BIBLIOGRAPHIC DATA SHEET	1. CONTROL NUMBER	2. SUBJECT CLASSIFICATION (695)
	PN-AAK-274	AAOO-0000-G786

3. TITLE AND SUBTITLE (240)
Vietnamese agricultural situation and near-term prospects

4. PERSONAL AUTHORS (100)
Daly, R.F.; Hoffman, R.G.; Nelson, Frederick; Weingarten, Hyman; Hancock, Nancy; Chugg, Boyd; Rojko, Anthony

5. CORPORATE AUTHORS (101)
USDA/ERS

6. DOCUMENT DATE (110)	7. NUMBER OF PAGES (120)	8. ARC NUMBER (170)
1973	70 p.	

9. REFERENCE ORGANIZATION (130)
USDA/ERS

10. SUPPLEMENTARY NOTES (500)
(In Field Report 26)

11. ABSTRACT (950)
BR

12. DESCRIPTORS (920)
Vietnam
agricultural
agriculture
rice
rubber
fishes
swine
economic conditions
agricultural development

13. PROJECT NUMBER (150)
—

14. CONTRACT NO.(140)	15. CONTRACT TYPE (140)
unknown	

16. TYPE OF DOCUMENT (160)

AID 590-7 (10-79)

Field Report 26

VIETNAMESE AGRICULTURAL SITUATION AND NEAR-TERM PROSPECTS

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January 1973

FOREWORD

This analysis, based on the work of the Vietnam Demand Analysis Team, is part of a broad effort to study Vietnam's agriculture and its interrelationships with the general economy. The first phase of this effort was a review of Vietnam's 5-Year Rural Economic Development Plan, with a report published in December 1971. A second phase analyzed systems for marketing oilseeds, poultry, fruits and vegetables, sugar, swine, and grain. Another phase studied production-distribution relationships for farm commodities.

These studies are a cooperative effort between the Agency for International Development (AID) Mission to Vietnam, the Ministry of Land Reform, Agriculture, Fishery and Animal Husbandry Development of the Government of South Vietnam, and the Economic Research Service (ERS) of the U.S. Department of Agriculture. The program of research that ERS was requested to develop was intended (1) to bring together and analyze available economic information as a basis for the work of the new Directorate of Agricultural Economics and AID personnel, (2) to develop and test appropriate research techniques and procedures for continuing the informational base needed for planning, and (3) to provide experience and training for the staff of the newly-created Directorate of Agricultural Economics

The Demand Analysis Team compiled and quantified many of the factors affecting demand and prices in Vietnam and how these factors relate to the national accounts through such items as gross national product, etc. Based on this information, the Team developed the following report which illustrates a technique used to generate intermediate term projections of supply and demand for major agricultural products as well as projected gross national product, household income, and other national account factors.

Members of the Demand Analysis Team preparing this report were: Rex F. Daly (supervisor), Robert G. Hoffman, Nancy Hancock, Frederick Nelson, and Hyman Weingarten. Daly and Hoffman had the broadest involvement in most commodity analyses and development of the general economy framework. Hancock carried out most of the research on the general economic profile of the economy. Nelson was primarily responsible for the research on rubber, and Weingarten orchestrated the computer facilities and the programs at AID, Military Assistance Command Vietnam (MACV), and USDA required to carry out the analytical work. Anthony Rojko and Boyd Chugg of the Foreign Demand and Competition Division, ERS, were primarily responsible for the analyses on foreign market prospects. Terry Barr of the Economic and Statistical Analysis Division, ERS, assisted in summarizing and interpreting the consumer expenditure survey data.

Many others contributed to the overall effort. We want to recognize the contribution of Dr. Ernest Nesius and his staff at AID/Saigon and the staff of the Agricultural Economics and Statistics Services, Vietnam Ministry of Agriculture, as well as the staffs of the National Institute of Statistics and Bank of Vietnam. We acknowledge the assistance of the staffs of the AID and MACV computer centers in Saigon as well as cooperative support from many on the staff of ERS' Economic and Statistical Analysis Division and the Foreign Demand and Competition Division.

William A. Faught
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HIGHLIGHTS OF

VIETNAMESE AGRICULTURAL SITUATION AND NEAR-TERM PROSPECTS[1/]

The following summary discusses some of the more significant results and issues for the Vietnamese agricultural sector based on the work of the ERS Demand Analysis Team. More complete discussions of the current situation, assumptions and prospects for the future are contained in the body of this report, which is primarily intended as an illustrative vehicle to present in an organized manner much of the Team's effort.

In its work, the Team developed quantitative supply-demand models for selected agricultural commodities and integrated these with a national income model. These quantitative models were then used to derive the results reported here. Care should be taken in interpreting these essentially illustrative results. In particular, one should be aware of the larger number of explicit and implicit assumptions underlying each projection. Also these results reflect the situation as it was assessed near mid-1972.

The major points highlighted below have been divided between "Agricultural Situation and Near-Term Prospects" and "Major Policy issues."

Agricultural Situation and Near-Term Prospects

General Supply-Demand Balance

1. The demand-supply balance for most goods, especially food, is tight and promises to continue so in coming years.

2. Domestic production of major food items increased about 12 percent from 1964 to 1970. Population gains of about 20 percent plus increased per capita use pushed total food consumption up nearly 25 percent. Imports then made up about 15 percent of total consumption in 1970.

1/ Part of a study of supply and demand relationships for Vietnamese agricultural products by the Economic Research Service of the U.S. Department of Agriculture in cooperation with the Government of Vietnam and the U.S. Agency for International Development. The Demand Analysis Team, under the supervision of Rex F. Daly, completed much of its work in the March-August period of 1972. An application of the results of the Team's efforts is shown in the following report. This report in turn has been distilled from a much broader report giving a more thorough review of the Team's total effort.

3. Domestic markets for food will continue to increase as population grows. Additional demand will also be generated from any increase in per capita purchasing power. Therefore the demand for foods high in the consumer preference list--poultry, pork, red meats, sugar, and many fruits and vegetables--will increase even more rapidly than the demand for staple foods as the economy grows. A growing demand for livestock also will expand markets for feed grains (including paddy for feed) which are already in tight supply.

4. Consumer buying power--measured by real per capita household income--could grow significantly in the near future depending on the war and alternative assumptions concerning investment levels, exports, etc.

5. Food production self-sufficiency may be difficult to achieve in the next several years. Domestic food production requirements may increase about 50 percent in the next five years considering both the effect of increasing population and a possible rise in per capita use associated with any gains in per capita consumer income.

6. Export demand prospects are promising in nearby markets for most food and feed grains, and should add demand strength for Vietnamese production. However, the tight demand-supply balance in Vietnam, present and prospective, does not bode well for greatly expanded exports in the next several years. Net exports of food stuffs--the excess of food exports over food imports--will be difficult.

Rice

1. Rice import requirements appear sizeable for 1973 to maintain prices (adjusted for changes in general price level) near 1972 levels. War time conditions shifted Vietnam from a major rice exporter to major rice importing status to maintain per capita disappearance at about 200 kg. per person. Depending on 1972-73 production assumptions, imports could range from 300,000 to 700,000 m.t.

2. Results of quantitative demand analysis suggest significant rice/livestock interrelationships. The interplay of the rice/livestock sector plays an important role in the total demand for rice, as well as rice deliveries from the surplus producing areas.

3. Future rice production gains may have to come mainly from increased plantings. Rice production prospects in the next few years may be dampened because paddy yield increases may slow.

Fish

1. Fish production increases in recent years pushed per capita disappearance to just under 40 kg. compared with 25 kg. per capita in the early 1960's.

2. Sizeable exports of fish may be possible within the next few years; however, continued substantial capital inputs will be required to continue to increase fish production.

Livestock

1. Hog production exhibits cyclic patterns apparently influenced by pork, rice and chicken prices.

2. Feed availability as well as continued improvements in management will greatly influence future gains in hog production.

Rubber

1. Export earnings from rubber in 1972 may reach a low for recent years--$6.6 million--because of a combination of low production and low prices.

2. Rubber production and export earnings prospects during the next 5 years are limited by the present planted area and the maximum potential yields for the type and age of the current producing trees.

3. Total rubber production under a moderately optimistic projection may nearly double by 1977 from an estimated 1972 level of 32,500 m.t. This will still be below the record production of 78,100 m.t. in 1961.

4. Domestic rubber use is projected to increase to about 10,000 m.t. by 1977 based on mid-range projections of per capita national income and prices along with assumed increases in population.

Major Policy Issues

Appraisals for the next 5 years point to a generally tight supply situation for major food crops and rubber relative to probable growth in demands. Large future gains in output will be required if the

nation is to become more self-sufficient. Some of the important policy issues concerning this situation are discussed below:

A. Increases in Agricultural Production. Vietnam has a large agricultural resource base. An early return to peacetime conditions and demobilization could free many resources for rebuilding the Nation's economy. Development and use of available resources and manpower should receive high priority by policy makers. Local businessmen and government administrators probably are aware of many highly promising private and public investment and rebuilding possibilities. Some of the major factors to consider in the development areas are:

1. Demobilization and movement of the population back to rural areas.

2. Reclamation and development of land for crops.

3. Increased use of high-yielding varieties and improved breeding stock.

4. Investment in rebuilding and improving water control systems.

5. Capital outlays to rebuild and expand tree products and fisheries production.

6. Creation of general conditions of security and business confidence through fiscal and monetary programs to control inflation, increasing incentives to save and expand priority investment, establishment of a trade and price policy that facilitates the conduct of business and assures reasonable return prospects.

7. Recognition that the above measures will likely entail substantial outside resources as well as domestic investment.

8. Other factors to be considered include the development of domestic facilities to transport, market, and process increased quantities of food and other agricultural products.

B. Domestic Demand Growth. Growth in domestic demand occurs from gains in population and consumer purchasing power. Limiting the growth of either factor while pushing production could alleviate the tight supply/demand balance. Curbs on

population growth may be difficult to achieve. And consumer purchasing power may be dampened by adopting unpopular tax and savings policies designed to restrict growth in household income and the demand for food. This may be done by using taxes and other fiscal measures to limit income flow, or by letting prices and/or special taxes discourage domestic use. Such restrictive programs may facilitate a much needed expansion in export earnings.

C. Export Prospects. Expanding production and expanding markets for agricultural products both increase the possibility of exports. Nearby markets are growing rapidly and will likely provide outlets, particularly for available foods, feeds and probably rubber. However, the only food items that appear to be available for export in the near future will probably be selected tropical fruit and vegetable items and possibly fishing products.

VIETNAMESE AGRICULTURAL SITUATION AND NEAR-TERM PROSPECTS

Social and economic upheavals associated with the war have dominated Vietnam's economy in much of the past decade. General shortages, black markets, huge imports, excessive demand pressures, and general inflation characterized the war years, especially 1965-69. Inflationary pressures eased some in 1970 and 1971. However, increased hostilities in 1972 complicated the economic reform program of 1970 and 1971 designed to reduce the economy's dependence on U.S. aid. Renewed war in the northern areas brought more refugees, food provisioning, and larger imports of rice. Increased hostilities and the generally high cost of imported goods, as the piaster was allowed to seek its own level (devalued) under the reform program, apparently sharply reduced the demand for imports. Uncertainties of the war and the planned dampening effects of reform measures led to cuts in industrial production in 1972 and a sharp drop in general economic activity and a build up in stocks of nonfood imports. At the same time, prices continued to rise, especially the price of rice, other foods, and domestic products in general.

The demand-supply balance for most goods, including food, is tight and promises to continue so in coming years. Domestic production of major food commodities, including fish, apparently increased around 12 percent from 1964 to 1970, but population grew about 21 percent. As a result, per capita food output declined some 7 percent over the 6-year period. Food imports, however, increased sharply and, in 1970, they made up possibly 12 to 15 percent of total domestic use of food. In the same comparison for 1964, imports were about 3 percent of total food use. Imports of grain in 1970 approximated 25 percent of total domestic use. Around 60 percent of fats and oils used were imported and 75 percent of the sugar and most of the dairy products were imported in 1970. Including the large volume of imports, total domestic use of food in 1970 was approximately a fourth above 1964. Population growth accounted for around 20 percent of the increase and larger per capita use for the balance.

As Vietnam's population grows and hopefully becomes more prosperous, markets for food will increase. Even the demand for basic staple foods, which are not particularly responsive to price and income changes, will grow with increases in the number of mouths to be fed and gains in consumer buying power. Moreover, demand for poultry, pork, other red meats, sugar, and many fruit and vegetable items, foods high on the consumer preference list, will increase even more rapidly than the demand for staple foods. A growing demand for livestock also will expand markets for feed grains (including paddy and rice for feed) which are already in tight supply.

In order to illustrate the relative size of the production deficit, let us assume population growth of about 16 percent (3 percent annually) from 1972 to 1977 and a similar growth in real purchasing power. These forces would increase the domestic market for food some 25 to 30 percent, assuming no big change in the relative prices of foods. If food imports in 1972 were equal to about

15 percent of total domestic use, an output increase of around 35 percent would be required to match the growth in population without an increase in per capita food use. The combined impact of a growing economy and a rise in per capita use may require a domestic food production increase of around 50 percent to match demand expansion in the next 5 years. Obviously, net exports of food stuffs in any volume will be difficult to manage in the next several years. The trade balance, however, would not preclude the possibility of a continued sizable volume of food imports with export expansion above the severely reduced level in recent years.

Vietnam's ability to meet the expanding demand for foods and other farm products will depend on its capacity to increase farm output or continue to finance imports of food. Vietnam has a substantial agricultural resource base for a nation of 20 million people. It once exported large quantities of rice and other foods to nearby markets and shipped large quantities of rubber to Europe. Food output has recovered rather sharply from depressed levels in 1967 and 1968, according to estimates for recent years. But big further gains in output will be needed, as indicated above, just for Vietnam to become self-sufficient. Any general expansion in net exports must depend primarily on the ability of agriculture to produce a surplus above domestic needs. This will be a difficult task that will require a concentration of investment and productive effort in agriculture as well as programs to curb expansion in domestic demand. Expanded investment programs will be needed to reclaim paddy land. Also needed are efforts to increase hectares planted to high-yielding varieties, introduce improved breeding stock, rebuild and expand water control systems, rebuild the rubber industry, and develop fishery and forestry resources. Such expansion in farm investment and output also will require demobilization and a shift of population back to rural areas. Moreover, it will require the development of domestic commercial markets and facilities to market, process, and ship greatly expanded output of food and other farm products. Much of the output development work for fisheries, the rubber industry, other forest products, and crop and livestock production will require scarce foreign exchange. In general, these resources must come from earnings of foreign exchange or continued large foreign aid commitments.

The economic pressure for greatly expanded exports is obvious. And Vietnam's export demand prospects are promising in nearby markets for most foods and feed grains. Markets for food in Japan, Taiwan, Hong Kong, and Malaysia have expanded rapidly in the past 10 to 15 years. Such markets provided convenient and obvious outlets for food and other farm products from Vietnam. But the tight demand-supply balance in Vietnam, present and prospective, does not bode well for greatly expanded exports in the next several years. This does not preclude the possibility and desirability of developing export potentials, especially for high-value speciality items such as selected seafoods, tropical fruit items, some vegetables, spices, and perhaps a number of forestry products. Moreover, if a cutback in foreign aid occurs and expanded exports are mandatory, some expansion is possible with relatively optimistic production prospects and a tight rein on increases in domestic markets for food and other farm products. Such limits on domestic demand expansion may require tough, aggressive tax and savings policies designed to restrict growth in household income and in the demand for food. A restrictive program also may require curbs on population growth in order to facilitate a much needed expansion in export earnings.

Prospects for the next several years center on the war and the time and conditions under which it is terminated. We suspect that most observers and many involved in planning for Vietnam feel that an assumption that the war will continue unabated is just too dismal to contemplate. Accordingly, we have outlined three alternative sets of conditions as a basis for projections for the next 5 years. The first (alternative I) is generally optimistic. It assumes a cutback in aid of about 2 billion ($VN) per year, a 5 billion ($VN) annual reduction in imports, and a 3 billion ($VN) cut in government expenditures from 1972 levels. With peace conditions and demobilization, investment outlays increase around 8 percent per year, including a like increase in the number of fishing boats and 50,000 hectares per year planted to improved varieties as well as an increase of 50,000 hectares per year of reclaimed paddy land. Export volume is assumed to increase 10 percent per year and livestock production is projected to expand 3 percent per year.

The second set of assumptions (alternative II) is super optimistic. It assumes that aid levels and government expenditures hold around 1972 levels with imports declining about 2 billion ($VN) per year from 1972. As demobilization progresses under peacetime conditions, resources would be available for an accelerated rate of capital expansion--double that assumed for alternative I--and a 20 percent annual gain in the volume of exports. This most optimistic set of conditions also assumes a more rapid population shift back to rural areas, reclamation of 100,000 hectares of paddy land per year, accelerated seed and breeding programs, a step up in technology, and a 5 percent annual increase in livestock production.

The pessimistic assumption (alternative III) assumes war conditions until 1974, an annual increase of 3 billion ($VN) in aid levels, an increase of about 6 billion ($VN) in imports, and a 5 billion ($VN) increase in government expenditures largely to finance a continuation of hostilities. Capital outlays and exports are assumed around the reduced 1972 rates. Technology, plantings to high-yielding varieties, and land reclamation hold unchanged and the annual gain in livestock production slows to 2 percent.

GENERAL ECONOMIC CONDITIONS AND PROSPECTS

Gross domestic expenditures for goods and services rose sharply from 1971 to 1972 in terms of goods and the current piaster value of outlays. Aid levels and government expenditures also rose sharply in 1972 to finance increased hostilities. Apparently, investment outlays and exports drifted lower. Larger imports and increased government expenditures, financed in large measure by foreign aid, accounted for much of the increase in total domestic spending but contributed little to domestic product. As a result, gross national product (output) and the real income flow to households this year may about match 1971 levels. Accordingly, a decline in per capita real income is indicated. Even so, demand for food is expanding, but buying of imported items is slow and inventories have risen (table 1).

Three sets of projections, based on assumptions outlined above, will help to explore possible development of the Vietnam economy in the next 5 years. The first alternative is generally optimistic and fairly realistic in that it assumes an early termination of the war. It also assumes cuts in aid, government expenditures and imports along with an 8 to 10 percent annual gain in investment and exports. Projections under alternative I suggest a very modest growth in gross domestic expenditures--less than population growth. But with fewer of the purchases coming from imports and more from domestic production, the gross national product--a measure of the overall economy's output--is projected to increase nearly 6 percent per year. This represents annual growth in per capita real GNP of about 3 percent.

Annual growth in real household income, however, runs only fractionally more than population. Thus, household income per capita holds about steady. The relative stability projected for household income from the growing GNP reflects the assumption of an accelerating diversion of total income into government revenue and gross business saving. In recent years, insofar as we can estimate, the sum of government revenue and savings has totaled less than 20 percent of the GNP. In 1968, the ratio was probably around 16 percent. The assumptions of higher tax rates, a more efficient tax collection system, and programs to encourage increased savings operate to restrict the income flow to households and increase the ratio of revenue plus savings to GNP to nearly 30 percent by 1977. Such an increase would require higher taxes as well as aggressive administration of special tax and savings programs.

