251	9119	.2152	0	1953
1980	10	2653 2/	0	526	2589	6750	243	-155	2251	9119	.1815	470	1655
81	11	0	0	0	0	6750	243	-155	2251	9119	.1530	0	1355
2000	30	0	0	0	0	0	0	0	0	0	0	0	0
2001	31	-12527 2/	0	480	-13015	6750	243	-155	2251	9119	.0071	0	65
Total		34875	-1290	3386	36571	177565	6377	-4187	62571	242725	.0050	-78	27635

Interest Percent (15)	Present Value of Capital (16)	Benefit /Cost Ratio (17)	Present Value of Outputs (18)
5.00	38507	2.87	
10.00	31502	1.76	110545
20.00	26724	.93	60564
30.00	21469	.61	24851
			12952

Source: As shown in Exhibit IV.D-1 as modified in Ch. IV, section IV.D.3.

- Notes: 1/ Adjusted by accounting prices.
 2/ Assumes retentions to be paid in order to more fully reflect cost of installing project facilities.
 3/ Residual value in 31st period.

EXHIBIT IV.2-6

PROJECT PORTION OF FOREIGN EXCHANGE EARNINGS
FIRST GUINEAN RICE MODERNIZATION PROJECT

Year F.Y. 1970	Project Intake Approved Marketing 1000 Bacs	One Grade Price Difference C1	Benefit Average Value of One Grade 1000 CS	Value of Approved Marketing Intake 1000 CS	Benefit % of Intake Value 1000 CS	Value of Total Paddy Intake 1000 CS	Ratio of Benefit of Total Value	90% Hilled Rice Intake 1000 Bacs	90% Hilled Rice Exports 1000 Bacs	Ratio of Exports to Intake	Percent of Benefit to Exports	F-X Value of Export Sales 1000 CS	Project Portion of F-X Earnings 1000 CS	F-X Earnings Adjusted for Accounting Prices 1000 CS
1971	0	n.a.	0	0	0	0	0	n.a.	n.a.	n.a.	n.a.	0	0	
1972	0	n.a.	0	0	0	0	0	n.a.	n.a.	n.a.	n.a.	0	0	
1973	267.8	1.75	468.6	126.3	72.5	576.8	.0413	532.5	552.8	.71	2.94	n.a.	0	
1974	268.8	1.75	470.6	276.6	152.4	836.4	.0555	1181.8	587.4	.49	2.73	2527	775	
1975	281.7	1.75	492.9	247.2	155.2	2753.4	.0778	1322.3	597.4	.45	5.37	49275	1318	
1976	277.3	1.75	486.8	1212.1	274.7	2657.3	.0778	1433.1	513.1	.36	4.82	24578	4556	
1977	285.9	1.75	499.9	1669.4	338.8	3872.8	.0875	1755.5	574.9	.33	4.28	73524	3547	

Source: Data Base Exhibits 2.5, F.3, F.12, 1.2-3, and 2.15.

Note: n.a. = not applicable

E. Project Description

The 1967 project focused on two aspects of the Guyana rice industry. One, the need to improve exportable rice varieties and grades to meet the growing competition in its traditional markets by other rice producing nations. Two, the need to modernize handling and processing facilities in order to maintain paddy quality and reduce the after-harvest losses being experienced. These objectives were supported by nineteen prior technical reports covering the years 1952 to 1967 and culminating in a coastal agricultural research station study by Louisiana State University, a management study by Maynard Associates, and the Rhodes-Checchi project feasibility study.

On November 27, 1968, the Agency for International Development initiated the first rice modernization project by authorizing a Loan (no. 540-L-008) to the Government of Guyana in the amount of \$12.9 (million US). The GOG was to contribute the equivalent of \$4.6 (million US) to bring the total estimated project cost to \$17.5 (million US). The Loan and GOG expenditures on the project through March 31, 1978, are \$12.47 and 5.56 (million US) respectively.

The broad socio-economic objectives of the project were defined as: (a) to continue the growth rate of seven percent in gross domestic product, (b) to increase the income of rice farmers, (c) to enable the rice industry to compete effectively in traditional and new markets, and (d) to increase by one percent annually the export earnings attributable to rice.

Undertakings by the terms of the Loan Agreement, as amended,
included the development of:

- a. a 600-acre rice research station
- b. a pure-line seed storage unit at MARDS
- c. six paddy receiving, drying, storage, and loading centers with a total storage capacity of 51,200 metric tons or one-fifth of annual production
- d. Improvement of paddy transport with 50 special bulk paddy wagons
- e. additional facilities in Georgetown for receiving and transferring milled rice with a capacity of 8,500 metric tons
- f. upgrading of government owned milling facilities
- g. technical assistance
 - (1) six persons to be trained in rice research techniques for six months each
 - (2) storage center construction contractor to train operating personnel for twelve months at each site
 - (3) a 24-month contract to assist Guyana Rice Board personnel in all phases of managerial and operating functions
- h. the consolidation of the management and operations of the Guyana Rice Marketing Board and the Guyana Rice Development Corporation.

