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RICE COST OF PRODUCTION IN VIETNAM - 1968/69
RICE CROP AND PRELIMINARY ESTIMATES FOR 1970

BY

RAY S. FOX

FOREIGN ECONOMIC DEVELOPMENT SERVICE/USDA

U. S. AGENCY FOR INTERNATIONAL DEVELOPMENT
OFFICE OF ASSOCIATE DIRECTOR FOR FOOD AND AGRICULTURE
AGRICULTURE ECONOMICS DIVISION
SAIGON, VIETNAM
MARCH, 1971

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OFFICE OF ASSOCIATE DIRECTOR FOR FOOD AND AGRICULTURE

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Rice Cost of Production In Vietnam - 1968/69

Rice Crop and Preliminary Estimates for 1970

By: RAY S. FOX^{1/}

In Cooperation With

The Agricultural Economics and Statistics Service

Ministry of Land Reform Agriculture and Fishery Development

PREFACE

This report presents information on costs and related input requirements of Vietnamese rice producers. The data presented are the result of a cooperative effort of the Agricultural Economics and Statistics Service (AESS) of the Vietnamese Ministry of Land Reform, Agriculture and Fishery Development (MLRAFD) and several USAID/ADFA agricultural economists and statisticians. AESS, with USAID assistance, designed and conducted the rice costs of production survey from which this report was prepared.

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BRIEF

The per hectare costs of producing rice varies with cultural practice and region. The regional differences for similar cultural practices are due to differences in the level of costs of labor and land preparation. The cost difference between cultural practices, using traditional technology, is due primarily to the intensity with which labor is utilized. Labor costs (1970 preliminary prices) vary from a low of VN\$6,255 for floating rice to a high of VN\$26,530 for double transplanted rice. Rent on land also varied considerably with a low of 10 percent for double transplant rice to a high 20 percent for floating rice.

Costs on a per kilogram basis vary considerably less between cultural practices than they do on a per hectare basis. This reflects the paddy yield differences between cultural practices. Applying improved technology to local rice varieties will increase yields about 600 kilograms per hectare without decreasing costs appreciably. However, the per kilogram production costs for TN varieties are significantly lower than for transplanted local rice varieties.

Vietnam: Preliminary 1970 Estimates of Per Kilogram
Paddy Production Costs by Region and Cultural
Practice

<u>Cultural Practice</u>	<u>Southern Region</u>		<u>Coastal Lowlands</u>	
	<u>Traditional Technology</u>	<u>Improved Technology</u>	<u>Traditional Technology</u>	<u>Improved Technology</u>
	- - - - - VN\$ per Kilogram - - - - -			
<u>Broadcast</u>				
Floating	13.17	-	-	-
Non-floating	13.41	14.35	-	-
<u>Double Transplant</u>	16.88	-	-	-
<u>Single Transplant</u>				
Local Varieties	18.18	17.81	21.56	20.51
TN Varieties	-	12.81	-	14.87

The preliminary data on TN varieties indicates a mean paddy yield of 4,475 kilograms per hectare and a response coefficient of 3.65 at a fertilizer application rate of 322 kilograms of fertilizer. At existing prices (fertilizer - VN\$12 per kilogram; paddy - VN\$23 per kilogram) this results in a marginal return to fertilizer of 7.0 in the Southern Region. This fertilizer data is of a very preliminary nature and is subject to revision as all of the results from the survey currently being conducted by AESS on the costs of producing TN rice varieties for the 1970/71 crop becomes available.

INTRODUCTION

The recent introduction of improved rice production technology necessitates the need for up-to-date information which can be used for decision making activities at the national, regional, local and farm level. The significant price adjustments within the economy, which are and have been and are likely to continue for some time, also heighten the need for revision of available knowledge. This survey was an attempt by AESS to provide this information as it relates to rice production.

It is intended that this be one of numerous cost of production studies to be conducted on various enterprises of the agricultural sector. The overwhelming prominence of rice in the Vietnamese agricultural sector required that this area be investigated first. However, as rice self-sufficiency approaches realization comparative production costs for supplementary, complementary and competitive agricultural enterprises must be known if rational policy and producer decisions are to be made.

OBJECTIVES

The objectives of this survey and resultant analysis were to:

- (1) quantify input requirements by region and farm size for the various types of cultural practices being used by Vietnamese rice producers;
- (2) estimate costs and returns to farm operators under past and current price relationships;
- (3) organize and present a method of analysis which can be used as an aid to both national and farm planners and, as more cost studies become available, provide the basis for projecting potential incomes from alternative crops.

PROCEDURES AND METHODS OF ANALYSIS

A. The Survey Sample: A 703 farm random sample was developed as a means of acquiring production cost data. The sample was stratified by; (1) two regions - Coastal Lowlands and Southern Region; (2) four farm sizes; and (3) four cultural practices - single transplant, double transplant, broadcast floating rice and broadcast non-floating rice. Averages were then to be computed to provide a basis for "constructing" rice farms of selected size and cultural practice.

The complexity of the questionnaire combined with limited enumerator skills resulted in only 260 useable schedules. As a result of the diminution of the sample it must be realized that randomness and therefore representativeness has undoubtedly been lost. Also, because of this reduced sample size it has become impossible to measure the effects of farm size on production costs. Thus, the data presented in the annex of different farm sizes within a given cultural practice assumes no economies of scale. This of course is not a valid assumption where the opportunity costs of family labor are about zero. In that case family labor would have to be treated as a fixed cost to be allocated on a per unit basis which would decrease with increased farm size. The unit cost of livestock power, if owned, would also decline with increased farm

size. Of the farms in the survey 1 percent used owned livestock power only, 67 percent hired their livestock power and 32 percent used both owned and hired livestock power.

1. Cultural Practices - Cultural practices of rice producers vary with drainage capability, surface water depth during the monsoon season and custom. In this study production cost estimates were made for the following cultural practices.

a. Single transplant rice: This method of rice cultivation is practiced in most of Vietnam with the exception of those Delta provinces adjacent to Cambodia and the areas of the central Delta where floating rice is grown and double transplanting is practiced respectively. The seeds are sown in a seed bed and the seedlings are later transplanted into a puddled field (paddy) from 20 to 40 days later. The cost of transplanting represents from 30 to 35 percent of total labor costs.

b. Broadcast non-floating rice: This limited practice is followed in the same geographical areas as single transplanting. The seed, however, is sown directly into a puddled paddy and weeding and water control procedures are used during the growing period.

c. Double transplant rice: This cultural technique of the central Delta is probably practiced as a weed control device since weeding as such is not practiced. The seed is sown in a seed bed and the seedlings later transplanted to a larger plot where they

remain until the seedlings are stooling.^{1/} At this time the second transplanting into the flooded field is performed. There is very little tillage of the soil. Field preparation is primarily one of vegetation removal either by pulling and/or with the use of a sickle. This is a very high labor intensive method of rice production.

d. Broadcast floating rice: The rice seed is sown onto a plowed field at the beginning of the rainy season. With the exception of a limited amount of weeding the farmer pays very little attention to the crop during the growth period. The floating rice varieties grow rapidly and are able to survive in relatively deep waters that are endemic to the provinces of the western Delta.

2. Regional Stratification - Rice producers were enumerated in the following province

a. Coastal Lowlands:

(1) Phu-Yen (2) Quang-Ngai

b. Southern Region:

(1) An-Giang (5) Long-An
(2) Ba-Xuyen (6) Phong-Dinh
(3) Dinh-Tuong (7) Sa-Dec
(4) Gia-Dinh

^{1/} The seedlings are transplanted from a nursery bed of about 1/10 of a hectare to an area of about $\frac{1}{4}$ hectare when expressed in per hectare terms.

The regional breakdown is one of the Delta (Southern Region) and other. Here Delta refers to the area flooded by the Mekong river and its branches and tributaries. About 80 percent of the rice grown in South Vietnam is produced in this area.

The Coastal Lowlands refers to those coastal provinces of South Vietnam which are north of Saigon. It represents a heterogeneous area which extends in a north-south direction for about 375 miles. Only two of the 10 provinces of this region were included in the study and it should be remembered that significant differences within the region are likely to exist.

B. Analysis: After the survey had been completed it was decided to use USAID's automatic data processing facilities as a means of expediting the summarization. Since this was an after thought the questionnaires had not been constructed with the guidance of a systems analyst. Thus the data was not in a form readily adaptable to card punching. The result was one of considerable delay in preparing the data for computer input; lax in editing of the questionnaires and resultant numerous computer runs were necessary until a useable print out become available.

