and production of rice by the Soviets increased rapidly between 1960 and 1980. However, consumption peaked at almost 3 million tons in 1980 and has remained below 2 million tons since then. Imports of rice by the Soviet Union have declined in response to declining consumption in the country.

Although a net exporter of rice, China has increased its imports of rice since 1985 and imports may exceed 1 million metric tons in 1989. Chinese policy sets rice retail prices below world levels to provide low-cost food to urban workers. Yet this policy discourages farmers from producing rice and puts pressure on Chinese foreign exchange earnings. China may have difficulty meeting domestic demand unless its policies are changed.

Developing countries import about 70 percent of world rice imports. While the share of this group of countries in total has remained relatively constant, there have been major changes in market shares by individual countries and regions. Since the early 1960's, the African and Middle Eastern countries have increased their shares of world imports, while the shares of Asian countries have fallen.

Several factors are responsible for these changes. In the 1970's, rapid income growth and increased urbanization caused the demand for rice in many African and Middle Eastern countries to expand sharply. Increased urbanization shifted consumption patterns away from traditional staples, such as cassava in Africa, toward rice and wheat. Increased urban populations also prompted many governments to institute cheap food policies subsidizing politically active and vocal urban consumers while taxing farmers. These low prices for rice further stimulated consumption and dampened production increases, adding to large imports.

From 1962 to 1971, milled rice imports by Middle Eastern countries annually averaged 373,000 metric tons. But in the next 10 years, total rice imports tripled to an annual average of 1.3 million tons each year. In 1987, the Middle East imported a record 2.8 million tons of rice. African rice imports followed a similar pattern, averaging about 635,000 tons from 1962 to 1971, then doubling to nearly 1.5 million tons (average annual basis) in the following decade. Africa imported a record 3 million tons of rice in 1982. These imports were paid for by earnings on oil exports (Middle Eastern countries and Nigeria), through increased borrowing in international financial markets, and additional food aid from rice exporters, particularly the United States. Rice imports by Africa have declined since 1982 due to declining food aid and lower national incomes.

Iran, Iraq, and the EC have consistently been among the largest importers of rice, although countries such as Bangladesh, India, and, in 1989, China occasionally made sizable purchases. Saudi Arabia is also a large importer of rice, importing about 500,000 tons each year. Iraq and Saudi Arabia constitute important markets for U.S. rice exporters. Whether the Middle East will continue to grow as a rice market is unclear. Iran has attempted to increase domestic production since the war with Iraq ended.

Many of the same demand factors that contributed to the growth in imports by Middle Eastern countries, such as rising incomes and increasing populations, are at work in Asia. But these countries have generally reduced their shares of world trade. Asia's share of world imports declined from almost two-thirds in 1961 to less than one-third in the 1980's. Income growth, increased urbanization, oil exports by Indonesia, and low-cost credit in the 1970's expanded import demand. However, two factors have worked to reduce the Asian countries' share of world

trade while the African and Middle Eastern shares have increased. First, unlike the African countries, most importing Asian countries did not tax producers and discourage production. Also, nominal rates of producer protection for rice importers in East Asia have been rising, supporting higher domestic prices and stronger production incentives. India pursued policies designed to encourage production and stocks, and from 1976 to 1988 was a small net exporter. One reason that former large importers of rice--such as Indonesia, Malaysia, and South Korea --have become almost self-sufficient is that their governments have raised support prices and other producer supports, investment in irrigation, and technological assistance.

The second important factor in reducing the Asian share of world imports has been the successful adoption of high-yielding varieties of rice in many Asian countries. Yields in Africa have stagnated or declined, but yields in many Asian countries have risen dramatically. Adoption of high-yielding varieties has been much more widespread in the importing countries of Asia than in the traditional exporting countries (Burma and Thailand). This has been true because these varieties are generally successful only when grown on irrigated rice land using fertilizer. This type of farming predominates in most former large rice-importing countries such as South Korea, India, China, and Indonesia. Burma instead relies more on natural rainwater, uses little fertilizer, and produces mostly in river deltas. Although Thailand's dry season crop is irrigated, much of Thailand's production is rainfed. Even the newer varieties of the 1970's and 1980's have not been successful on nonirrigated rice farms.

Thus, the Asian countries have been better able to expand production to meet consumption growth than the African countries that have been forced to rely more on area expansion. The International Rice Research Institute, located in the Philippines, has not been successful at finding high-yielding varieties suitable for Africa. This problem is due to the sensitivity of high-yielding varieties to fertilizer and moisture levels. High-yielding varieties tend to perform best with abundant fertilizer and moisture. Since water is scarce and irrigation expensive in much of Africa, high-yielding varieties may not be economical. In addition, consumers have been slow to accept these varieties, a problem being overcome in Asia.

The total volume of rice imported by Asia peaked in 1972 and basically declined until 1987. Imports by South Vietnam and Kampuchea dropped off in large part because of the end of Vietnam War. South Korea was the largest importer of rice in 1981, importing almost 2.3 million tons, yet was self-sufficient after 1983. Indonesia was the largest importer of rice in 1980, importing over 2 million tons. But by 1986, Indonesia was almost self-sufficient in rice. Sri Lanka annually imported almost 500,000 tons in the 1960's and about 400,000 tons in the early 1970's. Yet, since 1981, Sri Lanka has averaged annual imports of only 166,000 tons. However, imports of rice by some Asian countries increased in 1987 and 1988, especially by China (although a net exporter), Indonesia, and India. Although India's increase in imports was weather related and not a new trend, Indonesia is debating reducing its goal of 100-percent self-sufficiency in rice because of budget constraints. China has experienced difficulty in meeting domestic demand in recent years.

Developments in Exporting Countries

There have been several developments in the major rice exporting countries in the 1970's and 1980's that have dramatically shifted market shares and sources of supply. Positions have also changed among the smaller exporters. Thailand's share of world exports increased from about 20 percent in the 1970's to roughly 40 percent in 1988 in response to large-scale domestic policy reform. Australia entered the world market as a major exporter in the mid-1970's due to yield and quality gains and competitive pricing. Price policies designed to promote rice production in India and Pakistan resulted in India becoming a small net exporter and Pakistan becoming a major exporter in the 1970's. But price ceilings in Brazil enacted in the early 1960's and an overvalued currency in the 1970's and 1980's resulted in that country becoming a net importer.

In the early 1960's, the volume of rice exports was 6-7 million tons, compared with current levels of 11-13 million tons. More than two-thirds of the world's rice exports were supplied by four countries. Thailand and Burma supplied over 3 million tons, or about half of the world's rice exports in the 1960's. The United States shipped 15-16 percent, or a little over 1 million tons of rice, and China exported 7-9 percent of all rice exports. But by 1972, just three countries were supplying 63 percent of the 8.7 million tons traded in the world rice market: Thailand (2.1 million tons), the United States (1.9 million), and China (1.4 million). Policy and political turmoil had hindered Burma's ability to export. The United States and Thailand became the major exporters of rice in the mid- and late-1970's (table 13).