In conjunction with these specific Loan activities, the GOG undertook to increase the pace of water control and settlement improvements in the Tapakuma area west of the Essequibo River, in the Black Bush

Polder area east of the Berbice River, as well as along other sections of the coastal belt.

Conditions precedent to disbursement from the Loan were met in late 1970 and expenditures commenced at that time. The last major payout occurred in late 1977. Four engineering firms, including Nance Engineering Company, Mitchell, Wertz-Hettlesater, and Black and Veatch International, were engaged at various times to review engineering recommendations, and design and supervise the construction of the six drying/storage centers as well as the milled rice facility at Georgetown. Total costs of these engineering services rose from an original estimate of \$360,000 (US) to \$2.17 (million US) including the local currency equivalent of \$372,000 (US) (see Exhibit IV.E-1 on the following page).

On March 19, 1970, the initial turnkey construction contract was signed with Pemar International, Inc. of Florida. The contractor substantially completed work on four drying/storage centers (Anna Regina, Wakenaam, Ruimzicht, and MARDS-Burma), and purchased substantial amounts of equipment and materials for the remaining two center sites. Materials for 50 bulk paddy wagons were also supplied and training of personnel in the operation of the centers undertaken. Following the termination of Pemar's services, the Guyana Rice Board was approved by AID to proceed by force account with construction of the remaining two centers at Black Bush Polder and Somerset-Berks. The GRB was also authorized to construct a milled rice storage facility at Georgetown in place of the originally planned bulk storage units at the Anna Regina and MARDS-Burma centers. Descriptions of each of the major Project Components begin on page IV.31.

EXHIBIT IV.E-1

SUMMARY OF ESTIMATED PROJECT COSTS AND ACCRUED EXPENDITURES: 3/31/78
FIRST GUYANA RICE MODERNIZATION PROJECT

<u>Project Elements</u>	<u>First Year Operated</u>	<u>Original Estimates</u>			<u>Accrued Expenditures</u>		
		<u>Loan</u>	<u>GRB</u>	<u>Total</u> (in US dollars)	<u>Loan</u>	<u>GRB</u>	<u>Total</u>
Rice Research Station	1974	565,000	470,000	1,035,000	804,857	709,660	1,514,717
Drying/Storage Centers:							
1. Anna Regina	1973	n.a.	n.a.	n.a.	1,479,930	604,656	2,084,586
2. Somerset/Berks	1977	n.a.	n.a.	n.a.	1,433,175	719,845	2,153,020
3. Wakenaam	1974	n.a.	n.a.	n.a.	832,831	363,730	1,196,561
4. Ruimzicht	1974	n.a.	n.a.	n.a.	1,388,227	458,040	1,846,267
5. HARDS-Burma	1972	n.a.	n.a.	n.a.	1,832,944	654,918	2,487,862
6. Black Bush Polder	1975	n.a.	n.a.	n.a.	799,042	670,476	1,469,518
Subtotal		9,812,000	3,018,000	12,830,000	7,766,149	3,471,665	11,237,814
Milled Rice Facilities	1978	-	450,000	450,000	1,873,357	1,139,773	3,013,146
Tech. & Mgt. Assistance	1977	550,000	144,000	694,000	169,156	40,276	209,432
Engineering Services	1977	285,000	75,000	360,000	1,801,342	371,656	2,172,998
Paddy Wagons	1976	500,000	5,000	505,000	220,007	185	220,192
Contingencies		1,188,000	438,000	1,626,000	-	-	-
Unallocated Retentions		-	-	-	797,625	-	797,625
		-	-	-	(550,210)	(59,690)	(1,019,900)
Total		12,900,000	4,600,000	17,500,000	12,472,293	5,673,731	18,146,024

Source: Data Base Exhibit I.1 and original estimates from 1968 Capital Assistance Paper.

1. Rice Research Station

Guyana rice industry studies, conducted prior to the Rice I project, clearly established the need for new, high-quality, high-yield, pure-line rice varieties. In order to develop responsive varieties under Guyana conditions, a continuing rice research program was recommended along with a Tropical Agricultural Research Station. A MARDS-Burma location, where 600 acres were available, was selected rather than trying to expand the closely confined Ministry of Agriculture station at Mon Repos. In addition to developing new varieties, the new station was expected to disseminate knowledge of improved farming practices gained while multiplying seed from the research activities. Guyana's existing extension service would then be expanded to introduce rice farmers to the better seeds and husbandry techniques.

