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SOME ASPECTS OF  
PROCUREMENT AND  
DISTRIBUTION OF  
FOODGRAINS IN INDIA

P. S. GEORGE

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ASPECTS OF PUBLIC SECTOR PROCUREMENT AND DISTRIBUTION  
OF FOODGRAINS IN INDIA

by

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## FOREWORD

Studies of food subsidies are an important part of IFPRI's research portfolio. Their primary purpose is to help governments of developing countries assess how current and alternative subsidy policies affect human nutrition, food consumption, income growth and distribution, fiscal costs, agricultural production, and foreign trade. Results from studies in several countries have been published as IFPRI's research reports. This working paper series was initiated to meet requests for additional information on the nature, implementation, and effects of subsidies in various countries. The food subsidy papers complement IFPRI's research reports on the subject by providing detailed descriptive analyses of operational and implementation issues and impact.

Working papers are written primarily for those responsible for policy design, implementation, and analysis. They are intended to provide information about the nature and performance of various types of subsidy programs in order to facilitate interchange of such knowledge among countries. All of the papers in the series present final results from completed studies and have undergone review.

This first paper of the series provides a detailed and analytical description of a very large public procurement and distribution system that has been in effect in India for a long period of time. P. S. George of the Centre for Development Studies at Trivandrum provides a detailed description and analysis of the way the system operates and its costs and benefits. Additional analyses of food ration shop schemes and food subsidies in the Indian subcontinent are described in Impact of Subsidized Rice on Food Consumption and Nutrition in Kerala, Research Report 5; Public Distribution of Foodgrains in Kerala --Income Distribution Implications and Effectiveness, Research Report 7; Foodgrain Supply, Distribution, and Consumption Policies within a Dual Pricing Mechanism: A Case Study of Bangladesh, Research Report 8; Two Analyses of Indian Foodgrain Production and Consumption Data, Research Report 12; The Impact of Public Foodgrain Distribution on Food Consumption and Welfare in Sri Lanka, Research Report 13; Agricultural Price Policies Under Complex Socioeconomic and Natural Constraints: The Case of Bangladesh, Research Report 27; and Policy Modeling of a Dual Grain Market: The Case of Wheat in India, Research Report 38.

Per Pinstrup-Andersen

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Per Pinstруп-Andersen of IFPRI was keenly interested in the study, and he was a constant source of help and guidance at various stages. An earlier draft was reviewed by Pinstруп-Andersen and Harold Alderman. I have greatly benefited from their comments in revising the report.

A number of officials connected with public distribution in India and the states of Gujarat, Kerala, Punjab, Tamil Nadu, and West Bengal rendered valuable help in identifying relevant data. G. Placid and Mrs. G. George were helpful in collection and tabulation of data. I have also benefited from discussions with colleagues and a number of other knowledgeable persons. I am grateful to all of them.

P. S. George

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**PART ONE: OVERVIEW**

## 1. INTRODUCTION

Public procurement and distribution of food has been an integral part of the food management policy of the Government of India for four decades. It began as rationing of available foodgrains, but a number of changes were introduced in the rationing concept during subsequent years. The major components of this food management policy over the years have been monopoly imports, procurement from domestic producers, trade regulations, price control, food distribution through fair price shops, and buffer stock operations.<sup>1</sup> A number of auxiliary devices and institutional arrangements were created to support the food distribution policy. This study describes the development of the public procurement and distribution system, reviews the operations, and makes some observations about the effects of the system.

### EVOLUTION OF PUBLIC DISTRIBUTION

The present system of public distribution in India has evolved from its beginnings during the Second World War, when supplies from Burma were cut off and the British administration in India was faced with the problem of arranging emergency supplies of food. Prior to this, the central government had convened three Price Control Conferences (PCC) between October 1939 and October 1941, but it had decided against imposing food price controls. However, under the Defence of India Rules, provincial governments were given the discretion to intervene if prices increased more than 20 percent above the levels that prevailed in September 1939.

Direct government intervention in foodgrain markets through price control and movement restrictions introduced at the time of the fourth PCC in February 1942 was ineffective. The situation during April in 1942 was described as ". . . the failure of wheat to come forward under the Government of India's maximum price, shortage of supplies in industrial areas, scramble to buy rice in the rice growing area to make up for the loss of the Burma imports, a holding back of

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<sup>1</sup>See H. Knight, Food Administration in India, 1939-47 (Stanford, Cal.: Stanford University Press, 1954); Arvind Gupta, Public Distribution of Foodgrains in India, CMA Monograph 69 (Ahmedabad: Indian Institute of Management, 1977); and John Wall, Foodgrain Management: Pricing, Procurement, Distribution, Import and Storage Policy, World Bank Staff Working Paper No. 279 (Washington, D.C.: World Bank, 1978).

supplies from the market in the hope of better prices still to come. . . ."<sup>2</sup> To overcome this situation, the fifth PCC in April 1942 introduced a system of licensing wholesale dealers in foodgrains, and the sixth PCC the following September decided to handle all purchases for export from surplus provinces through a central agency. A Department of Food was created in December 1942 to administer government food distribution policies.

Soon after the creation of this department, action was initiated to establish procurement mechanisms in the states and to arrange supplies for deficit regions. Because of difficulties in organizing these activities, the government introduced unrestricted free trade, which resulted in speculation, hoarding, and undue price increases even in surplus areas. The problem was further complicated by the Bengal famine, and by July 1943 it was concluded that control of foodgrain supplies was necessary and inevitable, and that free trade was impossible.

The 1943 Foodgrains Policy Committee recommended imports of foodgrains to create a reserve stock, procurement arrangements to secure a higher proportion of grains for public distribution, introduction of rationing, statutory price controls, and creation of administrative machinery for improved coordination between central and state administrations. By February 1945 rationing covered 516 towns and about 50 million persons.

There were three types of distribution arrangements: statutory rationing, nonstatutory rationing, and controlled distribution, the distinction between them being the extent to which private trade was allowed to function in the market.

Between Independence in 1947 and the appointment of the Foodgrains Enquiry Committee in 1957, there was complete control, partial control, and complete decontrol. The rationing policy of 1944 continued until 1951. The increased cost of subsidizing imports, the heavy administrative burden, and the growing public sentiment against controls led to a system of licensed dealers in foodgrain distribution in 1952. Even this system was removed in 1953 when wheat and coarse grains were decontrolled. However, to meet the price rise following crop failures during 1955/56, major cities were cordoned off and credit squeezes were introduced. By 1957 foodgrain procurement operations and distribution through fair price shops had been introduced.

The next phase in the evolution of the public distribution system was based on the 1957 recommendations of the new Foodgrains Enquiry

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<sup>2</sup>Knight, Food Administration in India, 1939-47, p. 50.

Committee. Price stabilization, control over trade, and progressive socialization of trade were the essential ingredients. Measures included open market purchases of foodgrains, socialization of a part of the wholesale trade, licensing of traders, and imports of rice and wheat.

The price increase during the early 1970s influenced the government to take over wholesale trade of wheat beginning in April 1973, and it planned to take over wholesale trade of rice the following season. The government's failure to achieve procurement targets for wheat raised serious questions about nationalization of foodgrain trade, however, and the attempt was abandoned in 1974. During subsequent years the improved overall availability of foodgrains and the comfortable buffer stock accumulated by public agencies induced the government to remove most controls imposed during periods of scarcity.

#### EXISTING ORGANIZATIONAL STRUCTURE

The central and state governments, along with various supporting organizations carry out the functions of procurement, movement, storage, and distribution of foodgrains. Charts showing the flow from producers to consumers through trade channels and the public distribution system for wheat (Figure 1) and rice (Figure 2) indicate some of the organizations involved in carrying out the different functions.

At the central level, the Department of Food is responsible for all policy decisions. The Food Corporation of India (FCI), an autonomous agency set up by the central government, is responsible for handling procurement, imports, storage, and distribution of foodgrains. FCI carries out these functions through its own network across the country, and it also uses services of other state and central government agencies. The procurement and sale prices of foodgrains from the central pool are determined by the Department of Food based on the recommendations of the Agricultural Prices Commission and the views of the National Development Council.

Some state governments have set up their own corporations which act as agents to FCI for procurement and internal distribution. Most state governments have their own departments for food and civil supplies. In some areas producer cooperative societies are involved in procurement and consumer cooperatives are involved in distribution.

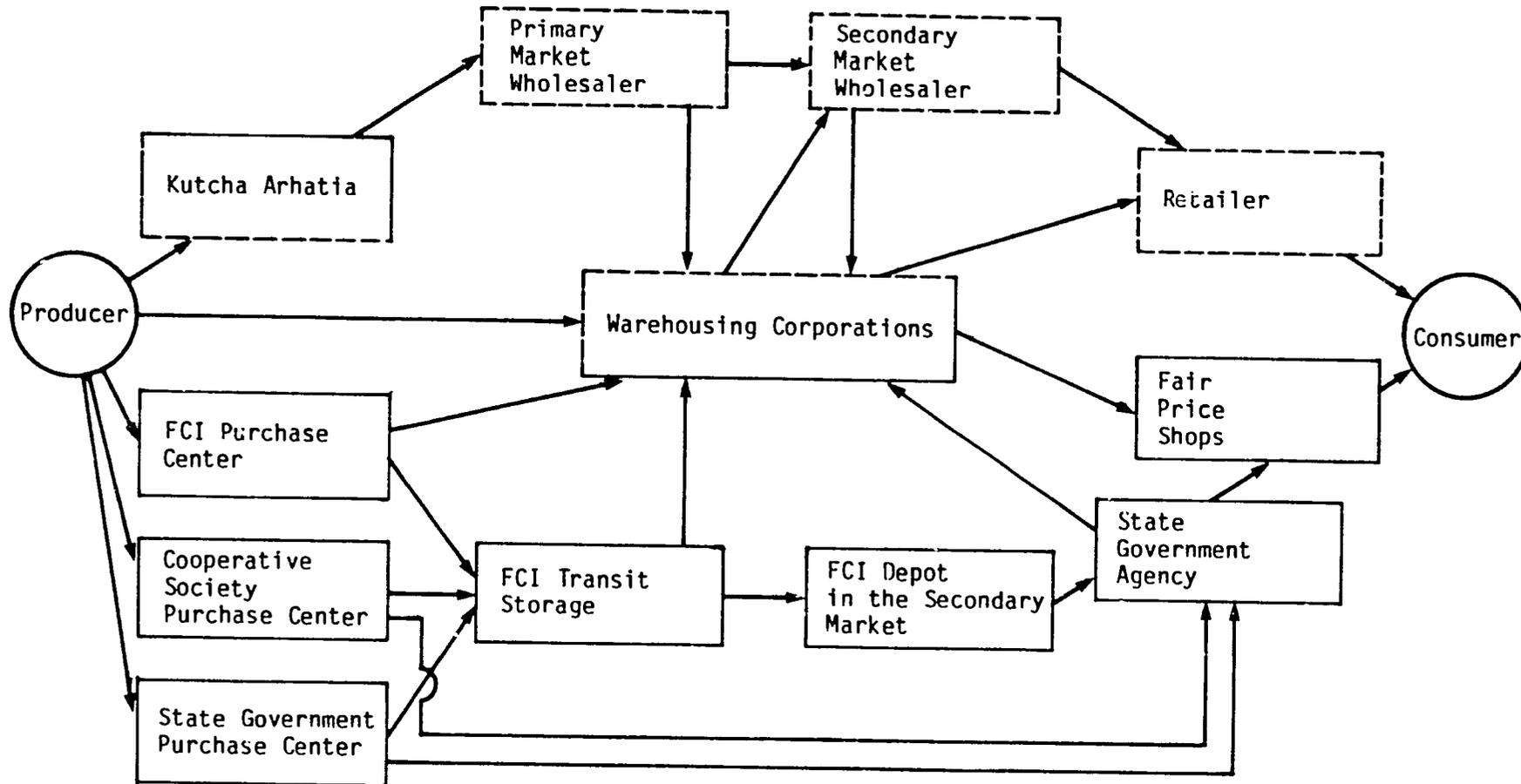
#### Procurement Agencies

In recent years wheat has been procured under price support operations. FCI has been the major agency involved but some state governments have also helped to organize procurement. FCI procures

Figure 1--Flow of wheat through trade channels and the public distribution system