In 1981, world rice exports grew to 13.1 million metric tons, a record not broken until 1989. The leading exporter was Thailand with 3.05 million tons, followed by the United States with 3 million tons of rice exports. Pakistan was the third largest exporter, supplying almost 1.1 million tons. Thailand is currently the largest rice exporting country, with almost 40 percent of the market. The U.S. share has returned to almost 20 percent after declining to less than 17 percent in 1984. Pakistan ranks third with 8-9 percent. Both China's and Burma's shares declined during most of the 1980's.

As recently as the late 1970's, the United States and Thailand both exported about 22 percent of world trade. During that period, Thailand imposed special taxes and domestic sales quotas on exporters to generate revenue and assure adequate domestic supplies. This combination translated into a restrictive export policy. U.S. rice exports expanded rapidly during the 1970's while world prices were above the U.S. loan rate. The United States also provided aid to several Asian markets in the 1970's--South Vietnam, South Korea, Kampuchea, and Indonesia--and targeted market development activities to Iran. Also, the OPEC countries were flush with cash and at the time the United States was the only source of consistently high-quality milled and parboiled rice. Much of the U.S. commercial exports went to OPEC countries. U.S. parboiling capacity doubled, but Thailand was to soon recognize the importance of these markets and increase its production and processing to cash in on these marketing opportunities.

By the 1980's, several factors had emerged which hurt the U.S. market position. Thailand lowered its export taxes in response to lower world prices and expanded its market share in the early 1980's. Global recession, falling OPEC revenues, self-sufficiency policies in Indonesia and Korea, and government changes in Southeast Asia and Iran all worked to weaken demand for U.S. rice and U.S. prices

Table 13--Milled rice imports of selected regions by major suppliers, 1976-87

Importer and calendar year	Exporter			Total imports
	United States	Thailand	Others	
		1,000 metric tons		
Middle East:				
1976	465.2	199.4	456.4	1,121
1977	665.1	243.8	463.1	1,372
1978	712.6	265.8	499.6	1,478
1979	773.0	285.0	737.0	1,795
1980	717.2	477.1	634.7	1,829
1981	515.0	564.2	849.8	1,929
1982	667.6	650.2	668.2	1,986
1983	642.5	682.6	852.9	2,178
1984	785.6	828.7	823.7	2,438
1985	637.4	777.0	880.6	2,295
1986	688.3	691.9	1,109.8	2,190
1987	814.2	1,056.2	976.6	2,847
Sub-Saharan Africa:				
1976	154.6	359.1	437.3	951
1977	418.7	677.9	578.4	1,675
1978	524.7	601.0	990.3	2,116
1979	277.3	593.3	1,026.4	1,897
1980	423.0	549.4	1,147.6	2,120
1981	628.7	741.7	1,193.6	2,564
1982	699.0	1,448.4	819.6	2,967
1983	369.8	1,171.5	1,282.7	2,824
1984	307.8	1,452.7	833.5	2,594
1985	450.9	1,113.6	822.5	2,387
1986	362.8	1,574.3	669.9	2,607
1987	429.0	1,601.6	599.4	2,630
EC-12:				
1976	358.9	20.9	646.2	1,026
1977	413.0	32.7	487.3	933
1978	422.8	30.5	640.7	1,094
1979	306.3	56.7	671.0	1,034
1980	240.3	134.4	535.3	910
1981	414.4	83.3	923.3	1,421
1982	347.5	98.2	881.3	1,327
1983	330.1	140.5	576.4	1,047
1984	427.0	304.8	514.2	1,246
1985	254.5	350.4	653.1	1,258
1986	250.1	310.1	782.8	1,343
1987	406.4	116.8	638.8	1,162

Source: United Nations trade data.

fell to loan levels. The loan rate acted as a price floor for U.S. rice and allowed other exporters to undercut U.S. exporters. As a result, the U.S. market share declined from over 23 percent in 1980 to less than 17 percent in 1985. The marketing loan provision of the Food Security Act of 1985 freed up U.S. export prices from the loan rate and enabled the United States to regain some of its lost market shares.

The U.S. Role in the World Rice Market

The United States normally produces about 2 percent of the world rice crop. In 1983/84, because of a 30-percent decline in production induced by the payment-in-kind program, the U.S. crop accounted for just 1 percent of the world's production. However, the United States still accounted for almost 20 percent of world exports that year. Thus, while the U.S. rice crop is insignificant compared with world production, its impact on trade is large. Moreover, U.S. rice is a source of production stability in an often volatile, unreliable world rice market. The entire U.S. crop is irrigated, assuring more stable yields and, when combined with large stocks, more stable supplies. Production capacity is resilient and far outweighs domestic requirements. Hence, large increases in output are possible in a relatively short period of time. These factors make the United States a more important player in the world market than its production or even its export share suggest.

The mix of countries buying U.S. rice have changed several times over the past 40 years. Changes in political relations, improved production in foreign countries, and protectionist policies shifted many countries from net importers to self-sufficient countries or even net exporters. In the 1950's, Cuba, India, Pakistan, and Indonesia were the biggest markets for U.S. rice. In the next decade, India, Pakistan, and Indonesia remained strong markets, but demand for U.S. rice also grew in Western Europe, South Korea, South Vietnam, and South Africa. Japan was a significant importer of rice through 1966. But by the end of the 1960's, India ceased importing U.S. rice and Pakistan became a major exporter. Relations were severed with Cuba ending rice trade, but markets began to open in the Middle East and Africa.

Asia, primarily South Korea, South Vietnam, and Indonesia, was the principal market for U.S. rice in the early 1970's. However, successful policies aimed at self-sufficiency in South Korea and Indonesia and Vietnam's reunification under the Communist regime were responsible for the decline of the Asian market after the mid-1970's. Only Indonesia remained a strong market until the end of the decade. Asia's share of U.S. exports declined from almost 70 percent in 1970 to less than 21 percent in 1980.

By 1980, the Middle East and Africa had developed into the two strongest markets for U.S. rice. Exports to these regions were growing. Iran, Iraq, Saudi Arabia, South Africa, and Nigeria became the largest buyers of U.S. rice (table 14).