The total Project cost of facilities at the Rice Research Station amounted to US \$1.56 (million). The annual operating expenses are averaging US \$155,400 with payrolls for staff amounting to US \$79,000.

Descriptive material related to the successful history of the new variety development program is provided in Chapter III, Section A. At present, some 75 to 80 percent of all paddy grown in Guyana is produced from the new high-yielding varieties developed at the Rice Research Station.

The benefits to farmers from the cultivation of the new varieties are very real. These benefits accrue primarily from the price differential between the new higher-yielding varieties and the traditional lower-quality varieties. This difference has been quantified in Data Base Exhibit F.3 and is summarized in Exhibit III.E-2.

In 1975, the average price differential between new and traditional paddy received at the GRB drying and storage centers stood at G\$3.60 per bag. Incremental costs of production for the new varieties have been estimated at G\$0.13 (see Data Base Exhibit G.23). Paddy grown from new variety seed taken in at the GRB facilities alone, in 1975, amounted to over 758,000 bags, producing additional income to farmers of some G\$2,380,000 (at a net rate of G\$3.14 per bag).

While costs of production since 1975 have escalated, so has the volume of paddy produced from the improved varieties. From roughly one-third of total production in 1972, the improved varieties now constitute some three-fourths of all paddy produced in Guyana. This increase has been fostered, not only by price incentives, but also by the high-yield characteristics of the new grains which, in the presence of improved husbandry and water control, have produced yield increases averaging between seven and eight percent annually since 1971.

2. Drying/Storage Centers

The six drying/storage centers that were built as part of the Rice I Project are sited four to the northwest of Georgetown and two to the southeast (see Map 8). The four westerly centers are as follows:

- Somerset/Berks -- located on the Essequibo west coast about 48 airline miles from the Georgetown rice storage terminal (see Data Base Exhibit E.16).
- Anna Regina -- located on the Essequibo coast about ten airline miles east of Somerset/Berks and 38 airline miles from Georgetown.
- Wakenaam -- situated on the west shore of Wakenaam Island in the Essequibo River estuary and about 23 airline miles from Georgetown.

- Ruimveldt -- sited in the West Demerara Region between the Essequibo and Demerara Rivers about five air line miles west of Georgetown.

The two easterly centers are:

- MARDS/Burma -- located in the eastern section of the East Demerara Region between the Mahaicony and Abari Rivers, about 40 airlines miles from the Georgetown rice storage terminal.
- Black Bush Polder -- situated in the East Berbice Region and inland to the south of the frontlands along the coast, about 80 airline miles from Georgetown.

Investment and Capacity

The investment in the above facilities, including engineering costs, is US \$8,159,145 plus Guyana dollar expenditures of G\$9,202,948 for a total in equivalent US dollars of US \$11,939,083 (see Data Base Exhibit 1.1). The GRB contribution invested in the facilities thus comes to 32 percent. The storage capacity of these facilities is 52,073 metric tons of commercial paddy and 2,032 metric tons of seed, for a total of 852,000 bags of 140 lbs. each, as shown in Exhibit III.B-2. The seed storage is located at the MARDS/Burma site. The average investment cost per bag of storage capacity is US \$14.01.

The investment, capacity and unit storage costs for each of the six facilities identified above are as follows:

EXHIBIT IV.E-2

RICE I DRYING AND STORAGE FACILITIES

INVESTMENT PER UNIT OF CAPACITY

<u>Facility</u>	<u>Investment Cost US\$</u>	<u>Storage Capacity (bags)</u>	<u>Investment Cost US\$ (bag)</u>
Somerset/Berks	2,729,098	140,000	19.49
Anna Regina	2,243,857	160,000	14.02
Wakenaam	1,397,955	80,000	17.47
Ruimzicht	2,084,115	160,000	13.03
MARDS/Burma	2,664,702	192,000 ^{a/}	13.88
Black Bush Polder	<u>1,955,744</u>	<u>120,000</u>	<u>16.30</u>
TOTAL	11,939,083	852,000	14.01

Source: Data Base Exhibit I.1 and Exhibit III.B-2.

a/ Includes seed storage of 32,000 bags.

Anna Regina, Ruimzicht and MARDS/Burma facilities have similar investment costs per bag of storage capacity. Ruimzicht's close proximity to Georgetown appears to have effected marginally lower costs. On the other hand, the Wakenaam and Black Bush Polder facilities illustrate how quickly unit costs rise as capacity diminishes. Somerset is a special case of adverse factors: (1) the facility was not completed until late in 1977 and, consequently, suffered most from price inflation; (2) in order to economize, foundation pilings were not used and the vertical silo alignment shifted enough to require re-design and major repairs to the conveyor lines; (3) the facility was constructed under force account, a consistently high cost procedure, after the preceding building contracts with the outside contractor were terminated; and (4) four of the 32 silos were not erected even though the foundation pads had been poured.