1. Farm Characteristics - Tables 1 through 4 provide a picture of the make-up of the survey sample farms. Table 1 indicates simple averages of farm size, production and paddy utilization by region, cultural practice and land ownership. It is interesting

to note that the largest farm operations, on the average, were in the land "owned and rented" category. Table 2 shows this same basic data on a per hectare basis. Tables 3 and 4 are frequency distributions by farm size of the floating and single transplanting rice farms of the sample.

Tables 5 through 10 are data in terms of piasters of the costs and returns to rice producers by region and cultural practice in 1968 and preliminary 1970 prices. Tables 11 and 12 estimate the cash needs of improved technology rice producers at selected foreign exchange rates. If more detail is desired on the physical inputs and related prices or a more thorough understanding as to how the data were developed please refer to Tables 1A through 16A of the annex.

2. Cost Components: Draft Power - An attempt was made to acquire data on the cost of owning and operating both tractors and draft animals. In the case of tractors practically all farmers included in the sample who used tractors had their land tilled with hired equipment. The data acquired on the cost and maintenance of draft animals was extremely sparse and of no significance. As indicated earlier a significant part of the land was prepared with the use of hired draft animals. Under the circumstances it seems to be appropriate to use the hire rate for both tractors and draft animals to estimate the cost of land preparation.

Labor - Job specialization, with local variation, is being practiced by Vietnamese rice producers. That is some activities are performed by women and others by men. Transplanting, weeding, reaping and paddy drying are generally considered womens work. Land preparation, water control, insecticide and fertilizer application, threshing and transporting the paddy home are performed primarily by men. In this report to compensate for lower wages paid to women total man work days (MWD) were estimated by applying a factor of 0.75 to woman work days and added to the MWD. Wage rates also differ within the man and/or woman category for the various tasks of producing rice.

Seed - Seed inputs varied by cultural practice. About 120 kilograms of seed per hectare was used for broadcasting and 45 kilograms per hectare by farmers using the transplanting technique.

Fertilizer - An attempt was made to identify the response of rice to fertilizer. Using the sample survey data for the 1968/69 rice crop and the preliminary data from two of the 11 provinces surveyed in 1970, two linear correlation equations were computed (charts 1A, 2A). The result was a response coefficient for local rice varieties (non-floating) of 2.54 at a mean fertilizer application rate of 192 kilograms (50 percent urea and 50 percent 16-16-8) per hectare and a paddy yield of 2,594 kilograms.^{1/} With TN varieties

^{1/} In terms of production this means that an additional kilogram of fertilizer will produce 2.54 kilograms of paddy.

the response coefficient was 3.65 at a mean fertilizer application rate of 322 kilograms (30 percent urea and 70 percent 16-16-8) and a paddy yield of 4,475 kilograms.

In both cases the coefficient of determination (r^2) was very low reflecting other factors such as varietal differences, soil characteristics, different application ratios of N-P-K, timely application of insecticides and fertilizer, weeding and other management practices. Thus, these equations provide little insight for making recommendations at the micro level since local factors have not been isolated for additional analysis. However, on a macro basis it does provide an indication as to what yields might be expected if the mean or near mean indicated cultural techniques were extended to areas similar to those included in this survey.

Insecticides - No effort was made to identify the response of rice to insecticides. The insecticides being used by sample farmers were primarily those farmers who were also using fertilizer. Therefore, the response to insecticides has been incorporated into the fertilizer analysis.

Interest - The data on interest indicated in the tables is not a sample survey average. To arrive at an interest charge the costs of land preparation, labor (excluding harvesting), insecticides and fertilizer were assumed to have been paid for with borrowed money (opportunity cost if not borrowed) and an interest rate of two percent per month for four months was charged.

IMPLICATION

A. Policy - The survey data on production costs have been summarized in a manner which will make it possible for individuals with varying interests to select those cost factors that are useful to them. Interested parties include rice producers, government officials, lending institutions and manufactures and distributors of agricultural inputs and products. Government officials normally would consider the full cost of production, including returns to land and management as well as a "normal profit." They may also consider a concept of "equitable farm family income" that would include returns to family labor and also returns to land if the level of tenancy were low.

Farmers on the other hand, at least in the short run, are more likely to consider only variable costs in developing their production plans. To the individual farmer variable costs are generally those input costs which require cash outlays at the time of their utilization. They include fertilizer, insecticide, seed and hired labor. Hired labor is used primarily at the time of transplanting and harvesting. At these two peak labor requirement periods timeliness necessitates that a significant proportion of these two tasks be accomplished by non-farm family labor. Per hectare hired labor requirement may run as high as VN\$4,500 for single transplant rice to as low as VN\$3,000 for floating rice. However, cash outlays are necessary only for the transplanting period since hired labor for harvesting is generally paid for with paddy. Thus, hired labor for transplanting

and land preparation cost, if hired draft power is utilized, are the primary cash outlays for traditional rice production techniques.

1. Risk Factor - For farms using improved rice production technology cash outlays increase significantly with the purchase of fertilizer and insecticides. Although these higher cash expenditures increase the potential for greater producer incomes they also increase the loss potential if there is a crop failure. For local variety rice producers (Southern Region) using improved technology 48 percent of cash outlays are due to fertilizer and insecticides (Table 11). For TN varieties 54 percent of the cash outlays are due to fertilizer and insecticide inputs. In an economy where money is a relatively scarce resource as it is in rural Vietnam the shift to new technology presents a real risk to those farmers who must borrow money to meet their cash needs at planting time.

In recent years in many areas of Vietnam rice production risks have increased considerably. Illegal taxing of rice producers by hostile forces has increased production costs to farmers so affected. Military operations have also proved to be very destructive to a standing rice crop. Although, these risk factors are not normally associated with rice production they have become real factors which cannot be ignored by a farmer who is contemplating cash expenditures or technological innovation.

2. Foreign Exchange Rates - Fertilizer and insecticides are being imported into Vietnam at an effective exchange rate of VN\$118 to

US\$1 (exchange rate of VN\$80 to US\$1 plus a VN\$38 tax). What would be the effect of increasing the exchange rate to VN\$275?

The immediate effect would be an increase in the cash outlay for fertilizer and insecticides by rice producers of from 65 to 70 percent assuming no decline in rates of application (Table 11). These increased costs would add about 18 percent to the costs per kilogram of producing rice. It would reduce the marginal returns of fertilizer from 4.54 to 1.94 for local rice varieties. For TN varieties the marginal returns for fertilizer would decline from 7.00 to 3.00. This undoubtedly would restrict fertilizer inputs on local rice varieties and when considering the risk factor a marginal return on TN varieties of 3.00 might also limit or prevent the expansion of area devoted to these high yielding varieties. If the marginal returns to fertilizer at the mean rate of application indicated in chart 2A for TN varieties were to be maintained at 4.00 under an exchange rate of VN\$275, paddy would have to sell at a price of about VN\$30 per kilogram. This of course assumes that the mean fertilizer application rate is a point on the rice/fertilizer production function that is increasing at a decreasing rate. If this were not the case producers could increase their marginal returns to fertilizer by increasing their rate of application.

3. Family Income - The survey did not acquire total family farm income data as such. However, that part of farm family income which

resulted from their rice production enterprises can be estimated. This estimated income will vary with farm size, rate of double cropping and the number of farm workers per family.

In addition to the "Returns to Management" indicated in the attached tables, there is also a part of the labor costs that can be attributed to family income. On farms of 1 to 2 hectares, from 20 to 30 percent of the labor for a single crop for transplanting and harvesting and about 100 percent of other labor costs can be considered as family income. Since labor requirements for transplanting and harvesting go beyond that which can be supplied by the farm family, family incomes increase at something less than an arithmetic rate with increased farm size. This is not the case however of a farm with double cropping capability. A one hectare farm producing two rice crops annually on the same area should double family income assuming production costs and yields are equal for both crops.

Also if the farm operator is the owner of the rice land, the cost of "Rent on Land" is considered as part of the family income. As the "Land to the Tiller" program is consummated returns to land will in all cases become part of family income.

The question as to what an equitable family income should be is a sociological and not an economic one. However, it should be remembered that if rural stability is to be established farmers must have sufficient incomes to participate in the consumer economy which has developed so rapidly in the urban areas of Vietnam.

One other factor that must also be considered is that a large number of farms are less than one hectare in size. In the Southern Region about 22 percent of the rice farms are less than one hectare. While in the Central Lowlands the rice farms under one hectare represent 75 percent of all farms. However, the rate of double cropping is greater in the Central Lowlands which somewhat increases the "effective" farm size.