Alternative II also specifies a quick termination of hostilities. But it assumes too a continuation of aid and government expenditures around the high 1972 levels. With an assumed sharper rise in investment outlays--about twice those for alternative I--gross domestic expenditures (available resources) increase about 6-1/2 percent per year. Since imports decline moderately under this alternative, the projected GNP rise is accelerated accordingly, rising around 11 percent per year from 1972 to 1977. This is nearly double the annual gain projected for alternative I. But assumed conditions for alternative II may be too optimistic; these assume demobilization of the economy and, at the same time that government expenditures and aid levels would hold at 1972 highs and provide resources for the larger public and private investment outlays assumed. We also stepped up revenue and savings at the rates assumed in alternative I. Effective implementation of these conditions would provide substantial

Table 1.--General economic growth and household income, 1968 and estimates 1969 to 1972

(Billion piasters)

Item	Variable	1968	Estimated			
			1969	1970	1971	1972
Private consumption expenditures	C	318.5	440.4	663.6	835.4	1,031
PCE in 1960 $VN	C'	77.7	87.2	95.9	102.0	100.7
PCE deflator, 1960=100	PC	410	505	692	819	1,024
Government consumption expenditure	G	86.5	130.6	153.9	204	340
GCE in 1960 $VN	G'	42.4	48.9	51.3	60.0	80
GCE deflator, 1960=100	PG	204	267	300	340	425
Gross investment	I	31.3	55.6	60.0	69.9	69.6
Investment in 1960 $VN	I'	14.3	22.4	16.8	14.6	12.0
Investment deflator, 1960=100	PI	219	248	357	479	580
Exports	EX	28.2	34.1	35.7	45.0	52
Exports in 1960 $VN	EX'	9.1	8.3	6.1	6.7	6.0
Export deflator, 1960=100	PEX	309	411	585	672	870
Imports	M	105.8	135.2	133.9	139.0	214
Imports in 1960 $VN	M'	46.6	63.8	55.3	54.5	70
Import deflator, 1960=100	PM	227	212	242	255	305
Net factor payments	FP	26.4	23.9	20.0	17.0	19.0
NFP in 1960 $VN	FP'	8.8	5.4	4.2	2.7	2.5
NFP deflator, 1960=100	PFP	300	443	476	630	760
Gross national product	GNP	385.3	549.4	799.3	1,032.3	1,298
GNP in 1960 $VN	GNP'	105.8	108.4	119.0	131.5	131.2
GNP deflator, 1960=100	PY	364	507	672	785	989
Gross domestic expenditure	GDE	436.4	626.6	877.5	1,109.3	1,441
GDE in 1960 $VN	GDE'	134.4	158.5	164.0	176.6	192.7
GDE deflator, 1960=100	PE	325	395	535	628	748
Household income	HI	309	441	641	831	1,043
HI in 1960 $VN	HI'	84.9	86.9	95.4	105.8	105.5
HI deflator, 1960=100	PY	364	507	672	785	989
Household income per capita	HI/N2	19,004	26,663	36,988	44,415	54,041
HI/N2 in 1960 $VN	HI'/N2	5,221	5,254	5,505	5,655	5,466
Population	N2	16.26	16.54	17.33	18.71	19.3

Table 2.--General economic growth and household income, alternative projections, 1972 to 1977

(Billion piasters in 1972 prices)

Item	Variable	Alternative	Projected					
			1972	1973	1974	1975	1976	1977
Private consumption expenditure	C	I	1,031	1,099	1,139	1,194	1,256	1,324
		II	1,037	1,149	1,262	1,395	1,522	1,649
		III	976	1,007	1,098	1,124	1,144	1,167
Food expenditures	CF	I	631	708	754	812	872	936
		II	637	734	829	940	1,042	1,137
		III	573	590	673	687	694	706
Gross national product	GNP	I	1,296	1,375	1,434	1,513	1,612	1,721
		II	1,296	1,454	1,622	1,820	2,018	2,225
		III	1,240	1,268	1,356	1,376	1,388	1,405
Gross domestic expenditure	GDE	I	1,444	1,459	1,459	1,481	1,511	1,549
		II	1,444	1,541	1,638	1,758	1,870	1,982
		III	1,399	1,466	1,571	1,631	1,683	1,743
Household income, total	HI	I	1,040	1,081	1,097	1,129	1,172	1,219
		II	1,045	1,146	1,244	1,359	1,469	1,576
		III 1/	997	1,022	1,094	1,111	1,121	1,135
Household income, per capita	HI/N2	I	53,886	54,322	53,512	53,507	54,009	54,420
		II	54,145	57,588	60,683	64,408	67,696	70,357
		III	51,658	51,357	53,366	52,654	51,659	50,670
Gross business saving and government revenue (GNP less HI)		I	256	294	337	384	440	502
		II	251	308	378	461	549	649
		III	243	246	262	265	267	270
Population (million)	N2		19.3	19.9	20.5	21.1	21.7	22.4

1/ In this assumption the security shifter was cut back to a very low hostility by 1974; it would have been more logical to assume a gradual shift toward peace time conditions over the period as the change from 1973 to 1974 appears too abrupt.

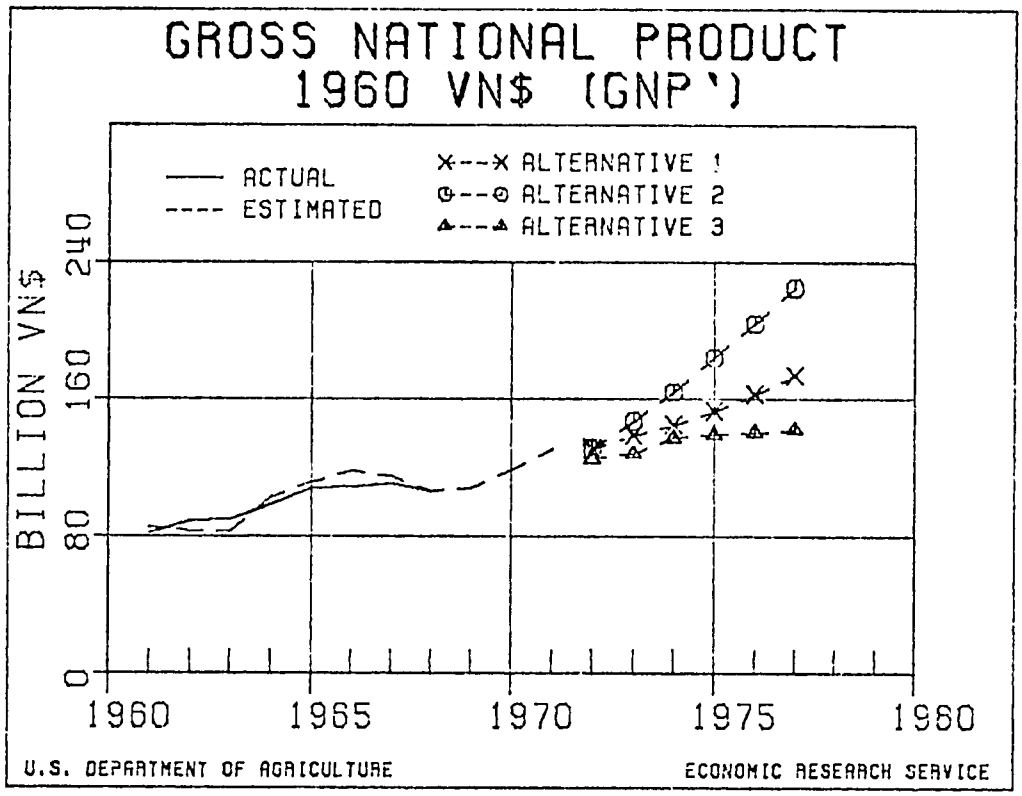

Figure 1

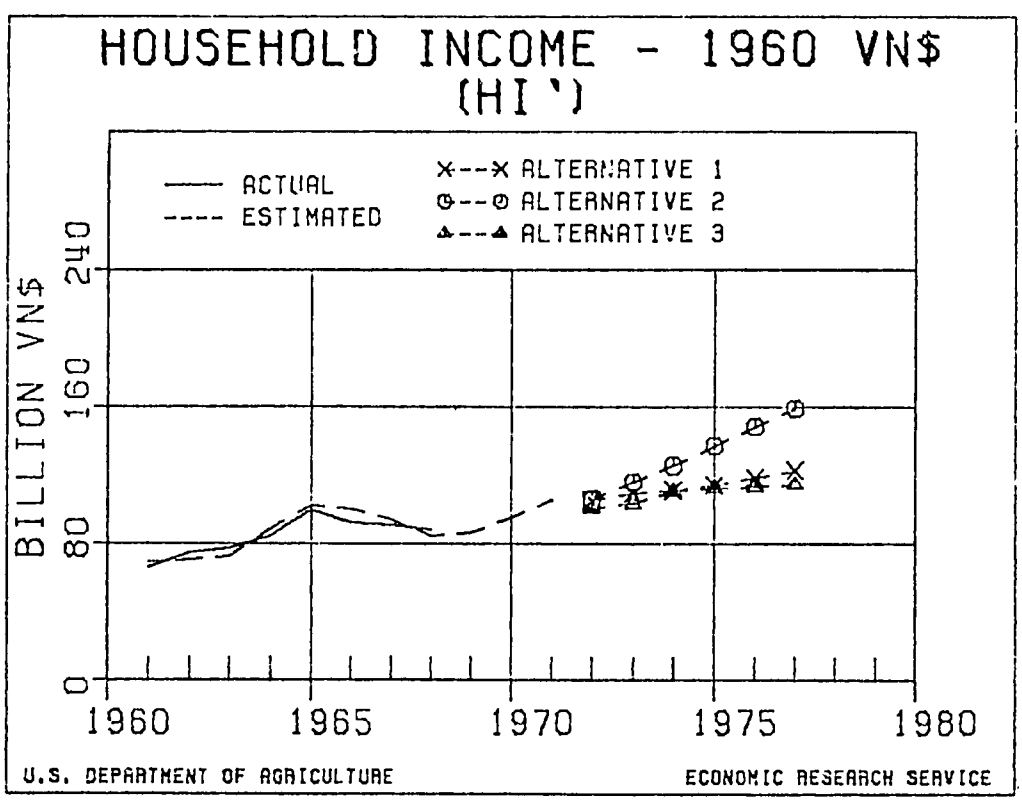

Figure 2

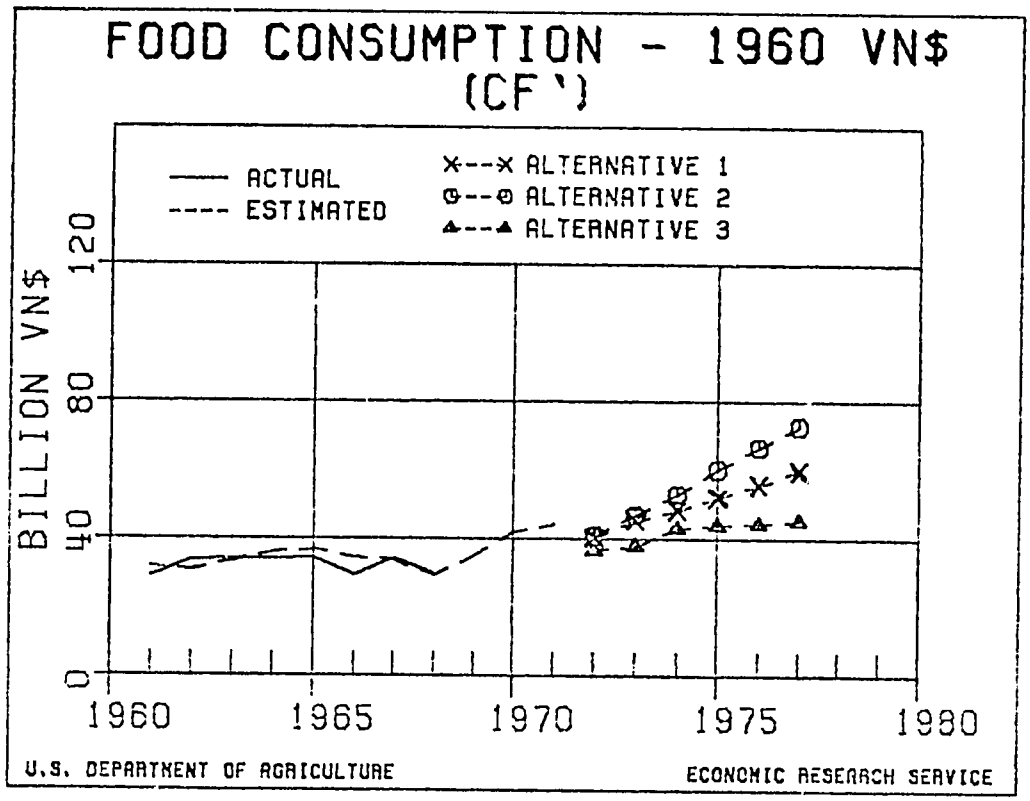

Figure 3

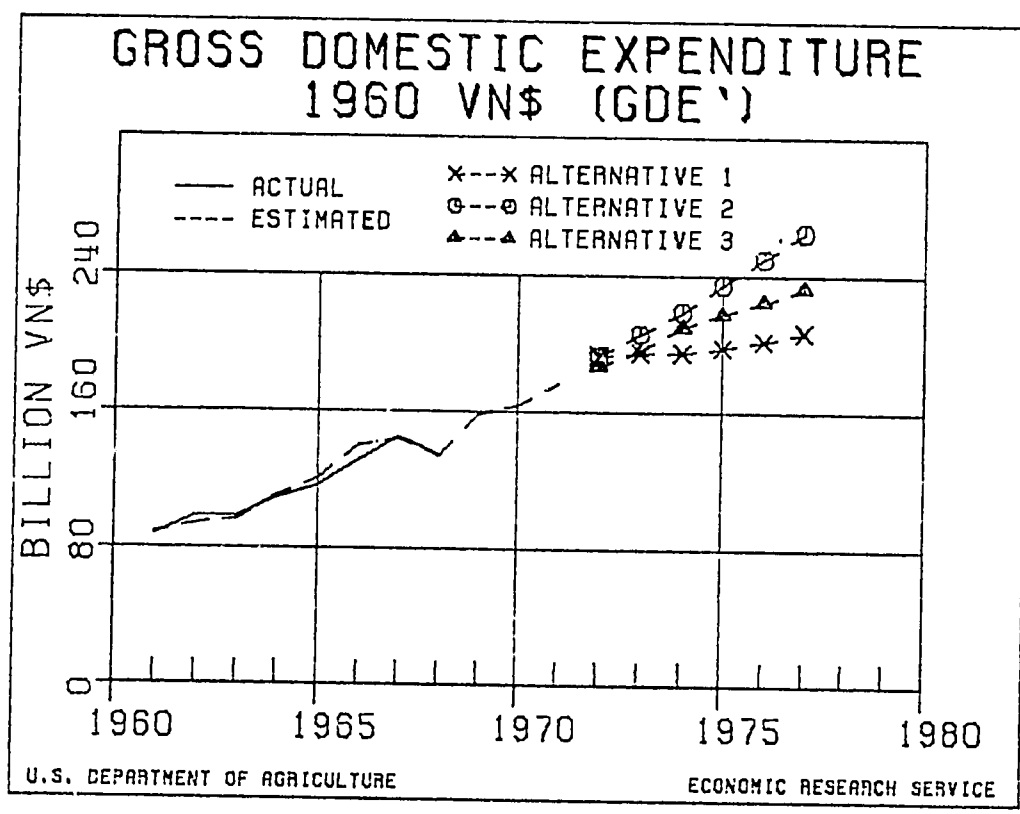

Figure 4

resources for expanded investment, land reclamation, movement of people back to rural areas, and other programs to expand domestic output and exports.

Pessimistic alternative III assumes the war would continue until 1974. It further assumes rising levels of aid, government expenditures and imports with little change in the volume of investment and exports, and no change in technology. Although gross domestic expenditures rise under this alternative, much as they have in past years, aid and imports provide most of the resources for increased spending. The GNP increases about 2-1/2 percent per year. With the projected 3 percent growth in population, per capita GNP declines. Since no change was assumed in tax and savings rates, household income also increases around 2-1/2 percent per year and real per capita buying power declines slightly over the period.

RICE SITUATION AND NEAR TERM PROSPECTS

Rice supplies early in 1972 appeared reasonably well in balance with prospective demand. But this was all changed by increased hostilities accompanying the spring northern invasion. In addition to losses from the crop about ready for harvest, thousands of refugees made provisioning necessary in many provinces north of Saigon where fighting was heavy. Uncertainty about the war affected rice deliveries from the Delta and the price rise began to accelerate around mid-year. Rice imports, originally scheduled at 125,000 to 150,000 tons, may total nearly 300,000 tons in 1972. Moreover, a strong market for rice probably will result in minimal carry over stocks and the Saigon wholesale price rise this year may average 50 percent above 1971.

Rice Supply Situation

Paddy production in the 1971/72 crop year was the largest crop in more than a decade totaling some 11 percent larger than the 5.7 million tons produced in 1970. Production gains in recent years reflected a recovery in the hectares planted to paddy as well as sharply higher yields due largely to rapid expansion in hectares planted to high-yielding varieties.

Paddy Hectares Up 14 Percent Since 1966

From a low point in 1966 of 2.3 million hectares, the area planted to paddy steadily climbed to 2.6 million in the 1971/72 crop year. The average annual gain in hectares planted about equaled percentage gains in population. However, planted area in 1971/72 was only 2 percent above the previous high of 2.6 million hectares in 1964/65.

Vietnam's West Delta region covers one of the most productive rice areas in Southeast Asia. Nearly 80 percent of the nation's crop comes from the area generally south and west of Saigon. Since the low in 1966, paddy plantings climbed nearly 20 percent to 1.9 million hectares in the 1971/72 crop year. The remaining production area (other than the Delta) generally includes the rice deficit areas of Vietnam. In the deficit area, planted paddy hectares remained virtually stable in recent years except for a 2 percent increase for the 1971/72 crop year.

1972/73 Planting Prospects Uncertain

Prospective paddy plantings for the 1972/73 crop year remain clouded by several uncertainties. Recent increases in rice prices relative to the consumer price and the associated tight demand-supply balance, should encourage larger plantings of paddy. However, changes in the exchange rate have increased fertilizer costs sharply which at least partly cancels out more favorable grower prices.

Larger areas of paddy last year will tend to increase plantings this year as will further increases in total area planted to high-yielding varieties and associated gains in technology. But as gains in the area planted to high-yielding varieties slows, the overall impact on paddy production slows accordingly.

The invasion and subsequent step up in hostilities may have the largest impact on plantings and rice production in 1972. The current level of fighting is probably the most intense since 1968, but so far it does not appear to have had as much impact in the Delta as the 1965-68 period. We assumed about one-half the 1965-68 hostility impact in the Delta and the full hostility impact in the "other" producing region. Combined effects of increased hostilities based on past experience could knock out around 50,000 hectares of rice in each region.

Combined effects of major forces on hectares planted to rice in 1972 suggest an overall decline of 10,000 to 15,000 hectares in the Delta and 25,000 to 30,000 in the other region. Under more pessimistic assumptions concerning the security situation, another 40,000 to 50,000 hectares may be lost.

Paddy Yields Continue Recovery From Depressed 1968 Levels

Vietnam's paddy yields, bolstered by an especially sharp increase for the rice deficit region, reached more than 2,400 kg. per hectare in the 1971/72 crop year. Delta yields increased nearly 30 percent from a 1968 low, while yields in the other region jumped nearly 40 percent in the same period. Much of the gain springs from the rapid expansion in the improved high-yielding TN varieties--up from 40,000 hectares in 1968/69 to 674,000 in 1971/72. The share of total hectares planted to TN varieties has increased from around 2 percent in 1968/69 to more than a fourth in 1971/72. Since TN varieties yield about twice as much as local rice (according to the AESS data for the 1971/72 crop), increased plantings have been a major force improving overall paddy yields in recent years.

Yields May Be Lower In 1972-73

Crop yields in 1971/72 apparently reflect relatively favorable general growing conditions. Current prospects for 1972/73 growing season probably are only average or below, especially in much of the Delta. Thus, less favorable weather may well reduce yields, perhaps as much as 3 or 4 percent from 1971/72 if other yield factors remain essentially unchanged.

An expected small gain in planting to TN varieties also will tend to limit yield increases. Similarly, a further decline in the rural labor force will operate to limit gains in yields. The combined impact of poorer weather, increased hostilities, further reduction in the rural labor force, and a smaller gain in hectares of TN varieties could well reduce 1972/73 crop yield by as much as 8 to 10 percent. Obviously, such a forecast depends importantly on the level of hostilities as well as weather conditions and population movements.

Production Prospects Lower
For 1972/73

With prospective yields and hectares pointing to a decline this year, the 1972 rice crop could drop back around the 1971/72 crop level, a decline of possibly 10 percent under conditions specified above for the 1972 crop.

Paddy production reached a decade record of 6.3 million m.t. in the 1971/72 crop year, up 11 percent from the previous year. The production gain was nearly 50 percent from the low in 1966. Although hectares of paddy have increased steadily since 1966, most of the gain in production was due to increased yields in this period.

Table 3.--Paddy: Hectares, yield, production 1969 to 1972

Item and region	Unit	1969	1970	1971	1972 1/
Hectares					
Delta	1,000	1,787	1,854	1,948	1,872
Other	1,000	643	657	677	672
Total	1,000	2,430	2,511	2,625	2,544
Yield					
Delta	Kg./hectare	2,198	2,367	2,441	2,268
Other	Kg./hectare	1,846	2,021	2,318	2,053
Total	Kg./hectare	2,105	2,276	2,409	2,211
Production					
Delta	1,000 m.t.	3,928	4,388	4,755	4,246
Other	1,000 m.t.	1,187	1,328	1,569	1,380
Total	1,000 m.t.	5,115	5,716	6,324	5,626

1/ Estimated from model alternative I.

Rice Demand and Price Situation

Import Requirements Higher

Domestic disappearance of rice in Vietnam has been maintained at about 200 kg. per person since 1960, although ranging from below 190 to above 220 kg. per person. Vietnam was an important exporter of rice in the early 1960's, but in order to maintain food supplies and hold price levels, large imports of rice were necessary in the late 1960's. These reached a peak of 750,000 m.t. in calendar year 1967 then dropped off to 138,000 m.t. in 1971. However, renewed

hostilities in 1972, associated problems of transporting rice, and thousands of refugees generated larger import requirements in 1972--possibly more than twice as much as in 1971. Poorer paddy production prospects for this fall also point to substantially higher rice import requirements for 1973. To maintain per capita disappearance around 200 kg. could require upward of 500,000 m.t. This estimate will depend on the course of the war and size of the 1972 crop. Our best judgment is that import requirements for 1973 could range from around 300,000 m.t. to perhaps more than 700,000 m.t. under pessimistic assumptions.

1972 Rice Deliveries

Rice deliveries into commercial channels (Saigon) are the most important single factor determining rice import requirements. Deliveries from the surplus producing areas move in response to many factors. The most important is the size of the rice crop itself--a larger crop usually results in larger deliveries.

Deliveries have averaged from about 10 to 15 percent of the crop in recent years. Although the size of the rice crop largely determines deliveries, the ratio of hog prices to rice prices and the general security conditions are also major determinants of deliveries from surplus areas and subsequent rice import requirements.