Operating Intake and Costs

Three years of operating accounts, from 1974/75 through 1976/77 crop seasons, are summarized below. The basic data is found in Data Base Exhibit 1.2. Start-up periods are not included because they distort unit costs due to relatively small paddy intake quantities. The Somerset/Berks facility is also excluded because operations did not start until late in 1977. The other five facilities processed over three million bags (195,150 metric tons) of paddy at an operating expenditure of G\$5.3 million (US dollar equivalent at 1:2.55 = US \$2.1 million). The expenditure per bag processed is G\$1.74 (US \$0.68). The average utilization ratio over the period is 144 percent. This ratio is less favorable than it at first appears because the importance of double cropping has been increasing. As a result, full utilization of the storage capacity twice a year is practicable and when normal withdrawals during the harvest are taken into account, the utilization ratio may approach a value of 240 percent. At present the level of utilization is being held back by insufficient intake, cleaning and drying flow capacities. Improvements to increase flow rates at the various facilities are proposed in this study and are estimated to cost US \$251,000. It is further estimated that these improvements will lower total unit costs by about US 8 cents per bag annually, so that this added investment will be recovered in two-and-one-half to three years.

The year-by-year overall operating results are presented on the next page for the five active facilities.

<u>Year</u>	<u>Intake</u> (bags)	<u>Utilization</u> <u>Ratio</u>	<u>US dollars</u>	
			<u>Investment</u> <u>Cost/Bag</u> (25-yr. life)	<u>Annual</u> <u>Operating</u> <u>Cost/Bag</u>
1974/75	985,159	1.38	.37	.58
1975/76	998,856	1.40	.37	.67
1976/77	1,089,027	1.53	.34	.78
AVERAGE	1,024,347	1.44	.36	.68

Comparable three-year averages for each of the five active facilities appear as follows:

<u>Facility</u> <u>Location</u>	<u>Intake</u> <u>3 yr. avg.</u> (bags)	<u>Utilization</u> <u>Ratio</u>	<u>US dollars</u>	
			<u>Investment</u> <u>Cost/Bag</u> (25-yr. life)	<u>Annual</u> <u>Operating</u> <u>Cost/Bag</u>
Anna Regina	285,324	1.69	.31	.61
Wakenaam	95,849	1.20	.58	1.08
Ruimzicht	91,957	.57	.91	1.11
MARDS/Burma	334,481	1.74	.32	.55
Black Bush Polder	210,069	1.75	.37	.64

The utilization ratio at Ruimzicht is far below that of the other facilities. The rice farmers in the Ruimzicht area have small farms but produce high quality paddy. In order to protect this quality from comingling, they initially resisted the notion of mixing their paddy with that of other farmers and have persisted in this attitude much longer than in other areas. This point of view is changing and preliminary results in 1977/78 are now much better.

<u>Year</u>	<u>Ruimzicht</u> <u>Utilization Ratio</u>
1974/75	.37
1975/76	.59
1976/77	.76
1977/78	1.09

This trend is expected to continue but is not likely to reach levels obtained in other areas where the acreage and production are greater.

U. S. Comparisons

Average investment and operating costs for comparable paddy drying/storage facilities in the Southern United States^{1/} have been adjusted to the basis of 140 lb. bags and updated for inflation and higher fuel costs. The average Guyana results have been adjusted to a 125 percent utilization ratio and operating costs to U. S. dollars at the rate of 1:2.55 in order to achieve comparability.

<u>Location</u>	<u>Intake (bags)</u>	<u>Utilization Ratio</u>	<u>US dollars</u>	
			<u>Investment Cost/Bag (25-yr. life)</u>	<u>Annual Operating Cost/Bag</u>
Guyana	889,190	1.25	.41	.72
Southern United States	889,190	1.25	.32	.91

The Guyana drying/storage facilities have a not unexpected higher unit investment. Earlier planning estimates projected a 20 percent higher figure, which proved, due to contractor/construction problems, to be 28 percent on the basis of the above analysis. Operating costs, on the other hand, are lower in Guyana than in the United States due to lower wage rates even though facilities are highly overstaffed in Guyana, particularly at Wakenaam and Ruimzicht.

^{1/} "Costs of Building and Operating Rice Drying and Storage Facilities in the South," Marketing Research Report No. 1011, United States Department of Agriculture Economic Research Service, September 1973.

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EXHIBIT IV.E-3

SCHEDULE OF SUBSIDIARY ACCOUNTS

PADDY DRYING/STORAGE CENTERS
(Location)

<u>Account No.</u>	<u>Class/Function</u>	<u>TOTAL</u>		<u>DETAIL</u>	
		<u>Debit</u>	<u>Credit</u>	<u>Debit</u>	<u>Credit</u>
—	Direct Labor				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				
—	Administrative Overhead				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				
—	Electricity				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				
—	Drier Fuel				
—	Drying				
—	Repairs to Structures				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				
—	Repairs to Equipment				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				
—	Depreciation, Structures				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				
—	Depreciation, Equipment				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				
—	1/				
—	Other				
—	Receiving				
—	Drying				
—	Storage				
—	Loading Out				

1/ This category may, of course, be extended to suit needs as perceived by management.