Frequency Distribution of Rice Farms by Farm Size and Region, 1960-61 Agricultural Census, Vietnam

<u>Farm Size</u>	18 Provinces of Southern Region	9 Provinces of Central Lowlands
	----- % -----	
Less than 0.5 ha.	5.68	43.27
0.5 ha. to 0.9 ha.	16.18	31.73
1.0 ha. to 1.9 ha.	33.86	19.03
2.0 ha. to 2.9 ha.	18.49	3.86
3.0 ha. to 4.9 ha.	15.67	1.59
5.0 ha. and over	10.12	0.52
	100.00	100.00
Number of Farms	816,506	579,514

Source: Report on the Agricultural Census of Vietnam, 1960-61, Agricultural Economics and Statistics Service.

B. Continued Study - Acquiring production costs requires a relatively complex questionnaire. Because of this and the use of unskilled enumerators a considerable proportion of the questionnaires

were unuseable from the 1968/69 rice crop survey. In future studies of this nature I would suggest that AESS, as they are currently doing on TN rice varieties, carefully select farmers for enumeration and not attempt to develop a random sample. By selecting a small number of farmers in selected provinces AESS fieldmen will be able to do the interviewing which should provide data that is comparable from region to region and thus more readily additive. The smaller sample would also lend itself to relatively quick hand tabulation making the information available on a more timely basis.

Information on the response of rice to various levels and combinations of fertilizer (N-P-K) by variety, soil types and location is still very much an unknown entity. If this information and a soil survey map were available recommendations to farmers could be made as well as an estimate of the production potential for land on a national basis. Assuming that farmers apply N-P-K at different levels and ratios, fertilizer/rice production functions by region could be estimated. Information could be gathered during the annual survey on the amount of N-P-K used on rice and related yields, whether or not pesticides were applied and if growing conditions were "normal". Using multiple correlation techniques an equation of three independent variables (N-P-K) could be estimated. If the data would lend itself to developing a production function for fertilizer, optimum rates of N-P-K application could be estimated for a given set of price relationship.

RSFox:ktt
March 19, 1971

Table: 1

Farm Characteristics: Survey Averages of Area, Production and Utilization of Paddy - Rice Cost of Production Survey, 1968/69 Crop

Number of Farms Averaged		Total area (ha.)	Area Harvested (ha.)	Paddy Production (kgs.)	Paddy Utilization					
					Sale (kgs)	Labor (kgs)	Rent (kgs)	Home (kgs)	Seed (kgs)	Feed (kgs)
<u>Southern Region</u>										
87	<u>Floating (Broadcast)</u>	3.81	3.74	5,641	1,533	1,247	732	1,414	446	269
35	Owned Only	3.93	3.87	5,507	2,063	1,047	-	1,611	501	285
44	Rented Only	2.89	2.85	4,417	769	939	990	1,182	326	211
8	Owned and Rented	8.32	8.02	12,950	3,418	3,818	2,512	1,825	862	515
35	<u>Broadcast (non-floating)</u>	1.66	1.57	3,404	1,121	174	270	1,509	197	129
14	Owned Only	1.23	1.22	2,931	936	79	-	1,607	136	173
17	Rented Only	1.36	1.18	2,619	672	106	338	1,289	152	53
4	Owned and Rented	4.48	4.42	8,400	3,675	800	925	2,100	600	300
18	<u>Double Transplant</u>	1.60	1.52	3,232	503	457	286	1,774	42	170
2	Owned Only	0.85	0.75	2,100	600	100	-	1,200	50	150
16	Rented Only	1.69	1.62	3,374	491	502	322	1,846	41	172
0	Owned and Rented	-	-	-	-	-	-	-	-	-
113	<u>Single Transplant</u> ^{1/}	2.00	2.05	4,201	1,521	233	386	1,515	86	460
33	Owned Only	1.87	1.95	3,985	1,694	315	-	1,456	89	431
69	Rented Only	1.84	1.90	3,990	1,233	171	521	1,487	75	503
11	Owned and Rented	3.45	3.29	6,168	2,804	373	698	1,866	145	282
<u>Costal Lowlands</u>										
29	<u>Single Transplant</u> ^{2/}	1.11	1.11	3,214	1,019	634	62	1,406	72	21

1/ 5.5% of total area planted was double cropped in rice. Includes 10 TN-8 farmers, six of which produced a second crop.

2/ 37.8% of total area planted was double cropped in rice. Only one hectare of the total was rented.

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Table: 2

Farm Characteristics: Paddy Production and Utilization on a Per Hectare
Basis - Rice Cost of Production Survey, 1968/69 Crop

Number of Farms		Total Area		Paddy Production (kgs.)	Paddy Utilization					
		Planted (ha.)	Harvested %		Sale (kgs)	Labor (kgs)	Rent (kgs)	Home (kgs)	Seed (kgs)	Feed (kgs)
<u>Southern Region</u>										
87	<u>Floating (Broadcast)</u>	1.0	98.2	1,480	402	327	192	371	117	71
35	Owned Only	1.0	98.5	1,400	525	266	-	410	127	72
44	Rented Only	1.0	98.6	1,527	266	324	342	409	113	73
8	Owned and Rented	1.0	96.4	1,556	410	459	302	219	104	62
35	<u>Broadcast (non-floating)</u>	1.0	94.3	2,045	674	105	162	907	118	79
14	Owned Only	1.0	99.4	2,385	762	64	-	1,308	110	141
17	Rented Only	1.0	87.0	1,919	494	78	248	948	112	39
4	Owned and Rented	1.0	98.9	1,877	821	179	207	469	134	67
18	<u>Double Transplant</u>	1.0	95.5	2,021	315	286	179	1,109	26	106
2	Owned Only	1.0	88.2	2,471	706	118	-	1,412	59	176
16	Rented Only	1.0	95.9	1,993	290	297	190	1,090	24	102
0	Owned and Rented	-	-	-	-	-	-	-	-	-
113	<u>Single Transplant</u>	1.0	97.3	1,900	689	105	174	685	39	208
33	Owned Only	1.0	96.4	1,973	839	156	-	721	44	213
69	Rented Only	1.0	92.2	1,895	586	81	247	706	36	239
11	Owned and Rented	1.0	95.5	1,791	814	108	203	542	42	82
<u>Coastal Lowlands</u>										
29	Single Transplant	1.0	100.0	2,895	918	571	56	1,266	65	19

Table: 3

Southern Region: Frequency Distribution of Survey
Sample of Floating Rice Farms by
Farm Size.

<u>Farm Size</u>	<u>Number of Farms</u>	<u>Percent</u>
Less than 0.5 ha.	6	6.9
0.5 ha. to 0.9 ha.	8	9.2
1.0 ha. to 2.0 ha.	20	23.0
2.0 ha. to 3.9 ha.	19	21.8
4.0 ha. to 7.9 ha.	22	25.3
8.0 ha. and over	12	13.8
Total	87	100.0

Table: 4

**Southern Region: Frequency Distribution of Survey Sample
of Single Transplant Farms by Farm Size**

<u>Farm Size</u>	<u>Number of Farms</u>	<u>Percent</u>
Less than 0.5 ha.	4	3.5
0.5 ha. to 0.9 ha.	12	10.6
1.0 ha. to 1.4 ha.	36	31.9
1.5 ha. to 2.4 ha.	31	27.5
2.5 ha. to 4.9 ha.	18	15.9
5.0 ha. and over	12	10.6
Total	113	100.0

Table: 5

Southern Region: Comparative Costs and Returns of Rice Producers on a Hectare Basis by Cultural Practice, Using Traditional Technology - 1968 Prices

	<u>Broadcast</u>		<u>Double Transplant</u>	<u>Single Transplant</u>
	<u>Floating</u>	<u>Non-floating</u>		
	----- V N \$ -----			
<u>Costs</u>				
Land Preparation	2,850	3,420	-	3,850
Labor	4,425	4,390	17,250	11,660
Seed	1,800	1,680	760	680
Rent on Land	5,400	3,780	3,400	4,200
Interest	405	480	1,120	960
Total Cost	14,880	13,750	22,530	21,350
Cost Per Kilogram (Paddy)	9.92	7.64	11.26	11.24
<u>Returns (Gross)</u>				
Paddy (MT)	1.50	1.80	2.00	1.90
VN\$	27,000	25,200	34,000	28,500
<u>Returns to Management</u>	12,120	11,450	11,470	7,150
<u>Paddy Price Per Kilogram</u>	18	14	17	15

Table: 6

Southern Region: Comparative Costs and Returns of Rice Producers on a Hectare Basis by Cultural Practice, Using Traditional Technology - 1970 Prices

	<u>Broadcast</u>		<u>Double Transplant</u>	<u>Single Transplant</u>
	<u>Floating</u>	<u>Non-floating</u>		
	V N		\$	
<u>Costs</u>				
Land Preparation	4,500	5,400	-	6,200
Labor	6,255	9,020	26,530	19,340
Seed	2,400	2,760	1,035	1,035
Rent on Land	6,000	6,210	4,600	6,440
Interest	600	760	1,600	1,520
Total Cost	19,755	24,150	33,765	34,535
Cost Per Kilogram (Paddy)	13.17	13.41	16.88	18.18
<u>Returns (Gross)</u>				
Paddy (MT)	1.50	1.80	2.00	1.90
VN\$	30,000	41,400	46,000	43,700
<u>Returns to Management</u>	10,245	17,250	12,235	9,165
<u>Paddy Price Per Kilogram</u>	20	23	23	23

Note: Prices used to formulate this table are preliminary.