----- Trade Channels

———— Public Distribution System

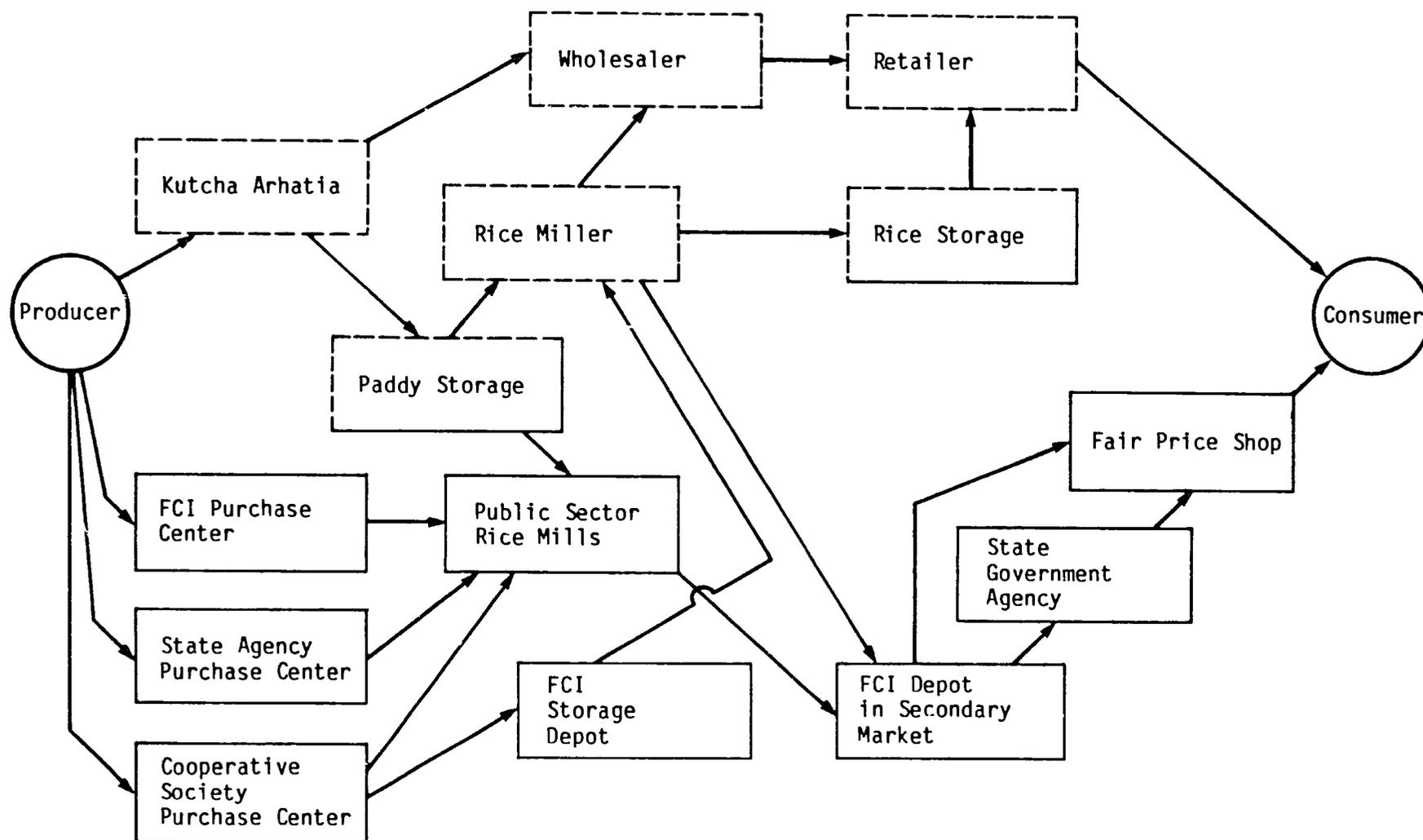


Note: A kutcha arhatia is a small agent who operates on commission in wholesale assembly markets, acting for all sellers from the countryside, including cultivators.

Figure 2--Flow of rice through trade channels and the public distribution system

--- Trade Channels

— Public Distribution System



Note: A kutcha arhatia is a small agent who operates on commission in wholesale assembly markets, acting for all sellers from the countryside, including cultivators.

foodgrains on behalf of both central and state governments at support or levy prices fixed by the Government of India. FCI is allowed to offer farmers lower prices for foodgrains of inferior quality (as assessed by FCI) than what is paid for Fair Average Quality (FAQ).

### Procurement Methods

State governments are free to determine the methods of procurement. These have included purchases from the open market, monopoly purchase, levy on traders, and levy on producers.

Wholesale trade of wheat was nationalized in 1973, and this introduced monopoly procurement. It was soon realized that monopoly procurement would only succeed in areas where the government was able to handle the entire market surplus of all food commodities. The takeover of wholesale trade in wheat was abandoned the next year and a levy on traders was introduced.<sup>3</sup> As availability improved, wheat procurement was made under price support operations.

Compulsory procurement of paddy and rice remained in force over the years. The description of procurement arrangements during 1981/82 reflects the nature of variations among the states (see Table 1). Even within a given state, procurement arrangements varied over time.

### Zoning

The government imposed restrictions on movement of foodgrains by private trade, particularly of rice and wheat, from one region to another through creation of food zones. Zoning restrictions varied over time for different regions and crops. Convenience in procurement, reduced cost of public distribution, and equitable distribution among consumers were some of the justifications offered for introducing zonal arrangements.<sup>4</sup> However, there was a strong feeling that zonal barriers were ineffective in achieving either production or consumption objectives of the national food policy.

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<sup>3</sup>For a detailed discussion of various procurement methods and their advantages and disadvantages, see India, National Commission on Agriculture, Interim Report on Agricultural Prices Policy, 1975 (New Delhi: Controller of Publications, 1975); and India, National Commission on Agriculture, Projections of Demand for Selected Agricultural Commodities in India, 1975-2000 (New Delhi: Controller of Publications, 1973). For conflicting views on the effects of procurement, see M. L. Dantwala, "Incentives and Disincentives in Indian Agriculture," Indian Journal of Agricultural Economics 22 (1967): 1-22; and V. M. Dandekar, Food and Freedom (Dharwar: Kanak University, 1967).

<sup>4</sup>India, Ministry of Food, Annual Report, 1975-76 (New Delhi: Controller of Publications, 1976).

Table 1--Procurement methods for paddy rice, kharif season, 1981/82

State	Procurement Method
Andhra Pradesh	50 percent levy on rice millers and dealers
Assam	50 percent levy on movement of paddy outside the state
Bihar	Rice millers: 50 percent or 250 tons of rice in lump sum; wholesalers: 35 percent or 100 tons of rice in lump sum
Gujarat	50 percent levy on millers and dealers
Haryana	90 percent levy on millers and dealers for common and fine varieties; 75 percent for superfine varieties
Karnataka	50 percent levy on millers and dealers; 70 percent levy on movement of paddy outside the state
Kerala	Graded levy on producers
Madhya Pradesh	60 percent levy on millers and dealers; 60 percent levy on movement of paddy outside the state
Punjab	90 percent levy on millers and dealers for common varieties; 75 percent for fine and superfine varieties
Rajasthan	50 percent levy on millers and dealers
Tamil Nadu	50 percent levy on wholesalers of rice
Uttar Pradesh	60 percent levy on millers and dealers
West Bengal	60 percent levy on rice millers and wholesalers

Source: India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics (New Delhi: Controller of Publications, 1981), p. 203.

### Storage

Storage facilities are required for both transit and buffer stock operations. FCI has its own covered storage capacity of about 8 million metric tons and about 1.3 million metric tons CAP (cover and plinth).<sup>5</sup> Besides its own godowns, FCI rents storage space from other public sector agencies such as the Central Warehouse Corporation, state warehousing corporations, state governments, and private agencies. Utilization of storage capacity, both owned and rented, depends largely on the procurement and distribution policies of the central government and the availability of infrastructure, such as transport and labor.

### Distribution

FCI procures foodgrains for the public distribution system in the states based on the allocations made by the central government. In certain states, FCI acts as a wholesale agent of the state government for both procurement and distribution. In other cases, FCI issues stocks allotted from the central pool.

At the state level, arrangements are made for distribution through fair price shops. The extent of coverage of fair price shops and eligibility for purchases from these shops are determined by state governments. Each eligible household is given a card on which the maximum quantity entitled from the fair price shop is recorded, and based on how many cards are registered at each shop, the quota of grains for the shop is determined. A cardholder can obtain his quota only from the shop where it is registered. It is the responsibility of the licensee of the fair price shop to take delivery of foodgrains from the storage depot and to arrange for its transportation to the shop.

### Pricing

The procurement price of foodgrains is fixed by the central government. The Agricultural Prices Commission makes recommendations on procurement prices, and these are discussed at meetings of state chief ministers. Commission amounts, transport charges, and margins to various handling agencies are also determined by state governments. Restrictions are imposed by state governments with regard to pricing and distribution of end products of roller flour mills. The central government exercises restrictions on the sale price of end products by requiring its approval for these prices.

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<sup>5</sup>For the purposes of this report, all tons are metric tons. The term CAP refers to a storage system adopted in 1976 as an emergency measure. Plinths or platforms are filled with foodgrains and covered with plastic because of limited warehouse space.

## 2. COVERAGE OF PUBLIC PROCUREMENT AND DISTRIBUTION

### PROCUREMENT VOLUME

Over the years, the volume of foodgrains procured has increased substantially from 1.1 million tons in 1963/64 to 15.5 million tons in 1983/84. The composition of the 1983/84 procurement was about 7 million tons of rice, 8.3 million tons of wheat, and the balance in coarse grains. Though rice accounted for the major share during the early 1960s, wheat exceeded rice in all but one year (see Table 2). Procurement of rice accounted for about 10 percent of rice production in 1980/81, and wheat procurement was about 18 percent of wheat production.

Whereas the procurement volume accounted for only about 10 percent of total production of all foodgrains, it is important to note that government procurement accounted for a major share of marketed surplus during the period 1971/72 to 1981/82:<sup>6</sup>

<u>Year</u>	<u>Rice</u>	<u>Wheat</u>
	(percent)	
1971/72	30.3	54.5
1972/73	29.2	58.7
1973/74	39.4	38.4
1974/75	43.6	62.7
1975/76	49.5	76.4
1976/77	33.4	62.2
1977/78	37.2	81.7
1978/79	37.5	57.5
1979/80	49.2	93.0
1980/81	35.3	60.3
1981/82	41.7	65.0

The changes in the relative shares of rice and wheat in total procurement of foodgrains were mainly brought about by relatively larger increases in the production of wheat. About 90 percent of the variations in the procurement volume of wheat was explained by changes in the amount of wheat produced. However, changes in rice production

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<sup>6</sup>Marketed surplus corresponds to actual market arrivals. This may differ from marketable surplus depending on factors such as farm-level storage and distress sales.

Table 2--Internal procurement of foodgrains, selected years

Year	Total Procurement	Share of Total Procurement		Procurement as a Share of Production		
		Rice	Wheat	Rice	Wheat	All Foodgrains
	(million metric tons)	(percent)		(percent)		
1963/64	1.1	91.5	8.5	2.8	1.0	1.4
1969/70	6.5	45.3	49.1	7.3	15.9	6.5
1970/71	8.8	36.3	58.0	7.6	21.4	8.1
1974/75	8.2	46.4	49.6	9.4	16.8	8.1
1975/76	13.3	47.6	49.7	12.8	23.3	11.0
1976/77	9.9	44.9	52.4	10.9	17.8	8.8
1977/78	10.5	46.1	53.6	9.2	17.8	8.3
1978/79	14.2	44.3	54.9	11.7	21.9	10.7
1979/80	10.2	38.7	60.1	9.3	19.2	9.3
1980/81	12.1	46.0	53.2	10.4	17.6	9.3
1981/82	14.0	51.2	47.1	n.a.	n.a.	n.a.
1982/83	14.8	47.5	52.1	n.a.	n.a.	n.a.
1983/84	15.5	45.2	53.7	n.a.	n.a.	n.a.

Sources: Compiled from India, Economic Survey, various issues (New Delhi: Controller of Publications, various years); and India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics, various issues (New Delhi: Controller of Publications, various years).

Note: n.a. means not available.

could account for only about 45 percent of the variations in rice procurement. The elasticity of rice procurement with reference to rice production was 2.0. The estimated regression equations between procurement ( $P_c$ ) and production ( $P_d$ ), are

$$\text{for rice, } P_c = -2,727 + 0.15 P_d; R^2 = 0.44; \\ (2.9)$$

$$\text{for wheat, } P_c = -3,140 + 0.31 P_d; R^2 = 0.91; \\ (10.38)$$

$$\text{and for all foodgrains, } P_c = -11.23 + 0.186 P_d; R^2 = 0.77. \\ (6.01)$$

The figures in parentheses are t-values.

Among the states, Punjab accounted for the largest share of wheat procurement, although Haryana and Uttar Pradesh also contributed (see Table 3).

An analysis of procurement in relation to wheat production in each state indicates that about half the production in Punjab and about a third of that in Haryana were procured by government agencies (see Table 4). In the other states, the share of production sold to public agencies was relatively low.<sup>7</sup>

Punjab also accounted for the largest share of rice procurement (see Table 5). All states that contributed to the total procurement either retained or increased their individual shares over the years, with the exception of Madhya Pradesh, whose share declined considerably.

The intensity of rice procurement was not uniform. During 1981/82 about 82 percent of rice production in Punjab was sold to the government (see Table 6). The figure for Haryana was almost as high. Rice, however, is not the staple food in either state. Before the winter wheat crop, however, a monsoon rice crop intended for consumption in other states is often grown. Since interstate movement of foodgrains was controlled by the central government, most production from these two states was sold through government agencies.<sup>8</sup>

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<sup>7</sup>During 1978/79-1980/81, the share of Punjab, Haryana, and Uttar Pradesh in all-India production of wheat was 22.2 percent, 10.0 percent, and 33.2 percent respectively. The share of these states in total wheat procurement was 66.6 percent, 15.6 percent, and 8.1 percent.

<sup>8</sup>During 1978/79-1980/81, the share of Andhra Pradesh, Tamil Nadu, Punjab, and Haryana in the total production of rice was 14.0 percent, 10.3 percent, 6.3 percent, and 2.3 percent respectively.

Table 3--Shares of states in total domestic wheat procurement, selected years

State	1971/72	1974/75	1979/80	1980/81	1981/82	1982/83	1983/84
	(percent)						
Haryana	13.9	12.7	19.5	15.6	17.0	16.4	16.9
Madhya Pradesh	0.9	6.3	...	...	2.5	0.8	0.7
Punjab	57.6	55.4	59.1	66.6	57.1	62.3	62.3
Uttar Pradesh	22.4	16.3	16.6	8.1	22.7	17.9	17.4
Others	5.2	9.3	4.8	0.3	0.7	2.4	2.7

Sources: Compiled from India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics, various issues (New Delhi: Controller of Publications, various years); and India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Agricultural Situation in India, various issues.

Note: The ellipses indicate a negligible amount.

Table 4--Procurement of wheat as a percentage of wheat produced, selected states, selected years

State	1971/72	1974/75	1979/80	1980/81	1981/82
	(percent)				
Haryana	34.1	22.2	42.3	28.7	30.4
Madhya Pradesh	2.0	5.9	0.5	...	...
Punjab	38.8	44.5	53.2	55.7	44.0
Rajasthan	2.4	10.2	11.1	0.7	0.3
Uttar Pradesh	11.2	11.0	12.0	3.9	11.6

Source: Compiled from India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics, various issues (New Delhi: Controller of Publications, various years).