Facility Management

The preceding analytical results give an indication that the GRB managers of the drying/storage facilities have performed quite well. Further, the gathering of pertinent data during the study indicates that management achieved this success in spite of inconsistent record-keeping at individual facilities and inadequate differentiation in the subsidiary accounts.

Management can benefit from a revision of the "Schedule of Subsidiary Accounts" to reflect both class and function of costs, as illustrated on the opposite page.

3. Georgetown Rice Terminal

The Georgetown rice terminal had a 1967 storage capacity of 31,340 metric tons (MT) of milled rice, divided as follows in bag bond areas:

Receiving bonds	13,180 (MT)
Export bonds	14,750 (MT)
Local sales bond	<u>3,410 (MT)</u>
TOTAL	31,340 (MT)

The Rice I Project replaced 29 percent of the receiving bond capacity with storage silos transferred from proposed storage capacity at the MARDS and Anna Regina drying/storage centers. The net effect was to reduce much needed storage capacity at these two centers by 7,500 MT of paddy. In the process, rice storage capacity at Georgetown was increased by 4,140 MT of milled rice. In addition, the receiving rate at the terminal was increased by providing for bulk delivery of milled rice as well as mechanical handling from receiving pits to bulk storage in the silos.

These improvements were completed early in 1978 at an investment cost of US \$3.3 (million). In the meantime, a fire in August 1977 burned out some 24,000 MT of the bag bond storage capacity, i.e., all of the export area and 71 percent of the original receiving area. The new Rice I receiving facilities helped to alleviate the seriousness of this loss by providing more efficient receiving capacity and mechanical delivery of bulk milled rice to the blending and bagging operations. The bagged output must presently be trucked to a nearby dock facility for actual export shipments.

The Rice II Project proposes to rebuild the bond storage areas and provide additional equipment for more efficient handling of export shipments at an overall cost of US \$2.5 million (see Chapter VII for details). However, analysis of the total transport network in Chapter VI raises long-term questions of overall benefits to be derived from major investments at this site. The technical answers are negative for such investments but larger policy considerations are deemed to be beyond the scope of this study.

4. Other Project Investments

In addition to investments in rice research, drying and storage facilities, and the Georgetown terminal described above, the Rice I Project provided funds in three other categories totalling some US\$690,000, of which an equivalent 37 percent was contributed locally. The conversion to US dollars is calculated on the basis of the prevailing exchange rates in the year the expenditures were recorded (see Data Base Exhibits A.11 and 11 through 1n).

- Transport Equipment

Transport equipment was provided in the form of paddy wagons for bulk transport (US \$356,147) and field vehicles needed for supervisory travel between facility locations (US \$ 39,067). The paddy wagons have been slow in developing their potential but now that the bulk handling facilities are in operation at the Georgetown terminal their utility will become more pronounced. The usefulness of paddy wagons for moving paddy from the fields to drying/storage centers was handicapped by the inadequate rural feeder-roads with dirt surfaces. These roads proved unsafe for bulk carriers when it rains, which occurs on 25 percent of the days during peak harvest periods.

- Office Equipment

Additional office equipment was provided by the Project at a cost of US \$ 22,000, as supplied from local funds.

- Training

Operation of the drying/storage facilities is controlled from a large electrical switchboard with lighted functional indicators. A model of the switchboard with lighted flow lines was provided as a training device for the new operating personnel. The reported training costs totalled US \$148,520. The favorable operating results, to date, are a clear indication that this training expenditure and method was effective.

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F. Data Listings

Description of the Data Listings

Information contained in the data base has been extracted and analyzed to produce a series of seven data listings. The purpose of these listings is to consolidate and arrange the basic data in such a way that it may be utilized to produce the ultimate rate of return result. Three of these data listings are used to feed information to other listings. These underlying listings are: farmer price differentials, Exhibit IV.F-6; production and intake of paddy, seed, and milled rice--by quantity, Exhibit IV.F-7; and production and intake of paddy, seed and milled rice--by value, Exhibit IV.F-8.

Other data listings are: listing of investment expenditures, Exhibits IV.F-1 and IV.F-2; listing of farm benefits, Exhibit IV.F-3; listing of after-harvest benefits, Exhibit IV.F-4; and listing of operating expenses and credits, Exhibit IV.F-5. From these data listings is extracted the information which is displayed on the rate of return analysis sheets Exhibit IV.D-5 and Exhibit IV.D-6.