Past experience suggests that the larger 1971/72 paddy crop would increase 1972 deliveries by perhaps 75,000 m.t. from 1971. In addition, the higher price of rice relative to pork should also add to total deliveries. But increased hostilities, which tend to limit increases in deliveries, may limit the gain in deliveries to possibly 40,000 to 50,000 m.t. over 1971. Overall prospects for 1973 point to smaller deliveries in line with prospects for a smaller crop, although a reduction in hostilities would help to bolster deliveries next year.

Prices Advanced Rapidly in 1972

Wholesale rice prices in Saigon this year may average 6,500 to 7,000 $VN/100 kg.--up from last year's 4,800 $VN/100 kg. Despite a large 1971 rice crop, the renewed hostilities and subsequent disruption of distribution channels and perhaps general uncertainty have increased the price pressures. In order to maintain adequate food supplies in deficit areas, substantial imports have been necessary and even larger imports may be required in 1973, depending on the 1972 crop. If prices are to be maintained at 1972 levels (excluding the effects of a rise in the general price level) imports of around 500,000 m.t. may be required for 1973. Demand pressures come from a number of forces; a 3 percent increase in population, a generally strong demand for food, and continued gains in the demand for paddy for livestock feed.

Table 4.--Rice: Supply and use, and related demand factors, 1969-72

Item	Unit	1969	1970	1971	1972 1/
Total production:					
Paddy	1,000 m.t.	4,366	5,115	5,716	6,324
Rice	1,000 m.t.	2,620	3,069	3,430	3,794
Beginning stocks	1,000 m.t.	205	9	57	38
Imports	1,000 m.t.	332	568	138	250
Exports	1,000 m.t.	---	---	---	---
Net imports	1,000 m.t.	332	568	138	250
Ending stocks	1,000 m.t.	9	57	38	63
Domestic use					
Total	1,000 m.t.	3,148	3,589	3,587	4,019
Per capita	Kg.	190	207	202	215
Population (N2)	Mil.	16.5	17.3	17.8	18.7
Wholesale price	$VN/100 kg.	3,135	4,023	4,799	6,800

1/ Estimated.

Near-Term Prospects for Rice

Appraisals of prospective demand expansion for rice and probable growth in rice production point to a generally tight supply situation for the next 5 years, even under relatively optimistic production prospects. Projections under fairly optimistic assumptions (alternative I), both for limiting demand expansion and encouraging larger output, suggest a continued tight supply balance in coming years. In fact, the model simulations indicate that continued small net imports are more likely than an export surplus during the next 5 years.

Planning for an export surplus may require a rise in the relative price of rice (or some equivalent subsidy to growers and a corresponding curb on domestic demand). In addition, the realization of the ultra optimistic supply conditions of alternative II, and possibly other limitations on domestic demand restrictive enough to dampen domestic demand would be necessary.

Major Assumptions for Rice

Appraisals for rice simulated for the next 5 years are based on the overall analytical framework for rice and the general economy. Projected alternatives for coming years are based on the three sets of assumptions outlined above. The specific assumptions concerning rice are as follows:

Alternative I

1. Intense hostilities affecting primarily the northern region of Vietnam only in 1972, and little effect thereafter.
2. Slight decline in TN varieties in 1972, with an annual increase of 50,000 hectares thereafter.
3. Rural population increasing 100,000 per year.
4. Reclamation of land would bring in 50,000 hectares of paddy per year.

Alternative II

1. Intense hostilities affecting primarily the northern region of Vietnam only in 1972, and little effect thereafter.
2. No change in TN varieties from 1971 to 1972, and an annual increase of 100,000 hectares thereafter to a total of 1.0 million hectares.
3. Rural population increasing 200,000 per year.
4. 100,000 hectares of paddy added annually through reclamation.

Alternative III

1. Intense hostilities in 1972 severely affecting the northern areas of Vietnam, and affecting the Delta only to a limited extent. The entire country affected by increased hostilities in 1973, with no hostility effect thereafter.
2. No change in hectares of TN varieties from 1972 level.
3. No change in rural population from 1972.
4. No reclamation of abandoned land.

Rice Production Prospects

The assumptions concerning rice under each alternative are all fairly optimistic in that each limits any deterioration from the current situation, for example, limited backsliding in hectares of improved rice varieties, and rural population from current levels. Gains in TN (improved) varieties have averaged about 150,000 hectares per year since being introduced, but land capabilities apparently impose a practical ceiling of about 1.0 million hectares. Therefore assumption I assumes a modest increase of 50,000 hectares per year while alternative II assumes a nearly average increase of 100,000 hectares per year to the ceiling level. Alternative III assumed essentially no increase in land area of improved varieties from the current level.

The technology factor assumptions directly relate to the level of TN plantings as well as assumed annual increases in improved general production practices. Since the TN varieties require substantial amounts of inputs such as fertilizers and pesticides, a corresponding general increase in technology was assumed to increment each year under each assumption, and was increased at faster rates in alternatives I and II along with increased TN plantings.

Another important assumption to consider in the rice supply sector is the rural population. The population data are considered to be fairly reliable indicators of changes in the population mix, and therefore lend some insight into the effects of rural population on production. Alternative I assumed relatively stable security conditions with some gain in the rural population. Alternative II assumed even larger gains, while alternative III held rural population constant.

Land reclamation project proposals offer additional changes in the production capacity of the supply sector. The reclamation of 50,000 to 100,000 hectares annually under alternative I and II respectively are associated with corresponding increases in the real investment levels of under the same alternatives.

The level of hostilities represent another important factor affecting the level of output. Generally, the statistical analysis suggests that the military activities of the 1965 to 1968 period had significant impact on yields and hectares planted. Although activities in the other years have probably also influenced production, a major shift in the effects were experienced in the 1965-68 period. Assumptions for the three alternatives therefore considered some effect of such conditions for the Delta and "other" regions in 1972, and only additional effects in 1973 for alternative III.

Paddy Plantings and Yields

Plantings to paddy, projected in the analytical framework, increase for each alternative. Annual gains average 6 percent for I, 10 percent for II, and 3 percent for III. Under the optimistic assumptions (I and II), increased plantings come mainly from assumed land reclamation. This ranges from around 250,000 hectares of new paddy for alternative I to 500,000 for the optimistic alternative II during the 5 years.

Paddy yield projections show relatively slow growth during the next 5 years. Much of this is due to the assumed stabilizing in TN variety plantings at around 1.0 million hectares. Technology may expand more slowly also as plantings to new varieties stabilize. Moreover, reclaimed land may be of less than average quality or it may take several years to come back into full efficient production.

Table 5.--Paddy projections: Hectares, yield and production, 1973 to 1977

Item, region and alternative	1973	1974	1975	1976	1977
Hectares			1,000 hectares		
Delta					
I	1,947	2,047	2,142	2,230	2,312
II	1,991	2,166	2,335	2,481	2,616
III	1,785	1,890	1,937	1,957	1,985
Other					
I	699	756	829	911	998
II	714	810	929	1,051	1,174
III	579	616	650	680	723
Total					
I	2,646	2,803	2,971	3,141	3,310
II	2,705	2,976	3,264	3,532	3,790
III	2,364	2,506	2,587	2,637	2,708
Yield			Kg./hectare		
Delta					
I	2,393	2,425	2,457	2,489	2,521
II	2,439	2,503	2,567	2,613	2,640
III	2,202	2,347	2,347	2,347	2,347
Other					
I	2,105	2,136	2,168	2,199	2,231
II	2,143	2,206	2,269	2,308	2,321
III	2,046	2,067	2,067	2,067	2,067
Total					
I	2,317	2,347	2,376	2,405	2,434
II	2,361	2,422	2,482	2,522	2,541
III	2,164	2,278	2,277	2,275	2,272
Production			1,000 m.t.		
Delta					
I	4,659	4,964	5,263	5,550	5,829
II	4,856	5,421	5,994	6,483	6,906
III	3,931	4,436	4,546	4,593	4,659
Other					
I	1,471	1,615	1,797	2,003	2,227
II	1,530	1,787	2,108	2,426	2,725
III	1,185	1,273	1,344	1,406	1,494
Total					
I	6,130	6,579	7,060	7,553	8,056
II	6,386	7,208	8,102	8,909	9,631
III	5,116	5,709	5,890	5,999	6,153

Demand Growth and Implications for Trade

Demand for rice depends mainly on population growth, consumer buying power, and growth in the livestock industry. Of course, domestic use also must reflect changes in relative prices for rice and in supplies available. The supply, price, and use balance is illustrated by projected per capita disappearance:

Per capita disappearance of rice, 1972 and projections to 1977

Year	Alternatives		
	I	II	III
	Kg./capita		
1972 1/	205	205	205
1973	195	189	194
1974	191	191	196
1975	192	205	197
1976	195	219	188
1977	202	234	176

1/ Estimated.

The above per capita use projections reflect population growth of 3 percent for each alternative. For alternative I, total domestic use increases nearly 16 percent from 1973 to 1977. In addition to population growth, this alternative reflects fairly stable per capita household income and 3 percent growth in livestock numbers. Demand expansion relative to projected supplies was strong enough to push the relative price of rice by 1977 to a level just moderately above 1972.

Alternative II projects total domestic disappearance by 1977 around 36 percent above 1973. This increase reflects population growth, a 6 percent annual increase in per capita household income, and a 5 percent annual increase in livestock numbers. But perhaps more important in the big increase in domestic use is the associated projected decline in the relative price of rice from 1973 to 1977.

Alternative III projects little change in total domestic use with large assumed imports accounting for a substantial part of total use. This alternative reflects population growth, a 2 percent annual increase in livestock numbers, and a small decline in per capita household income. But with limited production and supplies, the relative price of rice rises from 1973 to 1977, enough to further reduce per capita disappearance of rice.

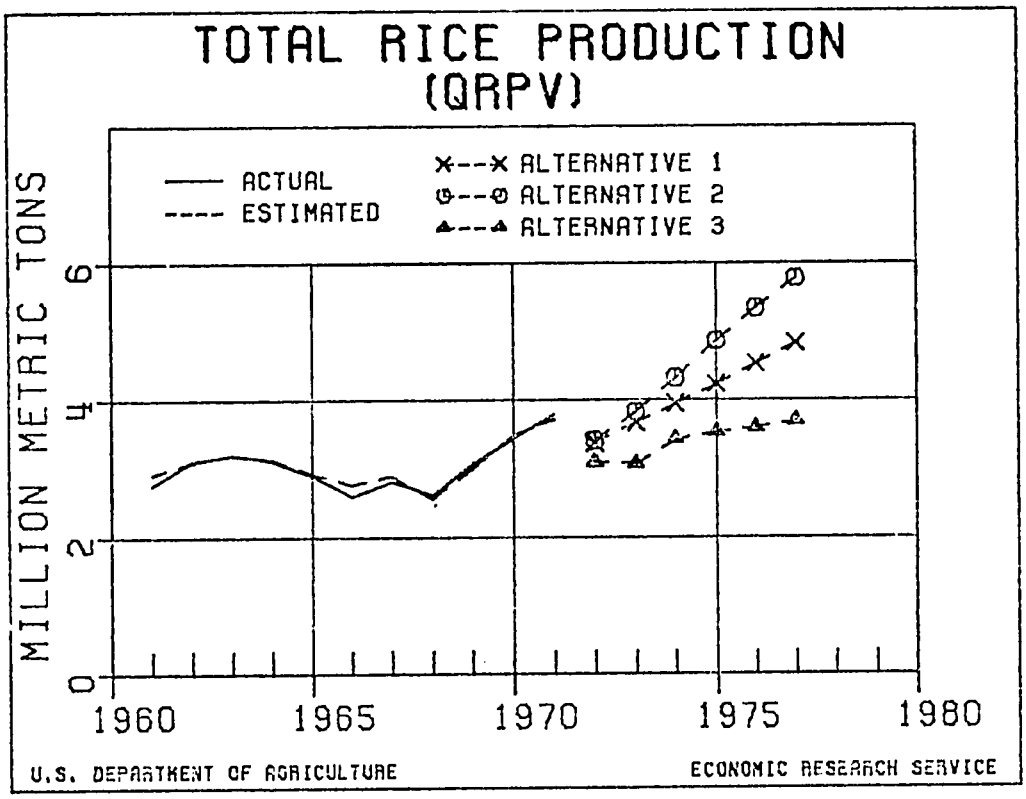

Figure 5

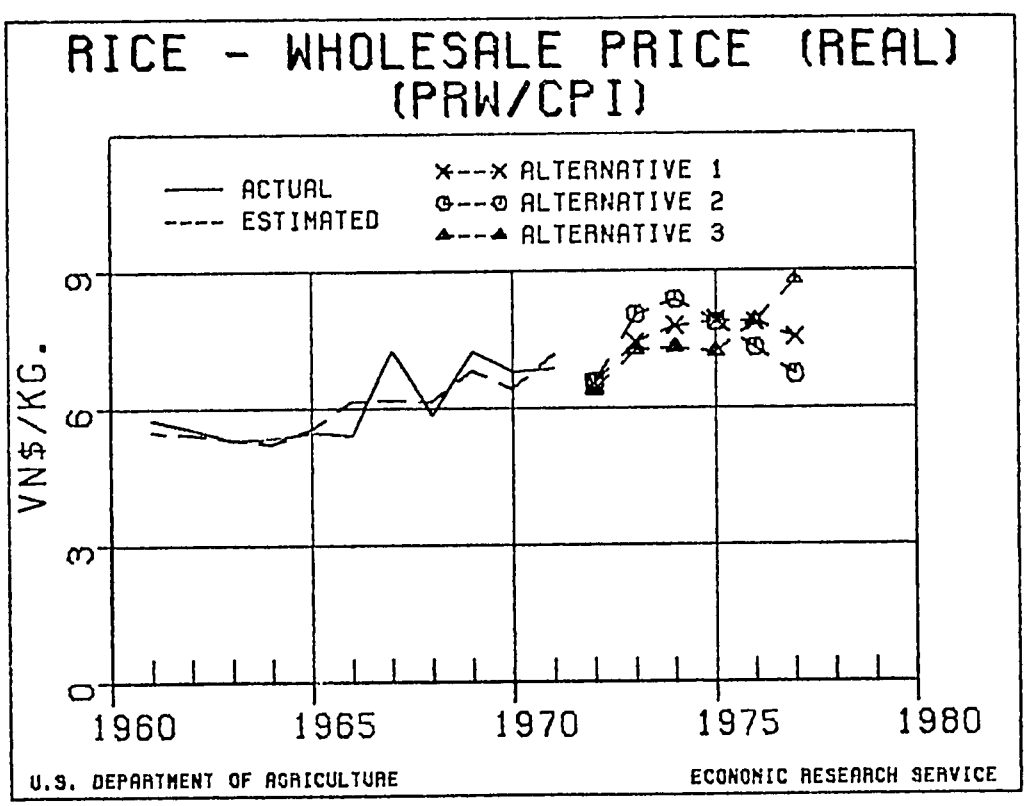

Figure 6

Table 6.--Rice: Projected supply and use, and prices under three alternatives, 1973 to 1977

Item and alternative	Unit	1973	1974	1975	1976	1977
Total rice production						
I	1,000 m.t.	3,375	3,678	3,947	4,237	4,533
II	1,000 m.t.	3,407	3,832	4,325	4,862	5,344
III	1,000 m.t.	3,099	3,069	3,425	3,534	3,598
Net imports						
I	1,000 m.t.	500	250	100	---	---
II	1,000 m.t.	350	80	0	-100	-100
III	1,000 m.t.	750	950	725	550	350
Domestic disappearance						
I	Kg./cap.	195	191	192	195	202
II	Kg./cap.	189	191	205	219	234
III	Kg./cap.	194	196	197	188	176
Wholesale price						
I	$VN/100 kg. 1/	7,750	8,100	8,225	8,200	7,850
II	$VN/100 kg. 1/	8,350	8,700	8,150	7,575	7,000
III	$VN/100 kg. 1/	7,725	7,775	7,650	8,400	9,350

1/ Expressed in terms of 1972 prices assuming the 1972 wholesale rice price at 6800 $VN/100 kg.

In the initial phase of the demand analysis, rice trade was assumed as follows:

Year	Alternative		
	I	II	III
	1,000 m.t.		
1973	500	350	750
1974	250	80	950
1975	100	---	725
1976	---	-100	550
1977	---	-100	350

As you will note, assumed import levels for the next few years were not high enough to avoid some decline in per capita disappearance and rising prices in the next 2 or 3 years for all alternatives (see rice price figure). It was 1977 before projected rice production brought per capita use for alternative I near the

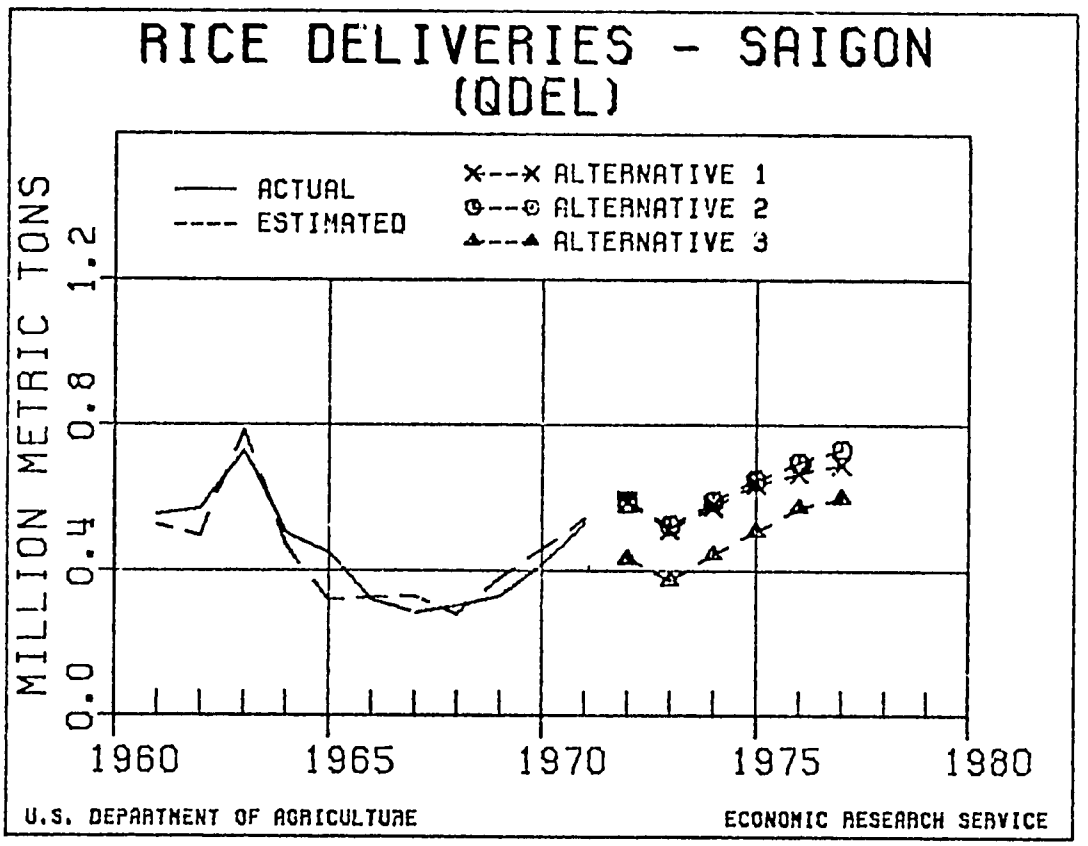

Figure 7

estimated 1972 disappearance (table 6). The very optimistic alternative II suggests production gains large enough to cover assumed exports of 100,000 m.t. in 1976 and 1977 and provide as well for a sizable increase in per capita use along with a declining price for rice relative to the general price level. This suggests that larger assumed exports would have been more reasonable for the most favorable alternative.

Even the large imports for the next few years, under the pessimistic alternative, are not large enough to maintain per capita use and prices around 1972 levels during the next few years. But, as assumed imports decline, per capita use declines enough to result in sharply rising prices toward the end of the 5-year projection period. Under past operating techniques such a rise in prices probably would have resulted in continued large imports for alternative III.

Rice deliveries show generally increasing levels under the three alternatives because of increasing rice production.

Table 7.--Rice deliveries, 1972 estimate and projections to 1977

Year	Alternative I		Alternative II		Alternative III	
	Production	Deliveries	Production	Deliveries	Production	Deliveries
	1,000 m.t.					
1972	3,710	619	3,710	619	3,710	619
1973	3,375	514	3,407	525	3,099	372
1974	3,678	578	3,832	590	3,069	447
1975	3,947	637	4,325	648	3,425	519
1976	4,237	668	4,862	697	3,534	574
1977	4,533	690	5,344	734	3,598	598

However, because of a slower rise in livestock production for alternative III, deliveries are an increasing share of rice production. In comparison the rapid advance in livestock feed demand for alternative II results in a declining share of production going into deliveries and a larger share of paddy is fed. For alternative I, projected deliveries hold around 15 to 16 percent of production.

Simulations of Rice Trade Potentials

Projections above assumed rice imports and exports. Now we will further explore trade potentials and their implications for the rice sector and the general economy. Suppose we use the analytical framework to stimulate probable trade levels under several general price and income objectives.