South Korea briefly returned as a strong market for U.S. rice in the late 1970's and early 1980's, but vanished after 1983 as domestic production expanded to meet domestic demand. The United States lost its Nigeria sales because the country banned rice imports due to foreign exchange shortages and increased reliance on smuggled Thai rice. The European Community and Canada remained stable but small markets for U.S. rice throughout the 1970's and 1980's. Together, they account for 15-20 percent of total shipments. Large sales of rough rice to Brazil in

Table 14--Market shares of major customers for U.S. rice, calendar years, 1979-88

Country	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
					Percent					
EC-12	13	8	14	16	16	22	16	15	19	13
Iraq	9	9	3	9	12	21	21	16	21	23
Saudi Arabia	8	8	8	13	12	13	10	8	8	9
Iran	13	6	4	1	0	0	0	0	0	0
South Africa	0	4	4	5	6	6	4	4	3	4
Indonesia	13*	6*	3*	1*	3*	3*	---	---	---	2
Nigeria	2	6	13	14	5	1	1	0	0	0
South Korea	6	22	36	9	9	0	0	0	0	0
Canada	3	3	3	4	4	5	5	3	3	4
Philippines	0	0	0	0	0	1*	7*	0	0	7*
Brazil	---	---	---	0	0	0	0	20	0	0
Senegal	---	1*	1*	1*	1*	---	7	2*	3	4
Liberia	2	2*	3*	3*	3*	4*	3*	3*	4*	3*
Haiti	1*	1*	---	---	---	---	---	1	4	2
Other	26	25	9	24	28	26	26	28	35	30
Total 1/	100	100	100	100	100	100	100	100	100	100

--- = Negligible.
* Denotes PL 480 customer. All others are commercial buyers.
1/ Totals may not add to 100 due to rounding.
Source: U.S. Dept. Agr., Foreign Agricultural Service.

response to a weather-related shortfall in production made that country the largest market for the United States in 1986. Concessional exports have made Liberia and Senegal important outlets for U.S. rice in the late 1980's. Less developed countries currently account for two-thirds to three-fourths of U.S. rice exports.

Although the U.S. rice export position deteriorated between 1982 and 1985 and is still below the 1981 level, there are some bright spots. When rice exports are classified by three types--regular milled, brown, and parboiled--an upward trend in parboiled rice exports is evident since 1966, with exports increasing from about 145,000 tons in 1966 to a peak of 1 million in 1981. Although parboiled exports have declined from the 1981 peak, they have still averaged over 650,000 tons since 1982 (table 15). Milled rice exports have fluctuated since 1966, with a moderate upward trend evident after 1985. Although brown rice exports increased during the late 1960's and 1970's, they have basically declined since 1980 and exports are currently less than the 1966 level.

The United States has lost market share in some countries, notably the regular milled and brown rice markets. This segment of growing import demand for rice has shifted to Thailand on the basis of more attractive prices for comparable quality rice. In 1984, the United States lost a premium market in Nigeria, a previously large buyer of U.S. long-grain parboiled rice, to Thailand. Thailand is also gaining market shares in Western Europe, South Africa, and Saudi Arabia through improved quality and more competitive pricing. Thailand exported over 100,000 metric tons to the United States in 1988/89.

The Role of PL 480 in U.S. Rice Exports

Government-assisted exports authorized under PL 480 have played an important role in expanding U.S. rice exports. The total volume of rice exports moving through Government programs peaked in the early 1970's and Government-assisted exports as a share of total exports have declined since. Government exports as a percentage of all rice exports ranged from almost 80 percent in 1957 to less than 20 percent in the 1980's (app. table 12). In the 1950's, Japan, Pakistan, India, and Indonesia were key markets for Government rice exports. In the 1960's, India and Indonesia were the major recipients. South Vietnam, Kampuchea, and South Korea received most of the PL 480 rice in the early 1970's. Although Indonesia was the largest recipient of PL 480 shipments in the late 1970's, most assistance was targeted to African countries after 1975.

Table 15--U.S. milled rice exports by type, selected years 1/

Crop year	Brown	Milled	Parboiled	Total 2/	PL 480 and AID share of total 3/
	- - - - - - - - 1,000 metric tons			- - - - - - - -	Percent
1966/67	217.7	1,347.2	145.1	1,719.0	46.6
1970/71	626.0	630.5	263.1	1,473.7	64.0
1974/75	546.5	1,388.3	242.5	2,194.4	27.9
1979/80	475.4	1,461.9	598.4	2,705.9	17.9
1980/81	1,202.7	957.7	781.7	3,027.6	17.8
1981/82	502.6	941.8	1,000.9	2,681.9	13.4
1982/83	354.3	954.1	846.5	2,218.7	16.8
1983/84	334.3	882.4	821.8	2,270.2	20.9
1984/85	166.2	927.7	630.8	1,954.2	23.7
1985/86	309.6	891.6	523.8	1,918.6	30.1
1986/87	278.5	1,484.0	596.4	2,679.8	16.3
1987/88	178.1	1,289.6	652.9	2,290.3	21.2

1/ All rice is reported on a milled-equivalent basis.
2/ Numbers may not not add due to rounding.
3/ PL 480 and AID shipments are on fiscal year of first year.
Source: U.S. Dept. Commerce, Bureau of the Census.

The largest recipient of PL 480 rice shipments in the 1980's has been Bangladesh. Other consistently large recipients in this decade have been Guinea, Liberia, Sierra Leone, Somalia, Madagascar, and Yemen. In addition, Peru received large PL 480 shipments in the late 1970's and early 1980's. The Philippines received over 150,000 tons of rice in 1985, making the country the largest recipient of PL 480 rice that year. In the 1980's, PL 480 rice shipments have been about evenly split between long and medium grain.

Future Developments in Rice Trade

There are three critical issues likely to shape the U.S. role in the world rice market ahead. The first is growth in total world demand. World rice production has been increasing at an annual average rate of 3 percent for the past decade while growth in use has been marginally slower. Although world exports increased rapidly from about 8.6 million tons in 1971 to 13.1 million in 1981, world trade has stagnated at 11-13 million tons since 1979. If world exports continue to stagnate at this level and production in exporting countries continues to increase, the distribution of world trade--the sources of supply and demand--will become more important. Competition among exporters could intensify.

The historical data suggest that growth in the market will depend heavily on developments in Africa and the Middle East. Their increased role has been a result of income growth, growth in urban population, policies which stimulate consumption and dampen production increases, and limited production capacity. As the cost of consumer subsidies in these nations rises, some governments may choose to raise consumer prices. And if self-sufficiency policies were adopted or if suitable high-yielding varieties are developed for nonirrigated rice, the growth in world import demand could weaken further. Finally, a slowdown in income growth in the Middle East as a result of lower oil prices could encourage these countries to consume less rice and more lower priced wheat.