EXHIBIT IV.F-1

PROJECT INVESTMENT EXPENDITURES
FIRST GUYANA RICE MODERNIZATION PROJECT

Year (1)	Total Investment In Project			Research & Seed Station			Drying/Storage Facilities			
	Total (2)	Direct	Foreign	Total (5)	Direct	Foreign	Total (8)	Direct	Foreign Exchange	
		Labor (3)	Exchange (4)		Labor (6)	Exchange (7)		Labor (9)	Charged (10)	Retained (11)
(In thousands of Guyana dollars)										
1970	2613.8	788.2	0.	0.	0.	0.	2164.7	671.1	0.	0.
1971	6152.1	488.7	4708.3	134.8	20.2	69.8	5693.1	390.9	4437.2	495.2
1972	9420.0	904.4	6508.5	121.3	9.4	109.9	8695.0	730.6	6336.3	242.7
1973	4355.8	301.2	3355.0	495.7	145.6	0	3524.7	134.2	3191.7	1179.4
1974	2405.7	380.5	1177.6	639.2	160.1	122.7	978.6	113.4	612.9	2.2
1975	3830.7	599.1	1957.7	663.4	151.9	178.5	2509.2	355.5	1330.2	3.2
1976	5579.5	449.1	4230.8	928.8	10.3	905.6	1198.5	222.8	479.9	3.0
1977	3092.5	403.1	1791.9	345.5	15.1	294.5	752.8	150.6	237.9	(6.2)
1978	213.6	35.4	95.2	4.1	.1	3.9	108.1	19.7	44.5	0.
1979	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1980	2063.3	0.	1920.5	0.	0.	0.	2063.3	0.	1920.5	(1920.5)

Georgetown Facilities			Paddy Wagons		Rice Mill Improvements			Tech. & Maint. Asst.		S-Active
Total	Direct	Foreign	Total	Foreign	Total	Direct	Foreign	Total	Foreign	Storage
(12)	Labor	Exchange	(15)	Exchange	(17)	Labor	Exchange	(20)	Exchange	Centers
(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
0.	0.	0.	0.	0.	377.8	117.1	0.	71.3	0.	2037.1
299.6	19.5	145.6	11.5	11.5	58.4	18.1	0.	49.7	43.2	5342.4
484.1	127.5	72.9	(1.6)	(1.6)	119.1	36.9	0.	1.1	0.	2759.4
183.6	6.6	162.4	(.8)	(.8)	47.8	14.8	0.	3.8	1.7	2253.9
425.0	107.0	19.7	352.9	352.3	0.	0.	0.	1.0	0.	251.5
553.6	81.7	230.0	77.7	77.7	0.	0.	0.	81.8	81.3	257.8
3368.8	216.0	2671.9	0.	0.	0.	0.	0.	173.4	173.4	555.1
1827.1	227.4	1093.4	0.	0.	127.3	0.	127.3	38.8	38.8	27.8
101.4	16.6	47.8	0.	0.	0.	0.	0.	0.	0.	39.2
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1577.1

Source: Data Base Exhibit I.F.

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EXHIBIT IV.F-2

INVESTMENT EXPENDITURES
FIRST GUYANA RICE MODERNIZATION PROJECT
ACCOUNTING PRICES, US DOLLARS

<u>Year</u>	<u>Engi- neering</u>	<u>Research Station</u>	<u>Anna Regina</u>	<u>Somerset/ Berks</u>	<u>Wakenam</u>	<u>Ruim- zicht</u>	<u>MARDS- Burma</u>
<u>Loan Expenditures</u>							
1970	-	-	-	-	-	-	-
1971	333,619	3,789	11,261	20,963	16,332	287,092	1,589,587
1972	360,979	50,456	1,378,996	12,714	547,300	875,942	153,671
1973	328,670	-	89,306	804,914	158,895	113,032	89,319
1974	145,979	61,340	367	-	100,332	100,379	367
1975	240,671	89,257	-	441,576	9,972	11,782	-
1976	246,878	452,787	-	95,032	-	-	-
1977	116,023	147,228	-	57,121	-	-	-
1978	28,523	-	-	855	-	-	-
<u>GRB Expenditures</u>							
1970	194,621	-	286,122	25,426	126,399	165,398	247,875
1971	9,941	22,758	126,993	76,028	11,717	75,989	253,349
1972	69,062	5,081	145,237	128,579	191,754	183,408	111,764
1973	(2,579)	183,450	17,134	21,147	32,098	32,387	40,358
1974	41,027	190,111	29,170	12,717	1,762	858	1,572
1975	20,855	164,104	-	175,489	-	-	-
1976	24,301	11,221	-	111,280	-	-	-
1977	12,290	16,805	-	151,559	-	-	-
1978	2,138	-	-	17,620	-	-	-