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Table: 7

Southern Region: Comparative Costs and Returns of Rice Producers on a Hectare Basis by Cultural Practice, Using Improved Technology - 1968 Prices

	Broadcast Non-floating	Single Transplant	
		Local Varieties	TN Varieties
	V N \$		
<u>Costs</u>			
Land Preparation	3,420	3,850	3,850
Labor	5,390	12,990	14,600
Seed	1,680	675	675
Insecticide	3,250	3,250	3,250
Fertilizer	1,430	1,710	2,970
Rent on Land	5,040	5,850	10,125
Interest	920	1,440	1,600
Total Cost	21,130	29,765	37,070
Cost Per Kilogram (Paddy)	8.80	11.06	8.24
<u>Returns (Gross)</u>			
Paddy (MT)	2.40	2.60	4.50
VN\$	33,600	39,000	67,500
<u>Returns to Management</u>	12,470	10,235	30,430
<u>Paddy Price Per Kilogram</u>	14	15	15

25

Table: 8

Southern Region: Comparative Costs and Returns of Single Transplant Rice Producers on a Hectare Basis, Using Improved Technology - 1970 Prices

	<u>Broadcast Non-floating</u>	<u>Single Transplant</u>	
		<u>Local Varieties</u>	<u>TN Varieties</u>
	-----	V N \$	-----
<u>Costs</u>			
Land Preparation	5,400	6,200	6,200
Labor	11,270	21,805	24,680
Seed	2,760	1,035	1,035
Insecticide	3,860	3,860	3,860
Fertilizer	1,560	2,280	3,960
Rent on Land	8,280	8,970	15,525
Interest	1,320	2,160	2,400
Total Cost	34,450	46,310	57,660
Cost Per Kilogram (Paddy)	14.35	17.81	12.81
<u>Returns (Gross)</u>			

Table: 9

Coastal Lowlands: Comparative Costs and Returns of Single Transplant Rice Producers on a Hectare Basis, Using Traditional and Improved Technology - 1968 Prices

	Local Varieties		TN Varieties
	<u>Traditional Technology</u>	<u>Improved Technology</u>	
	----- V N \$ -----		
<u>Costs</u>			
Land Preparation	4,375	4,375	4,375
Labor	13,670	15,090	16,130
Seed	1,125	1,125	1,125
Insecticide	-	3,600	3,600
Fertilizer	-	3,700	5,280
Rent on Land	7,125	10,000	16,875
Interest	1,200	1,840	2,000
Total Cost	27,495	39,730	49,385
Cost Per Kilogram (Paddy)	14.47	14.71	10.97
<u>Returns (Gross)</u>			
Paddy (MT)	1.90	2.70	4.50
VNS	47,500	67,500	112,500
<u>Returns to Management</u>	20,005	27,770	63,115
<u>Paddy Price Per Kilogram</u>	25	25	25

24

Table: 10

Coastal Lowlands: Comparative Costs and Returns of Single Transplant Rice Producers on a Hectare Basis, Using Traditional and Improved Technology - 1970 Prices

	<u>Local Varieties</u>		<u>TN Varieties</u>
	<u>Traditional Technology</u>	<u>Improved Technology</u>	
	----- V N \$ -----		
<u>Costs</u>			
Land Preparation	10,800	10,800	10,800
Labor	17,760	19,910	21,420
Seed	1,440	1,440	1,440
Insecticide	-	4,980	4,980
Fertilizer	-	2,820	3,960
Rent on Land	9,120	12,800	21,600
Interest	1,840	2,640	2,720
Total Cost	40,960	55,390	66,920
Cost Per Kilogram (Paddy)	21.56	20.51	14.87
<u>Returns (Gross)</u>			
Paddy (MT)	1.90	2.70	4.50
VN\$	60,800	86,400	144,000
<u>Returns to Management</u>	19,840	31,010	77,080
<u>Paddy Price Per Kilogram</u>	32	32	32

Note: Prices used to formulate this table are preliminary.

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Table: 11

Southern Region: Estimated Cash Outlays On Per Hectare Basis For Single Transplant Rice Producers at Selected Foreign Exchange Rates on Imported Inputs - 1970 Prices

	Local Varieties		TN Varieties	
	<u>VN\$118/US\$1</u>	<u>VN\$275/US\$1</u>	<u>VN\$118/US\$1</u>	<u>VN\$275/US\$1</u>
	----- V N \$ -----			
Cash Outlays	12,820	20,980	14,500	24,900
Labor and Land Preparation ^{1/}	6,680	6,680	6,680	6,680
Insecticides	3,860	8,990	3,860	8,990
Fertilizer	2,280	5,310	3,960	9,230
<u>Other Costs</u>	33,490	33,490	43,160	43,160
<u>Total</u>	46,310	54,470	57,660	68,060
<u>Costs Per Kilogram of Paddy</u>	17.81	20.95	12.81	15.12
<u>Marginal Returns to Fertilizer</u> ^{2/}	4.54	1.94	7.00	3.00

Note: 1970 prices are preliminary

^{1/} Forty percent of land preparation cost and 12 MWD for transplanting

^{2/} This represents the marginal returns over marginal costs assuming fertilizer application at the mean rates indicated in charts 1A and 2A and assuming a farm price for paddy of VN\$23 per kilogram. Fertilizer prices used were VN\$12 at the VN\$118 to US\$1 and VN\$28 at the VN\$275 to US\$1.

Table: 12

Coastal Lowlands: Estimated Cash Outlays on Per Hectare Basis at Selected Exchange Rates on Imported Inputs - 1970 Prices

	Local Varieties		TN Varieties	
	<u>VN\$118/US\$1</u>	<u>VN\$275/US\$1</u>	<u>VN\$118/US\$1</u>	<u>VN\$275/US\$1</u>
<u>Cash Outlays</u>				
<u>Labor and Land Preparation</u> ^{1/}	15,720	26,090	16,860	28,750
Insecticides	7,920	7,920	7,920	7,920
Fertilizer	4,980	11,600	4,980	11,600
	2,820	6,570	3,960	9,230
<u>Other Costs</u>	39,670	39,670	50,060	50,060
<u>Total Costs</u>	55,390	65,760	66,920	78,810
<u>Costs Per Kilogram of Paddy</u>	20.51	24.35	14.87	17.51
<u>Marginal Returns to Paddy</u> ^{2/}	6.77	2.90	9.73	4.17

Note: 1970 prices are preliminary.

^{1/} Forty percent of land preparation costs and 18 MWD for transplanting.

^{2/} This represents the marginal returns over marginal costs assuming fertilizer application at the mean rates indicated in charts 1A and 2A and assuming a farm price for paddy of VN\$32 per kilogram. Fertilizer prices used were VN\$12 at the exchange rate of VN\$118 to US\$1 and VN\$28 at the exchange rate of VN\$275 to US\$1.

ANNEX

All of the producer input data (the "quantity" column in the tables) in the following tables were derived from the 1968/69 rice crop with the exception of TN varieties which also include preliminary 1970/71 rice crop data from one province in the Southern Region and one province of the Coastal Lowlands. This preliminary data was secured from a survey AESS is currently conducting of TN variety rice producers. They are interviewing about 12 farmers in each of 11 provinces. At the time this report was being prepared only the questionnaires of two provinces (24 producers) were available. All the cost data in the tables with 1970 prices were developed from those two province and are therefore preliminary.