The second issue is the U.S. policy response to developments in world rice markets and policies in the other exporters, notably Thailand. Thailand moved toward more competitive marketing practices by removing the last of its export taxes in 1986. When the gap between U.S. and Thai prices for milled rice widened in the mid-1980's, U.S. exports declined as buyers switched to Thailand's rice. Provisions of the Food Security Act of 1985, including declining loan rates and the marketing loan provision, restored some of the U.S. competitiveness in the world market.

Finally, any multilateral trade liberalization resulting from negotiations could substantially affect the world rice market and the U.S. position. Domestic support and trade policies in the United States, Japan, and, to a lesser extent, the EC depress world prices and reduce trade volumes. The removal of import barriers by Japan could open a huge japonica market for the United States and other suppliers. The world indica market could increase somewhat also if the EC eliminated its protection of domestic producers. The United States would likely gain market share in the japonica trade but could lose markets to lower cost indica producers such as Thailand in the long run. Much uncertainty surrounds this issue and depends on the pace and extent of liberalization and the extent of the countries participating.

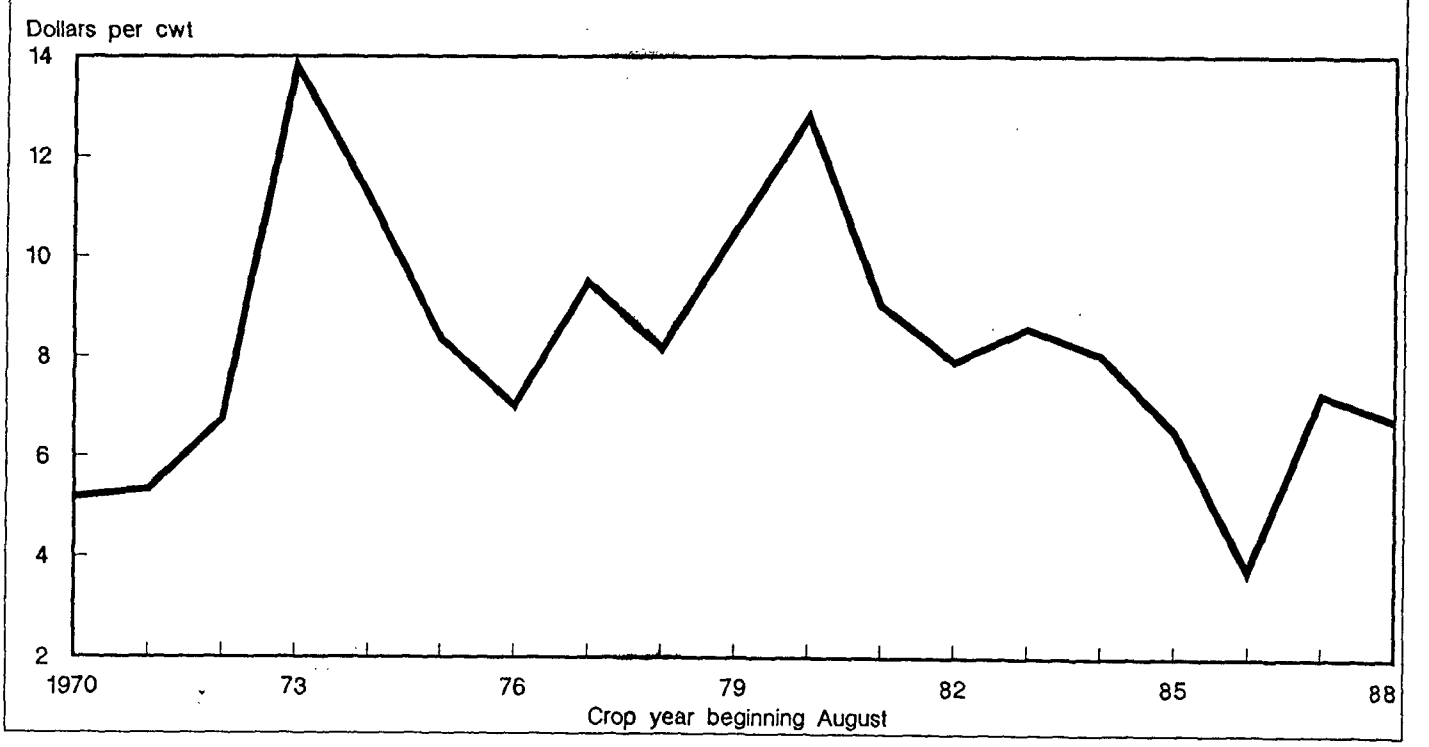
Prices and Returns

Historical movements in producer prices for rice were limited until the 1970's but have moved dramatically since. U.S. season average farm prices remained fairly stable until the 1970's due in large part to acreage and marketing restrictions that constrained production. Output tended to have the market near support prices with limited government intervention. Gross returns grew despite the stable prices because average yields per acre increased.

However, farm prices for rice hit an all-time high during the 1973/74 season, reaching $17.50 per cwt in June 1973, more than double current prices (fig. 2). Prices fell the next season, hitting $6.17 in March 1976. They then began an upward trend that continued through the early months of 1981, peaking at nearly $14 in April of that year. On an overall decline through marketing year 1986/87, prices fell below the loan rate by August 1982, and the 1982/83 season was ushered in with prices that remained below the loan rate for all but 3 months of the marketing year. The payment-in-kind program in 1983/84 allowed U.S. farm prices to remain above the loan rate throughout the marketing year, although prices began a steady decline after February 1984.

Without the continued powerful effect of the payment-in-kind program, farm prices continued to tumble in 1984/85 and were below the loan rate in 4 of the last 6 months of the marketing year. Although the loan rate declined each crop year after 1983/84, farm prices remained below the loan rate throughout 1985/86 and 1986/87. The marketing loan provision of the Food Security Act of 1985 allowed

Figure 2
U.S. farm prices of rough rice



U.S. farm prices to drop close to the world price after April 15, 1986. The 1987 drought, resulting in a poor harvest in much of Asia in 1988, began pushing prices up in August 1987 and the U.S. farm price finally exceeded the loan rate in November 1987. U.S. farm prices remained above the loan rate until December 1988. U.S. farm prices for April 1989 averaged the loan rate of $6.63 per cwt.

Focusing on these historical farm price trends above can result in misleading conclusions about producers' economic welfare. The effects of deficiency payments, participation rates, and cash expenses must also be included when analyzing producer welfare. For example, farm prices during August-December 1986 averaged $3.87 per cwt, $3.33 below the national average loan rate and substantially below the $11.90 target price. Yet, 95 percent of the 1986 rice base acreage was enrolled in the 1986 rice program, assuring producers an average price of $10.51 per cwt (including deficiency payments, marketing loan payment, and market sales) for virtually all their rice. Hence, although the market value of rice production and marketing loan payments in 1986/87 was $907 million, down from $1.12 billion in 1984/85, deficiency payments added $495 million to producer returns, bringing total returns to an estimated $1.4 billion. Yet, this is only 6 percent less than the total returns earned during 1984/85 when the season average market price was $8.04 per cwt, over twice the season average price in 1986/87 of $3.75. Thus, farm prices alone, particularly during years of acreage programs, do not provide an accurate assessment of producers' welfare (table 16).