#### PROCUREMENT PRICE

Each year since its inception in 1964, the Agricultural Prices Commission has made recommendations on prices for different commodities. Commission reports mention that these recommendations were influenced by cost of production, trends in the open market wholesale price, incentives for securing a balanced growth in output of related crops, reduction in interstate price dispersion, and the need for curtailing inflation. However, an analysis of Commission recommendations indicates no direct relationship between recommended prices and any of these considerations.

Commission recommendations are discussed at the National Development Council. During the late 1960s and early 1970s a minimum support price and a procurement price were specified. Minimum support prices were a long-term guarantee to producers that in the event of a market glut for any reason, including production increases, prices would not be allowed to fall below minimum economic levels.<sup>9</sup> At the same time, procurement prices were essentially intended for the purchase of quantities needed by the government for maintaining the public distribution system and for building up buffer stocks. By the

<sup>9</sup>India, Ministry of Food, Annual Report, 1976-77 (New Delhi: Controller of Publications, 1977).

Table 5--Shares of states in total rice procurement, selected years

State	1971/72	1974/75	1979/80	1980/81	1981/82	1982/83	1983/84
	(percent)						
Andhra Pradesh	8.6	23.4	11.9	12.3	15.0	23.1	18.6
Haryana	10.1	7.3	14.1	12.1	12.0	10.1	8.8
Madhya Pradesh	13.7	4.0	2.3	6.1	5.0	2.6	4.2
Punjab	24.7	25.6	58.3	45.4	42.4	46.0	44.0
Tamil Nadu	5.2	11.6	3.3	3.1	7.9	6.0	8.2
Uttar Pradesh	9.5	7.5	1.8	10.6	9.9	8.0	10.4
Others	28.2	21.2	9.8	10.4	7.8	4.2	5.8

Source: Compiled from India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics, various issues (New Delhi: Controller of Publications, various years).

Table 6--Procurement of rice as a percentage of rice produced, selected states, selected years

State	1971/72	1974/75	1979/80	1980/81	1981/82
	(percent)				
Andhra Pradesh	5.7	15.6	7.4	9.8	13.8
Haryana	59.0	70.9	58.7	54.6	70.6
Madhya Pradesh	11.6	6.3	4.9	8.4	9.7
Punjab	83.8	82.1	75.4	78.3	82.3
Tamil Nadu	3.0	10.5	2.3	4.2	10.3
Uttar Pradesh	7.8	8.1	2.9	10.6	12.2
West Bengal	3.9	3.4	1.2	1.9	0.8

Source: Compiled from India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics, various issues (New Delhi: Controller of Publications, various years).

mid-1970s the practice of announcing the minimum support price was given up, mainly because of the policy of purchasing the entire quantity offered for sale at the procurement price.

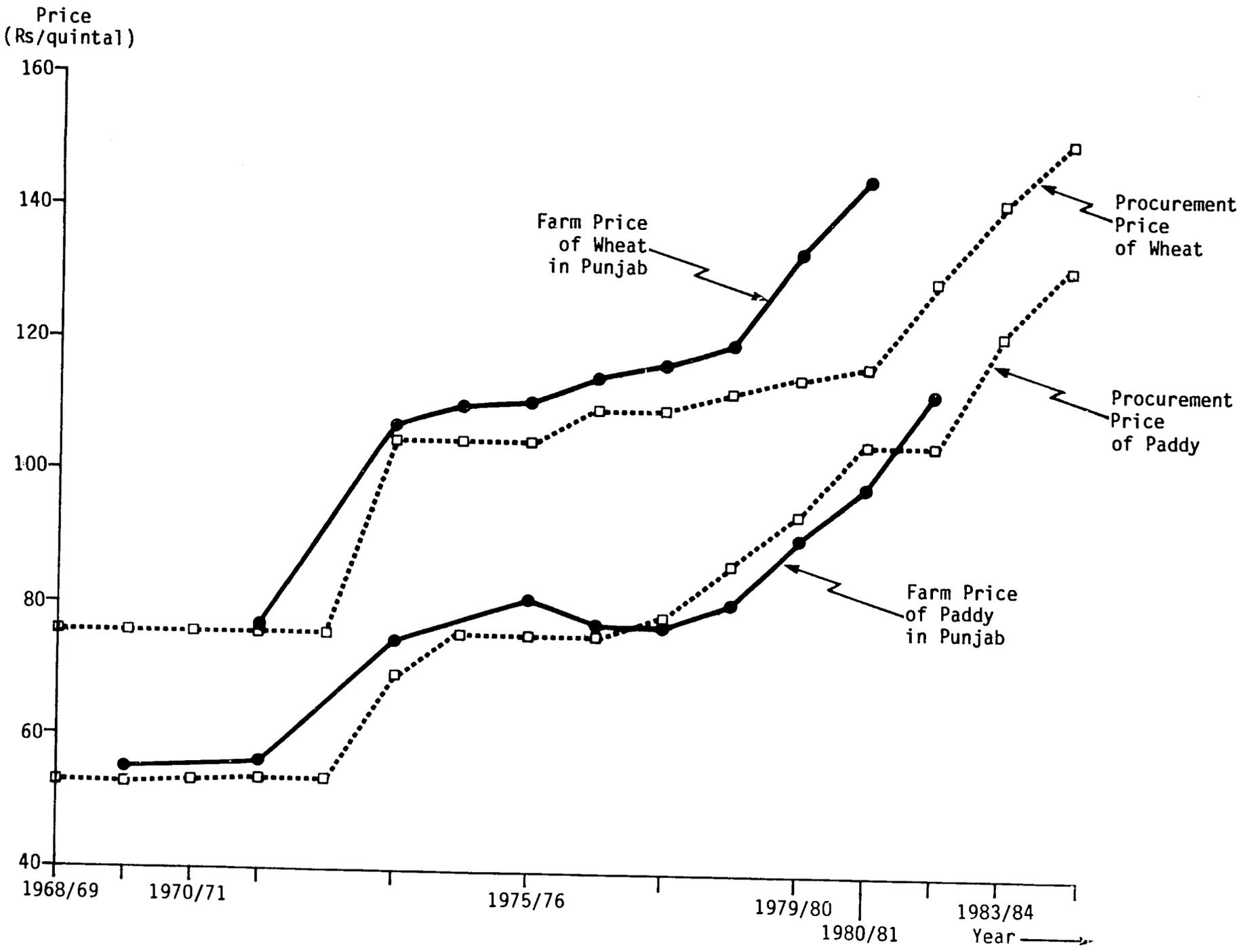
The procurement price of wheat was fixed at Rs 54 per quintal (hundredweight) in 1965/66, and this price rose to Rs 151 by 1983/84.<sup>10</sup> Whereas the procurement price remained at Rs 76 per quintal for five years after 1968/69 and at Rs 105 for three years after 1973/74, there was an increase in each subsequent year. The procurement price of paddy (common variety) was Rs 40 per quintal during 1965/66, and it rose to Rs 132 by 1983/84.<sup>11</sup> For paddy the procurement price remained constant from 1967/68 to 1969/70 and from 1974/75 to 1976/77 (see Figure 3).

Farm harvest prices in many states were much higher than procurement prices. Punjab was the only state where the farm harvest price of paddy was more or less the same as the procurement price. It

<sup>10</sup>At 1965/66 price levels, the 1983/84 deflated price of wheat came to Rs 42 per quintal. Thus, the real price fell during the period.

<sup>11</sup>At 1965/66 price levels, the 1983/84 price of paddy corresponds to Rs 37 per quintal.

Figure 3--Procurement and farm prices of paddy and wheat, 1968/69-1980/81.



may be recalled that Punjab is not a rice-consuming area, and most of the paddy produced in the state is sold to government procurement agencies. Prices in some major producing and consuming states are given in Table 7.

#### DISTRIBUTION

During the period 1971-83, the number of fair price shops increased from 120,000 to 290,000. Most fair price shops are owned either by private retailers or cooperative societies. As of December 31, 1981, 660 million people were covered by fair price shops (see Table 8).<sup>12</sup> On an average, each fair price shop served a population of 2,335 persons. The number of persons per shop was least in Assam and highest in Uttar Pradesh.

Table 7--Farm harvest prices for paddy and wheat in selected states, 1978/79 and 1979/80

Price	Paddy		Wheat	
	1978/79	1979/80	1978/79	1979/80
	(Rs/quintal)			
Procurement price	85.0	95.0	115.0	117.0
Farm harvest price in:				
Andhra Pradesh	84.8	97.3	n.a.	n.a.
Kerala	125.8	133.2	n.a.	n.a.
Madhya Pradesh	80.6	97.9	121.8	149.3
Punjab	85.6	94.9	123.7	140.3
Tamil Nadu	149.1	178.7	n.a.	n.a.
Uttar Pradesh	81.1	108.1	109.1	122.4

Source: India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Agricultural Situation in India (New Delhi: Controller of Publications, August 1982) p.322.

Note: n.a. means not available.

<sup>12</sup>The 1981 population of India was 685 million.

Table 8--Coverage of fair price shops, by states, December 1981

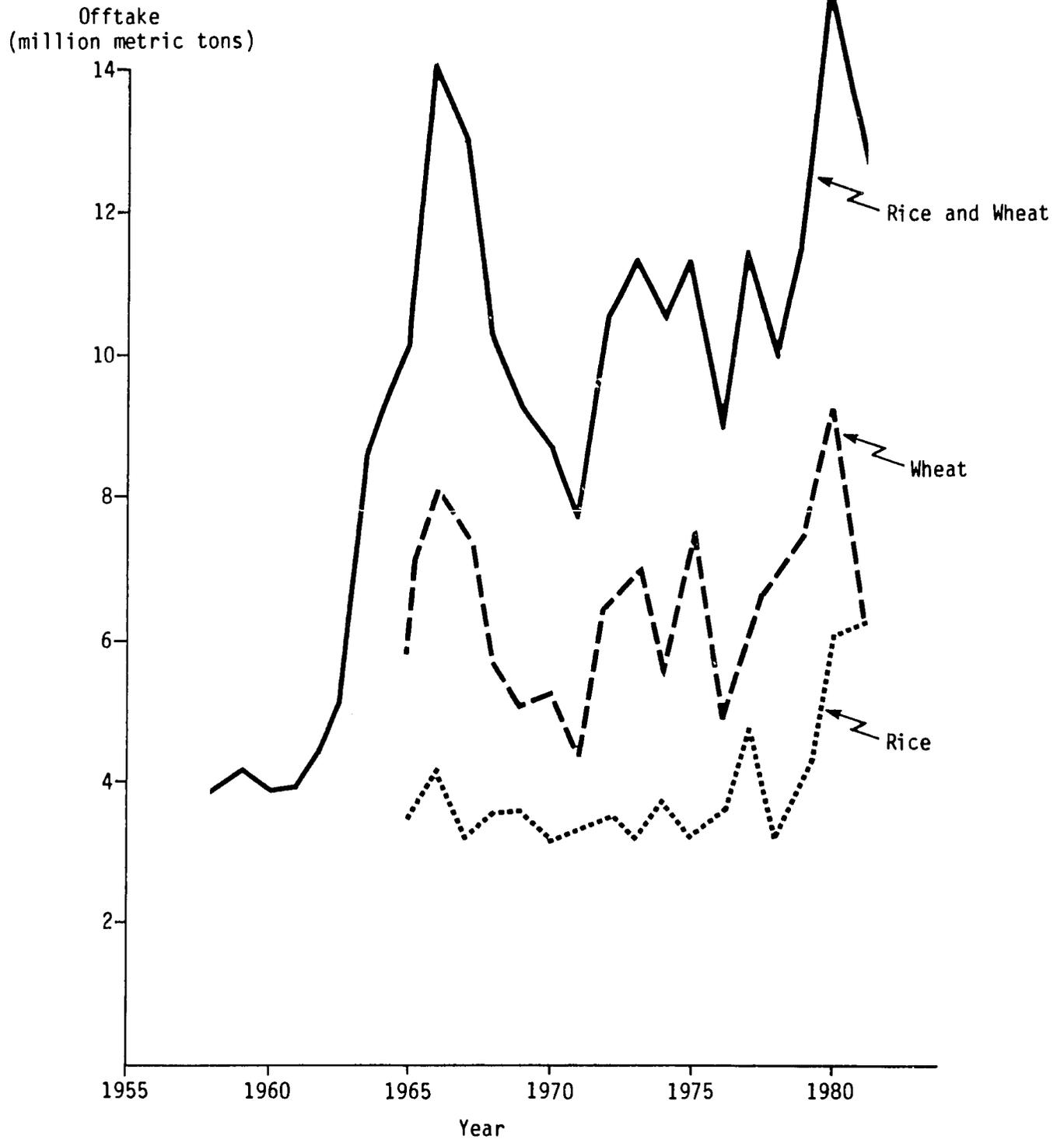
State	Number of Fair Price Shops	Population Covered
		(millions)
Andhra Pradesh	28,734	52.6
Assam	16,389	18.9
Bihar	37,142	69.8
Gujarat	9,956	36.1
Haryana	5,343	12.9
Kerala	11,635	21.6
Madhya Pradesh	22,812	47.5
Maharashtra	29,315	63.3
Orissa	17,150	21.2
Punjab	10,321	18.5
Rajasthan	10,057	34.1
Tamil Nadu	17,536	50.6
Uttar Pradesh	20,001	103.5
West Bengal	18,496	55.6
All India	282,920	660.5

Source: India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics (New Delhi: Controller of Publications, 1981), p. 58.

The offtake (the amount of rations purchased) from fair price shops indicates actual quantities distributed, which in turn is an outcome of the interaction between forces of demand and supply. The demand for purchases from fair price shops is influenced by a number of factors, the most important being the availability of foodgrains in the open market. During years of production shortfalls, the availability on the open market will be reduced and there will be increased demand for purchases from the public distribution system. At the same time it is most difficult to procure foodgrains for the system during periods of production shortfalls. Thus when the demand from consumers is high, the government supply position is tight.