Table: 1 A

Southern Region: Costs and Returns to Local Variety Rice Producers on Four Hectares - Broadcast Floating Rice, 1968/69 Rice Crop

	<u>Unit</u> ^{1/}	<u>Unit Price (VN\$)</u>	<u>Livestock Power</u>		<u>Mechanical Power</u>	
			<u>Quantity</u>	<u>Value (VN\$)</u>	<u>Quantity</u>	<u>Value (VN\$)</u>
<u>Costs</u>						
Paddy Preparation						
Mechanical Power	MWD	4,300	-	-	2.0	8,600
Livestock Power	MWD	570	20.0	11,400	-	-
Labor						
Planting	MWD	200	6.0	1,200	6.0	1,200
Weeding	MWD	250	2.0	500	2.0	500
Harvesting	MWD	250	64.0	16,000	64.0	16,000
Seed	Kgs.	15	480.0 ^{3/}	7,200	480.0 ^{3/}	7,200
Rent on Land	Kgs. ^{2/}	18	1,200.0 ^{3/}	21,600 ^{4/}	1,200.0 ^{3/}	21,600
Interest	VN\$	-	-	1,620 ^{4/}	-	1,400 ^{5/}
<u>Returns</u>						
Paddy Production	Kgs.	18	6,000	108,000	6,000	108,000
Returns to Management	VN\$	-	-	48,480	-	51,500

1/ MWD refers to man work days.

2/ Paddy.

3/ Twenty percent of production.

4/ Interest on VN\$20,300 @ 2 percent per month for 4 months.

5/ Interest on VN\$17,500 @ 2 percent per month for 4 months.

Table: 2 A

Southern Region: Costs and Returns to Local Variety Rice Producers on
Two Hectares - Broadcast Non-floating Rice, 1968/69 Rice Crop

	<u>Unit</u> ^{1/}	Unit Price (VN\$)	<u>Improved Technology</u>		<u>Traditional Technology</u>	
			<u>Quantity</u>	<u>Value</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Costs</u>						
Paddy Preparation ^{2/}	MWD	570	12.0	6,840	12.0	6,840
Labor						
Planting	MWD	260	3.0	780	3.0	780
Weeding	MWD	300	4.0	1,200	4.0	1,200
Insecticide Application	MWD	200	4.0	800	-	-
Fertilizer Application	MWD	200	4.0	800	-	-
Harvesting	MWD	200	36.0	7,200	34.0	6,800
Seed	Kgs.	14	240.0	3,360	240.0	3,360
Insecticide ^{8/}	Kgs.	4/	4/	6,500	-	-
Fertilizer ^{8/}	Kgs.	11	260.0	2,860	-	-
Rent on Land	Kgs. ^{3/}	14	720.0 ^{5/}	10,080	540.0 ^{5/}	7,560
Interest	VN\$	-	-	1,840 ^{6/}	-	960 ^{7/}
<u>Returns</u>						
Paddy Production	Kgs.	14	4,800	67,200	3,600	50,400
Returns to Management	VN\$	-	-	24,940	-	22,900

1/ MWD refers to man work days

2/ Livestock Power

3/ Paddy

4/ 100 kilograms of BHC @ VN\$55 per kilogram and 4 liters of endrine @ VN\$250 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$23,000 @ 2 percent per month for 4 months.

7/ Interest on VN\$12,000 @ 2 percent per month for 4 months.

8/ Fertilizer was applied at a rate of about one-half urea and one-half amophoskø (16-16-8).

Table: 3 A

Southern Region: Costs and Returns to Local Variety Rice Producers
on One Hectare - Double Transplant, 1968/69 Rice Crop

	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Costs</u>				
<u>Labor</u>				
Seed Bed Preparation and Planting	MWD	280	3.0	840
Paddy Preparation	MWD	350	17.0	5,950
First Transplanting	MWD	230	9.0	2,070
Second Transplanting	MWD	230	18.0	4,140
Harvesting	MWD	250	17.0	4,250
Seed	Kgs.	17	45 ^{4/}	760
Rent on Land	Kgs. ^{3/}	17	200 ^{4/}	3,400
Interest	VN\$	-	-	1,120 ^{2/}
<u>Returns</u>				
Paddy Production	Kgs.	17	2,000	34,000
Returns to Management	VN\$	-	-	11,470

1/ MWD refers to man work days

2/ Interest on VN\$14,000 @ 2 percent per month for 4 months.

3/ Paddy

4/ Ten percent of production

Table: 4 A

Southern Region: Costs and Returns to Local Variety Rice Producers on One Hectare -
Single Transplant, 1968/69 Rice Crop

	Unit ^{2/}	Unit Price (VN\$)	Livestock Power				Machine Power ^{1/}			
			Improved Technology		Traditional Tech.		Improved Technology		Traditional Tech.	
			Quantity	Value (VN\$)	Quantity	Value (VN\$)	Quantity	Value (VN\$)	Quantity	Value (VN\$)
Costs										
Land Preparation										
Seed Bed	MWD	550	1.0	550	1.0	550	1.0	550	1.0	550
Paddy	MWD	550	6.0	3,300	6.0	3,300	0.5	2,150	0.5	2,150
Labor										
Seed Bed Preparation and Planting	MWD	250	4.0	1,000	4.0	1,000	4.0	1,000	4.0	1,000
Paddy Preparation	MWD	250	3.0	750	3.0	750	3.0	750	3.0	750
Transplanting	MWD	220	18.0	3,960	18.0	3,960	18.0	3,960	18.0	3,960
Weeding	MWD	220	5.0	1,100	5.0	1,100	5.0	1,100	5.0	1,100
Insecticide Application	MWD	240	2.0	480	-	-	2.0	480	-	-
Fertilizer Application	MWD	240	2.5	600	-	-	2.5	600	-	-
Water Control	MWD	300	2.0	600	2.0	600	2.0	600	2.0	600
Harvesting	MWD	250	18.0	4,500	17.0	4,250	18.0	4,500	17.0	4,250
Seed	Kgs.	15	45.0	675	45.0	680	45.0	680	45.0	680
Insecticide	Kgs.	4/	4/	3,250	-	-	4/	3,250	-	-
Fertilizer ^{8/}	Kgs.	9	190 ^{5/}	1,710	-	-	190 ^{5/}	1,710	-	-
Rent on Land	Kgs.	3/	390 ^{5/}	5,850 ^{6/}	280 ^{5/}	4,200 ^{7/}	390 ^{5/}	5,850 ^{6/}	280 ^{5/}	4,200 ^{7/}
Interest	VN\$	-	-	1,440 ^{6/}	-	960 ^{7/}	-	1,440 ^{6/}	-	960 ^{7/}
Returns										
Paddy Production	Kgs.	15	2,600	39,000	1,900	28,500	2,600	39,000	1,900	28,500
Returns to Management	VN\$	-	-	9,230	-	7,150	-	10,380	-	8,300

1/ Machine power is applied to the preparation of the soil only. The seed bed is prepared in the traditional manner.

2/ MWD refers to man work days.

3/ Paddy.

4/ 50 kilograms of BHC @ VN\$55 per kilogram and 2 liters of endrine @ VN\$250 per liter

5/ Fifteen percent of production.

6/ Interest on VN\$18,000 @ 2 percent per month for 4 months.

7/ Interest on VN\$12,000 @ 2 percent per month for 4 months.

8/ Fertilizer was applied at a rate of about one-half urea and one-half amophosko (16-16-8).

Table: 5 A

Southern Region: Costs and Returns to Local Variety Rice Producers on Two Hectares -
Single Transplant, 1968/69 Rice Crop

	Unit	Unit Price (VN\$)	Livestock Power				Machine Power ^{1/}			
			Improved Technology		Traditional Tech.		Improved Technology		Traditional Tech.	
			Quantity	Value (VN\$)	Quantity	Value (VN\$)	Quantity	Value (VN\$)	Quantity	Value (VN\$)
Costs										
Land Preparation										
Seed Bed	MWD	550	2.0	1,100	2.0	1,100	2.0	1,100	2.0	1,100
Paddy	MWD	550	12.0	6,600	12.0	6,600	1.0	4,300	1.0	4,300
Labor										
Seed Bed Preparation and Planting	MWD	250	8.0	2,000	8.0	2,000	8.0	2,000	8.0	2,000
Paddy Preparation	MWD	250	6.0	1,500	6.0	1,500	6.0	1,500	6.0	1,500
Transplanting	MWD	220	36.0	7,920	36.0	7,920	36.0	7,920	36.0	7,920
Weeding	MWD	220	10.0	2,200	10.0	2,200	10.0	2,200	10.0	2,200
Insecticide Application	MWD	240	4.0	960	-	-	4.0	960	-	-
Fertilizer Application	MWD	240	5.0	1,200	-	-	5.0	1,200	-	-
Water Control	MWD	300	4.0	1,200	4.0	1,200	4.0	1,200	4.0	1,200
Harvesting	MWD	250	36.0	9,000	34.0	8,500	36.0	9,000	34.0	8,500
Seed	Kgs.	15	90.0	1,350	90.0	1,350	90.0	1,350	90.0	1,350
Insecticide	Kgs.	4/	4/	6,500	-	-	4/	6,500	-	-
Fertilizer	Kgs.	9	380.0 ^{5/}	3,420	-	-	380.0 ^{5/}	3,420	-	-
Rent on Land	Kgs.	3/	780.0 ^{5/}	11,700 ^{6/}	570.0 ^{5/}	8,550 ^{7/}	780.0 ^{5/}	11,700	570.0 ^{5/}	8,550 ^{9/}
Interest	VN\$	-	-	2,880 ^{6/}	-	1,920 ^{7/}	-	2,720 ^{8/}	-	1,760 ^{9/}
Returns										
Paddy Production	Kgs.	15	5,200	78,000	3,800	57,000	5,200	78,000	3,800	57,000
Returns to Management	VN\$	-	-	18,470	-	14,160	-	20,930	-	16,620

1/ Machine power is applied to the preparation of the soil only. The seed bed is prepared in the traditional manner.