History of Rice Programs

Programs of the 1920's

Proposals for government intervention in the rice market date back to the early 1900's but did not become law until the 1930's. The end of World War I brought a sharp drop in U.S. farm exports and began a period of sustained low returns to farming. Rice farm prices averaged $3.34 per cwt during 1914-20 and fell to $2.10 by 1922. Widespread support emerged for Government help in raising farm returns. A leading proposal was the McNary-Haugen Plan, which was debated in Congress during much of the 1920's. The plan proposed a two-price market: crops would be sold at a high enough price on the domestic market to support incomes and surpluses would be sold abroad at world prices. Rice was one of the eight commodities that the legislation would have covered. Vetoed by the President twice, the plan never became law.

Limited Government involvement was provided for in the Agricultural Marketing Act of 1929. This act set up a federally funded corporation to make loans to marketing cooperatives that would purchase surplus crops. However, the onset of the Depression and resulting buildup of surpluses led to the failure of the program by 1932. Rice prices fell to an all-time low of $0.93 per cwt in that season and added rice producer support to calls for large-scale government intervention.

Programs of the 1930's

The farm programs of the 1930's ultimately shaped the rice sector into the 1980's. The objective of the decade's first Agricultural Adjustment Act (AAA) of 1933 was to restore the purchasing power of farm commodities to their 1910-14 level, a concept referred to as parity. Rice was designated as one of the original seven

Table 16--Rice sector costs and returns, 1975-88

Crop year	Farm value 1/	Direct payments 2/	Total income	Total cash expenses 3/	Returns above cash expenses 4/ Total	Per cwt Nominal	Per cwt 1982$
	Million dollars					Dollars	
1975	1,072	0	1,072	758	314	2.45	4.12
1976	811	129	940	656	284	2.46	3.89
1977	941	4	945	565	380	3.83	5.69
1978	1,087	59	1,146	796	350	2.63	3.64
1979	1,384	1	1,385	849	536	4.06	5.17
1980	1,873	2	1,875	1,132	743	5.08	5.93
1981	1,654	22	1,676	1,360	316	1.73	1.84
1982	1,246	267	1,513	1,200	313	2.04	2.04
1983	876	618	1,494	769	725	7.27	7.00
1984	1,119	380	1,499	977	522	3.76	3.49
1985	1,203	468	1,671	912	759	5.63	5.07
1986	907	495	1,402	768	634	4.75	4.17
1987	1,038	545	1,583	735	848	6.54	5.56
1988 5/	1,137	570	1,707	941 6/	766	4.80	3.90

1/ Production times average farm price, including marketing loan gains: $322 million in 1985, $407 million in 1986, $96 million in 1987, and $60 million in 1988.

2/ The sum of deficiency, diversion, disaster payments, and in 1983, the value of payment-in-kind.

3/ Cash expenses per planted acre times acreage planted.

4/ The difference between total income and total cash expenses; this difference was divided by the quantity produced, and then deflated (1982 = 1.0).

5/ Preliminary.

6/ Calculated from a forecast cash expense of $321 per acre.

Sources: U.S. Dept. Agr., Agricultural Stabilization and Conservation Service, and Costs of Production for Major U.S. Crops, 1975-87, U.S. Dept. Agr., Economic Research Service, May 1989.

commodities covered in the act. This was to be accomplished through a mix of supply controls and processing taxes.

Supply control was administered through contracts negotiated between the Government and rice millers. Contracts with producers were introduced with the DeRouen Rice Act of 1935 and were financed with a processing tax. The Supreme Court ruled against processing taxes and declared the AAA production control features unconstitutional in January 1936.

The Agricultural Adjustment Act of 1938 introduced many of the provisions found in today's programs. It provided nonrecourse loans for rice, referendums for

marketing quotas, acreage allotments, and direct payments to bring producer prices up to parity, if funds were appropriated. However, loans for rice were not offered until a subsequent act made them mandatory for farmers harvesting within their acreage allotment beginning with the 1941 crop. Marketing quotas, operating through rice acreage allotments, were to be proclaimed if total supply was estimated to exceed normal supply by 10 percent. Normal supply was defined as expected exports, plus the previous year's domestic use, plus 10 percent to allow for carryover stocks. With stocks beginning to build in the late 1930's, USDA proposed rice quotas for 1939/40. But less than the required two-thirds of the producers voting supported them in the referendum, so they were not put into effect.

Program Adjustments from World War II Through the 1960's

Rice was added to the list of basic commodities eligible for nonrecourse loans in 1941 and the first loan program for rice was initiated. Rice acreage allotments were removed during the war and most of the subsequent decade, but were put into effect in 1950. Marketing quotas and acreage allotments were in place during 1955-73.

Swing from Shortages to Surpluses

There was a sharp increase in rice exports during World War II--from 5.7 million cwt in 1940 to 11.5 million cwt by 1945--which lowered stocks and pulled rice prices well above support levels. Because of high prices and strong demand, rice acreage allotments were lifted entirely and in some years price support levels were not even announced.

The Agricultural Acts of 1948 and 1949 revised the method used to calculate parity in order to account for productivity and other changes since the base period of 1910-14. Mandatory price support at 90 percent of parity, a level first set during the war, was continued in the 1948 Act, but the 1949 Act introduced flexibility, allowing a range for parity prices. However, because of the Korean conflict, subsequent legislation retained parity at 90 percent. Provision for marketing quotas continued. The provisions of the 1949 Act had little immediate effect on the rice market, as prices averaged above support levels in every year from 1941 to 1953, except for 1951.

In 1954, rice production reached a record 64 million cwt--over twice the average during World War II. However, domestic and export demand weakened, and carryover stocks amounted to 27 million cwt, seven times greater than the average of the previous 3 years. Commodity Credit Corporation loan activity for rice was significant for the first time and the CCC wound up owning 60 percent of the total carryover.

The Agricultural Act of 1954 attempted to deal with these surpluses by moving to flexible support prices, 82.5-90 percent of parity for 1955 and 75-90 percent thereafter. In addition, marketing quotas were proclaimed and voted in for the 1955 crop.

Marketing Quotas and Allotments: 1955-73

Marketing quotas and acreage allotments were in effect every year from 1955 through 1973. They were effective in reducing CCC-owned rice stocks from 27

million cwt at the end of 1955/56 to near 300,000 cwt by the end of 1961/62 and in preventing stocks from rebuilding in the 1960's. The pace of the stock reduction was limited by a legislated minimum national acreage allotment of 1.65 million acres from 1956 through 1961.