Alternatives I and II provide basic rice production capacities around which trade potentials and implications might be examined by varying the price of rice and household income levels. Framework (model) projections under assumptions specified above implied no export potential except under the optimistic production possibilities for alternative II. However, a number of variations in the price of rice and household income levels illustrate roughly the measures that may be necessary to restrict domestic markets sufficiently to permit exports.

Under assumed higher tax revenues and savings for alternatives I and II, total household income increases around 3 percent per year for alternative I and 9 percent for alternative II. These increases imply no gain in per capita purchasing power for the first alternative and an optimistic 6 percent gain per year for alternative II. The two optimistic alternatives assume higher tax rates and savings incentive programs as well as aggressive implementation of these programs.

With this background we can examine trade implications for five variations of alternatives I and II (table 8). The precise level of export availabilities indicated by each variation probably have much less meaning than the differences indicated among the various assumptions. Net trade projections under the assumptions outlined represent an indicated export availability. Whether such exports would be made depend on the availability of export markets, as well as the relative export price of Vietnamese rice.

Table 8.--Rice trade potentials projected to 1977

Year	Alternative I			Alternative II		
	Rice price 1/	Household income 2/	Net imports	Rice price 1/	Household income 2/	Net imports
	$VN/100 kg.	Bil. $VN.	1,000 m.t.	$VN/100 kg.	Bil. $VN	1,000 m.t.
	A. Rice prices held at 1972 levels; income generated from model					
1974	6,800	1,102	168	6,800	1,248	174
1975	6,800	1,130	89	6,800	1,354	61
1976	6,800	1,173	67	6,800	1,464	-15
1977	6,800	1,215	58	6,800	1,574	-69
	B. Rice prices increase 5 percent per year; income generated from model					
1974	7,500	1,109	98	7,500	1,256	107
1975	7,875	1,145	-19	7,875	1,369	-44
1976	8,250	1,195	-89	8,250	1,487	-171
1977	8,675	1,246	-152	8,675	1,607	-284
	C. Rice prices held at 1972 levels; income held at 1972 levels					
1974	6,800	1,040	135	6,800	1,040	68
1975	6,800	1,040	44	6,800	1,040	-101
1976	6,800	1,040	-119	6,800	1,040	-239
1977	6,800	1,040	-307	6,800	1,040	-361
	D. Rice prices increase 5 percent per year; income held at 1972 levels					
1974	7,500	1,040	59	7,500	1,040	-105
1975	7,875	1,040	-76	7,875	1,040	-232
1976	8,250	1,040	-178	8,250	1,040	-443
1977	8,675	1,040	-278	8,675	1,040	-654
	E. Rice prices decrease 5 percent per year; income held at 1972 levels					
1974	6,125	1,040	156	6,125	1,040	92
1975	5,800	1,040	91	5,800	1,040	-46
1976	5,525	1,040	80	5,525	1,040	-139
1977	5,250	1,040	94	5,250	1,040	-201

1/ Expressed in terms of 1972 prices assuming the 1972 wholesale rice price in Saigon at 6,800 $VN/100 kg.

2/ Household income in terms of 1972 price levels.

A. This assumption holds the relative price of rice at 1972 levels (allows for increase due to increases in the general price level) and takes the household income generated in the model--no change in per capita income for alternative I and 6 percent annual gain for II.

Holding relative prices at 1972 levels would imply an approximate supply-demand balance, with some imports most likely, for alternative I. With the strong domestic demand expansion for alternative II, only small export potentials are indicated even with relatively large increases in production.

B. Now allow the relative price of rice to rise 5 percent per year (faster than the general price level) and model generated income. Under these conditions a sizable export potential is suggested by 1976 and 1977.

C. This alternative holds household income at 1972 levels, which implies a decline in per capita buying power of about 3 percent per year. This would be a difficult alternative to effect in a growing peacetime economy. However, model projections show sizable exports, beginning around 1975 for alternative II, with a rather severe restriction in domestic demand compared with original alternatives.

D. Rising prices for rice, which encourage output and restrict domestic markets, and a decline in buying power--a politically difficult and economically inequitable assumption--suggest substantial rice exports for alternative II and sizable export potential for alternative I by 1976.

E. This alternative allows the relative price of rice and consumer buying power to decline for alterntives I and II. The analytical framework suggests continued imports for the first alternative, but sizable exports for alternative II toward the end of the projection period.

Differences among the above simulations illustrate the relatively drastic measures that may be needed to dampen domestic markets and encourage output sufficiently to permit exports. Some of these assumed conditions would be politically difficult, if not impossible, to effect, particularly in a growing peacetime economy.

Perhaps other measures should be explored--special taxes, production subsidies, etc.--which might effect desired restriction in domestic demand and output stimulation with less political strain and perhaps more economic and social equity.

PORK SITUATION AND OUTLOOK

1972 Supply and Price Situation

Estimates of controlled hog slaughter for 1972 indicate a slight decline from 1971 of about 1.0 million head. Although controlled slaughter for Vietnam averaged just over 1.0 million head for the 1960 to 1970 period, total pork production has probably been increasing. Estimates based largely on inventory numbers and assumed increases in improved breeding stock indicate total pork production apparently increased 8 to 10 percent annually in recent years. This estimate appears reasonable in the perspective of relatively stable real wholesale prices for pork since 1968 and the changes in household income, i.e. consumer purchasing power.

Wholesale pork prices (current prices) in Saigon have increased in recent years but at a much slower rate than the general price level. As a result, real pork prices (wholesale price adjusted for changes in the consumer price index 1963=100) have declined from a peak of 3,950 $VN/100 kg. in 1968 to about 3,100 $VN/100 kg. in 1972.

Pork prices may well have averaged lower in the 1968-71 period except that gains in household income and fairly strong rice prices have apparently added strength to pork prices. The slowdown in the economy in 1972, with some limiting effects on demand, was accompanied by indicated increases in total hog production in 1972. Consequently, prices for the year may show little change from 1971.

Table 9.--Controlled hog slaughter and wholesale pork prices, and related demand factors, 1969 to 1972

Item	Unit	1969	1970	1971	1972 1/
Controlled slaughter	Mil. head	1.060	1.138	1.115	1.025
Wholesale pork price	$VN/100 kg.	16,704	24,742	25,775	27,000
Household income	Bil. $VN	441	641	831	1,043
Population	Mil.	16.5	17.3	18.7	19.3

1/ Estimated.

Projected Supplies and Prices to 1977

Hog production represents the most important livestock enterprise in Vietnam measured in production value. Moreover, livestock including hogs is a major source of feed demand. Although the controlled slaughter of hogs probably has declined as a share of total hogs produced, the changes in controlled slaughter reflect in large measure changes in total hog production. Accordingly, an appraisal of projected hog production should describe most of the changes which might be expected in the total livestock economy.

Projections of controlled hog slaughter and associated wholesale pork prices were computed under three sets of assumptions for the 1973-77 period. In addition to assumptions outlined previously, other major assumptions for the pork sector included:

Alternative I (fairly optimistic)

1. Chicken prices remain around 1972 levels.
2. Rice production increases with increased technology and land reclamation, although no rice surplus appears likely through 1975.
3. Per capita consumer incomes increase, but only slightly over the period.

Alternative II (very optimistic)

1. Chicken prices remain around 1972 levels.
2. Rice production increases more than under alternative I due to the step up in technology and land reclamation.
3. Per capita household income grows 6 percent per year.

Alternative III (pessimistic)

1. Chicken prices remain around 1972 levels.
2. Rice production stagnates so that large rice imports are required through 1977.
3. Per capita consumer income trends slightly downward over the period.

Controlled Hog Slaughter

Under all three alternatives, controlled hog slaughter shows little change from 1972 to 1973, and from 1973 to 1974. However in the later years, the patterns of each alternative vary widely depending on the interactions of pork, rice, and chicken prices. For the 5-year period of 1972 to 1977, annual controlled slaughter averaged as follows:

Alternative I:	1.029 million head
Alternative II:	1.114 million head
Alternative III:	1.055 million head

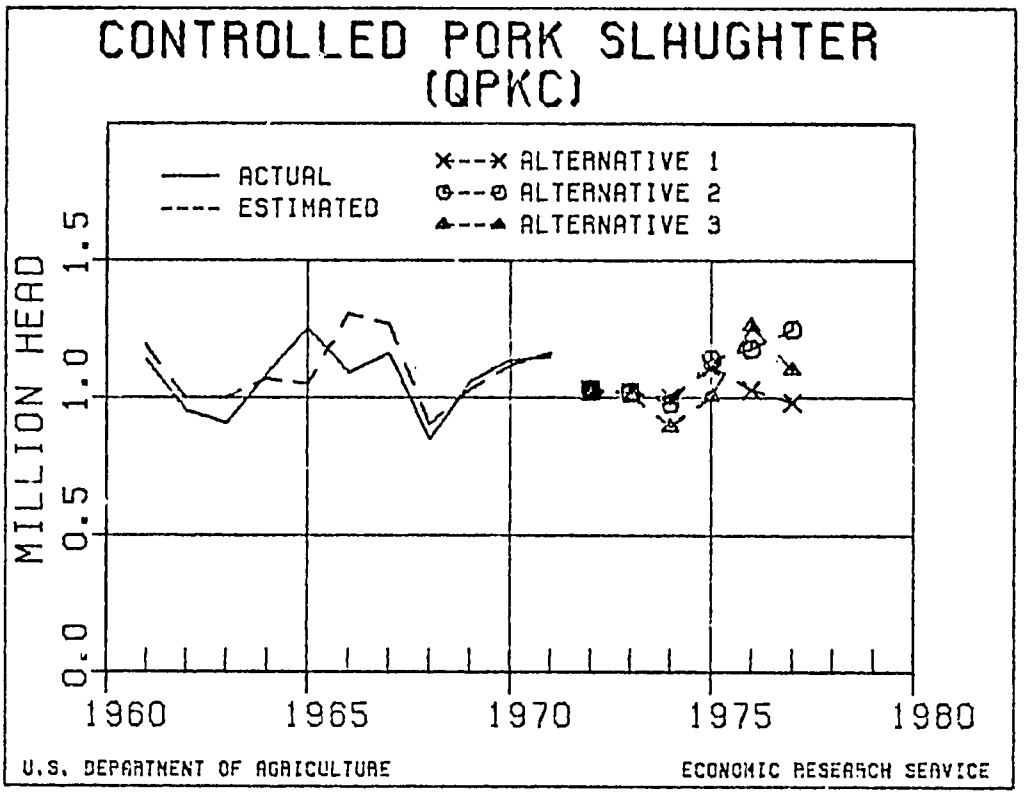

Figure 8

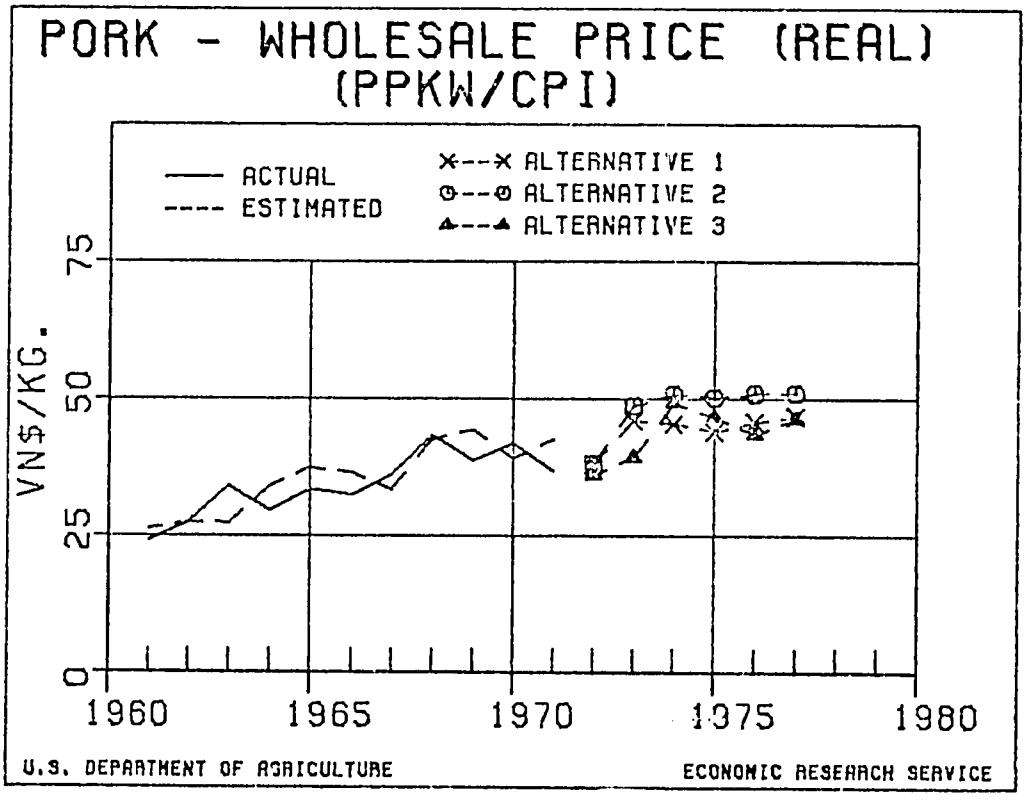

Figure 9

Controlled slaughter under the three projected alternatives averages relatively close to the average of recent years. Apparently the higher slaughter generated under alternative II is the result of higher pork prices associated with higher consumer incomes.

Wholesale Prices--Projected 1973 to 1977

Wholesale pork prices (real) tend to stabilize in the 1973 to 1977 period, although prices under alternative III remain at a relatively higher level. The effect of higher income through the 1973 to 1977 period tends to push up pork prices under alternative II despite larger controlled slaughter.

Table 10.--Controlled hog slaughter and wholesale pork price projections, 1973 to 1977

Item	Unit	1973	1974	1975	1976	1977
Controlled slaughter						
I	Mil. head	1.021	0.998	1.114	1.029	0.983
II	Mil. head	1.020	.981	1.142	1.179	1.249
III	Mil. head	1.011	.895	1.005	1.262	1.101
Wholesale price 1/						
I	$VN/100 kg.	40,300	39,800	38,500	40,000	40,900
II	$VN/100 kg.	42,700	44,500	44,000	44,600	44,700
III	$VN/100 kg.	34,400	43,100	40,800	38,000	40,600

1/ Expressed in terms of 1972 prices assuming the 1972 wholesale pork price in Saigon at 27,000 $VN/100 kg.

FISH SITUATION AND OUTLOOK

Current Situation

Fish catch in Vietnam this year may total about 10 percent above the 1971 production of 588,000 m.t. Except for small dips in 1965 and 1968, production has increased each year since 1960. Production jumped dramatically in the 1969 to 1970 period with the catch up nearly 25 percent. Much of the recent increases can be largely attributed to an aggressive expansion in the number of fishing boats which increased by more than 50 percent in the 1963 to 1970 period.

Another contributing factor was the generally increasing real price of fish during much of the 1960's. The wholesale price of fish (deflated) divided by the consumer price index (1963=100) is taken as a rough approximation of expected producer price adjusted for production costs. This real price rose from 3,096 $VN/100 kg. in 1960 to 5,941 $VN/100 kg. in 1968. Although real prices have declined since 1968, a continued expansion in the number of boats sustains production increases.

Domestic per capita fish disappearance increased along with gains in production during the 1960's. By 1971, per capita disappearance had reached nearly 37 kg. per person--nearly twice as high as in 1960. Sizable imports entered the country in 1968 and 1969, but in most years during the 1960's, there were net exports of fish.

Despite sizable gains in disappearance, wholesale fish prices (deflated by consumer price index) also increased, reflecting gains in consumer demand. Hog prices had an important impact on fish prices, and of course on increases in the wholesale price of pork (deflated) during the 1960's. Deflated fish prices have actually been declining since 1968, and in 1972 may well reach their lowest level since 1967.

Table 11.--Fish supply and utilization, wholesale fish prices, and related demand factors, 1969 to 1972

Item	Unit	1969	1970	1971	1972 1/
Fish catch	1,000 m.t.	463.8	577.4	587.5	655
Imports	1,000 m.t.	14.9	1.4	---	---
Exports	1,000 m.t.	---	---	1.2	---
Net imports	1,000 m.t.	14.9	1.4	-1.2	---
Domestic utilization	1,000 m.t.	478.7	578.9	586.3	655
Wholesale fish price	$VN/100 kg.	24,000	32,042	36,000	40,000
Household income	Bil. $VN	441	641	831	1,043
Population	Mil.	16.5	17.3	18.7	19.3

1/ Estimated.

Additional demand pressures arise from an increasing urban population relative to the total population. Fish production data apparently largely represent commercial fish catch which moves primarily to population centers. Production estimates may well exclude much of the "local" fish catch consumed by rural families. Therefore as the urban population increases, commercial demand may increase accordingly.

Near Term Prospects

Fish production increases in recent years make fish one of the brighter prospects for export potential in the relatively near future if recent production gains can be maintained. The projected fish catch, based on three sets of assumptions (shown below) indicate continued production gains for fish but these results may be optimistic. The analytical framework can make no allowance for the reported possibility that the fish catch increases may not be available in Vietnam's offshore waters.

Alternative I (moderately optimistic)

1. Fishing boats increase 8 percent per year.
2. Per capita household income increases slightly.
3. No fish exports generated through 1977.
4. Hostilities continue through 1972 and conditions stabilize in 1973 to 1977.

Alternative II (very optimistic)

1. Fishing boats increase 15 percent per year.
2. Per capita household income increases 6 percent per year.
3. Fish exports increase 200 m.t. per year.
4. Hostilities continue through 1972 and conditions stabilize in 1973 to 1977.

Alternative III (continued uncertainties)

1. Fishing boats increase 3 percent per year.
2. Per capita household income declines slightly over the period.
3. No fish exports generated.
4. Continued hostilities through 1973 with some move toward stability.

The projected catch increases under each alternative are due directly to increases in the number of boats and relatively stable price expectations. However, rates of increase on the commercial catch vary from 7 percent for alternative I to 12 percent for alternative II, and 5 percent for alternative III. Projected per capita supplies vary widely toward the end of the projection period.

Per capita production, 1972 estimate and projections to 1977

Year	I	II	III
	Kg./person		
1972 1/	34	34	34
1973	35	36	32
1974	38	40	33
1975	41	44	36
1976	42	49	37
1977	44	53	38

1/ Estimated.

Because of slower assumed growth in boat capacity, alternative III shows little increase in per capita production over the period. However, alternative II indicates an increase of more than 50 percent suggesting the possibility of even greater exports than assumed in the analysis. But care needs to be taken in appraising export potentials, because consumer incomes are also growing rapidly under alternative II, tending to push prices to a level somewhat above the other alternatives through 1977. Actually, alternative I with its small growth in consumer income suggests a possibility for limited exports, although prices would have to continue to rise along with the general price level rather than stabilize.

Table 12.--Fish catch, and wholesale fish price projections, 1973 to 1977

Item	Unit	1973	1974	1975	1976	1977
Fish catch						
I	1,000 m.t.	701	785	856	916	980
II	1,000 m.t.	707	820	935	1,057	1,184
III	1,000 m.t.	629	679	760	813	854
Wholesale price 1/						
I	$VN/100 kg.	53,200	50,900	49,000	50,000	50,600
II	$VN/100 kg.	56,400	57,000	56,100	56,000	55,400
III	$VN/100 kg.	44,500	61,100	57,300	53,700	55,800

1/ Expressed in terms of 1972 prices assuming the 1972 wholesale fish price in Saigon at 40,000 $VN/100 kg.