2/ MWD refers to man work days.

3/ Paddy.

4/ 100 kilograms of BHC @ VN\$55 per kilogram and 4 liters of endrine @ VN\$250 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$36,000 @ 2 percent per month for 4 months.

7/ Interest on VN\$24,000 @ 2 percent per month for 4 months.

8/ Interest on VN\$34,000 @ 2 percent per month for 4 months.

9/ Interest on VN\$22,000 @ 2 percent per month for 4 months.

10/ Fertilizer was applied at a rate of about one-half rea and one-half amophoska (16-16-8).

Southern Region: Costs and Returns to TN Variety Rice Producers on
One Hectare - Single Transplant, 1968/69 and
1970/71 Rice Crop Using 1968 Prices

<u>Costs</u>	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Costs</u> ^{2/}				
<u>Land Preparation</u>				
Seed Bed	MWD	550	1.0	550
Paddy	MWD	550	6.0	3,300
<u>Labor</u>				
Seed Bed Preparation and Planting	MWD	250	4.0	1,000
Paddy Preparation	MWD	250	3.0	750
Transplanting	MWD	220	18.0	3,960
Weeding	MWD	220	5.0	1,100
Insecticide Application	MWD	240	2.0	480
Fertilizer Application	MWD	240	4.0	960
Water Control	MWD	300	2.0	600
Harvesting	MWD	250	23.0	5,750
Seed	Kgs.	15	45.0	675
Insecticide	Kgs.	4/	4/	3,250
Fertilizer ^{7/}	Kgs.	9	330.0	2,970
Rent on Land	Kgs. ^{3/}	15	6755/	10,125
Interest	VN\$	-	-	1,600 ^{6/}
<u>Returns</u>				
Paddy Production	Kgs.	15	4,500	67,500
Returns to Management	VN\$	-	-	30,430

Note: Although inputs are based on the two crops specified, the unit prices are those for the 1968/69 crop only.

1/ MWD refers to man work days.

2/ Livestock power.

3/ Paddy.

4/ 50 kilograms of BHC @ VN\$55 per kilogram and 2 liters of endrine @ VN\$250 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$20,000 @ 2 percent per month for 4 months.

7/ Fertilizer was applied at a rate of about one-third urea and two-thirds amophosko (16-16-8).

Table: 7 A

Southern Region: Costs and Returns to TN Variety Rice Producers on
 One Hectare - Single Transplant, 1968/69 and 1970/71
 Rice Crop Using 1970 Prices

<u>Costs</u>	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Land Preparation</u> ^{2/}				
Seed Bed	MWD	800	1.0	800
Paddy	MWD	900	6.0	5,400
<u>Labor</u>				
Seed Bed Preparation and Planting	MWD	430	4.0	1,720
Paddy Preparation	MWD	430	3.0	1,290
Transplanting	MWD	350	18.0	6,300
Weeding	MWD	350	5.0	1,750
Insecticide Application	MWD	450	2.0	900
Fertilizer Application	MWD	450	4.0	1,800
Water Control	MWD	400	2.0	800
Harvesting	MWD	440	23.0	10,120
Seed	Kgs.	23	45.0	1,035
Insecticide	Kgs.	4/	4/	3,860
Fertilizer	Kgs.	12	330.0	3,960
Rent on Land	Kgs.	23	675 ^{5/}	15,525 ^{6/}
Interest	VN\$	-	-	2,400 ^{6/}
<u>Returns</u>				
Paddy Production	Kgs.	23	4,500	103,500
Returns to Management	VN\$	-	-	45,840

Note: Although inputs are based on the two crops specified, the unit prices are those for the 1970/71 crop only.

1/ MWD refers to man work days.

2/ Livestock power.

3/ Paddy

4/ 50 kilograms of BHC @ VN\$60 and 2 liters of endrine @ VN\$430 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$30,000 @ 2 percent per month for 4 months.

7/ Fertilizer was applied at a rate of about one-third urea and two-thirds amophoskø (16-16-8).

**Coastal Lowlands: Costs and Returns to Local Variety Rice Producers on One Hectare -
Single Transplant, 1968/69 Rice Crop**

	<u>1/</u> Unit	Unit Price (VN\$)	<u>First Crop</u>		<u>Second Crop</u>	
			Quantity	Value (VN\$)	Quantity	Value (VN\$)
Costs <u>2/</u>						
Land Preparation						
Seed Bed	MWD	350	2.5	875	2.5	875
Paddy	MWD	350	10.0	3,500	9.0	3,150
Labor						
Seed Bed Preparation and Planting	MWD	220	4.5	990	4.5	990
Paddy Preparation	MWD	220	3.5	770	3.5	770
Transplanting	MWD	180	25.0	4,500	25.0	4,500
Weeding	MWD	150	9.0	1,350	5.0	750
Insecticide Application	MWD	200	2.0	400	2.0	400
Fertilizer Application	MWD	200	3.0	600	2.0	600
Water Control	MWD	180	8.0	1,440	3.0	540
Harvesting	MWD	210	24.0	5,040	22.0	4,620
Seed	Kgs.	25	45.0	1,125	45.0	1,125
Insecticide	Kgs.	4/	4/	3,600	4/	3,600
Fertilizer ^{8/}	Kgs.	16	235 ^{5/}	3,760	145 ^{5/}	2,320
Rent on Land	Kgs. ^{3/}	25	400 ^{5/}	10,000 ^{6/}	340 ^{5/}	8,500
Interest	VN\$	-	-	1,840 ^{6/}	-	1,600 ^{7/}
Returns						
Paddy Production	Kgs.	25	2,700	67,500	2,300	57,500
Returns to Management	VN\$	-	-	27,710	-	23,160

Note: Of the 29 farms surveyed all used fertilizer but one.

1/ MWD refers to man work days.

2/ Livestock Power.

3/ Paddy.

4/ 50 kilograms of BHC @ VN\$60 per kilogram and 2 liters of endrine @ VN\$300 per liter.

5/ Fifteen percent of production

6/ Interest on VN\$23,000 @ 2 percent per month for 4 months.

7/ Interest on VN\$20,000 @ 2 percent per month for 4 months.

8/ Fertilizer was applied at a rate of about one-half urea and one-half amophoska (16-16-8).

Table: 9 A

Coastal Lowlands: Costs and Returns to TN Variety Rice Producers on
 One Hectare - Single Transplant, 1968/69 and
 1970/71 Rice Crop Using 1968 Prices

<u>Costs</u>	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Land Preparation</u> ^{2/}				
Seed Bed	MWD	350	2.5	875
Paddy	MWD	350	10.0	3,500
<u>Labor</u>				
Seed Bed Preparation and Planting	MWD	220	4.5	990
Paddy Preparation	MWD	220	3.5	770
Transplanting	MWD	180	25.0	4,500
Weeding	MWD	150	9.0	1,350
Insecticide Application	MWD	200	2.0	400
Fertilizer Application	MWD	200	4.0	800
Water Control	MWD	180	8.0	1,440
Harvesting	MWD	210	28.0	5,880
Seed	Kgs.	25	45.0	1,125
Insecticide	Kgs.	4/	4/	3,600
Fertilizer ^{7/}	Kgs.	16	330	5,280
Rent on Land	Kgs. ^{3/}	25	675 ^{5/}	16,875
Interest	VN\$	-	-	2,000 ^{6/}
<u>Returns</u>				
Paddy Production	Kgs.	25	4,500	112,500
Returns to Management	VN\$	-	-	63,115

Note: Although inputs are based on the two crops specified, the unit prices are those for the 1968/69 crop only.