The offtake from fair price shops increased substantially during the mid-1960s when there was a major decline in local production (Figure 4). As production increased in the late 1960s and early 1970s, there was a drop in the offtake. Throughout the 1970s, the total annual offtake remained at about 10 million tons. The shortfall

Figure 4--Offtake of rice and wheat from fair price shops, 1955-81



in production during 1979/80 and the resulting price increase contributed to further expansion of the offtake during the early 1980s.

Wheat accounted for the major share of foodgrains distributed through fair price shops. The relatively easy availability of wheat was the major reason for its dominance of public distribution. During the 1960s wheat was made available to the public distribution system through imports and U.S. Public Law 480 shipments. With increased wheat production and procurement, imported wheat was displaced by wheat procured from local markets. During the 1960s and 1970s the offtake of rice from the public distribution system remained more or less constant, but wheat offtake fluctuated widely from year to year, ranging between 4.5 million tons in 1971 and 8.8 million tons in 1980 (Figure 4).

Kerala, Maharashtra, Tamil Nadu, and West Bengal accounted for about half the foodgrains distributed through the public distribution system. Three major cities (Bombay, Calcutta, and Madras) accounted for the large share of offtake in Maharashtra, Tamil Nadu, and West Bengal. The extended coverage of public distribution in both urban and rural areas accounted for Kerala's high share in the total distribution of foodgrains (see Table 9).

Between 1966 and 1981, the offtake was highest during 1980 and lowest during 1971. The maximum offtake (14.99 million tons) was 192 percent above the minimum. However, variations from year to year in West Bengal and Kerala were very small. Variations in Maharashtra and Tamil Nadu were also within 30 percent of the offtake during 1971. Thus in all major states where public distribution existed, there was some stability in the offtake levels, especially in states with large urban populations (Maharashtra, Tamil Nadu, and West Bengal). The substantial deficit production within the state explained the large offtake in Kerala. Therefore, it can be inferred that the offtake from the public distribution system tended to remain stable in urban areas and areas with huge deficits. In areas where local production was sufficient for local consumption in normal years, dependence on public distribution was resorted to only during periods of shortage. Thus local production had an influence on the offtake from the public distribution system in many states (see Table 9).

The relatively high share of total offtake in the four states is also reflected in the per capita supply distributed through fair price shops (see Table 10). Though Kerala remained behind Maharashtra and West Bengal in the share of foodgrains distributed through the public distribution system, the per capita offtake in Kerala was the highest. West Bengal had the next highest per capita offtake. During 1981, 10 of the 15 states had per capita distribution below the per capita figure for India as a whole. The per capita availability data indicate that, even after allowing for the public distribution system,

Table 9--Quantities of foodgrains distributed through the public distribution system, selected years

State	Share in Total Distribution in 1981	Quantity Distributed				1980 Supply as a Share of 1971 Supply
		1966	1971	1980	1981	
	(percent)	(million metric tons)				(percent)
Andhra Pradesh	4.5	0.67	0.25	0.55	0.59	219
Assam	4.5	0.34	0.30	0.53	0.59	176
Bihar	4.6	0.81	0.41	1.01	0.60	245
Gujarat	3.3	0.83	0.15	0.35	0.43	236
Haryana	0.8	n.a.	n.a.	0.14	0.10	n.a.
Karnataka	4.8	0.73	0.27	0.57	0.63	213
Kerala	9.0	1.14	0.93	0.93	1.19	100
Madhya Pradesh	4.1	0.84	0.10	1.10	0.54	1,102
Maharashtra	12.2	2.27	1.24	1.56	1.59	126
Orissa	2.4	0.24	0.21	0.59	0.31	283
Punjab	1.7	n.a.	n.a.	0.32	0.22	n.a.
Tamil Nadu	8.7	1.42	0.51	0.66	1.14	129
Uttar Pradesh	7.3	0.75	0.25	1.89	0.95	757
West Bengal	15.8	2.22	2.15	2.33	2.07	108
All India	...	14.10	7.80	14.99	13.11	192

Source: India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics, various issues (New Delhi: Controller of Publications, 1981).

Notes: n.a. means not available.

Table 10--Per capita supply of foodgrains through the public distribution system, and per capita availability, 1975 and 1981

State	Per Capita Supply Through the Public Distribution System		Per Capita Availability 1975
	1975	1981	
(kilograms)			
Andhra Pradesh	19.3	11.0	142
Assam	19.9	29.9	134
Bihar	...	8.6	122
Gujarat	23.5	12.6	105
Haryana	10.4	7.9	197
Karnataka	16.9	17.0	161
Kerala	49.5	46.7	97
Madhya Pradesh	10.7	10.4	160
Maharashtra	26.9	25.5	116
Orissa	14.5	11.5	171
Punjab	5.4	13.3	229
Rajasthan	8.9	6.1	149
Tamil Nadu	28.2	23.7	132
Uttar Pradesh	9.9	8.6	130
West Bengal	35.2	37.9	167
All India	24.0	21.9	142

Sources: Data on per capita supply through the public distribution system is from India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Bulletin on Food Statistics, 1975 (New Delhi: Controller of Publications, 1975); and Bulletin on Food Statistics, 1981 (New Delhi: Controller of Publications, 1981). Data on per capita net availability is from Food Corporation of India, "All India Foodgrain Storage Project Report," Part 1, December 1976, p.58.

Note: Per capita availability is calculated using data on production within the state, movements in and out of the state, and changes in stocks. The ellipses indicate a nil or negligible amount.

the per capita availability in states with larger quantities sold through the public distribution system was low. West Bengal was an exception.

## ISSUE AND OPEN MARKET PRICES

The issue price of foodgrains sold through fair price shops is determined in two stages. During the first stage the central government determines issue prices of foodgrains from the central pool to the state governments, and during the second stage state governments determine prices to be paid by local consumers. Whereas the prices fixed by the central government were determined by such factors as the ability of the consumer to buy at the specified prices, the amount of subsidy from the government, and general price levels in the economy, state governments usually passed on their operating costs to consumers. The variation among states in the issue price of rice was higher than the variation in the issue price of wheat (see Table 11). The issue price from the central pool to state governments indicated relative stability during some years and sudden jumps during years when prices increased (see Table 12).

Open market prices are reported for selected markets for a few varieties of grains on a weekly basis, and some data on annual average prices are published by state departments of civil supplies. In the absence of data from all states, the data presented in Table 13 should

Table 11--Issue price of rice and wheat at the fair price shops, 1981-82

Foodgrain/State	Quality	Price	Effective Date
(Rs/kilogram)			
Rice			
Kerala	Coarse	1.85	Oct. 1, 1981
Maharashtra	Common	1.62	Jan. 1, 1981
Tamil Nadu	Medium	1.71	Feb. 3, 1981
West Bengal	Common	1.91	Oct. 1, 1981
Wheat			
Maharashtra	n.a.	1.77	Aug. 1, 1982
West Bengal	n.a.	1.75	Aug. 23, 1982

Source: India, Ministry of Agriculture and Irrigation, Indian Agriculture in Brief (New Delhi: Controller of Publications, 1982), p. 168.

Table 12--Issue prices of rice and wheat from the central pool, 1961-83

Year	Rice Price	Wheat Price	Ratio of Rice Price to Wheat Price
(Rs/quintal)			
1961-64	48.2	37.5	1.29
1965-66	71.0	70.0	1.01
1967	84.5	70.0	1.21
1968	102.0	78.0	1.31
1969-72	111.0	78.0	1.42
1973	140.0	90.0	1.56
1974-75	140.0	125.0	1.12
1976-78	150.0	125.0	1.25
1979-80	150.0	130.0	1.15
1981	165.0	145.0	1.14
1982	175.0	145.0	1.21
1983	188.0	160.0	1.16

Source: India, Ministry of Agriculture and Irrigation, Indian Agriculture in Brief, various issues (New Delhi: Controller of Publications, various years).

Table 13--Retail prices of rice and wheat in selected states, 1981

State	Rice Price	Wheat Price
(Rs/quintal)		
Andhra Pradesh	225	n.a.
Gujarat	n.a.	158
Kerala	330	n.a.
Punjab	204	162
Tamil Nadu	244	262
West Bengal	216	159

Source: India, Ministry of Agriculture and Irrigation, Agricultural Prices in India (New Delhi: Controller of Publications, 1982), p. 52.

merely be considered indicative of the nature of variations in the open market prices among the states and of variations between the open market price and the issue price from fair price shops. Open market prices in deficit states such as Kerala were substantially higher than issue prices. The gap between these two prices was small in surplus production areas such as Punjab.

#### PRICES AND OFFTAKE

The monthly ration offtake of total cereals was influenced by issue prices of rice and wheat from fair price shops as well as the open market price of cereals. These three variables explain about 80 percent of the variations in the monthly offtake from the public distribution system. All three variables had coefficients with significant values and signs conforming to normal expectations. The estimated equation is

$$Q_c = -35.76 - 0.162 \text{ RP(W)} - 2.37 \text{ RP(R)} + 5.368 \text{ Wc}; \quad R^2 = 0.82.$$

(2.89)                      (-3.28)                      (7.86)

The figures in parentheses are t-values. The elasticities are -0.264, -0.606, and 1.96 respectively, and

RP(W) = wheat price in fair price shops,  
 RP(R) = rice price in fair price shops,  
 Wc = the monthly wholesale price index of cereals (open market price), and  
 Qc = monthly offtake of cereals from the public distribution system.

The offtake of wheat from the public distribution system was directly related to the rice price in fair price shops and to the ratio between the wheat prices at the open market and fair price shops; it was indirectly related to the price of wheat in fair price shops.

$$Q_w = -103.50 - 0.16 \text{ RP(W)} + 2.05 \text{ RP(R)} + 124.53 \text{ MW}; \quad R^2 = 0.90.$$

(-6.04)                      (11.40)                      (13.45)

Again, the figures in parentheses are t-values. The elasticities are -0.32, 0.66, and 0.34.

MW = the ratio of the monthly wholesale price index of wheat to the ration price of wheat, and  
 Qw = the monthly ration offtake of wheat.

Neither the ration price of rice nor the gap between rice prices at the open market and fair price shops appears to influence offtake of rice. But wheat prices (both at the open market and fair price

shops) did have significant influence on rice offtake.<sup>13</sup> It is possible that the offtake of rice might have been influenced by availability factors.

$$\text{Log QR} = 4.756 + 1.286 \text{ Log MR} - 0.072 \log[\text{RP (R)}/\text{RP (W)}];$$

$R^2 = 0.704;$                       (5.65)                      -(2.08)

where

QR = the monthly ration offtake of rice, and  
 MR = the ratio of the monthly wholesale price index of wheat to the price of rice in fair price shops.

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<sup>13</sup>Since the log form of the equation gave better statistical properties, only the log equation is reported here.

### 3. COSTS AND BENEFITS OF PUBLIC DISTRIBUTION

Public distribution involves both direct and indirect costs. Direct costs consist of cash expenditures incurred by the central and state governments. Indirect costs include concessional rates of interest on bank loans for foodgrain purchases, cost to producers of the consumer subsidy through reduced procurement prices, possible negative effects of low prices on local production, and some transfer of income.

#### DIRECT COSTS

Because procurement prices of cereals and their issue prices are fixed by the central government, FCI has no control over them. In the past, the gap between the issue price and the procurement price was less than the handling cost incurred by FCI. Further, the landed cost of imported grains was higher than the issue price. The gap between the costs incurred by FCI (the procurement price and handling charges) and the amount realized through sales (the issue price) was met by the government and considered a consumer subsidy.

FCI operation costs include handling costs of moving, storing, and distributing foodgrains for the public distribution system and the cost of carrying stocks. Handling costs comprise the transportation charges for moving grains to consumer centers, interest, handling expenses incurred at godowns at the time of receipt and issue, storage charges, storage and transit losses, and administrative overhead. Between 1974/75 and 1980/81, handling costs doubled (see Table 14). In 1978/79 a major increase in costs occurred, rising to Rs 251 per ton from the previous year's cost of Rs 148 per ton, mainly because of the increased costs of freight and interest.

The size of the buffer stock maintained by FCI on behalf of the government depends on factors such as local procurement, imports, and offtake from the public distribution system. Whereas there was almost no buffer stock during 1974/75, by 1983/84 FCI had a buffer stock of about 7.1 million tons of foodgrains in addition to an operational stock of 5.1 million tons. The actual cost of carrying buffer stocks varied between Rs 236 per ton during 1977/78 and Rs 349 per ton during 1975/76.

The government subsidy increased from Rs 1,170 million in 1972/73

Table 14--Handling costs of normal operations of the Food Corporation of India, 1974/75-1981/82

Costs	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
	(Rs/metric ton)							
Administrative overhead	30.3	26.7	27.2	25.4	16.7	15.8	21.3	24.9
Freight	38.0	61.1	45.1	41.7	83.7	85.3	96.4	139.2
Godown charges	8.9	9.1	7.2	8.9	18.0	16.7	27.7	32.8
Godown handling expenses	9.8	12.1	13.5	13.1	14.9	14.6	21.1	33.3
Interest	25.6	35.8	46.1	46.5	87.0	60.9	71.6	79.6
Transit and storage loss	33.1	20.6	13.6	12.7	30.5	33.3	52.4	68.9
Total	145.7	165.4	153.1	148.3	250.8	226.6	290.5	378.7

Source: Food Corporation of India, Annual Report (New Delhi: FCI, various years).

to Rs 8,350 million in 1983/84<sup>14</sup> and budget estimates for 1984/85 had a provision of Rs 8,500 million for subsidy (see Table 15). Subsidy cost data are not readily available for the period prior to 1976/77, but data for subsequent years indicate that the consumer subsidy was higher than the cost of carrying buffer stocks. Actual shares depended on the quantity distributed and the size of the buffer stock.