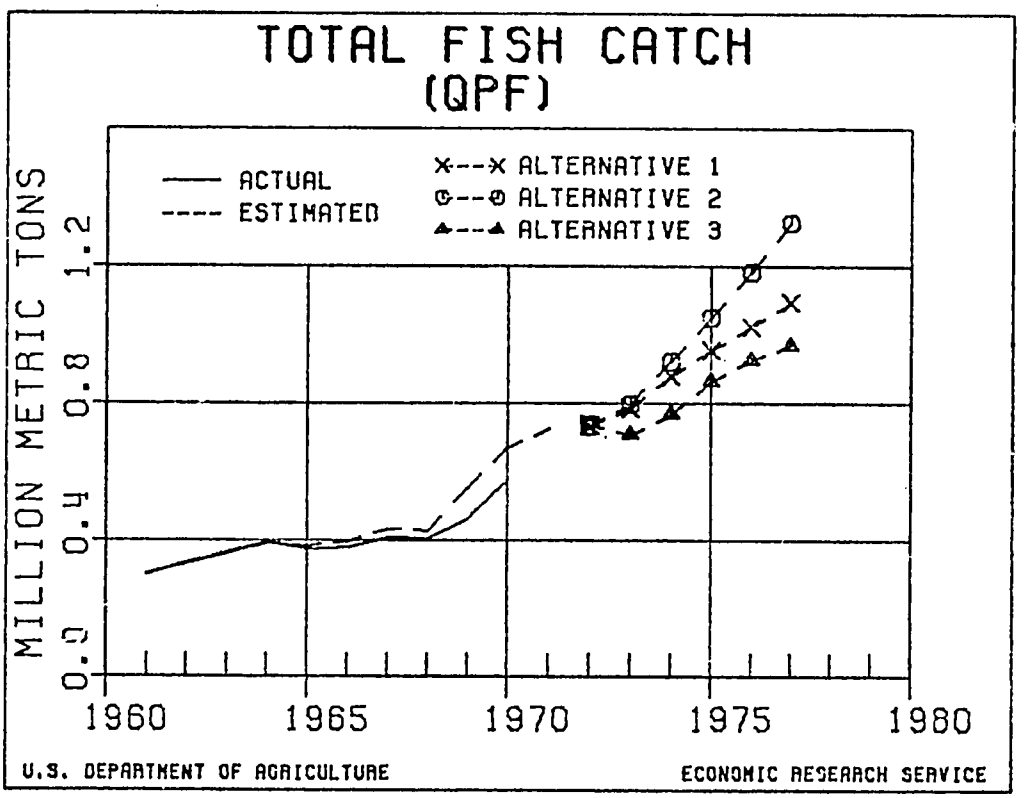

Figure 10

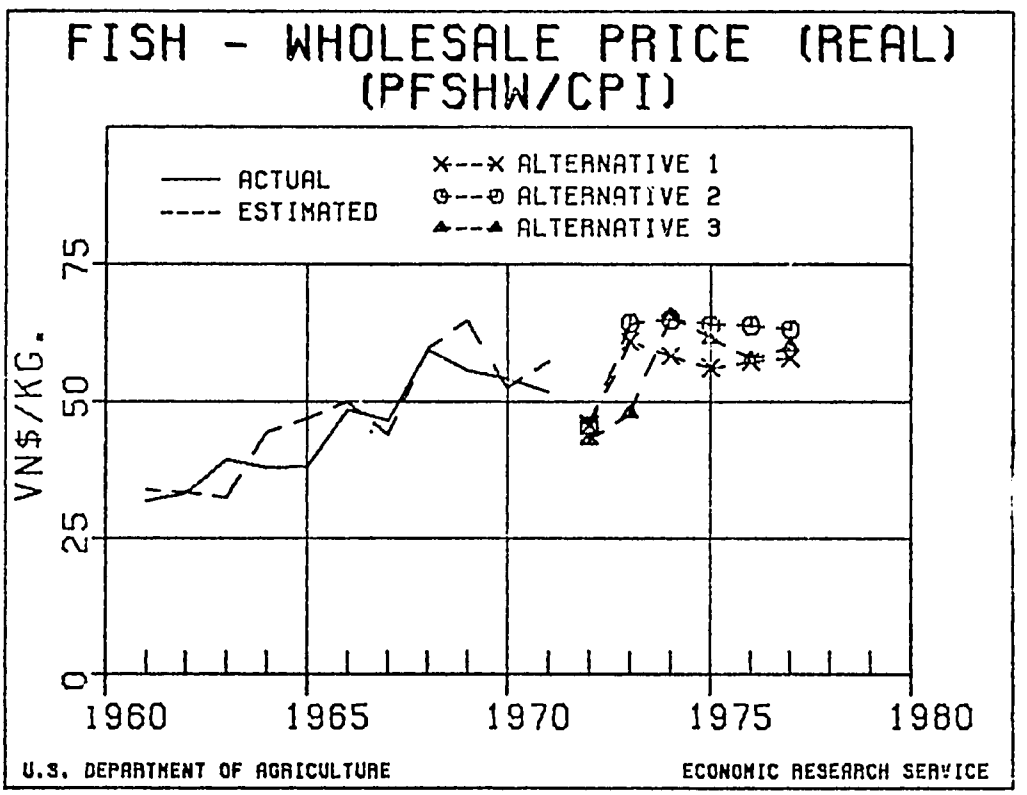

Figure 11

RUBBER SITUATION AND NEAR-TERM PROSPECTS

A combination of low prices and low production is estimated to result in an all-time low value of rubber exports in 1972--$6.6 million. This compares to $10.4 million exports in the low production year of 1969. No change in the value of exports is projected for 1973 under an optimistic projection of rubber production. Near-term prospects are limited by the existing area planted in rubber trees. An optimistic 5-year projection places the value of rubber exports at $15.3 million in 1977. These and other estimates are discussed below and in reference to the attached table--Situation and Near-Term Prospects for Rubber.

The Rubber Situation Through 1972

Total production of rubber increased from the 1969 low of 27,650 tons to 37,000 tons in 1971--the highest level since 1967. It is estimated that this resulted in the export of 29,600 tons worth $9.4 million at the FOB Saigon price of $.3172/kg. (RSS #1 quality French Franc area). This dollar value of exports is slightly lower than the $10.4 million for 1969, despite the increased production, because domestic use increased somewhat and the export price declined.

Production increased from the previous year level in both 1970 and again in 1971. This was due to increases in the tappable area and the yield per tappable hectare. Yield increases resulted from (1) increases in the percent of tappable area actually tapped from 48 percent in 1969 to 60 percent in 1971 and (2) a slightly higher yield per tapped area--934 kg./ha. in 1971. Tappable area increased because previously planted trees reached their seventh birthday during this time. This effect was partially offset by the replanting of old areas in 1971 which resulted in a decline in tappable area for 1970.

Production in 1972 is optimistically estimated to be around 32,000 to 32,500 tons assuming the low 1970 yield per tappable hectare of 479 kg./ha. is achieved. If the 803 hectares of trees planted in 1965 survived and were tappable in 1972 then tappable area could be the highest since at least 1951--60,377 hectares. With consumption and other domestic use equal to 7,600 tons, exports in 1972 could amount to 24,900 tons worth $6.6 million at a projected low export price of $.2645/kg.

Yields in 1972 are estimated to be low because a smaller percentage of tappable area will likely be tapped due to increased hostilities in 1972. If the 803 hectares expected to increase tappable area this year are lost, the lower production estimate of 32,000 is implied. Actual damages to existing trees and reductions in tapped area could have a considerably larger effect on output than suggested here. Production of 30,000 tons may turn out to be optimistic this year.

Prospects for Rubber by 1977

The prospects for rubber production and export earnings during the next 5 years are limited by the present planted area and the maximum potential yields for the type and age of trees now growing. A moderately optimistic projection of key variables indicates that total production could reach 67,500 tons by 1977. This is more than double the estimated 1972 level of 32,500 tons due to a projected doubling in yield per tappable hectare and a fractional increase in tappable area. The dollar value of exports are optimistically projected to increase from the estimated 1972 level of $6.6 million to possibly $15-1/2 million by 1977.

A less optimistic projection places total production at a level of 32,000 tons each year from 1972-1977 assuming a continued poor security situation which might keep yield at least as low as in 1970 and also keep tappable area from increasing above the 1971 level. Export earnings in this case would total less than $6 million by 1977, due to 60 percent smaller exports than under the optimistic projection.

The optimistic projection of rubber production for 1977 depends on the survival of nearly 870 hectares of trees planted in the 1966-1970 period and the return to a situation that would allow the tapping of most tappable areas by 1977. The small number of trees planted in recent years is the major factor constraining increases in production. This is a known factor. The major unknown factor is how many hectares of abandoned area, now considered theoretically tappable, will actually be tapped by 1977 and what is the probable yield per tapped hectare for these trees. The projection of 67,500 tons production for 1977 is based on a projection that the percent of tappable area that is tapped will approach 100 percent and that yield per tapped hectare will increase to 1,100 kg./ha. by 1978. The less optimistic assumption that results in only 32,000 tons production is based on a poor security condition in which no changes are projected for the next 5 years.

Domestic use is projected to increase to about 10,000 tons by 1977 based on a mid-range projection of national income per capita, population, and the price of rubber relative to the consumer price index. Thus 1977 exports could vary from about 85 percent to 70 percent of total production, depending on how much is produced.

The most optimistic projection of the dollar value of exports of about $15-1/2 million is based on the projected low export price of $.2645/kg. At this price the pessimistic production estimate results in less than $6 million in export earnings by 1977.

Table 13.--Situation and near-term prospects for rubber 1/

Item	1968	1969	1970	1971	Estimated 1972
Large plantations only					
Seven-year old tree area (ha.)	2,794	1,002	764	1,125	803
Change in tappable area (ha.)	-1,246	337	-1,595	2,994	803
Tappable area (ha.)	57,838	58,175	56,580	59,574	60,377
Yield per tappable area (kg./ha)	479	432	479	558	479
Total production and use 2/					
Total production (m.t.)	34,000	27,650	33,000	37,000	32,500
Domestic use (m.t.)	4,753	6,819	9,399	7,400	7,600
Quantity exported (m.t.)	29,247	20,831	23,601	29,600	24,900
Dollar value of exports (Mil. U.S. $)	11.0	10.4	9.6	9.4	6.6

	Projected				
	1973	1974	1975	1976	1977
Large plantations only					
Seven-year old tree area (ha.)	312	162	12	75	307
Change in tappable area (ha.)	312	162	12	75	307
Tappable area (ha.)	60,689	60,851	60,863	60,938	61,245
Yield per tappable area (kg./ha.)	485	514	600	776	982
Total production and use 2/					
Total production (m.t.)	33,100	35,200	41,100	53,200	67,600
Domestic use (m.t.)	8,300	8,600	8,900	9,300	9,800
Quantity exported (m.t.)	24,800	26,600	32,200	43,900	57,800
Dollar value of exports (Mil. U.S. $)	6.6	7.0	8.5	11.6	15.3

1/ Assuming a return to a relatively peaceful situation beginning in 1973. See text for less optimistic projection.

2/ These estimates are for large plantations and small plantations combined.

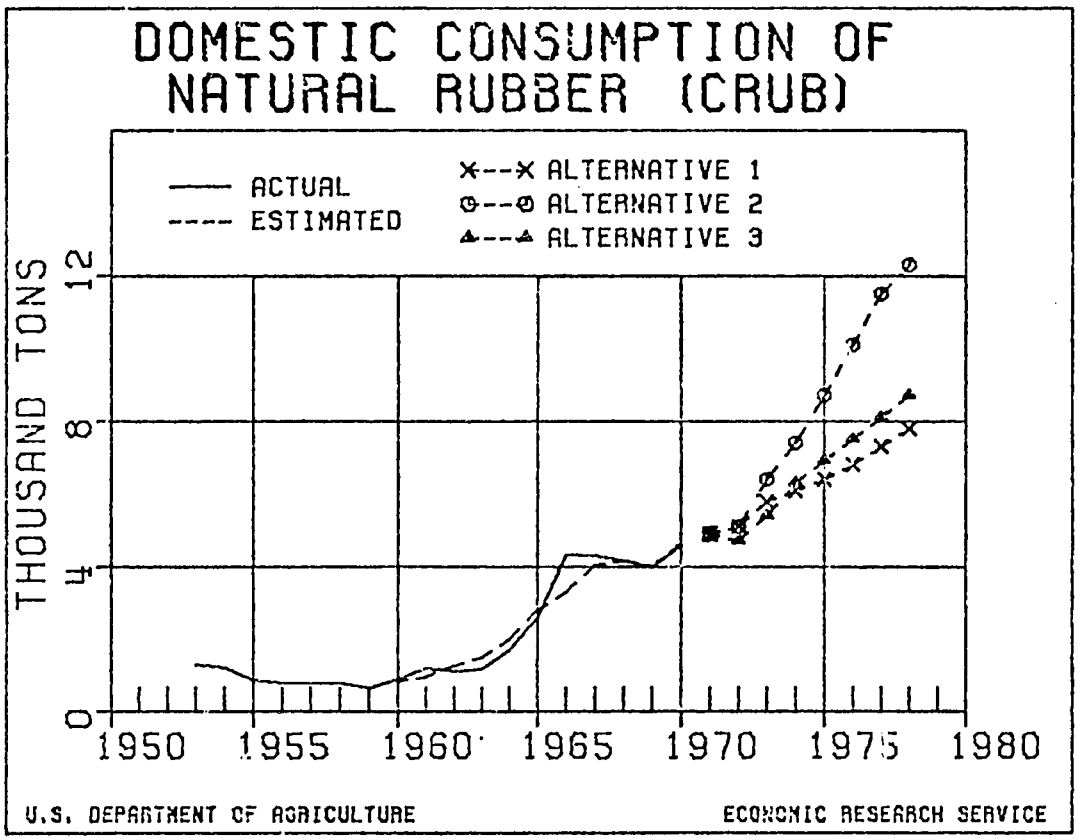
DOMESTIC CONSUMPTION OF
NATURAL RUBBER (CRUB)
ACTUAL
ESTIMATED
ALTERNATIVE 1
ALTERNATIVE 2
ALTERNATIVE 3
THOUSAND TONS
0
4
8
12
1950
1955
1960
1965
1970
1975
1980
U.S. DEPARTMENT OF AGRICULTURE
ECONOMIC RESEARCH SERVICE

Figure 12

POLICY ISSUES AND IMPLICATIONS

1. Economic development prospects for Vietnam center around the war and the time and conditions under which it will be terminated. An early return to peacetime conditions and demobilization could free many resources for rebuilding Vietnam's economy. Government can do much to create conditions of general security and business confidence through fiscal and monetary programs to control inflation, develop incentives to save and concurrently expand priority investment, and establish a trade policy that facilitates the conduct of business and assures reasonable returns prospect.

2. A period of war-time demands with inadequate domestic production, large aid inputs, and general inflationary pressures have imposed large management burdens on the government in trying to orchestrate greater economic stability and equity. Therefore a settlement of the war and a return to a secure peacetime situation sets the stage for a greatly improved economic environment. Local businessmen and government administrators probably are aware of many highly promising private and public investment possibilities without outside advice. However, even with a return to a stable peace, the country will likely require substantial outside resources to rebuild and expand its agriculture and generally expand the country's output potential.

3. Appraisals for the next 5 years point to a generally tight supply situation for major food crops and rubber relative to probable growth in demand. This general situation has important implications for programs relating to (1) expansion of domestic production, (2) limiting domestic demand, and (3) development of much needed exports to reduce dependence on foreign aid.

4. The need for production expansion programs is clear cut if the country is to approach self sufficiency. Vietnam has a large agricultural resource base. Development of these resources should receive high priority in allocating scarce resources. Specific actions to expand production might include movement of the population back to rural areas, reclamation of land for crops and pasture, programs to increase use of high-yielding varieties and improved breeding stock, investment in rebuilding and improving water control systems, and capital outlays to rebuild and expand rubber production, fisheries, and forest resources.

5. The generally tight supply-demand balance indicated for major foods also suggests the need for a policy and specific programs to limit domestic demand expansion and encourage increased savings and investment. Such objectives may require taxes and other fiscal measures designed to limit the flow of income to consumers; they may require some combination of prices and/or special taxes to limit domestic use and thus make supplies available for export; and they may require a system of support prices or subsidies to growers designed to stimulate expanded output. Such measures imply an efficient and aggressive government to carry out such policy directions even though the measures may be generally unpopular.

6. Export potentials must be explored and developed. Nearby markets are growing rapidly and will likely provide outlets, particularly for available foods, feeds, and probably for rubber. Vietnam's export prospects appear promising for a number of high-value foods including seafoods, selected tropical fruit and vegetable items, spices, forestry products, and possibly some animal products if feed resources can be developed. However, the current and prospective supply-demand balance for foods and rubber appear tight even under fairly optimistic assumptions for increased production. This situation springs mainly from the fact that a substantial share of total food use comes from imports. And it may be even longer before substantial net exports of foods will be available.

APPENDIX TABLES

Appendix table 1.--Gross national product or expenditure, 1960 to 1968, and estimates for 1969-71

(Billion $VN)

Item	Variable	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Private consumption	C	63.9	70.1	77.9	85.4	93.2	110.4	178.4	284.4	318.7			
Food	CF	31.7	32.3	39.4	42.4	44.1	54.8	86.7	155.5	177.7			
Nonfood	CN	32.2	37.8	38.5	43.0	49.1	55.6	91.7	128.9	141.0			
Government expenditure	G	14.0	15.3	19.7	21.0	25.0	32.5	52.9	73.5	86.5			
Public administration		8.5	9.2	10.2	11.5	13.0	12.0	15.0	24.6	27.6			
National defense		5.5	6.1	9.5	9.5	12.0	20.5	37.9	48.9	58.9			
Gross domestic investment	I	10.3	7.5	9.4	7.6	12.8	17.1	34.5	45.2	31.2			
Investment fixed	IF	6.6	6.8	8.7	8.1	9.2	12.0	27.5	35.1	25.5			
Net stock change	IS	3.7	0.7	0.7	-0.5	3.6	5.1	7.0	10.1	5.7			
Gross domestic expenditure	GDE	88.2	92.9	107.0	114.0	131.0	160.0	265.8	403.1	436.4			
Exports	EX	6.1	5.0	5.4	8.4	7.8	12.0	30.5	42.5	28.2			
Imports	-M	-11.6	-12.5	-17.9	-21.0	-23.0	-28.6	-76.0	-110.7	-105.8			
Gross domestic product	GNP	82.7	85.4	94.5	101.4	115.8	143.4	220.2	334.9	358.8			
Factor payments to abroad	FP	-0.8	-0.7	-.6	-0.4	-0.5	2.6	17.4	21.8	26.4			
Gross national product	GNP	81.9	84.7	93.9	101.0	115.3	146.0	237.6	356.7	385.3			
Net import, (M - EX)-FP		6.3	8.2	13.1	13.1	15.7	14.0	28.2	46.4	51.1			
Gross domestic expenditure	GDE	88.2	92.9	107.0	114.0	131.0	160.0	265.8	403.1	436.4			

Source: Vietnam Statistical Yearbook. Recent data from Estimates of National Income in Vietnam, National Bank of Vietnam July 1971 and Revenue National Du Vietnam, Banque National du Vietnam, 1968.

Appendix table 2.--Gross national product expenditures, billion 1960 piasters, 1960 to 1968 and estimates for 1969-71

(Billion $VN in 1960 prices)

Item	Variable identity	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Private consumption	C'	63.9	66.15	71.49	72.39	76.43	78.27	77.90	86.98	77.72			
Government expenditure	G'	14.0	14.75	18.51	19.01	21.62	24.91	33.92	37.44	42.45			
Gross investment	I'	10.3	7.34	8.76	7.28	11.22	13.43	19.49	20.95	14.27			
Domestic expenditure	GDE'	88.2	88.24	98.76	98.68	109.27	116.61	131.31	145.37	134.44			
Exports	EX'	6.13	5.68	5.86	6.28	7.35	9.90	14.61	15.32	9.11			
Imports	M'	-11.57	-11.50	-14.78	-16.56	-17.13	-20.44	-45.51	-56.76	-46.56			
Gross domestic product	GDP'	82.7	82.42	89.86	90.40	99.49	106.07	100.41	103.93	96.99			
Factor payments to abroad	FP'	-0.83	-.73	-.54	-.41	-.44	1.89	0.08	0.75	8.80			
Gross national product	GNP'	81.93	81.69	89.32	89.99	99.05	107.96	108.49	110.66	105.79			
Net import (M-EX) FP'		6.3	6.55	9.44	8.69	10.22	8.65	22.82	34.69	26.65			
Domestic expenditure	GDE'	88.2	88.24	98.76	98.68	109.27	116.61	131.31	145.37	134.44			

Appendix table 3.--Rice: Supply and use, calendar years 1960-71

Item	Variable name	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
		1,000 MT											
Paddy													
Production 1/	QPPV$_{-1}$	5,041	4,955	4,607	5,205	5,327	5,185	4,822	4,336	4,688	4,366	5,115	5,716
Seed use (2%)	-	101	99	92	104	107	104	96	87	94	87	102	114
Hulls (21%)	-	1,059	1,040	968	1,093	1,119	1,089	1,013	910	984	917	1,074	1,200
Bran (12%)	-	605	595	553	625	639	622	579	520	563	524	614	686
Brokens (5%)	-	252	248	230	260	266	259	241	217	234	218	256	286
Rice													
Production (60%)	QRPV$_{-1}$	3,024	2,973	2,764	3,123	3,196	3,111	2,893	2,602	2,813	2,620	3,069	3,430
Beginning stocks 2/	ESTK$_{-1}$	---	---	---	55	47	93	17	15	103	205	9	57
Imports	-	---	---	---	---	---	130	434	750	653	332	568	138
Exports	-	340	155	84	323	49	---	---	---	---	---	---	---
Net imports	RNIMP	-340	-155	-84	-323	-49	130	434	750	653	332	568	138
Ending stocks 2/	ESTK	---	---	---	47	93	17	15	103	205	9	57	38
Domestic use													
Total	QDV	2,684	2,818	2,680	2,808	3,101	3,317	3,329	3,264	3,364	3,148	3,589	3,587
Per capita (Kg.)	QDV/N2	190.7	194.4	187.7	198.7	216.0	220.8	220.3	200.8	206.9	190.3	207.1	201.7
Population (Thou.)	N2	14,072	14,494	14,275	14,133	14,359	15,024	15,112	16,256	16,259	16,543	17,333	17,784

1/ From paddy produced for current marketing year.

2/ Saigon stocks.