Another method used to reduce rice acreage was the soil bank program provided for in the Agricultural Act of 1956. It had two components: an acreage reserve program that paid farmers to annually divert rice land and a conservation reserve that paid farmers to retire land under long-term contracts that lasted from 3 to 10 years. Neither program was considered very effective. As such, the acreage reserve program ended in 1958 and the conservation reserve ended in 1961.

Starting with the 1961 crop, marketing quotas were announced and voted on when total supply exceeded normal supply. Prior to that, quotas were announced only when total supply exceeded normal supply by 10 percent. Marketing quotas were operated through acreage allotments. Normal supply less beginning stocks determined needed production, which was then converted to a national allotment based on U.S. average yields. The allotments were then apportioned to farms. All production from allotted acreage was eligible for price support, but production from acreage in excess of the allotment was subject to a penalty.

With the 1962 crop, rice allotments gradually increased, reaching 2.8 million acres by 1968. But, stocks began to build that year, and allotments were reduced below the 1968 level during 1969-73. Much of the agricultural legislation passed during the mid-1960's through the early 1970's made major changes in programs for other grains, but had little effect on rice. For example, the following provisions did not apply to rice: the marketing certificate program for wheat, introduced in 1964; the set-aside provisions for wheat, feed grains, and cotton, introduced in 1970; and the separation of target prices from support prices for wheat, feed grains, and cotton, introduced in 1973. But throughout this period of change elsewhere in commodity programs, the rice program continued in essentially its 1961 form.

Legislation of the 1970's

Given a surge in export demand related to crop shortfalls abroad, rice marketing quotas were suspended for the 1974 and 1975 crops. Acreage allotments were set at 2.1 million acres in 1974 and at 1.8 million in 1975. Allotments through 1981 were used for payment purposes only. Producers were not restricted on the acreage planted. However, they could receive program benefits only on allotment acres.

Exports grew sharply in the early 1970's, raising prices well above support prices. In 1973, the average farm price was $13.80 per cwt, compared with a support level of $6.07. The Rice Production Act of 1975 reflected these changed conditions and shifted rice production control from quotas and allotments to greater market orientation along the lines of the programs in place for the other grains. Acreage allotments were set at 2.1 million acres in 1974 and at 1.8 million in 1975. Allotments through 1981 were used for payment purposes only. A target price was established and direct (deficiency) payments were provided based on the difference between the August-December average farm price and the target price. The allotments became the payment base. Farmers could now plant in excess of their allotment, but eligibility for loans and deficiency payments was restricted to producers planting within their allotted acres. Target prices and loan rates were to be adjusted annually on the basis of the index of prices paid

and changes in yields. The act provided for annual set asides and set a limit of $55,000 on the payments a person could receive under the rice program. Unlike programs for other grains, disaster payments counted against the payment limit for rice.

Disaster payments could be made to cover losses due to natural causes that either prevented the crop from being planted or resulted in abnormally low yields. An allotment carried with it eligibility for disaster protection and no premium was required. The payment rate was a percentage of the target price and covered allotment production. The disaster payment program was replaced by the all-risk crop insurance program provided by the Federal Crop Insurance Act of 1980. Growers have been reluctant to pay the premiums required for coverage under this program, even though the Government also pays a significant portion. In 1983, only 110,000 rice acres were insured at an average premium of $10.34 an acre. This coverage was only 5 percent of the potentially insurable rice acreage.

The first deficiency payments, $128 million, were paid on the 1976 crop, which was also the first crop produced under the 1975 Act. These were the first direct Government payments for rice since 1957, when payments were made under the soil bank act.

The Food and Agriculture Act of 1977 contained provisions very similar to the 1975 Act. Rice production costs, rather than the index of prices paid, became the basis for adjusting the target price, with the loan rate adjusted by the same percentage as the target price. The loan rate could be lowered, but not below $6.31 per cwt.

The set-aside provision was continued, although one has never been in effect for rice, and a cash payment for diverting land was authorized. The limit on rice program payments was $55,000 per person in 1977; this was lowered to $52,250 in 1978 and $50,000 in 1979. Beginning in 1980, payments were limited to a combined total of $50,000 from the wheat, feed grains, upland cotton, and rice programs. Disaster protection continued with a separate payment limit. Rice prices stayed well above the loan rate during the life of the 1977 Act. With exports running high, acreage passed the 3-million mark for the first time in 1980 and reached a record 3.8 million in 1981.

Legislation of the 1980's

<u>The Agricultural and Food Act of 1981</u>

The Agricultural and Food Act of 1981 eliminated acreage allotments and marketing quotas for rice and made the rice program analogous to those for other grains. Rice farmers previously received deficiency payments on allotment production, regardless of actual production. However, allotments no longer reflected actual planting patterns. In disposing of allotments, the 1981 Act based deficiency payments on production from permitted plantings. Target prices were no longer adjusted by the formula based on rice production costs, but minimum target levels were established. The loan rate was to be adjusted by the same percentage as the target price, but could be lowered to a minimum of $8.00 per cwt if rice stocks were excessive or exports discouraged.

The acreage reduction program was introduced as a more specific acreage control method than the set-aside provision. When in effect, an acreage reduction program

required land to be diverted from a farm's rice base acreage and put into approved conservation uses. Compliance was required for eligibility for loans and deficiency payments.

The large acreage expansion in 1981, along with a decline in exports, precipitated a sharp rise in carryover stocks. This resulted in a 15-percent acreage reduction program for the 1982 rice crop. Program compliance was high, 78 percent of the 4-million-acre U.S. rice base. But a continued plunge in U.S. rice exports during the 1982/83 crop year caused rice stocks to bulge further to almost 72 million cwt. In 1983, there was a 15-percent acreage reduction program, a 5-percent paid land diversion, and an additional 10- to 30-percent payment-in-kind program for rice. Prospects for a large deficiency payment rate and the attractive payment-in-kind program, under which payments did not count against the payment limit, helped boost program enrollment to 98 percent of the 4.1-million-acre rice base. U.S. production declined by 50 million cwt and stocks declined 25 million cwt. At the same time, world rice production increased. Without acreage control, supplies would likely return to excessive levels again in 1984/85, so a 25-percent acreage reduction program was announced for 1984 rice. Farm prices were substantially below the target price during 1983/84, encouraging a high program enrollment rate of 87 percent in the 1984 program, despite the large acreage reduction requirement and the lack of a paid diversion.