The changes in consumer subsidy reflected the changes in procurement prices, procurement costs, handling costs, and issue prices. The subsidy was determined for different types of grains according to the source of origin (import or local procurement). Analysis indicates that the subsidy on imported grains was much higher than the subsidy on locally produced grains, mainly because from 1973 on world market prices of rice and wheat were higher than domestic procurement prices.<sup>15</sup> As for domestic procurement, prior to 1977/78 there was a subsidy on wheat and a net profit from the distribution of rice. However, after 1977/78 adjustments in the prices were such that both rice and wheat were subsidized. The gap between the rates of consumer subsidy on wheat and rice has gradually declined over the years. The economic cost included in the cost of sales of foodgrains (purchase, procurement incidentals, and distribution costs) for rice was estimated at Rs 269.45 per quintal in 1984/85 against Rs 241.12 per quintal in the preceding year. For wheat the economic cost was estimated at Rs 220.19 per quintal in 1984/85 against Rs 202.28 per quintal in the previous year. The 1984/85 budget assumes sales realization for rice at Rs 223.58 per quintal against Rs 201.29 per quintal estimated in the budget for 1983/84. For wheat the sales realization in 1984/85 is estimated at Rs 188.85 per quintal against Rs 171.56 per quintal in 1983/84. Thus the budget estimate of the consumer subsidy for rice is Rs 45.87 per quintal in 1984/85 against Rs 40.83 per quintal in 1983/84, and for wheat the estimate is Rs 31.34 per quintal against Rs 30.72 per quintal (see Table 16).

#### INDIRECT COSTS

Banks allow concessional rates of interest to FCI on foodgrain trade. In addition, working capital is provided by the government at a concessional rate.<sup>16</sup> The interest subsidy enjoyed by FCI due to this concessional rate of interest came to about Rs 954 million during 1980/81, up from Rs 527 in 1975/76.

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<sup>14</sup>At 1972/73 prices the 1983/84 subsidy would be Rs 3,350 million.

<sup>15</sup>Prior to 1973, the world market price of wheat was below the procurement price.

<sup>16</sup>See Vipin Garg, State in Foodgrain Trade in India (New Delhi: Vision Books, 1980).

Table 15--Breakdown of the government subsidy on foodgrains, 1972/73-1984/85

Year	Consumer Subsidy	Cost of Buffer Stock	Total
(Rs million)			
1972/73	n.a.	n.a.	1,170
1973/74	n.a.	n.a.	2,510
1974/75	n.a.	n.a.	2,725
1975/76	n.a.	n.a.	4,037 <sup>a</sup>
1976/77	n.a.	n.a.	4,000
1977/78	2,999	2,630	5,629
1978/79	2,955	2,628	5,583
1979/80	3,242	2,653	5,895
1980/81	4,842	1,761	6,603
1981/82	6,062	1,548	7,610
1982/83	n.a.	n.a.	7,110
1983/84	n.a.	n.a.	8,350
(revised)			
1984/85	n.a.	n.a.	8,500
(budgeted)			

Sources: Data up to 1980/81 from the Food Corporation of India, Annual Report (New Delhi: FCI, various years); and for subsequent years from the budget estimates of the Government of India.

Note: n.a. means not available.

<sup>a</sup>Includes Rs 1,060 million received during 1976/77 as arrears.

The cost of food distribution borne by producers is the difference between what producers might have received in the absence of the public distribution system and what they actually received under existing marketing arrangements. The total amount received by producers is represented by

$$\text{where } q P_1 + (Q - q)P_2,$$

$q$  = quantity sold to the government,  
 $P_1$  = procurement price,  
 $Q$  = total marketed surplus, and  
 $P_2$  = open market price.

The weighted average price (P) realized by farmers will be

Table 16--Rates of consumer subsidy incurred by the central government, 1973/74-1984/85

Year	Wheat		Rice	All Commodities
	Local	Imported	Local	
	(Rs/quintal)			
1973/74	16.59	58.71	-1.95	n.a.
1974/75	1.66	53.33	-5.37	n.a.
1975/76	10.74	40.82	-8.15	26.41
1976/77	11.68	42.05	-7.32	20.74
1977/78	31.63	n.a.	9.21	27.19
1978/79	32.72	n.a.	19.06	29.78
1979/80	28.14	n.a.	17.71	24.68
1980/81	40.20	n.a.	34.03	37.66
1981/82	53.73	n.a.	42.94	48.67
1983/84	30.72	n.a.	40.83	n.a.
1984/85	31.34	n.a.	45.87	n.a.

Source: Food Corporation of India, Annual Report (New Delhi: FCI, various years).

Notes: A negative sign indicates net gains. Data for 1982/83 are not available. Data for 1983/84 and 1984/85 were obtained from the budget estimates of the Government of India for 1984/85; n.a. means not available.

$$P = 1/Q [qP_1 + (Q - q) P_2]$$

$$= m P_1 + (1 - m) P_2,$$

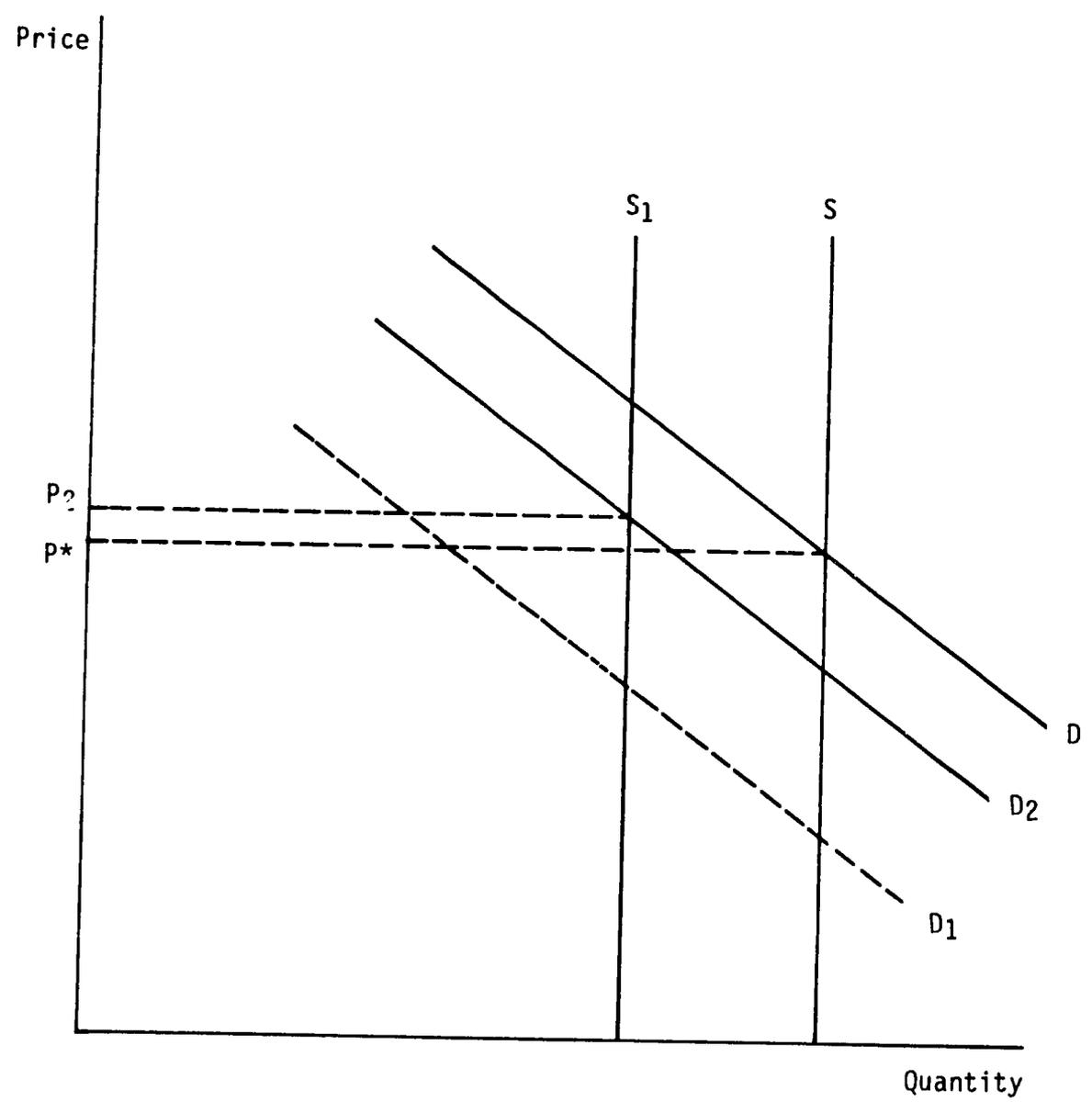
where

$$m = q/Q = \text{the proportion of grain sold to the government.}$$

Whether farmers incur a cost will be influenced by how much the price in the absence of a public distribution system ( $P^*$ ) differs from  $P$ . Thus, when  $(P^* - P)$  is positive, farmers are incurring a cost on account of the public distribution.

Determination of both  $P$  and  $P^*$  creates a number of problems. When the government takes away a portion of the marketed surplus, the availability of grains in the open market is reduced by that amount. On the demand side, there is a reduction in open market demand on account of purchases from the public distribution system. At the same time there is a positive effect on aggregate demand because of the income effect of the subsidy. In Figure 5,  $S$  represents the aggregate supply. The particular shape of the supply curve is assumed because

Figure 5--Hypothetical supply and demand curves



of the time lag involved in price response and the limited holding capacity of farmers.  $D$  represents the aggregate demand curve in the absence of subsidy. Thus without either procurement or the public distribution system, the market clearing price would have been at  $P^*$ . With the introduction of procurement the supply curve for the open market is shifted toward  $S_1$ , the distance between  $S$  and  $S_1$  representing the quantity procured for the public distribution system. With the introduction of the public distribution system consumers may buy less in the open market so that the demand curve will be shifted downward to about the position of  $D_1$ . However, the effect of the subsidy is to shift the demand curve upward to effect a partial neutralization of the downward shift. In this process the final demand curve for the open market is likely to be around  $D_2$ . The final market price will be represented by  $P_2$ . Whether or not  $P_2$  will be greater or less than  $P^*$  will depend on the slope of the demand curve, the quantity procured for the public distribution system, the difference between the issue price and the open market price, and the size of the subsidy.

Attempts to determine empirically the aggregate demand curve and to obtain price levels did not yield valid results. There are a number of possible reasons, the most important being the nature of aggregation involved. Because of the large size of the country, the varying degrees of surplus and deficit in many regions, and the localized nature of procurement and distribution through the public distribution system, available all-India data may have considerable aggregation bias, making it difficult to obtain micro relationships from these data.

Results obtained from previous studies also do not provide any definite conclusions. Findings of a study carried out at the World Bank indicate that the hypothetical open market price without market intervention is quite sensitive to the assumptions used.<sup>17</sup> Without a rationale for choosing one set of assumptions over another based on valid empirical findings, the choice can be subjective, and the results may have only limited relevance for policy analysis.

In a micro study based on primary data collected from Andhra Pradesh, Subbarao dealt with the issue of whether setting the procurement price below the open market price resulted in income losses to producers during the years 1973/74, 1974/75, and 1975/76.<sup>18</sup>

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<sup>17</sup>See Pasquale L. Scandizzo and G. Swamy, Benefits of Costs of Food Distribution Policies, The Indian Case, World Bank Staff Working Paper 509 (Washington, D.C.: World Bank, 1982).

<sup>18</sup>K. Subbarao, "Market Structure in Indian Agriculture, A Study of Economic Efficiency of Paddy/Rice Marketing System in West Godavari District" (Ph.D. dissertation, University of Delhi, 1977).

In Andhra Pradesh, the producer levy averaged between 5.8 and 9.2 percent of output during the three years. Findings of the study indicate that farmers were compensated for the lower procurement price through a rise in the open market price. Using Thamarajakshi's estimate of the price flexibility coefficient of per capita availability of rice of -1.10, Bardhan concludes that if the government procured 50 percent of the marketable surplus of rice in an area, then the open-market price for the rest of the supply would rise by 55 percent.<sup>19</sup>

Even if procurement prices were set up at half of what would have prevailed in the absence of procurement, the average price of the entire marketable surplus would still be higher than otherwise. The price flexibility coefficient of demand of -2.0 obtained by Mellor and Dar further reinforces this argument.<sup>20</sup> If farmers were compensated for the lower procurement price through a rise in open market prices, then the weighted price (P) would be at least equal to P\*, and therefore public distribution would not have caused any loss to rural producers. This is particularly likely when procurement is made under price support operations in surplus areas. Because of the distances between major surplus and deficit areas of the country, bottlenecks in transportation arrangements, and possible market imperfections, farmers might not get a price higher than the weighted price, even in a year of shortages.

The equivalence of the open market price without the public distribution system to the weighted price realized by farmers implies that consumers who purchase on the open market are paying something extra on account of public distribution. An estimate of this extra payment for 1980/81 was obtained using the farm harvest price, the procurement price, and the quantities sold in the open market and to government agencies. Of the 15.9 million tons of rice marketed during 1980/81, 5.6 million tons were sold to government agencies and the rest in the open market. Of the 10.6 million tons of marketed wheat, 6.4 million tons were obtained by procurement agencies, and the rest were sold in the open market. The weighted price of paddy was Rs 111.5 per quintal and that of wheat was Rs 132 per quintal. Assuming that ratios between retail prices and farm prices remained the same, retail prices corresponding to the weighted farm prices would be Rs 242 per quintal of rice and Rs 156 per quintal of wheat. The open market price during 1980/81 implied an excess payment over weighted prices of

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<sup>19</sup>Kalpna Bardhan, "Problems Related to Distribution of Foodgrains," Indian Council of Social Science Research Discussion Paper, New Delhi, 1975 (mimeographed).

<sup>20</sup>John W. Mellor and A. Dar, Determinants and Development Implications of Foodgrain Prices, India 1949-50 to 1963-64, Occasional Paper 3 (Ithaca, N.Y.: Cornell University Press, 1967).

Rs 8 per quintal of rice and Rs 4 per quintal of wheat. The excess payment by consumers on open market purchases during 1980/81 was Rs 992 million, and this represents a transfer of income from consumers buying from the open market.