Appendix table 4.--Paddy--hectares, yield, and production

	Unit	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Hectares													
Delta	1,000	1,590	1,662	1,753	1,787	1,779	1,675	1,629	1,650	1,746	1,787	1,854	1,948
Other	1,000	728	691	726	751	783	754	666	646	648	643	657	677
Total	1,000	2,318	2,353	2,479	2,538	2,562	2,429	2,295	2,296	2,394	2,430	2,511	2,625
Yield													
Delta	Kg./ha.	2,200	2,046	2,228	2,219	2,148	2,101	1,916	2,127	1,896	2,198	2,367	2,441
Other	Kg./ha.	2,001	1,748	1,789	1,814	1,742	1,728	1,824	1,824	1,630	1,846	2,021	2,318
Total	Kg./ha.	2,141	1,958	2,100	2,099	2,024	1,985	1,889	2,042	1,811	2,105	2,276	2,409
Production													
Delta	1,000 MT	3,498	3,400	3,906	3,965	3,821	3,519	3,121	3,510	3,310	3,928	4,388	4,755
Other	1,000 MT	1,457	1,207	1,299	1,362	1,364	1,303	1,215	1,178	1,056	1,187	1,328	1,569
Total	1,000 MT	4,955	4,607	5,205	5,327	5,185	4,822	4,336	4,688	4,366	5,115	5,716	6,324

Appendix table 5.--Selected rice and paddy prices

	Consumer Price Index (1963=100)	Current prices: Saigon--rice: Retail #1	Current prices: Saigon--rice: Retail #2	Current prices: Saigon--rice: Wholesale #1	Current prices: Provincial rice mills--paddy: West Delta	Current prices: Provincial rice mills--paddy: Central Lowlands	Current prices: Provincial rice mills--paddy: Farm value 1/
	Percent	$VN/100 Kg.					
1960	85.0	n.a.	500	397	265	357	259
1961	90.4	n.a.	680	519	349	470	364
1962	93.2	n.a.	650	520	339	457	360
1963	100.0	n.a.	650	529	337	453	363
1964	102.9	n.a.	770	550	363	489	402
1965	119.7	n.a.	880	654	373	580	442
1966	194.4	1,970	1,340	1,050	687	1,230	579
1967	279.0	3,780	2,720	2,030	1,333	1,529	1,200
1968	354.2	3,980	2,820	2,070	1,213	1,870	1,250
1969	431.6	5,520	3,950	3,135	2,051	2,364	1,700
1970	590.4	7,780	5,320	4,023	2,467	3,209	n.a.
1971	697.3	8,188	5,853	4,799	2,938	3,398	n.a.

	Deflated by Consumer Price Index: Saigon--rice: Retail #1	Deflated by Consumer Price Index: Saigon--rice: Retail #2	Deflated by Consumer Price Index: Saigon--rice: Wholesale #1	Deflated by Consumer Price Index: Provincial rice mills--paddy: West Delta	Deflated by Consumer Price Index: Provincial rice mills--paddy: Central Lowlands	Deflated by Consumer Price Index: Provincial rice mills--paddy: Farm value 1/
	$VN/100 Kg.					
1960	n.a.	588	467	312	420	305
1961	n.a.	752	574	386	520	403
1962	n.a.	697	558	316	426	336
1963	n.a.	650	529	337	453	363
1964	n.a.	748	534	353	475	391
1965	n.a.	735	546	312	485	369
1966	1,013	689	540	353	633	298
1967	1,355	975	728	478	548	430
1968	1,124	796	584	342	528	353
1969	1,279	915	726	475	548	394
1970	1,318	901	681	418	544	n.a.
1971	1,174	839	688	421	487	n.a.

1/ Bank of Vietnam data for farm value of output.

Appendix table 6.--Fish analysis data

Year	Supply			Utilization				
				Domestic				
				Per capita		Total	Exports	Net imports
	Production	Imports	Total	Total	Urban			
	M.T.	M.T.	M.T.	Kg.	Kg.	M.T.	M.T.	M.T.
Variable name	QPF	FIMP		QDF/N_2	QDF/NU_2	QDF	FEXP	FNIMP
1960	262,915	---	262,915	18.6	93.4	262,502	413	-413
1961	304,315	---	304,315	21.0	97.3	303,682	633	-633
1962	332,215	---	332,215	23.2	101.1	331,488	727	-727
1963	364,873	---	364,873	25.8	105.3	364,010	863	-863
1964	397,015	---	397,015	25.7	99.0	369,151	864	-864
1965	375,015	---	375,015	24.9	87.4	374,191	824	-824
1966	380,544	505	381,049	25.2	81.4	381,049	---	505
1967	410,740	724	411,464	25.3	75.5	411,464	---	724
1968	407,080	16,372	423,452	26.0	72.4	423,452	---	16,372
1969	463,844	14,880	478,724	28.9	75.2	478,724	---	14,880
1970	577,450	1,416	578,866	33.4	81.4	578,900	---	1,416
1971	587,500	---	587,500	36.7	97.0	586,270	1,230	-1,230

Appendix table 7.--Fish analysis data

Year	Consumer price index	Current prices					Deflated by CPI				
		At dock 1/	Wholesale	Retail			At dock	Wholesale	Retail		
				Ca'Loc'	Ca'Trô	Average			Ca'Loc'	Ca'Trô	Average
Variable name	1963=100	$VN 100 Kg.	$VN 100 Kg.	$VN/Kg.	$VN/Kg.	$VN/Kg.	$VN 100 Kg.	$VN 100 Kg.	$VN/Kg.	$VN/Kg.	$VN/Kg.
	CPI		PFSHW			PFR		PFSHW/CPI			PFR/CPI
1958	84.0	N.A.	2,653	N.A.	N.A.	N.A.	N.A.	3,158	N.A.	N.A.	N.A.
1959	86.1	N.A.	2,451	41.6	41.6	41.6	N.A.	2,847	48.3	48.3	48.3
1960	85.0	800	2,632	39.0	35.0	32.0	941	3,096	45.9	41.2	37.6
1961	90.4	800	2,673	39.2	33.2	36.2	885	3,178	43.4	36.7	40.0
1962	93.2	800	3,115	41.5	33.6	37.6	858	3,342	44.5	36.1	40.4
1963	100.0	1,150	3,938	49.0	44.7	46.8	1,150	3,938	49.0	44.7	46.8
1964	102.9	1,137	3,898	50.5	49.9	50.2	1,105	3,788	49.1	48.5	48.8
1965	119.7	1,447	4,561	60.8	60.7	60.8	1,209	3,810	50.8	50.7	50.8
1966	194.4	3,817	9,422	125.9	132.2	129.0	1,963	4,847	64.8	68.0	66.4
1967	279.0	6,145	12,979	149.0	167.0	158.0	2,202	4,652	53.4	59.9	56.6
1968	354.2	8,932	21,042	244.0	267.0	255.5	2,522	5,941	68.9	75.4	72.1
1969	431.6	9,213	24,000	306.0	334.0	320.0	2,135	5,561	70.9	77.4	74.2
1970	590.4	12,250	32,042	363.0	399.0	381.0	2,075	5,427	61.5	67.6	64.5
1971	697.3	N.A.	36,000	424.0	434.0	429.0	N.A.	5,163	60.8	62.2	61.5

1/ Derived from Bank of Vietnam estimate of total fish catch value divided by total catch.

Appendix table 8.--Selected pork data

Year	Controlled slaughter		Price index of pigs 1957-59 = 100	Selected prices								Consumer Price Index (excluding rent)
				Current				Deflated by Consumer Price Index				
				Wholesale			Retail, Saigon boneless leg	Wholesale			Retail, Saigon boneless leg	
	Vietnam	Saigon		Saigon	Provincial markets	Saigon Slaughter House		Saigon	Provincial markets	Saigon Slaughter House		
	000	000		$VN/100 Kg.								1963=100
1956	883.6	---	---	2,867	---	---	---	3,203	---	---	---	89.5
1957	929.5	---	---	2.375	---	---	---	2,794	---	---	---	85.0
1958	1,025.1	---	---	2,223	---	---	---	2,675	---	---	---	83.1
1959	1,024.6	---	---	2,319	---	---	---	2,715	---	---	---	85.4
1960	1,181.0	---	91.6	2,054	---	---	---	2,437	---	---	---	84.3
1961	1,139.3	---	95.5	2,179	---	---	---	2,418	---	---	---	90.1
1962	955.7	312.3	109.7	2,559	---	---	6,347	2,752	---	---	6,825	93.0
1963	909.2	330.6	141.5	3,412	---	---	7,190	3,412	---	---	7,190	100.0
1964	1,090.7	394.2	133.9	3,034	3,259	3,069	7,040	2,940	3,158	2,974	6,822	103.2
1965	1,247.5	413.9	159.4	4,025	3,852	4,088	9,210	3,286	3,144	3,337	7,518	122.5
1966	1,093.4	358.1	295.4	6,312	7,665	6,270	14,680	3,029	3,678	3,009	7,044	208.4
1967	1,163.3	369.3	435.9	10,117	10,436	9,950	23,400	3,311	3,415	3,256	7,657	305.6
1968	850.1	272.2	651.6	15,383	14,772	15,534	36,100	3,941	3,785	3,980	9,249	390.3
1969	1,060.5	354.8	726.4	16,704	18,393	16,150	39,500	3,555	3,914	3,437	8,406	469.9
1970	1,137.7	395.9		24,742	25,147		54,400	3,866	3,929		8,500	640.0

Appendix table 10. --Rubber prices and monetary yields to exporters

Year	Export price, RSS#1, FOB Saigon (French franc area) 1/			Effective net exchange rate for rubber 1/	Piaster yield 1/	RSS#1, Saigon price	
						Wholesale 3/	FOB 4/
	US¢/lb.	US¢/kg.	$VN/kg. 2/	VN/US	$VN/kg.	$VN/kg.	$VN/kg.
1947							32.29
1948							37.84
1949							37.36
1950							35.91
1951						24.10	24.10
1952						14.62	14.62
1953						15.37	15.37
1954						18.81	18.81
1955						27.87	27.87
1956						23.74	23.74
1957						23.92	23.92
1958	25.45	56.11	19.64	47.08	26.41	19.59	19.59
1959	31.48	69.40	24.29	47.08	32.67	23.97	23.97
1960	35.41	78.07	27.32	47.08	36.75	27.05	27.06
1961	27.17	59.90	20.96	43.93	26.32	20.60	20.59
1962	25.48	56.17	19.66	45.65	25.63	19.83	19.37
1963	23.66	52.16	18.26	45.65	23.80	18.06	17.92
1964	21.98	48.46	16.96	45.65	22.11	16.94	16.94
1965	22.55	49.71	17.47	45.65	22.70	17.36	17.36
1966	20.92	46.12	26.21	64.80	29.93	26.27	26.27
1967	17.44	38.44	30.77	91.41	35.14	30.74	30.47
1968	17.09	37.68	30.14	116.40	43.85	26.96	29.95
1969	22.56	49.74	39.78	116.40	57.88	62.86	39.86
1970	18.39	40.54	32.43	167.41	67.87	69.17	32.25
1971	14.39	31.72	25.39	291.00	92.62		
1972 (3-6-72)				405.00			
1980 5/	12.00	26.45		(405.00)	(107.36)		

1/ USAID, Vietnam, Office of Joint Economic Affairs, Annual Statistical Bulletin No. 11 (October 1968), and unpublished information from 1968-71.

The Piaster Yield is obtained from column 2 using the actual effective rate at which exporters were able to convert dollars to piasters in each month of the year. The reported prices and effective net exchange rates are averages for the year (column (5) = column (2) X Column (4).

2/ Converted from US#/Kg. to piasters using an exchange rate prior to June 1966 of 35/1 and since then using an exchange rate of 80/1.

3/ National Institute of Statistics, Vietnam Statistical Yearbook 1970 (and 1967-68 issue). 1969 and 1970 from National Institute of Statistics, Monthly Bulletin of Statistics, No. 2 (1972).

4/ AESS, Agricultural Statistics Yearbook 1970 (and earlier issues). This is the average export price in three market areas assumed equal the wholesale price 1951 to 1959. 1947-1951 based on changes in the price of rubber in New York.

5/ Based on FAO projections of changes in world price.

Appendix table 9.--Rubber: Production, area and yield 1/

Item	1950	1951	1952	1953	1954	1955	1956	1957
Large and small plantations combined 2/								
Production (M.T.)	33,936	37,280	45,602	53,256	51,086	66,340	70,230	69,660
Planted area (Ha.)	63,400	63,285	62,245	62,296	63,752	75,060	75,100	74,900
Tapped area (Ha.)								
Yield per tapped hectare (Kg/Ha.)								
Large plantations only 2/								
Production (M.T.)	33,936	37,280	45,602	53,256	51,086	53,651	59,435	59,379
Planted area (Ha.)	63,400	63,285	62,245	62,296	63,752	63,060	63,096	62,934
Tapped area (Ha.)		41,741	50,610	54,671	52,995	58,155	57,682	57,334
Tappable area (Ha.)		58,852	58,019	58,564	59,767	59,633	59,119	58,326
Yield (Kg./Ha.):								
Per tapped hectare		893	901	974	964	923	1,030	1,035
Per tappable hectare		633	786	909	855	900	1,005	1,018

Item	1958	1959	1960	1961	1962	1963	1964
Large and small plantations combined 2/							
Production (M.T.)	71,660	75,380	77,560	78,140	77,870	76,180	74,200
Planted area (Ha.)	76,300	100,800	109,470	122,720	135,630	142,770	134,700
Tapped area (Ha.)				72,783	73,590	72,630	72,530
Yield per tapped hectare (Kg/Ha.)				1,087	1,058	1,048	1,023
Large plantations only 2/							
Production (M.T.)	62,662	65,611	68,211	70,832	68,283	67,218	69,169
Planted area (Ha.)	64,280	68,034	72,047	74,437	75,051	74,703	75,268
Tapped area (Ha.)	57,212	57,313	57,467	57,621	56,906	56,961	56,935
Tappable area (Ha.)	57,935	57,848	58,138	58,290	58,055	57,435	57,704
Yield (Kg./Ha.):							
Per tapped hectare	1,095	1,145	1,187	1,229	1,200	1,182	1,223
Per tappable hectare	1,082	1,134	1,173	1,215	1,176	1,172	1,199

Item	1965	1966	1967	1968	1969	1970	1971
Large and small plantations combined 2/							
Production (M.T.)	64,770	49,455	42,510	34,000	27,650	33,000	
Planted area (Ha.)	129,660	126,340	115,735	105,730	104,950	105,800	
Tapped area (Ha.)	64,925	56,720	53,505	41,410	36,970	39,240	
Yield per tapped hectare (Kg/Ha.)	998	872	793	821	748	840	
Large plantations only 2/							
Production (M.T.)	56,425	46,440	39,413	27,695	25,147	27,095	
Planted area (Ha.)	75,207	74,897	73,376	70,732	69,955		
Tapped area (Ha.)	47,042	42,769	42,690	34,414	27,972		
Tappable area (Ha.)	57,635	57,941	59,084	57,838	58,175		
Yield (Kg./Ha.):							
Per tapped hectare	1,200	1,086	923	805	899		
Per tappable hectare	979	802	667	479	432		

1/ Major sources include: Agricultural Economics and Statistical Service, Ministry of Land Reform, Agriculture, Fishery and Animal Husbandry Development, Agricultural Statistics Yearbook, 1970 (and earlier issues).

National Institute of Statistics, Presidency of Republic of Vietnam, Directorate General of Planning, Vietnam Statistical Yearbook 1970 (and earlier issues).

United States Operations Mission to Vietnam, Division of Agriculture and Natural Resources, Vietnamese Agricultural Statistics, Saigon 1959.

2/ Statistics appear to be only for plantations of 500 Ha. or more ("large plantations") before 1955.

Appendix table 11.--Framework estimates of endogenous variables, 1968-71

Item	Unit	1968	1969	1970	1971
PE	1960=100	329	464	535	613
M'	Bil. 1960 $VN	46.6	63.8	55.3	54.5
GNP (current)	Bil. $VN	395	664	846	1,069
GNP' (real)	Bil. 1960 $VN	106	108	119	131
CN' (real)	Bil. 1960 $VN	48.4	52.2	54.0	57.7
GDE' (real)	Bil. $VN	134	159	164	177
CPI (including rent)	1963=100	356	561	680	820
CF' (real)	Bil. 1960 $VN	29.3	35.0	41.9	44.3
PY	1960=100	374	614	712	815
HI (current)	Bil. $VN	317	532	679	859
PNF	1960=100	295	410	471	539
PF	1960=100	600	1,000	1,239	1,520
NI (current)	Bil. $VN	335	562	716	905
PG	1960=100	214	278	312	349
PEX	1960=100	326	508	589	687
PI	1960=100	236	315	356	402
NI' (real)	Bil. 1960 $VN	89.5	91.7	100.7	111.0
HI' (real)	Bil. 1960 $VN	84.8	86.6	95.4	105.4
PC	1960=100	410	647	807	965
CPIX (excluding rent)	1963=100	386	613	746	901
PLT-7	Hectares	2,794	1,002	764	1,125
RML	Hectares	2,656	852	6,633	.0001
YRUB	Kg./hectare	449	432	479	558
TLA	Hectares	57,838	58,175	56,580	59,575
QRUB (Large Plantations)	Metric Ton	25,969	25,132	27,102	33,243
TQRUB (total)	Metric Ton	31,882	27,632	33,007	37,026
PCRB	Kg./capita	.30	.31	.38	.38
CRUB	Metric Ton	4,931	5,077	6,649	7,166
QREX	Metric Ton	26,366	19,752	21,519	27,860
EXRUB'	Bil. 1960 $VN	.24	.15	.12	.10
EXRUS	Thou. U.S. $	9,935	9,825	8,724	8,837
QDEL	1,000 M.T.	281	381	461	543
QDV/N2	Kg./capita	204	187	203	194
Δ ESTK	1,000 M.T.	-102	196	-48	19
PFSHW/CPI	$VN/100 Kg.	5,965	6,476	5,260	5,724
QPKC	Mil. Head	.905	1.028	1.118	1.163
PRW/CPI (real)	$VN/100 Kg.	615	684	642	718
PPKW/CPI (real)	$VN/100 Kg.	4,248	4,447	3,908	4,255
QDF	Mil. M.T.	444	568	671	728
QRPV	1,000 M.T.	2,567	3,003	3,481	3,724
QPF	Mil. Metric Ton	428	554	669	728
FNIMP	Mil. Metric Ton	16.4	14.9	1.40	.0001
RNIMP/N2	Kg./capita	38.0	20.0	32.0	7.0
HD	1,000 Hectares	1,688	1,782	1,852	1,884
HO	1,000 Hectares	638	652	677	695
YD	Kg./Hectare	1,882	2,140	2,392	2,455
YO	Kg./Hectare	1,723	1,827	2,028	2,274
ESTK	1,000 M.T.	205	9	57	38

Appendix table 11.--Framework estimates of endogenous variables, 1972-77

- Continued -

Item	Units	Alternative I					
		1972	1973	1974	1975	1976	1977
PE	1960=100	760	960	1,034	1,086	1,139	1,195
M'	Bil. 1960 $VN	70.0	75.0	60.0	55.0	50.0	45.0
GNP (current)	Bil. $VN	1,336	2,047	2,385	2,714	3,094	3,536
GNP' (real)	Bil. 1960 $VN	131	139	145	153	163	174
CN' (real)	Bil. 1960 $VN	60.3	62.0	62.9	64.6	66.9	69.4
GDE' (real)	Bil. $VN	193	195	195	198	202	207
CPI (including rent)	1963=100	1,103	1,528	1,694	1,816	1,941	2,077
CF' (real)	Bil. 1960 $VN	40.4	45.3	48.3	52.0	55.8	59.9
PY	1960=100	1,022	1,474	1,650	1,778	1,900	2,036
HI (current)	Bil. $VN	1,075	1,611	1,830	2,030	2,252	2,505
PNF	1960=100	665	837	900	945	990	1,038
PF	1960=100	2,096	2,975	3,321	3,578	3,841	4,125
NI (current)	Bil. $VN	1,131	1,689	1,920	2,130	2,366	2,635
PG	1960=100	419	515	550	575	600	627
PEX	1960=100	904	1,243	1,375	1,472	1,572	1,679
PI	1960=100	487	604	647	678	709	741
NI' (real)	Bil. 1960 $VN	110.7	114.6	116.3	119.8	124.5	129.4
HI' (real)	Bil. 1960 $VN	105.2	109.3	110.9	114.2	118.5	123.0
PC	1960=100	1,239	1,739	1,952	2,119	2,287	2,468
CPIX (excluding rent)	1963=100	1,214	1,686	1,870	2,006	2,145	2,295
PLT-7	Hectares	803	312	162	12	75	307
RML	Hectares	.0001	.0001	.0001	.0001	.0001	.0001
YRUB	Kg./Hectare	479	485	514	600	776	982
TLA	Hectares	60,378	60,690	60,852	60,864	60,939	61,246
QRUB(Large Plantations)	Metric Ton	28,921	29,435	31,278	36,518	47,289	60,144
TQRUB (total)	Million Tons	32,536	33,114	35,188	41,083	53,200	67,662
PCRB	Kg./capita	.38	.43	.43	.44	.46	.47
CI /B	Million Tons	7,373	8,486	8,848	9,321	9,946	10,594
QREX	Million Tons	23,163	22,628	24,340	29,763	41,254	55,067
EXRUB'	Bil. 1960 $VN	.05	.04	.04	.04	.06	.07
EXRUS	Thou. U.S. $	6,127	5,985	6,438	7,872	10,912	14,565
QDEL	1,000 M.T.	588	514	578	637	668	690
QDV/N2	Kg./capita	205	195	191	192	195	202
ΔESTK	1,000 M.T.	-25.0	.0001	.0001	.0001	.0001	.0001
PFSHW/CPI	$VN/100 Kg.	4,570	6,094	5,830	5,613	5,728	5,791
QPKC	Million head	1.027	1.021	.998	1.114	1.029	.983
PRW/CPI (real)	$VN/100 Kg.	654	745	780	791	788	755
PPKW/CPI (real)	$VN/100 Kg.	3,800	4,605	4,545	4,401	4,575	4,677
QDF	Million M.T.	735	785	878	955	1,023	1,095
QRPV	1,000 M.T.	3,375	3,678	3,947	4,237	4,533	4,833
QPF	Million M.T.	735	785	878	955	1,023	1,095
FNIMP	Million M.T.	.0001	.0001	.0001	.0001	.0001	.0001
RNIMP/N2	Kg./capita	13.0	25.0	12.0	5.0	.0001	.0001
HD	1,000 Hectares	1,872	1,947	2,047	2,142	2,230	2,312
HO	1,000 Hectares	672	699	756	829	911	998
YD	Kg./Hectare	2,268	2,393	2,425	2,457	2,489	2,521
YO	Kg./Hectare	2,053	2,105	2,136	2,168	2,199	2,231
ESTK	1,000 M.T.	63.0	63.0	63.0	63.0	63.0	63.0