1/ MWD refers to man work days.

2/ Livestock power.

3/ Paddy.

4/ 50 kilograms of BHC @ VN\$60 per kilogram and 2 liters of endrine @ VN\$300 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$25,000 @ 2 percent per month for 4 months.

7/ Fertilizer was applied at a rate of about one-third urea and two-thirds amophosko (16-16-8).

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**Coastal Lowlands: Costs and Returns to TN Variety Rice Producers on
One Hectare - Single Transplant, 1968/69 and 1970/71
Rice Crop Using 1970 Prices**

	<u>Unit</u> ^{1/}	<u>Unit Price (VN\$)</u>	<u>Quantity</u>	<u>Value (VN\$)</u>
Costs ^{2/}				
Land Preparation				
Seed Bed	MWD	640	2.5	1,600
Paddy	MWD	920	10.0	9,200
Labor				
Seed Bed Preparation and Planting	MWD	300	4.5	1,350
Paddy Preparation	MWD	300	3.5	1,050
Transplanting	MWD	200	25.0	5,000
Weeding	MWD	240	9.0	2,160
Insecticide Application	MWD	310	2.0	620
Fertilizer Application	MWD	310	4.0	1,240
Water Control	MWD	200	8.0	1,600
Harvesting	MWD	300	28.0	8,400
Seed	Kgs.	32	45.0	1,440
Insecticide	Kgs.	4/	4/	4,980
Fertilizer	Kgs.	12	330	3,960
Rent on Land	Kgs.	3/	675	21,600
Interest	VN\$	-	-	2,720 ^{6/}
Returns				
Paddy Production	Kgs.	32	4,500	144,000
Returns to Management	VN\$	-	-	77,080

Note: Although inputs are based on the two crops specified, the unit prices are those for the 1970/71 Crop only.

1/ MWD refers to man work days.

2/ Livestock power.

3/ Paddy.

4/ 50 kilograms of BHC @ VN\$80 per kilogram and 2 liters of endrine @ VN\$490 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$34,000 @ 2 percent per month for 4 months.

7/ Fertilizer was applied at a rate of about one-third urea and two-thirds amophoska (16-16-8).

Table: 11 A

Southern Region: Costs and Returns to Local Variety Rice Producers on Four Hectares -
Broadcast Floating Rice, 1970 Prices

	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	<u>Livestock Power</u>		<u>Mechanical Power</u>	
			<u>Quantity</u>	<u>Value</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Costs</u>						
Paddy Preparation						
Mechanical Power	MWD	6,000	-	-	2	12,000
Livestock power	MWD	900	20	18,000	-	-
Labor						
Planting	MWD	320	6	1,920	6	1,920
Weeding	MWD	350	2	700	2	700
Harvesting	MWD	350	64	22,400	64	22,400
Seed	Kgs.	20	480	9,600	480	9,600
Rent on Land	Kgs. ^{2/}	20	1,200 ^{3/}	24,000	1,200	24,000
Interest	VN\$	-	-	2,400 ^{4/}	-	1,920 ^{5/}
<u>Returns</u>						
Paddy Production	Kgs.	20	6,000	120,000	6,000	120,000
Returns to Management	VN\$	-	-	40,980	-	47,460

1/ MWD refers to man work days.

2/ Paddy.

3/ Twenty percent of production.

4/ Interest on VN\$30,000 @ 2 percent per month for 4 months.

5/ Interest on VN\$24,000 @ 2 percent per month for 4 months.

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Table: 12 A

Southern Region: Costs and Returns to Local Variety Rice Producers on Two Hectares -
Broadcast Non-floating Rice, 1970 Prices

	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	<u>Improved Technology</u>		<u>Traditional Tech.</u>	
			<u>Quantity</u>	<u>Value</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Costs</u>						
Paddy Preparation ^{2/}	MWD	900	12	10,800	12	10,800
Labor						
Planting	MWD	380	3	1,140	3	1,140
Weeding	MWD	400	4	1,600	4	1,600
Insecticide Application	MWD	450	4	1,800	-	-
Fertilizer Application	MWD	450	4	1,800	-	-
Harvesting	MWD	450	36	16,200	34	15,300
Seed	Kgs.	23	240	5,520	240	5,520
Insecticide	Kgs.	4 ^{4/}	4 ^{4/}	7,720	-	-
Fertilizer ^{8/}	Kgs.	12	260	3,120	-	-
Rent on Land	Kgs. ^{3/}	23	720 ^{5/}	16,560	540 ^{5/}	12,420
Interest	VN\$	-	-	2,640 ^{6/}	-	1,520 ^{7/}
<u>Returns</u>						
Paddy Production	Kgs.	23	4,800	110,400	3,600	82,800
Returns to Management	VN\$	-	-	41,500	-	34,500

1/ MWD refers to man work days.

2/ Livestock power.

3/ Paddy.

4/ 100 kilograms of BHC @ VN\$60 and 4 liters of endrine @ VN\$430 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$33,000 @ 2 percent per month for 4 months.

7/ Interest on VN\$19,000 @ 2 percent per month for 4 months.

8/ Fertilizer was applied at a rate of about one-half urea and one-half amophosko (16-16-8).

Table: 13 A

Southern Region: Costs and Returns to Local Variety Rice Producers on One Hectare -
Double Transplant, 1970 Prices

	<u>Unit</u> ^{1/}	<u>Value</u> <u>(VN\$)</u>	<u>Quantity</u>	<u>Value</u> <u>(VN\$)</u>
<u>Costs</u>				
<u>Labor</u>				
Seed Bed Preparation and Planting	MWD	480	3	1,440
Paddy Preparation	MWD	480	17	8,160
First Transplanting	MWD	350	9	3,150
Second Transplanting	MWD	350	18	6,300
Harvesting	MWD	440	17	7,480
Seed	Kgs. ^{3/}	23	45	1,035
Rent on Land	Kgs.-	23	200 ^{4/}	4,600
Interest	VN\$	-	-	1,600 ^{2/}
<u>Returns</u>				
Paddy Production	Kgs.	23	2,000	46,000
Returns to Management	VN\$	-	-	12,235

1/ MWD refers to man work days.

2/ Interest on VN\$20,000 @ 2 percent per month for 4 months.

3/ Paddy.

4/ Ten percent of production.

Table: 14 A

Southern Region: Costs and Returns to Local Variety Rice Producers on One Hectare -
Single Transplant, 1970 Prices

	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	<u>Improved Technology</u>		<u>Traditional Tech.</u>	
			<u>Quantity</u>	<u>Value</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
Costs						
<u>Land Preparation</u>						
Seed Bed	MWD	800	1.0	800	1.0	800
Paddy	MWD	900	6.0	5,400	6.0	5,400
<u>Labor</u>						
Seed Bed Preparation and Planting	MWD	430	4.0	1,720	4.0	1,720
Paddy Preparation	MWD	430	3.0	1,290	3.0	1,290
Transplanting	MWD	350	18.0	6,300	18.0	6,300
Weeding	MWD	350	5.0	1,750	5.0	1,750
Insecticide Application	MWD	450	2.0	900	-	-
Fertilizer Application	MWD	450	2.5	1,125	-	-
Water Control	MWD	400	2.0	800	2.0	800
Harvesting	MWD	440	18.0	7,920	17.0	7,480
Seed	Kgs.	23	45	1,035	45	1,035
Insecticide	Kgs.	3/	3/	3,860	-	-
Fertilizer ^{7/}	Kgs.	12	190	2,280	-	-
Rent on Land	Kgs. ^{2/}	23	390 ^{4/}	8,970	280 ^{4/}	6,440
Interest	VN\$	-	-	2,160 ^{5/}	-	1,520 ^{6/}
Returns						
<u>Paddy Production</u>	Kgs.	23	2,600	59,800	1,900	43,700
Returns to Management	VN\$	-	-	13,490	-	9,165

1/ MWD refers to man work days.

2/ Paddy.

3/ 50 kilograms of BHC @ VN\$60 and 2 liters of endrine @ VN\$430 per liter.

4/ Fifteen percent of production.

5/ Interest on VN\$27,000 @ 2 percent per month for 4 months.

6/ Interest on VN\$19,000 @ 2 percent per month for 4 months.

7/ Fertilizer was applied at a rate of about one-half urea and one-half amophosko (16-16-8).