When the weighted average price received by farmers is not less than the market clearing rate in a free market situation, farmers do not incur a loss. In the years when the government imported foodgrains, the import price was more than the domestic price. It has been argued that if the import price had been paid to domestic producers it would have provided enough incentive for increasing local production.<sup>21</sup> There are, however, a number of counterarguments.<sup>22</sup> The world market price of wheat was below the government procurement price until 1972. The procurement price of rice was also above the world market price in some years. The need for imports was not avoided on this account alone, however. Production response to price changes is a lagged one; when there are shortfalls in production in a year, price adjustments cannot augment supplies during the same year. Moreover, in many years when there were shortfalls in production in India, there were shortfalls in production in other areas also. Raising procurement prices would simultaneously raise prices for all foodgrains, and the inflationary consequences for domestic prices cannot be easily controlled.

Data on the cost of production of wheat in Punjab indicates that the procurement price of wheat was higher than the cost of production. The output-input ratios at the procurement price were favorable to wheat producers. Even at total cost, which included all cash-and-kind expenses, rental value of land, and imputed value of family labor, procurement prices were higher than the cost of production by a good margin (see Table 17).

A comparison of the cost of production and the procurement price of paddy in some of the paddy-producing states indicates that the procurement price was quite close to the cost of production of paddy. Between paddy and wheat, however, there was an apparent disadvantage

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<sup>21</sup>Theodore W. Schultz, "On Economics and Politics in Agriculture," in Distortions of Agricultural Incentives, ed. Theodore W. Schultz (Bloomington, Ind.: Indiana University Press, 1978) pp.3-23.

<sup>22</sup>M. L. Dantwala, "Incentives and Disincentives in Indian Agriculture."

for paddy producers,<sup>23</sup> which was partially offset by two factors: first, a much smaller percentage of paddy production was procured as compared to wheat, and second, the difference between the market price and procurement price was much wider for paddy than for wheat. Further, because the cost of production has a built-in component of returns on investment in land, and all family labor was accounted for at the market rate of wages, an output-input ratio of more than 1 would retain farmers' interest in farming operations.

Data on the profitability of input use, particularly fertilizers, indicate that returns on investment were profitable. The Fertiliser Association of India worked out the gross financial returns on every rupee invested in fertilizers.<sup>24</sup> It observed that application of nitrogen, phosphate, and potash fertilizers for paddy and wheat were highly profitable, even at the procurement prices fixed for the years selected (see Table 18).

Procurement operations of the government can also be viewed as an insurance against prices falling below the levels specified. Although the idea of a support price was given up, in effect the procurement price became a minimum support price. There were years when FCI had to enter the market to make purchases under price support operations. Supporters of procurement operations during both surplus and deficit years argue that if farmers want protection against a sharp fall in prices, they have to forgo the pleasure of a bonanza when prices are spiraling and permit the government to protect the consumer.<sup>25</sup>

#### EFFECTS OF PUBLIC DISTRIBUTION

In analyzing the effects of the public distribution system, it is important to keep in mind the stated objectives of the system. Prior to 1967, the objectives of government intervention in the foodgrain market were to achieve a steady growth of consumption, fair price distribution, socialization of the surplus, and self-sufficiency in

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<sup>23</sup>A study by Krishna and Raychaudhuri indicates that the wheat procurement price did not cover the cost of production in the 1950s, but in the late 1960s it allowed a margin of profit over full cost. (Raj Krishna and G. S. Raychaudhuri, Some Aspects of Wheat and Rice Price Policy in India, World Bank Staff Working Paper 381 [Washington, D.C.: World Bank, 1980]).

<sup>24</sup>Fertiliser Association of India, Fertiliser Statistics, various issues, 1982.

<sup>25</sup>Dantwala, "Incentives and Disincentives in Indian Agriculture."

Table 17--Cost of production and the output/input ratio of wheat in Punjab, 1970/71-1979/80

Year	Cost of Production		Procurement Price	Output/Input Ratio
	Cash and Kind	Total Cost		
		(Rs/quintal)		
1970/71	28.44	61.04	76.00	1.25
1971/72	31.37	59.71	76.00	1.27
1972/73	36.65	67.10	76.00	1.13
1973/74	41.08	74.34	105.00	1.41
1974/75	42.00	87.76	105.00	1.20
1975/76	50.91	99.45	105.00	1.20
1976/77	58.27	101.39	110.00	1.08
1977/78	62.65	108.57	110.00	1.08
1978/79	60.74	101.45	115.00	1.08
1979/80	62.40	102.88	117.00	1.14

Sources: Compiled from India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Agricultural Situation in India, various issues (New Delhi: Controller of Publications, various years); and India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Indian Agriculture in Brief, various issues (New Delhi: Controller of Publications, various years).

Table 18--Return from investment of 1 rupee on fertilizer, selected years

Year	Paddy			Wheat		
	Nitrogen (N)	Phosphate (P <sub>2</sub> O <sub>5</sub> )	Potash (K <sub>2</sub> O)	Nitrogen (N)	Phosphate (P <sub>2</sub> O <sub>5</sub> )	Potash (K <sub>2</sub> O)
	(Rs)					
1971/72	2.66	1.25	2.44	3.79	1.78	3.49
1972/73	2.61	1.27	2.41	3.65	1.78	3.36
1973/74	3.68	1.86	3.13	3.99	2.02	3.40
1974/75	2.04	1.04	1.82	2.90	1.48	2.58
1975/76	2.21	1.02	2.02	3.13	1.45	2.87
Oct. 1977	2.74	1.70	2.87	3.92	2.44	4.10
Nov. 1979	3.62	1.71	3.54	4.38	2.06	4.79

Source: Fertiliser Association of India, Fertiliser Statistics, various issues (New Delhi: FAI, various years).

foodgrains. Some subsequent statements, particularly in the national plans, indicate that the objectives of government intervention also include stability in both foodgrain availability and prices, and equity in distribution.

#### Effects on Food Availability

The availability of food in India has fluctuated widely. From 1955 to 1981 annual variation in the availability of foodgrains was more than 3 percent in 20 years. Variations in rice availability were more predominant than those in wheat availability. During the 14 years when total foodgrain availability was less than the previous year, rice alone or rice along with other commodities caused a decline in total food availability in 10 of the years. However, coefficients of variation in availability remained stable in spite of large fluctuations in local production.<sup>26</sup>

#### Effects on Wholesale Prices

In the absence of a retail price for India as a whole the index number of wholesale prices was taken as the best approximation for prices. Index numbers of wholesale prices indicate substantial annual fluctuations. Although the wholesale price index of rice for 1974 was 32.7 percent above the price index for 1973, the 1976 price was 18.4 percent below the 1975 level. Fluctuations in wheat prices were also substantial, ranging from -10.3 percent to 51.2 percent. Though variations in prices might have increased without the public distribution system, it is evident that distribution and storage arrangements were not adequate to bring about stability in price levels.

The index of wholesale prices also showed substantial seasonal variations. Rice prices generally reached a peak during August and September, before the kharif harvest, and dropped to a low in January. From 1971 to 1981 seasonal indexes reached a maximum range of 110 points during 1974 and a minimum range of 16 points in 1978. Wheat prices reached peak levels during the preharvest period of December to March and low levels during the postharvest period. The seasonal price indexes for wheat during 1971-81 showed a maximum range of 162 points during 1974 and a minimum range of 12 points during 1971. The behavior of wheat prices in 1974 was unusual because production levels were so low. In 1974, wheat prices reached their peak during September and remained high for a few months. Wholesale prices of all

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<sup>26</sup>The coefficients of variation of production during the periods 1955-59, 1960-69, and 1970-79 were 6.9, 10.2, and 9.2. The coefficients of variation of availability during the same periods were 4.5, 5.3, and 4.6.

cereals also showed a maximum variation of 125 points in 1974. In many years changes in wholesale prices of rice exercised a major influence on movement of cereal prices.

Wholesale prices of rice and wheat indicated substantial interstate variations. During 1980 the wholesale price per quintal of rice ranged from Rs 156 in Tamil Nadu to Rs 243 in West Bengal. In 1981 the wholesale price per quintal of rice ranged from Rs 170 to Rs 250 per quintal. In both 1980 and 1981 wheat prices in Andhra Pradesh were highest: the wheat price was 70 percent higher than the lowest price.

### Extent of Coverage

A few studies have attempted to determine requirements of the public distribution system based on different assumptions about its coverage (see Table 19). These estimates ranged from 12 million tons to cover cities, towns, and drought-prone areas in Kerala and Jammu and Kashmir to 41.5 million tons to cover vulnerable sections of the population in both urban and rural areas.

The actual distribution of 11.3 million tons during 1975 was less than the requirements estimated by all these studies. This indicates that at least some segments of the population were left uncovered by the public distribution system.

Equity considerations involved can be considered in relation to either the geographical distribution or the economic status of consumers. Because foodgrains procured from rural areas of surplus states are distributed in deficit areas, a transfer of income from one region to the other is involved. Further, when everyone in an area is not uniformly covered by public distribution, an income transfer in favor of the population covered by the public distribution system is involved.

Where there were no hard data on quantities distributed in urban and rural areas, estimates were obtained. Among areas accounting for a major share of public distribution, 54 percent of the quantity distributed in West Bengal went to the statutory rationing area of Calcutta and the rest went to modified rationing areas, mainly urban centers. Bombay in Maharashtra and Madras in Tamil Nadu accounted for the major share of quantities distributed in those states. The volume distributed in the union territory of Delhi was also substantial. Kerala and Jammu and Kashmir were the only states where public distribution covered both urban and rural areas. Taking all these factors into account, it is estimated that offtake in urban areas was about 85 percent of the total offtake from public distribution.

In many urban areas there is no information on the economic

Table 19--Studies estimating the foodgrain requirements of the public distribution system

Study	Reference Period	Coverage	Estimated Quantity Requirement
			(million tons)
Gulati and Krishnan	1973	Vulnerable segments in urban and rural areas	41.5
Gulati and Krishnan	1973	Same as above, excluding taxpayers and self-employed	30.1
George and Gavan	1975	Bottom 2 deciles	15.1
George and Gavan	1975	Bottom 4 deciles	29.0
National Commission on Agriculture	1975	Cities, towns, drought-prone areas in Kerala and Jammu and Kashmir	12.0
Vyas and Bandopadhyay	1975	Cities	4.5
Vyas and Bandopadhyay	1975	Urban population	10.0
Vyas and Bandopadhyay	1975	Urban and noncultivating rural population	33.3

Sources: J. S. Gulati and T. N. Krishnan, "Public Distribution and Procurement of Foodgrains, A Proposal," Economic and Political Weekly, May 1975, pp. 829-842; P. S. George and James Gavan, "Market Intervention in Food Distribution," Working Paper 78/5, International Food Policy Research Institute, Washington, D.C., 1977; India, National Commission on Agriculture, Interim Report on Agricultural Prices Policy, 1975 (New Delhi: Controller of Publications, 1975); and V. S. Vyas and S. C. Bandopadhyay, "National Food Policy in the Framework of a National Food Budget," Economic and Political Weekly, March 1975, pp. 112-118.

status of buyers from ration shops. The income reported on the application for the ration card may be unreliable. Ration shop records show purchases using each card, but entries may be misleading because cards may be used by others on a loan or mortgage basis.<sup>27</sup> In view of this difficulty, data from available cross-sectional surveys are used to obtain rough estimates of rationing effects. Results of consumer surveys in Kerala, Gujarat, and Tamil Nadu indicate that households with annual incomes of less than Rs 3,600 accounted for 87 percent of the foodgrains distributed in Kerala, 56 percent in Gujarat, and 50 percent in Tamil Nadu, as compared to population shares of 59 percent, 57 percent, and 65 percent falling into this income category in the three states. The percentage of foodgrains distributed among the different income groups in Table 20 indicates that the pattern of distribution differs significantly among states.

Distributions in West Bengal, Maharashtra, and Delhi, which account for a major share of the quantities distributed through the public system, are likely to fall within the range indicated for Kerala, Gujarat, and Tamil Nadu. Therefore, the percentage of foodgrains distributed among various income groups is estimated to be 65 percent in the category with an annual family income of less than Rs 3,600 per year, 20 percent in the category of Rs 3,600 to Rs 4,800, and 15 percent in the category of more than Rs 4,800.

### Consumer Gains

As in the loss of farm income, the crucial variable for determining consumer gains is price in the absence of public distribution. As discussed earlier, the market clearing price in the absence of the public distribution system may be below open market prices when the public distribution system exists.

Possible gains to consumers under public distribution can be estimated using the relationship

$$\text{where } G = P_0 q_0 - P_r q_r - P_m q_m,$$

$G$  = total gains,

$P_0$  = the open market price in the absence of the public distribution system,

$q_0$  = the quantity sold in the absence of the public distribution system,

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<sup>27</sup>Leela Gulati, "Rationing in a Peri-Urban Community, Case Study of a Squatter Habitat," Economic and Political Weekly, March 19, 1977, pp. 501-506.

Table 20--Distribution of foodgrains among income groups, selected states,  
1977 and 1981

Annual Family Income	Foodgrains Distributed		
	Gujarat 1977	Kerala 1977	Tamil Nadu 1981
(Rs)		(percent)	
Less than 3,600	56.6 (57)	86.8 (59)	50.0 (65)
3,600-4,800	23.5 (25)	7.6 (20)	20.0 (22)
More than 4,800	19.9 (18)	5.6 (21)	30.0 (13)
Total	100.00 (100)	100.00 (100)	100.00 (100)

Sources: Sample surveys of consumers conducted in Gujarat, Kerala, and Tamil Nadu.

Note: Figures in parentheses correspond to the percentage of the population in that income group.



C. Ration goods valued at the market clearing rate	
Value of ration quantity	28,490
Open market	31,478
Total	59,968
Additional payments on ration quantity	7,900
Savings on open market quantity	-992
Net additional payment	6,908

Thus, if rationing were abolished, quantities purchased from ration shops would cost an additional Rs 7,900 million and at the same time there would be a reduction of Rs 992 million on the cost of open market purchases, resulting in a net consumer gain of Rs 6,908 million.<sup>28</sup> The existing dual markets--public distribution and the open market--incur an additional expenditure of Rs 992 million on open market purchases to provide a ration income of Rs 7,900 million to those who buy from ration shops.