The Food Security Act of 1985

The Food Security Act of 1985 was enacted under the general feeling that farm programs cost too much, nearly $18 billion in fiscal year 1985, and must be brought under control. There was a consensus that the health of U.S. agriculture depended upon its ability to become more competitive in world markets and that price support levels should be set more in line with market-clearing prices, instead of being rigidly legislated by Congress as in the 1981 Act.

But, these considerations were tempered by concerns about the financial distress facing many farmers that would be compounded by the short-term price-depressing effects of a market-oriented farm policy in the short run. Many farmers expanded their farming operations in the late 1970's by obtaining large loans. The onset of declining commodity prices soon after 1980 when export markets weakened caused the value of farmland to fall. As a result, many farmers developed cash-flow problems and some even had their farms foreclosed. Farmers' net cash-flow reached a record low $30.2 billion in 1985, compared with $43.8 billion in 1979.

The 1985 Act was a compromise between a desire to make U.S. agriculture more competitive in world markets through lower loan rates in general--and the lower marketing loans for rice and cotton in particular--and an immediate need to continue farm income protection via frozen target prices and larger deficiency payments.

Unlike the 1981 Act in which minimum loan rates were rigidly legislated by Congress, the 1985 Act contained provisions for lowering the loan rate for rice to $7.20 per cwt, a 10-percent decline from $8.00 in 1985. For the 1987-90 rice crops, minimum loan rates were to be the higher of: (1) 85 percent of a 5-year moving average marketing prices, excluding the highest and lowest prices; or (2) $6.50 per cwt. However, loan rates could be reduced by no more than 5 percent from the preceding year.

A new marketing loan was also provided for in the 1985 Act. The Secretary was granted authority to implement marketing loans for grains, upland cotton, and soybeans but was required to implement them for rice and cotton if the world price were below the announced loan rate. For rice, the 1985 Act permitted producers to repay Commodity Credit Corporation loans at the lesser of the loan rate or world market price, but not less than a specified portion of the loan rate. For the 1986 and 1987 programs, rice producers were permitted to repay loans at the world market price, but not below 50 percent of the loan rate. The minimum loan repayment rate was set at 60 percent of the loan rate for 1988 and 70 percent for 1989 and 1990.

Section 1005 of the Food Security Act of 1985 authorized the Secretary of Agriculture to make in-kind payments in the form of generic certificates to farmers as payment for participation in numerous Government programs. These programs included the acreage reduction, paid land diversion, and conservation reserve programs as well as the rice marketing loans, disaster, and emergency feed programs. In addition, grain merchants and commodity groups have been issued certificates through the export enhancement program and the targeted export enhancement program. Generic certificates were also made available under the 1985 Act to producers selling rice or repaying price support loans when the world price for rice was below the current loan repayment rate. The payment rate was set equal to the difference between the loan repayment rate and the world price.

The 1985 Act also froze the 1986 minimum target price at the 1985 level, $11.90 per cwt, and set the minimum 1987 through 1990 target prices at declining levels. The target prices provide a basis from which direct payments are made to eligible producers if the national weighted average market price received by farmers for the first 5 months of the market year (August through December) falls below the target level.

A deficiency payment is a Government payment made to farmers who participate in wheat, feed grain, rice, or cotton programs. The payment rate for rice is per cwt and is based on the difference between the price level established by law (target price) and the higher of the market price during the first 5 months of the market year or the price per unit at which the Government will provide loans to farmers to enable them to hold their crops for later sale (loan rate). The total deficiency payment is equal to the payment rate multiplied by the acreage planted for harvest and then by the program yield established for the particular farm. The payment acreage is the acreage actually planted to rice, but it cannot exceed the permitted acreage. However, growers who underplant their permitted acreage by planting between 50 and 92 percent of the permitted acreage (the 50/92 provision) and devote the remaining permitted acres to a conserving use would receive payments on 92 percent of the permitted acreage.

Limited cross compliance was required for participants to be eligible for program benefits in the late 1970's and remains in effect under the Food Security Act of 1985. In a limited cross-compliance program, a producer participating in one commodity program must not plant in excess of the crop acreage base on that farm any of the other program commodities for which an acreage reduction program is in effect.

The Secretary of Agriculture could not reduce the loan rate for 1988 rice crop by more than 3 percent from the 1987 level according to the Budget Reconciliation Act

of 1987. The 1987 Act also slightly reduced minimum target prices for the 1988 rice crop to $11.15 per cwt and the 1989 crop to $10.80.

Program Costs

A summary of payments made directly to farmers for rice crops of recent years is shown in table 17. A longer and more detailed accounting of fiscal year costs is found in appendix table 6. As table 17 indicates, deficiency payments have made up the bulk of direct payments to rice producers since 1981. The marketing loan gains were also an important source of income in 1985 and 1986 when world prices were low. The marketing loan gain has been a less important source of income for rice producers after 1986 because U.S. and world prices converged.

The 1977 Act imposed payment limits on producers for the first time. Payment limits were initially set at $52,250 for one or more crops but, by 1980, payments could not exceed $50,000 per person for total payments received under the grain and cotton programs.

During the 1983/84 crop year, a program featuring acreage reduction, paid land diversion, and payment-in-kind was in effect. Payment limitations applied only to the acreage reduction and paid land diversion provisions. For program participants not in payment-in-kind, it would have taken a base acreage of approximately 450 acres and permitted plantings (payment acreage) would have to have been 360 acres (450 X .8) to reach the payment limit, based on the estimated national average program yield of 4,867 pounds per acre, a diversion payment rate of $2.70 per cwt, and a deficiency payment rate of $2.77 per cwt. A participant putting 30 percent of the base into the payment-in-kind program would need a base of 720 acres (and permitted plantings of 360 acres, or 50 percent of the base) to reach the payment limit. Thus, payment-in-kind permitted larger sized farms to participate fully in the 1983 program.

Table 17--Direct payments to rice producers, crop years 1981-88

Payments	1981	1982	1983	1984	1985	1986	1987	1988
				Million dollars				
Deficiency	21	267	233	380	375	495	545	570
Diversion	---	---	23	---	93	---	---	---
Disaster	---	---	---	---	---	---	---	---
Payment-in-kind	---	---	1/ 362	---	---	---	---	---
Marketing loan gains	---	---	---	---	322	407	96	60
Total	21	267	618	380	790	902	641	630

--- = No payment.

1/ 42.3 million cwt valued at the estimated average farm price of $8.65 per cwt for 1983/84.

Source: U.S. Dept. Agr., Agricultural Stabilization and Conservation Service.