Appendix table 11.--Framework estimates of endogenous variables, 1972-77

- Continued -

Item	Units	Alternative II					
		1972	1973	1974	1975	1976	1977
PE	1960=100	760	963	1,077	1,186	1,302	1,428
M'	Bil. 1960 $VN	70.0	68.5	67.0	65.0	63.0	61.0
GNP (current)	Bil. $VN	1,346	2,160	2,833	3,654	4,617	5,772
GNP' (real)	Bil. 1960 $VN	131	147	164	184	204	225
CN' (real)	Bil. 1960 $VN	60.5	65.2	70.1	76.0	81.9	88.2
GDE' (real)	Bil. $VN	193	206	219	235	250	265
CPI (including rent)	1963=100	1,103	1,534	1,795	2,055	2,345	2,673
CF' (real)	Bil. 1960 $VN	40.8	47.0	53.1	60.2	66.7	72.8
PY	1960=100	1,025	1,467	1,728	1,989	2,266	2,568
MI (current)	Bil. $VN	1,084	1,700	2,175	2,734	3,364	4,092
PNF	1960=100	665	839	937	1,031	1,130	1,238
PF	1960=100	2,096	2,988	3,534	4,080	4,691	5,386
NI (current)	Bil. $VN	1,140	1,782	2,280	2,868	3,532	4,300
PG	1960=100	419	516	571	623	678	738
PEX	1960=100	905	1,248	1,456	1,662	1,893	2,153
PI	1960=100	488	606	673	736	804	877
NI'(real)	Bil. 1960 $VN	111.2	121.5	131.9	144.2	155.8	167.5
HI' (real)	Bil. 1960 $VN	105.7	115.9	125.8	137.4	148.5	159.4
PC	1960=100	1,242	1,740	2,056	2,379	2,728	3,114
CPIX (excluding rent)	1963=100	1,215	1,693	1,983	2,271	2,593	2,956
PLT-7	Hectares	803	312	162	12	75	307
RML	Hectares	.0001	.0001	.0001	.0001	.0001	.0001
YRUB	Kg./hectare	479	485	514	600	776	982
TLA	Hectares	60,378	60,690	60,852	60,864	60,939	61,246
QRUB Large Plantations	Metric Ton	28,921	29,435	31,278	36,518	47,289	60,144
TQRUB (total)	Metric Ton	32,536	33,114	35,188	41,083	53,200	67,662
PCRB	Kg./capita	.38	.47	.53	.60	.68	.75
CRUB	Metric Ton	7,425	9,271	10,857	12,758	14,737	16,838
QREX	Metric Ton	23,111	21,843	22,331	26,326	36,463	48,823
EXRUB'	Bil. 1960 $VN	.05	.04	.03	.03	.04	.05
EXRUS	Thou. U.S. $	6,113	5,777	5,906	6,963	9,644	12,914
QDEL	1,000 M.T.	588	525	590	648	697	734
QDV/N2	Kg./capita	205	189	191	205	219	234
ΔESTK	1,000 M.T.	-25.0	.0001	.0001	.0001	.0001	.0001
PFSHW/CPI	$VN/100 Kg.	4,559	6,427	6,492	6,395	6,383	6,318
QPKC	Mil. Head	1.027	1.020	0.981	1.142	1.179	1.249
PRW/CPI (real)	$VN/100 Kg.	656	805	838	787	732	674
PPKW/CPI (real)	$VN/100 Kg.	3,802	4,877	5,084	5,025	5,094	5,110
QDF	Mil. M.T.	735	797	922	1,050	1,183	1,325
QRPV	1,000 M.T.	3,407	3,832	4,325	4,862	5,344	5,780
QPF	Mil. M.T.	735	797	922	1,051	1,183	1,326
FNIMP	Mil. M.T.	.0001	-.200	-.400	-.600	-.800	-1.000
RNIMP/N2	Kg./capita	13.0	18.0	4.0	.0001	-5.0	-5.0
HD	1,000 Hectares	1,872	1,991	2,166	2,335	2,481	2,616
HO	1,000 Hectares	673	714	310	929	1,051	1,174
YD	Kg./Hectare	2,289	2,439	2,503	2,567	2,613	2,640
YO	Kg. Hectare	2,070	2,143	2,206	2,269	2,308	2,321
ESTK	1,000 M.T.	63.0	63.0	63.0	63.0	63.0	63.0

Appendix table 11.--Framework estimates of endogenous variables, 1972-77

- Continued -

Item	Units	Alternative III					
		1972	1973	1974	1975	1976	1977
PE	1960=100	758	960	1,151	1,370	1,631	1,941
M'	Bil. 1960 $VN	70.0	75.5	81.0	87.0	93.0	99.0
GNP (current)	Bil. $VN	1,244	1,791	2,562	3,353	4,350	5,679
GNP' (real)	Bil. 1960 $VN	125	128	137	139	140	142
CN' (real)	Bil. 1960 $VN	58.6	60.5	64.2	65.8	67.3	68.8
GDE' (real)	Bil. $VN	187	196	210	218	225	233
CPI (including rent)	1963=100	1,100	1,527	1,971	2,521	3,228	4,139
CF' (real)	Bil. 1960 $VN	36.7	37.8	43.1	44.0	44.4	45.2
PY	1960=100	992	1,397	1,869	2,411	3,100	3,998
NI (current)	Bil. $VN	1,001	1,443	2,067	2,707	3,514	4,589
PNF	1960=100	663	837	1,001	1,189	1,413	1,679
PF	1960=100	2,090	2,975	3,903	5,065	6,571	8,527
NI (current)	Bil. $VN	1,053	1,517	2,170	2,840	3,685	4,810
PG	1960=100	419	515	606	711	835	983
PEX	1960=100	902	1,242	1,595	2,033	2,595	3,320
PI	1960=100	487	604	716	844	996	1,177
NI' (real)	Bil. 1960 $VN	106.2	108.6	116.1	117.8	118.8	120.5
HI' (real)	Bil. 1960 $VN	100.8	103.3	110.6	112.3	113.3	114.8
PC	1960=100	1,213	1,660	2,166	2,742	3,464	4,392
CPIX (excluding rent)	1963=100	1,211	1,686	2,178	2,788	3,573	4,584
PLT-7	Hectares	803	312	162	12	75	307
RML	Hectares	.0001	.0001	.0001	.0001	.0001	.0001
YRUB	Kg./hectare	479	485	514	600	776	982
TLA	Hectares	60,378	60,690	60,852	60,864	60,939	61,246
QRUB (Large Plantations)	Metric Ton	28,921	29,435	31,278	36,518	47,289	60,144
TQRUB (total)	M.T.	32,536	33,114	35,188	41,083	53,200	67,662
PCRB	Kg./capita	.36	.39	.45	.48	.50	.53
CRUB	Metric Ton	6,924	7,840	9,258	10,095	10,919	11,856
QREX	Metric Ton	23,612	23,274	23,929	28,989	40,281	53,806
EXRUB'	Bil. 1960 $VN	.06	.04	.03	.03	.03	.03
EXRUS	Thou. U.S. $	6,245	6,156	6,329	7,667	10,654	14,232
QDEL	1,000 M.T.	432	372	447	510	574	598
QDV/N2	Kg./capita	205	194	196	197	188	176
ΔESTK	1,000 M.T.	-25.0	.0001	.0001	.0001	.0001	.0001
PFSHW/CPI	$VN/100 Kg.	4,297	4,780	6,560	6,146	5,768	5,991
QPKC	Mil. Head	1.027	1.011	0.895	1.005	1.262	1.101
PRW/CPI (real)	$VN/100 Kg.	640	727	731	721	790	878
PPKW/CPI (real)	$VN/100 Kg.	3,612	3,929	4,923	4,664	4,342	4,645
QDF	Mil. M.T.	735	708	768	863	927	969
QRPV	1,000 M.T.	3,099	3,069	3,425	3,534	3,598	3,692
QPE	Mil. M.T.	735	708	768	863	927	969
FNIMP	Mil. M.T.	.0001	.0001	.0001	.0001	.0001	.0001
RNIMP/N2	Kg./capita	13.0	38.0	46.0	35.0	25.0	15.0
HD	1,000 hectares	1,824	1,785	1,890	1,937	1,957	1,985
HO	1,000 hectares	617	579	616	650	680	723
YD	Kg./hectare	2,150	2,202	2,347	2,347	2,347	2,347
YO	Kg./hectare	2,011	2,046	2,067	2,067	2,067	2,067
ESTK	1,000 M.T.	63.0	63.0	63.0	63.0	63.0	63.0

Appendix table 12.--48-equation Vietnam model 1/

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C
C     RUBBER PLANTINGS (HECTARES)                                  PLT-7          Y0(21)
      Y0(21)=(-8474.7+1.2535*((X7(21)*X7(27))/X7(29))+.27989*((X8(21)
     1*X8(27))/X8(29))-.068529*((X9(21)*X9(27))/X9(29))+.20826*((X10(21)
     2*X10(27))/X10(29))+1.1103*((X11(21)*X11(27))/X11(29))+6.7151*
     3X7(27)+1676.1*X0(33))*DEN(21)+(DEX(21)*X0(50))+CONAD(21)

C     RUBBER TREE REMOVALS (HECTARES)                              RTL            Y0(22)
      Y0(22)=( 4252.7-4.7211*((X0(21)*X0(27))/X0(29))-.50919*((X1(21)*X1
     1(27))/X1(29))+1.4082*((X2(21)*X2(27))/X2(29))+1.0310*((X3(21)*
     2X3(27))/X3(29))-1.6406*((X4(21)*X4(27))/X4(29))-116.5*X0(30))
     3*DEN(22)+(DEX(22)*X0(51))+CONAD(22)

C     RUBBER YIELD (KG/HECTARE)                                    YRUB           Y0(23)
      Y0(23)=(244.49+6.9501*X0(21)+5.9563*X1(21)+4.8583*X2(21)+3.6561
     1*X3(21)+2.3499*X4(21)+.93958*X5(21)-.57488*X6(21)+34.186*X0(30)
     2-249.30*X0(32)+.18768*X0(29))*DEN(23)+(DEX(23)*X0(52))+CONAD(23)

C     TOTAL FISH CATCH (MIL. M.T.)                                 QPF            Y0(41)
      Y0(41)=(-61.97+1.794*X0(20)+0.0263*Y1(35)+0.7278*Y1(41)-60.57*
     1X0(35))*DEN(41)+(DEX(41)*X0(54))+CONAD(41)

C     DELTA HECTARAGE (1000 HECTARES)                              HD             Y0(44)
      Y0(44)=(691.28+0.395*Y1(44)+3.84*X0(34)+0.40*((1.49+0.616*(Y1(37)
     1* (Y1(20) *0.01)))/(Y1(20)*0.01))-95.4*X0(35))*DEN(44)+(DEX(44)*
     2X0(55))+CONAD(44)

C     OTHER HECTARAGE (1000 HECTARES)                              HO             Y0(45)
      Y0(45)=(-267.8+0.927*Y1(45)+17.13*X0(16)+0.31*((116.03+0.7545*
     1(Y1(37)*(Y1(20)*0.01)))/(Y1(20)*0.01))-52.75*X0(35))*DEN(45)+
     2(DEX(45)*X0(56))+CONAD(45)

C     DELTA YIELD       (KG/HECTARE)                               YD             Y0(46)
      Y0(46)=(-1287.4+37.11*X0(26)+136.0*X0(16)-145.3*X0(35)+20.06*
     1X0(36))*DEN(46)+(DEX(46)*X0(57))+CONAD(46)

C     OTHER YIELD       (KG/HECTARE)                               YO             Y0(47)
      Y0(47)=(-719.1+49.39*X0(26)+68.11*X0(16)-20.45*X0(35)+17.7*X0
     1(37))*DEN(47)+(DEX(47)*X0(58))+CONAD(47)

C     RICE EQUIVALENT PRODUCTION (1000 M.T.)                       QRPV           Y0(40)
      Y0(40)=(((Y0(44)*Y0(46))+(Y0(45)*Y0(47)))*0.0006)

C     INVESTMENT PRICE DEFLATOR   (1960=100)                       PI             Y0(16)
      Y0(16)=(44.20+0.5834*Y0(01))+CONAD(16)

C     GOVERNMENT EXPENDITURE PRICE DEFLATOR (1960=100)             PG             Y0(14)
      Y0(14)=(56.95+0.477*Y0(01))+CONAD(14)

C     NATIONAL INCOME (CURRENT)  (BIL VN$)                         NI             Y0(13)
      Y0(13)=(Y0(03)-(Y0(03)*(X0(12)+X0(13)))-X0(14))+CONAD(13)

C     HOUSEHOLD INCOME (CURRENT) (BIL VN$)                         HI             Y0(10)
      Y0(10)=(Y0(03)-(Y0(03)*(X0(09)+X0(10)))-X0(11))+CONAD(10)

C     EXPORT PRICE DEFLATOR  (1960=100)                            PEX            Y0(15)
      Y0(15)=(-11.354+0.7954*Y0(07)+1.8370*X0(21))+CONAD(15)

C     IMPORT VALUE (REAL)  (BIL 1960 VN$)                          MI             Y0(02)
      Y0(02)=(8.22-0.1175*Y0(04)+2.1768*X0(06))+CONAD(02)

C     DOMESTIC EXPENDITURE DEFLATOR (1960=100)                     PE             Y0(01)
      Y0(01)=(13.62+0.2636*Y0(06)+2.845*X0(07)+0.1672*Y1(01))*DEN(01)
     1+(DEX(01)*X0(48))+CONAD(01)
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Appendix table 12.--48-equation Vietnam model 1/ - Continued

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C     CONSUMER PRICE INDEX (EXCLU RENT) (1963=100)                    CPIX        Y0(20)
      Y0(20)=(-9.28+1.1097*Y0(07))+COMAD(20)

C     GROSS NATIONAL PRODUCT (CURRENT) (BIL VN$)                      GNP         Y0(03)
      Y0(03)=((Y0(04)*Y0(09))*0.01)+COMAD(03)

C     NONFOOD EXPENDITURE PRICE DEFLATOR (1960=100)                   PNF         Y0(11)
      Y0(11)=(12.029+0.8589*Y0(01))*DEM(11)+(DEX(11)*X0(47))+COMAD(11)

C     FOOD EXPENDITURE PRICE DEFLATOR  (1960=100)                     PF          Y0(12)
      Y0(12)= -0.98218+1.49634*DLOG10(Y0(01))
      Y0(12)=(10**Y0(12))*DEM(12)+(DEX(12)*X0(46))+COMAD(12)

C     CONSUMER PRICE INDEX (INCLU RENT)(1963=100)                     CPI         Y0(07)
      Y0(07)=(13.130+0.299*Y0(11)+0.425*Y0(12))*DEM(07)+(DEX(07)*X0(49))
     1+COMAD(07)

C     GROSS DOMESTIC EXPENDITURE (REAL) (BIL VN$)                     GDE'        Y0(06)
      Y0(06)=(Y0(02)+Y0(04)-Y0(30)-X0(03)-X0(05))

C     NONFOOD CONSUMPTION EXPENDITURE (REAL)(BIL 1960 VN$)            CN'         Y0(05)
      Y0(05)=(7.296+0.1729*Y0(02)+0.3128*Y0(04))*DEM(05)+(DEX(05)*
     1X0(42))+COMAD(05)

C     NATIONAL INCOME (REAL) (BIL 1960 VN$)                           NI'         Y0(17)
      Y0(17)=(Y0(04)-(Y0(04)*(X0(12)+X0(13)))-((X0(14)/Y0(09))*100.))*
     1DEM(17)+(DEX(17)*X0(44))

C     PERSONAL CONSUMPTION DEFLATOR (1960=100)                        PC          Y0(19)
      Y0(19)=((Y0(08)*Y0(12)+Y0(05)*Y0(11))/(Y0(08)+Y0(05)))

C     HOUSEHOLD INCOME (REAL) (BIL 1960 VN$)                          HI'         Y0(18)
      Y0(18)=(Y0(04)-(Y0(04)*(X0(09)+X0(10)))-((X0(11)/Y0(09))*100.))*
     1DEM(18)+(DEX(18)*X0(45))+COMAD(18)

C     GROSS NATIONAL PRODUCT (REAL) (BIL 1960 VN$)                    GNP'        Y0(04)
      Y0(04)=(-Y0(02)+Y0(05)+X0(04)+Y0(08)+X0(01)+X0(03)+X0(05)+Y0(30))*
     1DEM(04)+(DEX(04)*X0(41))

C     IMPLICIT PRICE DEFLATOR  (1960=100)                             PY          Y0(09)
      Y0(09)=(((Y0(08)*Y0(12)+Y0(05)*Y0(11)+X0(04)*Y0(16)+X0(01)*Y0(14)
     1-Y0(02)*X0(08)+(X0(05)+Y0(30)+X0(03))*Y0(15))/Y0(04)))*DEM(09)+
     2(DEX(09)*X0(40))

C     FOOD CONSUMPTION (REAL)  (BIL 1960 VN$)                         CF'         Y0(08)
      Y0(08)=(-12.4986+0.00775*(1.667*Y0(40))+.0558*X0(18)+0.00277*
     1(Y0(43)*X0(15)))*DEM(08)+(DEX(08)*X0(43))+COMAD(08)

C     PER CAPITA RUBBER CONSUMPTION  (KG/PERSON)                      PCRB        Y0(27)
      Y0(27)=(-14.443833+.121798*X0(31)-.318744*DLOG(X0(28)/(Y0(20)*
     10.01))+1.483221*DLOG((Y0(17)*1000.)/X(15)))
      Y0(27)=(DEXP(Y0(27)))*DEM(27)+(DEX(27)*X0(53))+COMAD(27)

C     RUBBER CONSUMPTION (M.T.)                                       CRUB        Y0(28)
      Y0(28)=(Y0(27)*X0(15)*1000.)

C     TAPPABLE AREA (HECTARES)                                        TLA         Y0(24)
      Y0(24)=(Y1(24)+Y0(21)-Y0(22)-X0(22))

C     RUBBER PRODUCTION (LARGE PLANTATIONS)                           ORUB        Y0(25)
      Y0(25)=((Y0(24)*Y0(23))/1000.)