Since 65 percent of the ration quantities go to households with an annual income of less than Rs 3,600, the ration income to this group amounts to Rs 5,135 million.

#### BENEFIT-COST RATIO

In considering the benefit-cost ratio of public distribution, it is important to keep the major limitations in mind. As pointed out by Scandizzo and Swamy,<sup>29</sup> both the benefits and costs of public distribution are highly sensitive to a number of assumptions. The conventional method of estimating costs and benefits using data with and without the intervention often leads to different conclusions depending on the assumptions used in the "without" situation.

The consumer subsidy incurred by the Government of India is the direct fiscal cost of public distribution. The ration income (the savings to consumers at the open market price) is the direct benefit. At 1980/81 levels, the consumer subsidy was Rs 4,859 million and the

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<sup>28</sup>The potential decrease in total purchase caused by an elimination of the subsidy incomes associated with the public distribution system is ignored in these calculations.

<sup>29</sup>Scandizzo and Swamy, Benefits and Costs of Food Distribution.

ration income was Rs 7,900 million, indicating a benefit-cost ratio of 1.63.<sup>30</sup>

When the indirect costs are considered, the interest subsidy to FCI and the excess payment by consumers who obtain their supplies from the open market become relevant items of cost. The subsidy for 1980/81 was Rs 954 million and the excess payment on open market purchases was Rs 992 million. Thus the fiscal cost of the public distribution system is Rs 6,805 million, which implies a benefit-cost ratio of 1.16.<sup>31</sup>

#### NUTRITIONAL IMPACT

The impact of the public distribution of foodgrains on nutrition in Gujarat and Kerala was estimated using data on purchases from fair price shops, prevailing prices, and National Sample Survey estimates of calorie intake and the share of different commodities in total calorie intake.<sup>32</sup> Data on calorie intake and the percentage that consumption would be reduced were used to estimate the reduction in calorie intake. The reduction in calories ranged between 178 and 196 calories in Gujarat and 46 and 224 calories in Kerala (see Table 21).

#### POLICY IMPLICATIONS

Public distribution of foodgrains in India involves short-term policy measures based on a number of factors such as local production, consumption requirements, and international market conditions. When local production is quite unstable, as in many past years, it is important to take adequate measures to stabilize imports and to assure equitable distribution of available supplies.

In situations of scarcity, marginal shortages in supply lead to a relatively large increase in food prices, and it is often low-income consumers who suffer the most. Public distribution of foodgrains in major cities and in some food-deficit states introduces a dual price

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<sup>30</sup>Here it should be remembered that the definitions of consumer subsidy and ration income are such that they do not equate. Consumer subsidy paid by the government is the operational loss of FCI (the difference between the issue price of foodgrains and the actual handling cost incurred). Ration income is the difference between the value of foodgrains at the hypothetical free-market price and at the ration price. These definitions account for the difference in the consumer subsidy paid by the government and the income received by consumers.

<sup>31</sup>This ignores any costs or benefits to producers.

<sup>32</sup>For details see the sections on Gujarat and Kerala.

Table 21--Estimated reduction in daily per capita calorie intake brought about by elimination of cereal rationing, Gujarat and Kerala

State	Annual Household Income	Cereals	Decline	Reduction in Consumption
	(Rs)	(calories/person/day)	(percent)	(calories/person/day)
Kerala	Less than 600	777	17.7	138
	601-1,200	1,008	18.1	182
	1,201-2,400	1,569	14.3	224
	2,401-3,600	2,004	4.3	86
	3,601-4,800	2,216	2.2	49
	More than 4,800	2,241	1.9	46
Gujarat	Less than 2,400	1,749	11.0	192
	2,401-3,600	2,103	9.0	189
	3,601-4,800	2,448	8.0	196
	More than 4,800	2,968	6.0	178

Source: Estimated from the results of sample surveys of consumers conducted in Kerala and Gujarat.

system. Without a regular mechanism for food distribution in most cities and chronically deficit states, low-income consumers may experience major difficulties in maintaining the level of consumption achieved under rationing.

The effectiveness of the public distribution system depends on both supply and distribution arrangements. On the supply side, local procurement is the most important source, and when the procurement price is close to the open market price, farmers may not resist procurement. In surplus states, such as Haryana and Punjab, where the difference between the open market price and the procurement price is small, the farmers' loss of income is negligible. The large size of the country, the government control of transport facilities, and the unwillingness of private trade to make massive investments in marketing infrastructure will stand in the way of free trade.

On the distribution side, the effectiveness of the system depends on a number of factors such as the proximity of fair price shops, the gap between the open market price and the ration price, the regularity of supplies, commodity composition, social awareness, and the existence of physical distribution arrangements.

In many rural areas fair price shops are superfluous in a good crop year because of the easy availability of foodgrains at a reasonable price, and they are ineffective in supplying the quantities required in a bad year. Therefore, to make the system effective, it is necessary to formulate appropriate strategies to enable the system to survive in both good and bad years. The viability of retail outlets could be established through a stable minimum volume or by establishing a connection with distribution of other commodities. Whereas retail outlets for foodgrains alone are viable in a major deficit area (such as Kerala), in many rural areas foodgrain distribution must be linked with distribution of other essential commodities.

The effectiveness of the public distribution system in meeting consumption requirements of the poor can be influenced by properly identifying target groups and minimizing leakages. In India targeting based on family income has not proved satisfactory. However, in some areas broad exclusion categories based on factors such as land and income tax payments were introduced, and the quantities available through the public distribution system were restricted. In the absence of appropriate means tests for determining eligibility, the commodities offered and the quality of the foodgrains distributed through fair price shops have served as indirect means of targeting.

Public distribution of foodgrains in India has resulted in some redistribution of income. Because small farmers are excluded from levy obligations, they can benefit from a higher open market price for

their marketed surplus. Because of the subsidy, food-deficit areas receive an indirect income transfer from the central government. Further, consumers who depend on open market purchases (often the quality-conscious higher-income groups) contribute to the ration income of consumers who purchase foodgrains from fair price shops.

It is often pointed out that provision of increased employment and income opportunities are necessary to a lasting solution for poverty eradication. In the short run, however, public distribution can be a viable approach for increasing the nutritional status of the poor. Within this framework, effective management of sales, imports, and stocks can reduce the government subsidy. Krishna and Chhibber have demonstrated that if inventory and trade policies are rationalized, the government can ensure an increase in per capita consumption and yet reduce the cost of the system to about a third of what it would be if current policies were continued.<sup>33</sup> They claim that the model developed in their study can be used each year by governments to find the optimum values of the four main variables involved in government operations--purchases, sales, imports, and stocks.

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<sup>33</sup>Raj Krishna and Ajay Chhibber, Policy Modeling of a Dual Grain Market: The Case of Wheat in India, Research Report 38 (Washington, D.C.: International Food Policy Research Institute, 1983).

PART TWO: PUBLIC PROCUREMENT AND DISTRIBUTION  
IN FIVE STATES

#### 4. GUJARAT

The public distribution of foodgrains in Gujarat includes everyone except individuals having annual incomes of more than Rs 8,000 per year, traders registered under the Sales Tax Act, farmers having one-ninth more land than allowed under the limit set by the Land Ceiling Act, and farmers growing paddy or wheat. Households eligible for foodgrain purchases from fair price shops have been issued one type of card and those not eligible have another type for the purchase of sugar. On August 31, 1983, there were about 5.3 million cardholders: 85.7 percent were eligible to purchase foodgrains and the rest only sugar. There were 10,542 fair price shops (7,382 in rural areas, 2,788 in urban areas, and 367 in remote and inaccessible areas). Individual entrepreneurs and cooperative societies managed the major share of the shops. Fair price shops covered about 36.7 million persons.<sup>34</sup> The number of persons served per shop was larger in the rural areas.

#### OFFTAKE AND RATION PRICE

The average annual offtake from ration shops during the period 1966-76 was 371,500 tons, but the range was wide: 54,400-800,300 tons. There were substantial annual fluctuations in the ration offtake as a whole and for individual commodities. Rice offtake varied from 15,200 tons to 184,200 tons, wheat from 13,600 tons to 467,800 tons, and coarse grains from 5,400 tons to 349,000. Although wheat accounted for the major share of foodgrains sold through the public distribution system in most years, the share of coarse grains was high in some years. Though rice's share was low in most years, it accounted for more than half the foodgrains distributed through the public distribution system in 1981 and 1982.

Assuming that all eligible consumers purchased from ration shops, the per capita annual ration offtake of all foodgrains during 1982 was only 10.4 kilograms per capita.

Ration prices of rice, wheat, and coarse grains were fixed periodically for different varieties. Between 1965 and 1982, prices of rice and wheat increased more than 200 percent. Price increases

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<sup>34</sup>The 1981 population of the state was 34.1 million, and by August 1983, it was probably about 36 million. The coverage of fair price shops might indicate some duplication or bogus cards.

for coarse grains (maize, bajra, and jowar) during the same period were much lower than those for rice and wheat. Increases in open market prices of rice and wheat were much smaller than increases in ration prices. At the same time, the open market price of coarse grains more than doubled. Because coarse grains are generally consumed by low-income people, the relatively small increase in the ration price of jowar may have favored low-income consumers. Similarly the higher rate of increase for wheat and rice may have influenced some to switch to the open market.

The gap between the open market price and the ration price indicated substantial annual variations. The ratio varied between 104 and 208 for a coarse variety of rice, between 103 and 206 for jowar, and between 98 and 178 for bajra. Though the gap was large in some years, on the whole it was smaller than in many other regions of India. The ration offtake was high during the years when the gap was large.

The ration offtake of all cereals in Gujarat was largely influenced by their production in the state. About two-thirds of the variations in ration offtake of all cereals were explained by variations in output. In a regression equation with ration offtake as the dependent variable and cereal production as the independent variable, the coefficient was significant from both economic and statistical viewpoints. The ration offtake was highly elastic with respect to cereal production, with an elasticity of 2.6. The estimated equation was

$$Q_r = 1,337.99 - 0.285 P; R^2 = 0.69; \\ (-4.49)$$

$$\text{Log } Q_r = 26.59 - 2.597 \text{ Log } P; R^2 = 0.68; \\ (-4.37)$$

where

$Q_r$  = ration offtake of all cereals, and

$P$  = production of all cereals.

The figures in parentheses are t-values.

#### SOURCES OF SUPPLY

About 90 percent of the supply of rice and wheat came from the central pool of the Government of India through FCI. Paddy and bajra were also procured from local farmers. Outside purchases by the state government were mainly restricted to coarse grains from Punjab, Haryana, Uttar Pradesh, and Madhya Pradesh.

The allotment from the central pool was distributed among the districts of Gujarat based on the stock position and demand from each

ration shop. The quantities of rice, wheat, and coarse grains received from the central pool indicate that there was substantial variation over the years.

To supplement quantities from the central pool, the state government imposed a levy on farmers on a graded scale and made direct purchases from other states. However, the volume obtained under these two categories was very small.

#### PROCUREMENT PRICE

The procurement price of paddy remained at Rs 55 per quintal from 1967 to 1972 and increased to Rs 122 per quintal during 1982/83. The increase was steeper after 1978/79. During 1967/68-1982/83, the procurement price of coarse grains rose from Rs 65 to Rs 118. Procurement prices of all cereals did not change from 1974/75 to 1977/78.

#### COST OF DISTRIBUTION

According to arrangements with the central government, FCI supplied foodgrains at railway stations specified by the state. The state government was responsible for taking delivery at the railway stations, providing transit storage, and arranging for internal transportation. In order to facilitate these activities, the Civil Supplies Department was created and storage facilities were provided at convenient locations. Rent and establishment charges were considered a fixed cost of distribution. All other items of cost, including railway freight, octroi,<sup>35</sup> transport charges, transit loss, margins to the dealers, depreciation, interest, and labor charges were considered variables. Details of fixed and variable costs during 1976/77-1979/80 are given in Table 22. Between 1966/67 and 1978/79 the average total cost per ton of foodgrains handled increased from Rs 36.4 to Rs 515.9.

#### EFFECTS OF RATIONING

Data from surveys conducted in Ahmedabad provide some information

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<sup>35</sup>Octroi is a charge levied by a local agency when a truck enters its city limits.

on the impact of rationing on consumption.<sup>36</sup> A 1964 survey of selected households registered with fair price shops indicated that 35.3 percent of their wheat consumption and 23.3 percent of their rice consumption were met with purchases from fair price shops. The low-income households were most dependent on these shops.

A survey conducted by the author in 1977 indicated that 25.2 percent of wheat consumption and 89.4 percent of bajra consumption came from fair price shops (see Table 23). On the whole 39.3 percent of cereal consumption was met out of purchases from fair price shops. Average weekly household consumption of all cereals was 18.78 kilograms, of which purchases from fair price shops accounted for less than 8 kilograms. At the same time, each family was eligible to obtain up to 6 kilograms of rice and 18 kilograms of wheat or coarse grains, which indicates that only a small portion of the ration quota was utilized.

To determine the impact of the public distribution system on consumption, income and price elasticities are estimated using the 1970/71 National Sample Survey consumption data for urban areas of Gujarat. Prices in the absence of the public distribution system are assumed to be the same as open market prices in 1977, and it is further assumed that consumers would adopt a two-stage maximization process. The estimation of household consumption of cereals without the public distribution system indicates that the percentage shortfall in the consumption of households varied from 6 to 11 percent (see Table 24). Ration income in Ahmedabad is determined using quantities purchased from ration shops and the price without rationing. The average monthly household ration income amounted to Rs 10.69 or the equivalent of about Re 0.35 per kilogram of foodgrains distributed. It was observed earlier that the cost of distribution came to about Re 0.14 per kilogram during 1977/78, which indicates that the ration income to consumers was much higher than the cost of distribution. When the central government subsidy of Re 0.27 per kilogram during 1977/78 is added, however, the average total cost is Re 0.41 per kilogram. Considering the combined costs of the central and state governments, the benefit/cost ratio is unattractive.