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EXHIBIT IV.F-2 (continued)

<u>Year</u>	<u>Black Bush Polder</u>	<u>Georgetown Facility</u>	<u>Milled Rice Facility</u>	<u>Paddy Wagons</u>	<u>Tech. & Mgt. Assistance</u>	<u>Unal-located</u>	<u>Reten-tions</u>
<u>Loan Expenditures</u>							
1970	-	-	-	-	-	-	-
1971	14,706	3,278	-	-	21,597	238,250	(248,101)
1972	29,341	7,824	-	-	-	184,929	(121,330)
1973	643,495	58,848	-	-	837	123,846	(589,698)
1974	-	-	-	-	-	22,151	(1,091)
1975	39,224	68,478	-	181,171	40,630	60,804	(1,610)
1976	71,571	1,163,894	-	38,836	86,715	116,686	(1,476)
1977	705	488,681	63,665	-	19,377	48,330	3,096
1978	-	18,699	-	-	-	2,629	-

<u>GRB Expenditures</u>							
1970	3,555	-	188,419	-	35,535	-	-
1971	53,504	25,749	26,358	-	2,944	-	-
1972	209,656	162,346	49,407	-	465	-	(62,795)
1973	16,039	2,545	17,662	-	787	-	3,105
1974	62,130	109,323	-	-	350	-	-
1975	203,964	81,979	-	185	195	-	-
1976	112,848	229,381	-	-	-	-	-
1977	8,780	230,491	-	-	-	-	-
1978	-	16,119	-	-	-	-	-

Source: Data Base Exhibits A.11 (Accounting Prices) and I.1 (Capital Expenditures)

EXHIBIT IV.F-3

FARMER BENEFITS FROM GROWING APPROVED RICE VARIETIES
FIRST GUYANA RICE MODERNIZATION PROJECT

<u>Year</u>	<u>Qty. Milled Rice From Approved Varieties ,000 Bags</u>	<u>Adjusted Farm Output ,000 Bags</u>	<u>Farmer Net Price Diff. G\$</u>	<u>Farmer Banefits ,000 G\$</u>
1970	11.6	19.33	.49	9.5
71	36.2	60.33	.49	29.6
72	193.4	322.33	.50	161.2
73	301.6	502.6	1.00	502.6
74	488.5	814.17	3.36	2735.6
75	675.4	1125.67	2.97	3343.2
76	726.1	1210.17	2.44	2952.8
77	1003.6	1672.67	2.78	4650.0

Source: Data Base Exhibits F.3, F.11, and G.14 through G.17.

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EXHIBIT IV.F-4

GAIN FROM REDUCTION IN AFTER-HARVEST LOSSES
FIRST GUYANA RICE MODERNIZATION PROJECT

<u>Year</u>	<u>Project Approved Quantity ,000 Bags</u>	<u>Avg. Yearly Net Price Difference G\$ per Bag</u>	<u>Total Net Price Increase ,000 G\$</u>	<u>Total Approved Value ,000 G\$</u>	<u>6% of Total Value ,000 G\$</u>	<u>Total Gain ,000 G\$</u>
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1970	0	0	0	0	0	0
71	0	0	0	0	0	0
72	0	0	0	0	0	0
73	187.8	.750	140.9	1,208	72.5	213.4
74	268.1	1.125	301.6	2,707	162.4	464.0
75	861.7	1.500	1,292.6	14,270.	856.2	2,148.8
76	777.3	1.500	1,166.0	12,912	774.7	1,940.7
77	995.9	1.500	1,493.9	16,664	999.8	2,443.7

Source: Data Base information as shown in Exhibit IV.D-1.

EXHIBIT IV.F-5

PROJECT REVENUES, CREDITS, AND EXPENSES
FIRST GUYANA RICE MODERNIZATION PROJECT

Year Ending 30 Sep. (1)	Revenues and Credits				Expenses			Drying/Storage Center Expenses	
	Project Total (2)	Storage Centers (3)	Seed (4)	G'town Storage (5)	Project Total (6)	Included Labor (7)	Foreign Exchange (8)	Total (9)	Over- head (10)
	(In thousands of Guyana dollars)								
1970	0.	0.	0.	0.	0.	0.	0.	0.	0.
1971	15.1	0.	15.1	0.	14.3	7.9	.7	0.	7.
1972	83.8	0.	83.8	0.	79.4	43.7	3.7	0.	0.
1973	634.2	656.7	277.5	0.	487.8	212.4	77.1	224.8	86.9
1974	1124.7	737.2	387.5	0.	730.1	311.4	121.8	362.8	140.3
1975	1770.9	1372.6	398.3	0.	1824.8	557.8	551.6	1449.1	316.7
1976	1782.8	1496.8	286.0	0.	2077.9	688.0	553.8	1709.4	473.3
1977	2220.9	1765.4	455.5	0.	2573.7	808.3	767.3	2177.4	581.1
1978									
1979									
1980									