C     RUBBER PRODUCTION (TOTAL) (M.T.)                                TORUB       Y0(26)
      Y0(26)=(X0(24)*Y0(25))

C     RUBBER EXPORTS (M.T.)                                           OREX        Y0(29)
      Y0(29)=(Y0(26)-Y0(28)-X0(23))

C     RUBBER EXPORTS (BIL 1960 VN$)                                   EXRUB'      Y0(30)
      Y0(30)=((Y0(29)*X0(21))/(Y0(15)*10000.))
```

Appendix table 12.--48-equation Vietnam model 1/ - Continued

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C     RUBBER EXPORTS  (MIL US$)                                  EXRUS          Y0(31)
      Y0(31)=(Y0(29)*X0(25))

C     CONTROLLED PORK SLAUGHTER (MIL. HEAD)                      OPKC           Y0(36)
      Y0(36)=(.963+0.072*(Y1(38)/Y1(37))+0.216*(Y2(38)/Y2(37))+0.011*
     1(X1(19)/Y1(37))-0.058*(X2(19)/Y2(37))-0.015*X0(39))*DEN(36)+
     2(DEX(36)*X0(59))+CONAD(36)

C     RICE NET IMPORTS (KG/CAP)                                  RNIMP/N2       Y0(43)
      Y0(43)=(66.301-1.918*(Y0(32)/X0(15))-0.074*Y1(48))*DEN(43)+
     1(DEX(43)*X0(60))+CONAD(43)

C     WHOLESALE RICE PRICE (REAL) (VN$/100KG)                    PRW/CPI        Y0(37)
      Y0(37)=(1299.3-7.197*Y0(33)+3.276*X1(18)+62.268*(Y0(18)/X0(15)))
     1*DEN(37)+(DEX(37)*X0(61))+CONAD(37)

C     ENDING SAIGON RICE STOCK (1000 M.T.)                       ESTK           Y0(48)
      Y0(48)=(Y1(48)-Y0(34))

C     FISH-NET IMPORTS  (MIL. M.T.)                              FNIMP          Y0(42)
      Y0(42)=(75.17-1.943*X0(39)+2.745*X0(35)-0.0127*Y0(35))*DEN(42)+
     1(DEX(42)*X0(62))+CONAD(42)

C     RICE EQUIVALENT DELIVERIES (1000 M.T.)                     ODEL           Y0(32)
      Y0(32)=(Y1(40)*(0.07)+0.503*(Y0(37)/Y0(38))-0.044*X0(35)+0.084*
     1X0(38)))*DEN(32)+(DEX(32)*X0(65))+CONAD(32)

C     WHOLESALE PORK PRICE (REAL) (VN$/100KG)                    PPKW/CPI       Y0(38)
      Y0(38)=(815.1-802.6*Y0(36)+0.6264*Y0(37)+0.4533*Y0(35)+12.62*
     1Y0(18))*DEN(38)+(DEX(38)*X0(63))+CONAD(38)

C     WHOLESALE FISH PRICE (REAL) (VN$/100KG)                    PFSHW/CPI      Y0(35)
      Y0(35)=(1344.2-878.0*X0(35)+53.99*Y0(42)+0.8261*Y0(38)+624.7*
     1(Y0(17)/X0(15))-32.06*(Y0(41)/X0(17)))*DEN(35)+(DEX(35)*X0(64))
     2+CONAD(35)

C     FISH DOMESTIC DISAPPEARANCE (MIL. M.T.)                    ODF            Y0(39)
      Y0(39)=(Y0(41)+Y0(42))

C     ENDING SAIGON RICE STOCK CHANGE (1000 M.T.)                *ESTK          Y0(34)
      Y0(34)=(78.15+0.233*((Y1(40)+(Y0(43)*X0(15)))-(Y2(40)+(Y1(43)*
     1X1(15))))-0.217*Y0(37))*DEN(34)+(DEX(34)*X0(66))+CONAD(34)

C     RICE DISAPPEARANCE (KG/CAP)                                ODW/N2         Y0(33)
      Y0(33)= (Y1(40)/X0(15))+Y0(43)+(Y0(34)/X0(15))
```

1/ Many of the equations have supplementary variables included. These variables are DEN(i); DEX(i); and CONAD(i). The DEN and DEX variables are employed as "1" or "0" values to enable the particular equation to retain its generated value (DEN=1), or to take a preassigned exogenous value (DEX=1). This option allows some flexibility in manipulating the entire system. The CONAD variable is a device that permits the intercept of an equation to be shifted by a constant amount.

Appendix table 13.--Glossary of endogenous variables

C	DOMESTIC EXPENDITURE DEFLATOR (1960=100)	PE	YO(01)
C	IMPORT VALUE (REAL) (BIL 1960 VN$)	M'	YO(02)
C	GROSS NATIONAL PRODUCT (CURRENT) (BIL VN$)	GNP	YO(03)
C	GROSS NATIONAL PRODUCT (REAL) (BIL 1960 VN$)	GNP'	YO(04)
C	NONFOOD CONSUMPTION EXPENDITURE (REAL)(BIL 1960 VN$)	CN'	YO(05)
C	GROSS DOMESTIC EXPENDITURE (REAL) (BIL VN$)	GDE'	YO(06)
C	CONSUMER PRICE INDEX (INCLU RENT)(1963=100)	CPI	YO(07)
C	FOOD CONSUMPTION (REAL) (BIL 1960 VN$)	CF'	YO(08)
C	IMPLICIT PRICE DEFLATOR (1960=100)	PY	YO(09)
C	HOUSEHOLD INCOME (CURRENT) (BIL VN$)	HI	YO(10)
C	NONFOOD EXPENDITURE PRICE DEFLATOR (1960=100)	PNF	YO(11)
C	FOOD EXPENDITURE PRICE DEFLATOR (1960=100)	PF	YO(12)
C	NATIONAL INCOME (CURRENT) (BIL VN$)	NI	YO(13)
C	GOVERNMENT EXPENDITURE PRICE DEFLATOR (1960=100)	PG	YO(14)
C	EXPORT PRICE DEFLATOR (1960=100)	PEX	YO(15)
C	INVESTMENT PRICE DEFLATOR (1960=100)	PI	YO(16)
C	NATIONAL INCOME (REAL) (BIL 1960 VN$)	NI'	YO(17)
C	HOUSEHOLD INCOME (REAL) (BIL 1960 VN$)	HI'	YO(18)
C	PERSONAL CONSUMPTION DEFLATOR (1960=100)	PC	YO(19)
C	CONSUMER PRICE INDEX (EXCLU RENT) (1963=100)	CPIX	YO(20)
C	RUBBER PLANTINGS (HECTARES)	PLT-7	YO(21)
C	RUBBER TREE REMOVALS (HECTARES)	RML	YO(22)
C	RUBBER YIELD (KG/HECTARE)	YRUB	YO(23)
C	TAPPABLE AREA (HECTARES)	TLA	YO(24)
C	RUBBER PRODUCTION (LARGE PLANTATIONS)	QRUB	YO(25)
C	RUBBER PRODUCTION (TOTAL) (M.T.)	TORUB	YO(26)
C	PER CAPITA RUBBER CONSUMPTION (KG/PERSON)	PCRB	YO(27)
C	RUBBER CONSUMPTION (M.T.)	CRUB	YO(28)
C	RUBBER EXPORTS (M.T.)	QREX	YO(29)
C	RUBBER EXPORTS (BIL 1960 VN$)	EXRUB'	YO(30)
C	RUBBER EXPORTS (MIL US$)	EXRUS	YO(31)
C	RICE EQUIVALENT DELIVERIES (1000 M.T.)	QDEL	YO(32)
C	RICE DISAPPEARANCE (KG/CAP)	QDV/N2	YO(33)
C	ENDING SAIGON RICE STOCK CHANGE (1000 M.T.)	*ESTK	YO(34)
C	WHOLESALE FISH PRICE (REAL) (VN$/100KG)	PFSHW/CPI	YO(35)
C	CONTROLLED PORK SLAUGHTER (MIL. HEAD)	QPKC	YO(36)
C	WHOLESALE RICE PRICE (REAL) (VN$/100KG)	PRW/CPI	YO(37)
C	WHOLESALE PORK PRICE (REAL) (VN*/100KG)	PPKW/CPI.	YO(38)
C	FISH DOMESTIC DISAPPEARANCE (MIL. M.T.)	QDF	YO(39)
C	RICE EQUIVALENT PRODUCTION (1000 M.T.)	QRPV	YO(40)
C	TOTAL FISH CATCH (MIL. M.T.)	QPF	YO(41)
C	FISH-NET IMPORTS (MIL. M.T.)	FNIMP	YO(42)
C	RICE NET IMPORTS (KG/CAP)	RNIMP/N2	YO(43)
C	DELTA HECTARAGE (1000 HECTARES)	HD	YO(44)
C	OTHER HECTARAGE (1000 HECTARES)	HO	YO(45)
C	DELTA YIELD (KG/HECTARE)	YD	YO(46)
C	OTHER YIELD (KG/HECTARE)	YO	YO(47)
C	ENDING SAIGON RICE STOCK (1000 M.T.)	ESTK	YO(48)

Appendix table 14.-- Glossary of predetermined variables

C	GOVERNMENT EXPENDITURES (BIL 1960 VN$)	G'	X0(01)
C	TOTAL EXPORTS (BIL 1960 VN$)	EX'	X0(02)
C	FACTOR PAYMENTS (BIL 1960 VN$)	FP'	X0(03)
C	TOTAL INVESTMENT (BIL 1960 VN$)	I'	X0(04)
C	EXPORTS LESS RUBBER (BIL 1960 VN$)	EXOTH'	X0(05)
C	FOREIGN AID (CURRENT) (BIL VN$)	A	X0(06)
C	MONEY SUPPLY (CURRENT) (BIL VN$)	M0	X0(07)
C	IMPORT PRICE DEFLATOR (1960=100)	PM	X0(08)
C	REVENUE (TAX) FACTOR (% OF GNP)	REVF	X0(09)
C	SAVINGS FACTOR (% OF GNP)	SAVF	X0(10)
C	TRANSFER PAYMENTS (CURRENT) (BIL VN$)	TRANS	X0(11)
C	BUSINESS TAX FACTOR (% OF GNP)	BTAXF	X0(12)
C	DEPRECIATION FACTOR (% OF GNP)	DEPF	X0(13)
C	SUBSIDIES (CURRENT) (BIL VN$)	SUB	X0(14)
C	TOTAL POPULATION - SERIES 2 (MIL)	N2	X0(15)
C	RURAL POPULATION - SERIES 2 (MIL)	NR2	X0(16)
C	URBAN POPULATION - SERIES 2 (MIL)	NU2	X0(17)
C	LIVESTOCK INDEX (1957-59=100)	IOA	X0(18)
C	RETAIL CHICKEN PRICE (DEFLATED) (VN$/100KG)	PCKR/CPI	X0(19)
C	FISHING BOATS (1000)	B	X0(20)
C	RUBBER PRICE (FOB SAIGON)	PRUBF	X0(21)
C	RUBBER OTHER TAPPABLE AREA ADJUSTMENTS	OAT	X0(22)
C	RUBBER OTHER USE (M.T.)	OTR	X0(23)
C	TOTAL RUBBER PRODUCTION FACTOR	KR	X0(24)
C	RUBBER EXPORTS (US$ EQUIV)	PRUS	X0(25)
C	IMPROVED RICE HECTARAGE (100,000 HECTARES)	DIR	X0(26)
C	RUBBER YIELD (KG/TAPPABLE HECTARE)	NY	X0(27)
C	WHOLESALE RUBBER PRICE (VN$/KG)	PRRW	X0(28)
C	RUBBER CUTTERS WAGES (VN$/DAY)	WRUR	X0(29)
C	TIME (1951=1.0)	T51	X0(30)
C	TIME (RUBBER CONSUMPTION)	T60	X0(31)
C	RUBBER YIELD DUMMY SHIFTER (0-4)	DY	X0(32)
C	RUBBER PLANTINGS DUMMY SHIFTER (0-2)	DP	X0(33)
C	TECHNOLOGY SHIFTER - RICE	T'	X0(34)
C	HOSTILITY LEVEL SHIFTER (0/1)	DHL 5·	X0(35)
C	OTHER YIELD FACTORS - DELTA (NORMAL=100)	DUD	X0(36)
C	OTHER YIELD FACTORS - OTHER (NORMAL=100)	DUO	X0(37)
C	RICE DELIVERY SHIFTER (0/1)	D63	X0(38)
C	TIME (1960=60)	T	X0(39)
C	IMPLICIT PRICE DEFLATOR (1960=100)	PY	X0(40)
C	GROSS NATIONAL PRODUCT(REAL)(BIL 1960 VN$)	GNP'	X0(41)
C	NONFOOD CONSUMP EXPEND (REAL)(BIL 1960 VN$)	CN'	X0(42)
C	FOOD CONSUMPTION (REAL) (BIL 1960 VN$)	CF'	X0(43)
C	NATIONAL INCOME (REAL) (BIL 1960 VN$)	NI'	X0(44)
C	HOUSEHOLD INCOME (REAL) (BIL 1960 VN$)	HI'	X0(45)
C	FOOD EXPENDITURE PRICE DEFLATOR (1960=100)	PF	X0(46)
C	NONFOOD EXPEND PRICE DEFLATOR (1960=100)	PNF	X0(47)
C	DOMESTIC EXPENDITURE DEFLATOR (1960=100)	PE	X0(48)
C	CONSUMER PRICE INDEX(INCLU RENT)(1963=100)	CPI	X0(49)
C	RUBBER PLANTINGS (HECTARES)	PLT-7	X0(50)
C	RUBBER TREE REMOVALS (HECTARES)	RML	X0(51)
C	RUBBER YIELD (KG/HECTARE)	YRUR	X0(52)
C	PER CAPITA RUBBER CONSUMPTION(KG/PERSON)	PCRB	X0(53)
C	TOTAL FISH CATCH (MIL. M.T.)	QPF	X0(54)
C	DELTA HECTARAGE (1000 HECTARES)	HD	X0(55)
C	OTHER HECTARAGE (1000 HECTARES)	HO	X0(56)
C	DELTA YIELD (KG/HECTARE)	YD	X0(57)
C	OTHER YIELD (KG/HECTARE)	YO	X0(58)
C	CONTROLLED PORK SLAUGHTER (MIL. HEAD)	QPKC	X0(59)
C	RICE NET IMPORTS (KG/CAP)	RNIMP/N2	X0(60)
C	WHOLESALE RICE PRICE (REAL) (VN$/100KG)	PRW/CPI	X0(61)
C	FISH-NET IMPORTS (MIL. M.T.)	FNIMP	X0(62)
C	WHOLESALE PORK PRICE (REAL) (VN$/100KG)	PPKW/CPI	X0(63)
C	WHOLESALE FISH PRICE (REAL) (VN$/100KG)	PFSHW/CPI	X0(64)
C	RICE EQUIVALENT DELIVERIES (1000 M.T.)	QDEL	X0(65)
C	ENDING SAIGON RICE STOCK CHANGE (1000 M.T.)	*FSTK	X0(66)
C	UNSPECIFIED NONECONOMIC FACTORS (NORMAL=0)	SD	X0(67)

Appendix table 15.-- Projection assumptions for predetermined variables--1973-77

Variable name	Unit	1971 value	1972 value			Change each year from 1972 for alternative		
			I	II	III	I	II	III
G'	Bil. $VN	60.0	80.0	80.0	80.0	-3.0 bil.	n.c.	+5.0 bil.
EX'	Bil. 1960 $VN	6.7	6.0	6.0	6.0	+10.0 %	+20.0%	n.c.
FP'	Bil. 1960 $VN	2.7	2.5	2.5	2.5	+10.0%	+20.0%	n.c.
I'	Bil. 1960 $VN	14.6	12.0	12.0	12.0	+8.0%	+15.0%	+3.0 bil.
EXOTH"	Bil. 1960 $VN	6.2	5.5	5.5	5.5	+10.0%	+20.0%	n.c.
A	Bil. $VN	30.0	37.0	37.0	37.0	-2.0 bil.	n.c.	+3.0 bil.
MO	Bil. $VN	162.9	208.4	208.4	208.4	+5.0%	+10.0%	+20.0%
PM	1960 = 100	450.0	540.0	540.0	540.0	+50 pt.	+50 pt.	+50 pt.
REVF	% of GNP	.129	.129	.129	.129	+.01 pt.	+.01 pt.	n.c.
SAVF	% of GNP	.062	.062	.062	.062	+.01 pt.	+.01 pt.	n.c.
TRANS	Bil. 1960 $VN	5.8	5.8	5.8	5.8	n.c.	n.c.	n.c.
BTAXF	% of GNP	.119	.119	.119	.119	+.01 pt.	+.01 pt.	n.c.
DEPF	% of GNP	.034	.034	.034	.034	+.01 pt.	+.01 pt.	n.c.
SUB	Bil. 1960 $VN	.3	.3	.3	.3	n.c.	n.c.	n.c.
N2	Mil.	18.7	19.3	19.3	19.3	+3.0%	+3.0%	+3.0%
NR2	Mil.	10.5	10.3	10.4	10.2	+.1 mil.	+.2 mil.	n.c.
NU2	Mil.	8.2	9.0	8.9	9.1	(N2-NR2)	(N2-NR2)	(N2-NR2)
IOA	1957-59=100	149	154	154	152	+3.0%	+5.0%	+2.0 pt.
PCKR/CPI	1963 $VN	8,319	7,500	7,500	7,500	n.c.	n.c.	n.c.
B	Mil.	91.4	99.0	99.0	99.0	+8.0%	+15.0%	+3.0%
PRUBF	$VN	25.29	21.16	21.16	21.16	n.c.	n.c.	n.c.
OATA	Hectares	-1,870	0	0	0	n.c.	n.c.	n.c.
OTR	M.T.	2,000	2,000	2,000	2,000	n.c.	n.c.	n.c.
KR	% large plan	1.1138	1.1250	1.1250	1.1250	n.c.	n.c.	n.c.
PRUS	U.S. $/Kg.	.3172	.2645	.2645	.2645	n.c.	n.c.	n.c.
DIR	100,000 hectares	6.7	6.5	6.7	6.2	+.5 100,000	+1.0 100,000 1/	n.c.
NY	0/1.0	0	0	0	0	n.c.	n.c.	n.c.
PRBW	$VN	92.62	107.36	107.36	107.36	n.c.	n.c.	n.c.
WRUB	$VN	.0001	.0001	.0001	.0001	n.c.	n.c.	n.c.
T51	1951=1	21	22	22	22	+1.0 pt.	+1.0 pt.	+1.0 pt.
T60	1960=1	11	11	11	11	n.c.	n.c.	n.c.
DY	0/1.0	0	0	0	0	n.c.	n.c.	n.c.
DP	0/1.0	0	0	0	0	n.c.	n.c.	n.c.
T'	1960=60	79	80	80	80	+2.0 pt.	+2.0 pt.	+1.0 pt.
DHL5-8	0/1.0	0	1.0	1.0	1.0	1973-77=0	1973-77=0	1973=1.0; 1974-77=0

- Continued -

Appendix table 15.-- Projection assumptions for predetermined variables--1973-77
- Continued -

Variable name	Unit	1971 value	1972 value			Change each year from 1972 for alternative		
			I	II	III	I	II	III
OUD	Normal = 100	103	99	99	98	1973-77=100	1973-77=100	1973-77=100
OUO	Normal = 100	110	100	100	100	1973-77=100	1973-77=100	1973-77=100
D63	0/1.0	0	0	0	0	n.c.	n.c.	n.c.
T	1960=60	71	72	72	72	+1.0 pt.	+1.0 pt.	+1.0 pt.
PY 2/	1960=100	---	---	---	---			
GNP' 2/	Bil. 1960 $VN	---	---	---	---			
CN' 2/	Bil. 1960 $VN	---	---	---	---			
CF' 2/	Bil. 1960 $VN	---	---	---	---			
NI' 2/	Bil. 1960 $VN	---	---	---	---			
HI' 2/	Bil. 1960 $VN	---	---	---	---			
PF 2/	1960=100	---	---	---	---			
PNF 2/	1960=100	---	---	---	---			
PE 2/	1960=100	---	---	---	---			
CPI 2/	1963=100	---	---	---	---			
PLT-7 2/	Hectares	1,125	803	803	803	n.c.	n.c.	n.c.
RML 2/	Hectares	.0001	.0001	.0001	.0001	n.c.	n.c.	n.c.
YRUB 2/	Kg./hectares	558	479	479	479	n.c.	n.c.	n.c.
PCRB 2/	Kg.	---	---	---	---			
QDF 2/	1,000 M.T.	---	---	---	---			
HD 2/	1,000 hectares	0	3/47.7	3/47.7	0	40.0 Thou.	80.0 Thou.	n.c.
HO 2/	1,000 hectares	0	0	0	4/-52.75	10.0 Thou.	20.0 Thou.	n.c.
YD 2/	Kg./hectares	0	3/72.65	3/72.65	0	n.c.	n.c.	n.c.
YO 2/	Kg./hectares	0	0	0	4/-20.45	n.c.	n.c.	n.c.
QPKC 2/	Mil. head	---	---	---	---			
RNIMP/N2 2/	Kg./cap.	7.0	13	13	13	5/	5/	5/
PRW/CPI 2/	1963 $VN	---	---	---	---			
FNIMP 2/	1,000 M.T.	.0001	.0001	.0001	.0001	n.c.	-0.2 Thou.	n.c.
PPKW/CPI 2/	1963 $VN	---	---	---	---			
PFSHW/CPI 2/	1963 $VN	---	---	---	---			
QDEL 2/	1,000 M.T.	0	3/165	3/165	0	n.c.	n.c.	n.c.
ΔESTK 2/	1,000 M.T.	19	-25	-25	-25	n.c.	n.c.	n.c.
SD	0/1.0	0	0	0	0	n.c.	n.c.	n.c.
M' 2/	Bil. 1960 $VN	54.5	70.0	70.0	70.0	-5.0 bil.	-2.0 bil.	+ 6.0 bil.

- Continued -

Appendix table 15.-- Projection assumptions for predetermined variables--1973-77
- Continued -

1/ IR variety hectares were increased 100,000 hectares per year to a peak of 1.0 million hectares.

2/ These variables are also included as endogenous or determined by the system. However by using "0" for DEN(i) , and "1" for DEX(i), a predetermined value may be used in place of the value determined by the system. These predetermined values are included in their appropriate data field in the exogenous set.

3/ For 1972 under alternatives I and II the effects of including a "1" for the DHL5-8 variable were eliminated in the Delta hectares and yield equation, as well as the deliveries function by adding back into the equation the positive value of the DHL coefficient in each equation. In the following years the increasing values of the estimated reclaimed paddy was used in the same data field.

4/ Under alternative III for 1972, the impact of the DHL5-8 variable was assigned a value of "1" for the Delta region, and "2" for all other.

5/ Rice net imports were assigned the following predetermined values:

Alternative	1973	1974	1975	1976	1977
	Kg./capita				
I	25	12	5	0	0
II	18	4	0	-5	-5
III	38	46	35	25	15