In 1978, under the allotment system, approximately $58 million was paid in deficiency payments and about 27 percent of the payments made were in excess of $52,250 at that time (prior to enactment of the payment limitation). During the 1987/88 crop year, deficiency payments totaled $545 million. Maximum permitted plantings by participants indicate total payments could have reached $583 million. The payment limit probably accounts for actual payments falling short of this level. Arkansas, Louisiana, and Texas received nearly three-quarters of the total payments issued through Government programs. In addition, marketing loan gains totaled $122 million. Government payments and marketing loan gains totaled $887 million in 1986/87 and $667 million in 1987/88.

Program Effects

The rice programs has both direct and indirect effects on farmers, consumers, and taxpayers. The rice program affects:

- Prices received by farmers and paid by domestic and foreign consumers of rice.
- Incomes of farmers.
- Resources (specifically, land and other inputs used to produce rice).
- Consumption. By affecting prices, the rice program also affects the quantity of rice demanded in the United States and abroad.
- Foreign production and exports.

Farmers

The U.S. rice program affects prices received by rice producers, their incomes, the costs and value of resources used in rice production, and rice growers' production planning processes. Rice producers have also benefited from Government-assisted exports (app. table 6). When rice is exported through Government programs such as PL 480, prices are supported by expanding export market demand. Between fiscal years 1980 and 1987, net Government expenditures on the rice price support program, including those for PL 480, have totaled over $5 billion. The total value of rice production over the crop years 1980-87 totaled $9.09 billion.

Since the inauguration of target prices, direct Government payments have made up an increasing share of producer incomes. Direct payments bolster farm income, contrasted to raising prices. During fiscal years 1982-87, rice producers received $1.91 billion in direct payments under deficiency, diversion, and disaster program provisions. In 1982, Government payments comprised 17 percent of rice growers' gross incomes. By 1987, Government payments rose to 40 percent of growers' gross incomes. The data in table 18 demonstrate the difference in returns above cash costs made by direct payments. The benefits of participating in the rice program are clearly evident in comparing returns in 1987 and 1988, even though producers were required to idle land in both years in order to receive program benefits.

When program benefits are tied to acreage reduction provisions, the net effect can be a gain to producers, and an equal cost to society, particularly taxpayers. A good example of this situation occurred in 1987. Farmers idled 1.32 million acres

Table 18--Rice returns above cash costs, with and without direct Government payments, 1980-88 1/

Crop year	Net returns, 1982$ 2/ Without direct payments		With direct payments		Direct payments as a share of-- Farm value	Net returns
	$/cwt	$/acre	$/cwt	$/acre	- - Percent - -	
1980	5.91	255.8	5.93	256.5	0.1	0.3
1981	1.71	81.7	1.84	87.8	1.3	7.0
1982	.30	14.0	2.04	95.0	21.4	85.3
1983	1.03	47.0	7.00	318.6	70.5	85.2
1984	.95	46.6	3.49	171.3	34.0	72.8
1985	1.95	104.5	5.07	272.5	38.9	61.7
1986	.91	51.3	4.17	233.8	54.6	78.1
1987	1.99	109.3	5.56	305.8	52.5	64.3
1988	1.00	54.4	3.90	212.4	50.1	74.4
Average 1986-88	1.30	71.6	4.54	250.7	52.4	72.3

1/ See table 16 for explanation of net returns.
2/ Net returns are deflated, where 1982 = 1.0.
Sources: U.S. Dept. Agr., Agricultural Stabilization and Conservation Service and Costs of Production for Major U.S. Crops, 1975-87, U.S. Dept. Agr., Economic Research Service, May 1989.

in the acreage reduction program in order to be eligible for program benefits. Had those acres been in production, farmers would have harvested another 75-80 million cwt of rice. Valued at the prevailing loan rate, farmers would have received $523 million in additional gross revenue from production on the idled acres. Subtracting variable cash expense estimated at $254 per acre for 1.32 million acres, farmers could have realized a net revenue of $188 million on the idled acres. But Government deficiency payments for rice produced under the 1987 program totaled $545 million. Thus, producers received a gain of $357 million for participating in the rice program. Even if farmers expected a higher price at the time of sign-up for the program, they received added benefits from participation.

Farm program payments are based on an established payment rate per unit of commodity. Participants with higher output receive larger payments. Thus, farms with high yields per harvested acre or large farms are likely to receive the largest share of program payments, no matter what the price received for their crop or cost structure. As table 19 shows, less than 10 percent of producers had farms of more than 1,000 acres, yet they received 28 percent of the deficiency payments made in 1982. However, payment limitations affect large farms more than small farms.

Table 19--Percentage distribution of 1982/83 rice deficiency payments, by size of farm

Total cropland acres	Percent of: Participating acreage		Participating producers		Deficiency payments	
	Cumulative percent					
1-99	5.83	5.83	44.48	44.48	6.75	6.75
100-259	10.21	16.04	18.75	63.23	14.03	20.78
260-499	16.86	32.90	14.92	78.15	21.85	42.63
500-999	25.44	58.34	12.80	90.95	29.47	72.10
1,000-1,499	14.03	72.37	4.49	95.44	13.43	85.53
1,500-1,999	8.64	81.01	2.11	97.55	6.56	92.09
2,000-2,499	5.45	86.46	1.04	98.59	3.30	95.39
2,500 & over	13.54	100.00	1.42	100.00	4.62	100.00

Source: U.S. Senate Committee on the Budget. 1982 Farm Program Benefits: Participants Reap What They Sow, 1985.

Taxpayers

Rice program and related expenditures are, like other Government expenditures, an income transfer from taxpayers to the rice industry. In 1961, net price support and related expenditures for the rice program totaled $29.5 million, but expenditures for PL 480 contributed an additional $110 million to that. Expenditures for the rice program totaled $2.11 per taxpayer in 1961. In 1983, per-taxpayer rice program expenditures were $7.88. Not only did taxpayer expenditures nearly quadruple over 23 years, but the taxpayer base increased 53 percent. Between 1961 and 1987, average annual expenditures for the rice program were $176 million, excluding expenditures for PL 480. When PL 480 expenditures are included, the annual average over 27 years increases to $334 million. Total related expenditures for the rice program since 1961 have been $9.01 billion. And, $4.26 billion of these were for Government-assisted exports of rice.

Consumers

Domestic U.S. demand for rice is influenced more by tastes, preferences, geographic location, and cultural factors than by price. Thus, if the rice program alters the farm price of rice, domestic consumption is unlikely to change correspondingly. Retail prices for rice currently average $0.40-$0.50 per pound while farm prices for paddy (at loan) are $0.06-$0.07 per pound. Thus, farm prices for rice account for roughly 15 percent of the retail price paid by consumers, much higher than for other grains such as wheat. The higher farm share of rice price is explained by the large domestic consumption of rice as a whole grain. Wheat is consumed in processed forms, adding to the value of the final product (and hence, the price paid by consumers) and thus diminishing the farm share.