Oper- ating (11)	Drying/Storage Center Expenses				Research & Seed Station		
	Energy (12)	Mainte- nance (13)	Included Labor (14)	Foreign Exchange (15)	Total Expense (16)	Included Labor (17)	Foreign Exchange (18)
0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	14.3	7.9	.7
0.	0.	0.	0.	0.	79.4	43.7	3.7
26.8	85.1	26.0	67.7	64.7	263.0	144.7	12.4
43.3	137.3	41.9	109.3	104.5	367.3	222.9	17.3
221.8	704.5	206.1	351.1	534.4	375.7	226.6	17.2
300.3	708.8	226.9	485.3	541.5	368.5	202.7	12.3
359.2	976.4	260.6	582.4	749.6	396.3	275.9	17.7

Source: Data Base Exhibit 1.2.

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EXHIBIT IV.F-6

REALIZED PADDY PRICE DIFFERENCE TO FARMERS
FOR APPROVED PROJECT RICE VARIETIES
FIRST GUYANA RICE MODERNIZATION PROJECT

<u>Year</u>	<u>Farmer Price Difference</u>	<u>Associated Costs (adjusted for inflation)</u>		<u>Farmer Net Price Difference</u>
		<u>Farming Cost Difference</u>	<u>Drying Cost</u>	
1970	.95	.0957	.3681	.49
1971	.95	.0960	.3690	.49
1972	1.01*	.1061	.4079	.50
1973	1.56*	.1153	.4434	1.00
1974	4.24*	.1295	.4980	3.61
1975	3.60*	.1300*	.5000*	2.97*
1976	3.42*	.1428	.5494	2.44
1977	3.50*	.1482	.5700	2.78
1978	3.55	.1500	.6000	2.80
1979	3.55	.1500	.6000	2.80
1980	3.55	.1500	.6000	2.80

Source: Data Base Exhibits F.3, F.11, G.14-17, and I.2.

Note: * Statistical data of operations. Other data is calculated from monetary factors or estimated.

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EXHIBIT IV.F-7

PRODUCTION AND INTAKE OF PADDY, SEED, AND MILLED RICE
FIRST GUYANA RICE MODERNIZATION PROJECT

Year Ending 30 Sep.	Basic Harvest Acreage	Annual Yield per Acre	Total Paddy	Approved Varieties	Total Paddy	Approved Varieties	Paddy and Seed Intake at GRB Facilities		
							Project Facilities by Varieties		
							Total	Approved	Other
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	,000 acres		(In thousands of 140 lb. bags)						
1970	212.0	16.5	3502	55	784.9	13.1	0.	0.	0.
1971	171.7	17.2	2952	110	954.3	11.2	0.	0.	0.
1972	115.9	19.8	2316	333	973.0	83.9	0.	0.	0.
1973	147.5	16.3	2399	579	740.8	288.2	230.1	187.8	42.3
1974	187.9	21.4	4029	983	996.5	336.8	379.7	268.1	111.6
1975	181.2	24.9	4510	1934	1880.9	1062.8	1024.0	861.7	162.3
1976	117.4	23.2	2722	2651	1775.1	946.7	1037.7	777.3	260.4
1977	213.1	26.2	5644	4056	1834.7	1311.7	1177.8	995.9	181.9
1978									
1979									
1980									

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Paddy and Seed Intake at GRB Facilities			Seed Intake at GRB Facilities				GRB Milled Rice Intake			GRB Export Shipments
Other Facilities by Varieties			Project Facilities		Other Facilities		Total	Milled Rice Varieties		
Total	Approved	Other	Founda- tion	Pure Line	Founda- tion	Pure Line	Intake	Approved	Other	
(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
784.9	13.1	771.8	0.	0.	n.a.	5.5	998.0	11.6	986.4	778.5
954.3	11.2	943.1	1.5	4.0	n.a.	4.5	975.8	36.2	939.6	815.7
973.0	83.9	900.2	3.6	7.5	n.a.	17.9	1006.5	193.4	813.1	855.5
510.7	100.4	410.3	11.1	27.7	0.	25.4	932.5	301.6	630.9	662.8
610.8	68.7	542.1	15.5	23.3	0.	34.6	1181.8	483.5	698.3	520.4
856.9	201.1	655.8	15.9	22.9	0.	55.6	1322.9	675.4	647.5	913.1
737.4	169.4	568.0	10.6	28.2	0.	30.4	1433.1	726.1	707.0	940.6
656.9	315.8	341.1	16.9	21.9	0.	63.4	1755.5	1003.6	751.9	825.9

Source: Data Base Exhibits B.2, D.5, F.3, F.10, and F.11.

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