Table: 15 A

Coastal Lowlands: Costs and Returns to Local Variety Rice Producers on One Hectare -
Single Transplant

	Unit ^{1/}	Unit Price (VN\$)	1 9 6 8 Prices			
			Improved Technology		Traditional Tech.	
			Quantity	Value (VN\$)	Quantity	Value (VN\$)
Costs						
Land Preparation ^{2/}						
Seed Bed	MWD	350	2.5	875	2.5	875
Paddy	MWD	350	10.0	3,500	10.0	3,500
Labor						
Seed Bed Preparation and Planting	MWD	220	4.5	990	4.5	990
Paddy Preparation	MWD	220	3.5	770	3.5	770
Transplanting	MWD	180	25.0	4,500	25.0	4,500
Weeding	MWD	150	9.0	1,350	9.0	1,350
Insecticide Application	MWD	200	2.0	400	-	-
Fertilizer Application	MWD	200	3.0	600	-	-
Water Control	MWD	180	8.0	1,440	8.0	1,440
Harvesting	MWD	210	24.0	5,040	22.0	4,620
Seed	Kgs.	25	45	1,125	45	1,125
Insecticide	Kgs.	4/	4/	3,600	-	-
Fertilizer ^{8/}	Kgs.	-	234 ^{5/}	3,700	-	-
Rent on Land	Kgs. ^{3/}	25	400	10,000 ^{6/}	285	7,125 ^{7/}
Interest	VN\$	-	-	1,840 ^{6/}	-	1,200 ^{7/}
Returns						
Paddy Production	Kgs.	25	2,700	67,500	1,900	47,500
Returns to Management	VN\$	-	-	27,770	-	20,005

1/ MWD refers to man work days.

2/ Livestock power.

3/ Paddy.

4/ 50 kilograms of BHC @ VN\$60 per kilogram and 2 liters of endrine @ VN\$300 per liter.

5/ Fifteen percent of production.

6/ Interest on VN\$23,000 @ 2 percent per month for 4 months.

7/ Interest on VN\$15,000 @ 2 percent per month for 4 months.

8/ Fertilizer was applied at a rate of about one-half urea and one-half amophosko (16-16-8).

Table: 16 A

Coastal Lowlands: Costs and Returns to Local Variety Rice Producers on One Hectare -
Single Transplant

	<u>Unit</u> ^{1/}	<u>Unit Price</u> (VN\$)	1 9 7 0 Prices			
			<u>Improved Technology</u>		<u>Traditional Tech.</u>	
			<u>Quantity</u>	<u>Value</u> (VN\$)	<u>Quantity</u>	<u>Value</u> (VN\$)
<u>Costs</u>						
<u>Land Preparation</u> ^{2/}						
Seed Bed	MWD	640	2.5	1,600	2.5	1,600
Paddy	MWD	920	10.0	9,200	10.0	9,200
<u>Labor</u>						
Seed Bed Preparation and Planting	MWD	300	4.5	1,350	4.5	1,350
Paddy Preparation	MWD	300	3.5	1,050	3.5	1,050
Transplanting	MWD	200	25.0	5,000	25.0	5,000
Weeding	MWD	240	9.0	2,160	9.0	2,160
Insecticide Application	MWD	310	2.0	620	-	-
Fertilizer Application	MWD	310	3.0	930	-	-
Water Control	MWD	200	8.0	1,600	8.0	1,600
Harvesting	MWD	300	24.0	7,200	22.0	6,600
Seed	Kgs.	32	45	1,440	45	1,440
Insecticide	Kgs.	4/	4/	4,980	-	-
Fertilizer ^{7/}	Kgs.	12	235 ^{5/}	2,820	-	-
Rent on Land	Kgs. ^{3/}	32	400 ^{5/}	12,800	285 ^{5/}	9,120
Interest	VN\$	-	-	2,640 ^{6/}	-	1,840 ^{8/}
<u>Returns</u>						
Paddy Production	Kgs.	32	2,700	86,400	1,900	60,800
Returns to Management	VN\$	-	-	31,010	-	19,840

1/ MWD refers to man work days.

2/ Livestock power.

3/ Paddy.

4/ 50 kilograms of BHC @ VN\$80 per kilogram and 2 liters of endrine @ VN\$490 per liter

5/ Fifteen percent of production.

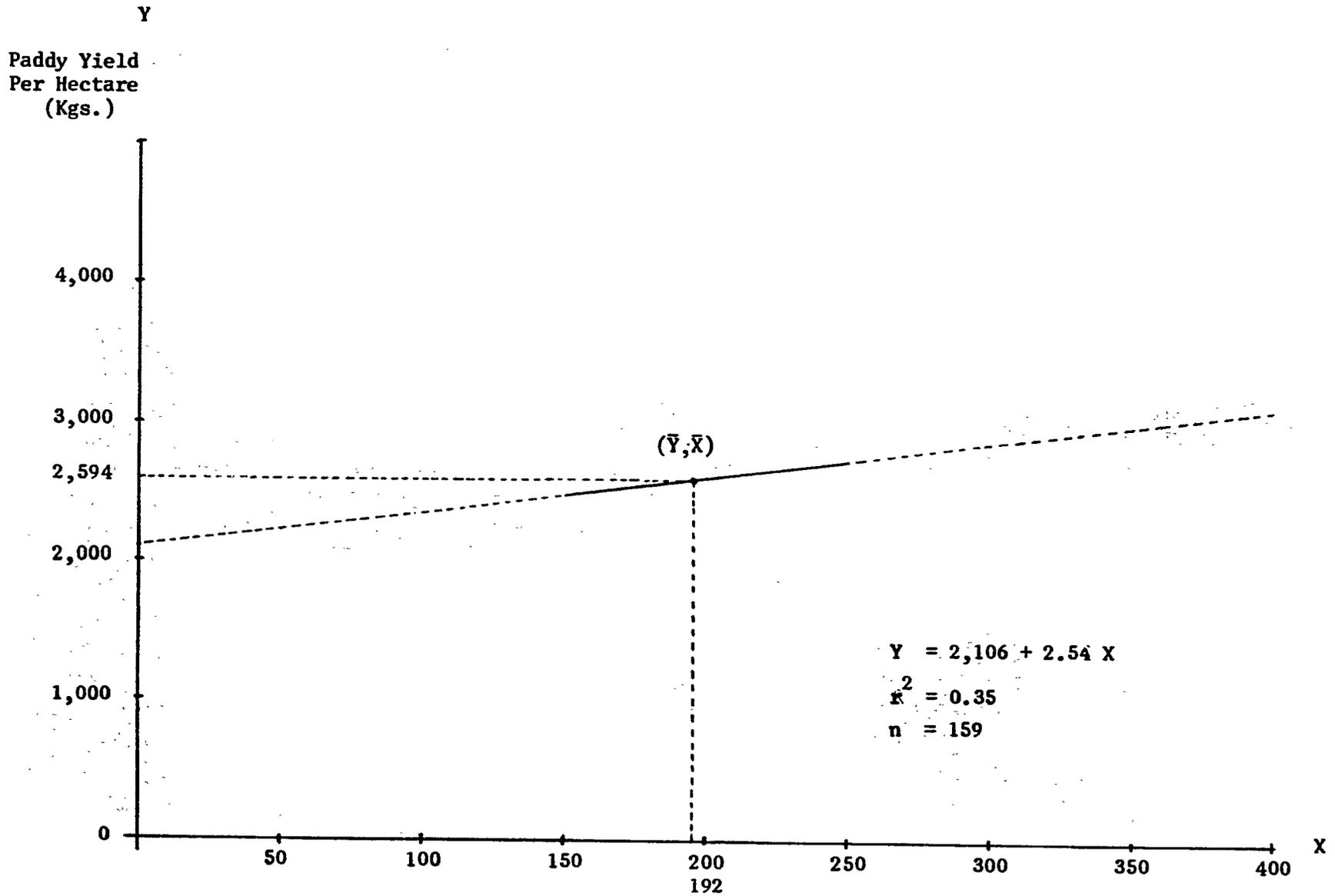
6/ Interest on VN\$33,000 @ 2 percent per month for 4 months.

7/ Fertilizer was applied at the rate of about one-half urea and one-half amophosko (16-16-8).

8/ Interest on VN\$23,000 @ 2 percent per month for 4 months.

Chart: 1 A

Traditional Rice Variety Fertilizer Response - 1968/69 Crop



Fertilizer Per Hectare (Kgs.)
(50 percent urea and 50 percent 16-16-8)

TN Rice Variety Fertilizer Response - 1968/69 and 1970/71 Crop