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<sup>36</sup>In addition to a survey conducted by the author in 1977, surveys include: M. S. Bhat, Public Distribution in Ahmedabad (Ahmedabad: Centre for Consumer Education and Research, 1965); K.K.S. Chauhan and U. K. Srivastava, Management of the Public Distribution System for Meeting the Needs of the Urban Poor (Ahmedabad: Indian Institute of Management, 1974); and Promod Verma, Consumption Expenditure of Ahmedabad Industrial Workers (Ahmedabad: Indian Institute of Management, 1974).

Table 22--Cost of food distribution, Gujarat, 1976/77-1979/80

Cost	1976/77	1977/78	1978/79	1979/80
	(Rs/quintal)			
Fixed				
Establishment charges	0.69	0.36	0.93	0.18
Rent	13.53	6.68	34.03	14.98
Subtotal	14.22	7.04	34.96	15.16
Variable				
Depreciation	0.38	0.25	1.50	0.77
Interest	0.50	0.23	0.07	0.24
Labor charges	2.26	0.76	1.01	0.82
Margin to dealers	0.78	0.92	5.80	10.45
Miscellaneous	2.05	1.14	2.81	1.27
Octroi	0.30	0.16	0.45	0.11
Railway freight	0.42	0.10	0.04	0.04
Shortages (transit loss)	3.57	1.29	1.87	0.98
Transport charges other than rail	4.33	2.25	3.28	2.86
Subtotal	14.59	7.10	16.63	17.14
Total	28.81	14.14	51.59	32.30

Source: Unpublished data supplied by Gujarat, Department of Civil Supplies.

Table 23--Amount of weekly consumption purchased from fair price shops, Gujarat, 1977

Monthly Household Income	Weekly Household Consumption			Percentage Supplied from Fair Price Shops		
	Wheat	Bajra	All Cereals	Wheat	Bajra	All Cereals
(Rs)	(kilograms)			(percent)		
200 or less	11.5	3.6	15.8.	49.5	81.7	54.6
201-300	15.2	5.7	22.5	23.2	81.1	36.3
301-400	14.2	3.2	18.4	21.7	95.3	36.5
More than 400	13.0	5.5	19.9	13.7	95.1	35.1
Total	13.0	4.6	18.8	25.2	89.4	39.3

Source: Sample survey conducted by P. S. George, 1977.

Table 24--Ration income to Ahmedabad consumers, Gujarat, 1977

Monthly Income	Estimated Weekly Consumption	Decline from Actual Consumption	Ration Income
(Rs)	(kilograms)	(percent)	(Rs/month)
200 or less	14.07	11.0	10.25
201-300	20.44	9.0	11.91
301-400	15.94	8.0	6.40
More than 400	17.88	6.0	5.63
Average monthly income	...	...	19.69

Source: Estimated from the results of a sample survey conducted by P. S. George, 1977.

Note: The ellipses indicate a negligible amount.

## 5. KERALA

The origin of public distribution of foodgrains in Kerala can be traced to the Second World War. However, a major expansion took place in 1964, when food shortages throughout India led to curtailment of private interstate trade in foodgrains. The Civil Supplies Department of the state government assumed responsibility for organizing supplies of foodgrains and for regulating distribution of available foodgrains through licensed retail outlets known as ration shops or fair price shops.

During the period 1971-82 imports from outside the state accounted for more than half the total foodgrains available in Kerala except for 1979. Imported rice and wheat were distributed through public distribution channels. Local production of rice was supplemented by tapioca, a cereal substitute for many low-income families.

### RATION OFFTAKE AND PRICES

The ration offtake<sup>37</sup> of rice during 1982 was about 1.16 million tons. The average annual offtake from 1965 to 1982 was about 1 million tons of cereals. Though the total offtake and the per capita annual offtake have shown some stability over the years, composition of the offtake has shifted substantially between rice and wheat in different years. The share of wheat in the total offtake varied from 3.8 percent in 1978 to 47.9 percent in 1975 (see Table 25). Variations in the commodity composition were mainly influenced by availability of foodgrains from the central pool.

The ration offtake indicates some degree of fluctuation in both total and per capita annual offtake. Though rice offtake was smallest during 1975, a substantial increase in wheat offtake kept the total ration offtake above the previous low. However, during 1979 when the rice offtake declined, there was no substantial increase in the wheat offtake. A partial explanation for the low ration offtake during 1969-74 lies in the increased availability of tapioca during this period. Per capita availability of tapioca reached a peak of 234 grams per day during 1973, declining in subsequent years, and

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<sup>37</sup>The quantities sold through ration shops indicate both ration offtake (which has a demand connotation) and availability. Whereas availability was a serious constraint for rice, it was not for wheat.

stabilizing at about 150 grams per day during the latter part of the 1970s and the early part of the 1980s. The fall in rice offtake during 1978-80 was not matched by an increase in wheat offtake.

The price of foodgrains sold through ration shops was based on the issue price from the central pool and the cost of distribution. In general the state recovered the distribution cost from consumers. During the period 1966/67-1982/83, the price per ton of rice distributed through ration shops increased from Rs 760 to Rs 1,910. During the same period the open market price per ton of rice increased from Rs 1,610 to Rs 3,130. The gap between the open market price for rice and the ration price during 1966/67 was Rs 850 per ton, and it increased to Rs 1,220 per ton by 1982/83. Although the absolute size of the gap increased, the proportionate increase was smaller so that during the period 1966/67-1982/83 the ratio between the open market

Table 25--Ration offtake of rice and wheat, Kerala, 1965-82

Year	Ration Offtake			Wheat as a Share of of Total Offtake	Per Capita Annual Offtake of Rice and Wheat
	Rice	Wheat	Total		
	(1,000 metric tons)			(percent)	(kilograms)
1965	906	303	1,209	25.6	65
1966	848	303	1,151	26.3	60
1967	613	455	1,068	42.6	55
1968	648	392	1,040	37.7	52
1969	839	116	955	12.1	47
1970	822	71	893	7.9	43
1971	843	56	899	5.2	42
1972	886	84	870	8.7	40
1973	762	198	960	20.6	43
1974	786	186	972	19.1	42
1975	531	489	1,020	47.9	43
1976	904	220	1,124	19.6	47
1977	1,363	n.a.	n.a.	n.a.	n.a.
1978	896	36	932	3.8	38
1979	549	33	582	5.7	23
1980	769	48	817	5.9	32
1981	1,063	44	1,107	4.0	44
1982	1,158	59	1,217	4.8	47

Source: Ration offtake data from Kerala, Department of Civil Supplies, various years.

Note: n.a. means not available.

and ration rice price declined from 1.12 to 1.64. It should also be noted that in years such as 1975, when the volume of sales through the public distribution system was low, the gap between the open market price and the ration price widened.

#### SOURCES OF SUPPLY

The supply of rice for the public distribution system came from both local procurement and imports from outside the state. Procurement from within the state declined after 1970/71. Procurement of paddy reached an all-time record high of 138,000 tons during 1968/69, dropping to a low of about 370 tons in 1981/82. Procurement's share of local production declined from 7.4 percent in 1969/70 to 0.02 percent in 1981/82. Procurement was undertaken under the provisions of the levy order of 1966 for Kerala rice and paddy procurement, but it should be inferred from the low procurement figures that the order was not strictly enforced. In 1978/79 the exemption limit for levy obligations of paddy was raised from 2 to 10 acres.<sup>38</sup> The decline in the volume of procurement is also reflected in the ratio of procurement to total offtake. Although the share of local procurement in total production during 1968/69 was 7.3 percent, this declined to less than 0.5 percent by 1982.

#### PROCUREMENT PRICE

The procurement price of paddy, which was determined by the central government, remained constant at Rs 65 per quintal for six years starting in 1967/68, increased to Rs 71.75 per quintal in 1973/74, and to Rs 74 per quintal for three years starting in 1974/75. By 1983/84 the procurement price had risen to Rs 132 per quintal.

The procurement price fixed by the government was substantially below the prevailing farm price of paddy. The ratio of the farm price to the procurement price ranged from 139 in 1970/71 to 333 in 1974/75. During 1974/75 when the farm price of paddy increased about 31 percent over the previous year's price, local procurement declined from 81,000 tons to 60,000 tons. The consistent trend of a high farm price in relation to the procurement price greatly discouraged farmers from selling paddy to public agencies.

#### COST OF DISTRIBUTION

The state government recovered its operating costs for food distribution from consumers. The wholesale price at which foodgrains were supplied to licensed dealers included the price charged by the central government and other expenses incurred by the state. Though the state government's expenditures were recovered from consumers,

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<sup>38</sup>The number of holdings with more than 10 acres accounted for only about 1 percent of the total holdings in the state.

there was an element of subsidy by the central government in the supply of foodgrains to Kerala. A rough estimate of the central subsidy for foodgrains distributed in Kerala on the basis of the average subsidy and the quantity distributed can be obtained.

<u>Year</u>	<u>Subsidy</u> (Rs million)
1973/74	70.0
1974/75	141.9
1977/78	93.9
1978/79	115.4
1979/80	149.6
1980/81	379.9

In addition to the foodgrains obtained from the central pool, a small quantity of the rice produced within the state was also available for the public distribution system. Because the quantity procured by the government was only a very small portion of the rice entering the market, it is unlikely that the open market price of rice would have been substantially altered in the absence of procurement. Therefore, an estimate of income loss to producers can be obtained from the procurement volume, procurement price, and open market price (see Table 26).

#### BENEFITS OF PUBLIC DISTRIBUTION

The major purpose of public distribution in Kerala is to provide foodgrains at a low price to consumers, and this implies that a ration income accrues to beneficiaries. Changes in consumption and nutrition levels and some degree of redistribution of income are also implied.

Ration income is defined as the gain to consumers realized by purchasing at subsidized prices instead of at higher open market prices. An estimate of ration income can be obtained if the price in the absence of public distribution can be determined. The maximum amount that buyers of foodgrains from ration shops will be prepared to pay is the open market price. The open market price was high in Kerala, a food-deficit area, because of movement restrictions. Without movement restrictions, the minimum open market price would correspond to an all-India free market price with adjustments for transport costs and the trade margin. Consumer gains in Kerala are evaluated using both these maximum and minimum levels (see Table 27).

In addition to the gross benefits of rationing, it is also important to analyze the impact of public distribution on income distribution and on the food consumption of those below the poverty

Table 26--Loss of farm income, Kerala, 1966/67-1980/81

Year	Procurement	Gap Between Farm Price and Procurement Price	Total Loss
	(1,000 metric tons)	(Rs/metric ton)	(Rs million)
1966/67	93.1	547.6	50.98
1967/68	118.6	754.8	89.52
1968/69	138.0	469.8	64.83
1969/70	130.9	353.1	46.22
1970/71	114.5	255.3	29.23
1971/72	105.0	346.2	36.35
1972/73	78.1	541.9	42.32
1973/74	80.1	1,157.8	92.74
1974/75	60.3	1,722.3	103.85
1975/76	60.0	1,089.2	65.35
1976/77	35.3	687.4	24.26
1977/78	20.9	536.9	11.22
1978/79	2.5	407.6	1.02
1979/80	0.7	382.4	0.27
1980/81	0.4	518.4	0.21

Source: Estimated by P. S. George.

line. Data on the characteristics of buyers from ration shops are not available; therefore data from limited consumer surveys are used for this analysis.

A household survey conducted in two villages of Kerala during 1977 indicates that about two-thirds of the rice consumed by households with annual incomes of less than Rs 600 per year came from ration shops. As family income increased, the proportion of rice consumption met from ration purchases declined (see Table 28).

From the actual consumption data in Table 28, consumption under a free market situation is estimated using the assumption that consumers followed a two-stage maximization process in determining the quantities of each item purchased. The all-India price is assumed to be the price in a major rice-producing state and allowances are made for shipment cost.<sup>39</sup>

<sup>39</sup>It is likely that the prices in the surplus states would have gone up in the absence of movement restrictions, and therefore consumption levels obtained here would provide an upper bound.

Table 27--Gains to consumers from rationing, Kerala, 1966/67-1981/82

Year	Gains Computed from	
	Kerala Open Market Price	All-India Open Market Price
	(Rs million)	
1966/67	620.5	n.a.
1967/68	818.4	n.a.
1968/69	713.3	n.a.
1969/70	514.6	n.a.
1970/71	424.3	n.a.
1971/72	380.2	n.a.
1972/73	560.3	n.a.
1973/74	820.4	n.a.
1974/75	1,401.5	n.a.
1975/76	1,670.6	435.6
1976/77	3,331.0	366.3
1977/78	915.3	495.3
1978/79	332.1	201.5
1979/80	343.3	147.4
1980/81	714.5	448.1
1981/82	1,454.1	715.1

Source: Estimated by P. S. George.

Note: n.a. means not available.

Table 28--Weekly household consumption of rice according to sources of supply, Kerala, 1977

Annual Income	Source of Rice Consumed			Total
	Ration Shops	Household Production	Open Market	
(Rs)		(kilograms/week)		
600 or less	5.65	...	2.75	8.40
601-1,200	6.39	...	3.04	9.43
1,201-2,400	7.70	1.77	4.00	13.47
2,401-3,600	6.67	1.11	6.11	13.89
3,601-4,800	4.90	2.00	5.10	12.00
More than 4,800	5.14	5.71	2.57	13.42
All groups	6.35	1.24	3.73	11.32

Source: Sample survey conducted by P. S. George, 1977.

Note: The ellipses indicate a negligible amount.

The estimated consumption of rice in the absence of rationing indicates that consumers in all income groups would experience a fall in consumption. Thus, when rationing is removed and the market price in the state becomes comparable with the price in surplus areas, actual consumption in all groups falls below the amount consumed under rationing (see Table 29). This decline is greatest for the low-income group, where consumption is already low. Needless to say, actual consumption is likely to fall below the levels in Table 29 when zonal restrictions are retained even after abolishing distribution through fair price shops.

Redistribution of income occurs for both producers and consumers. When a graded levy system is followed, small farmers are exempt from the levy, and it is large farmers who sell to the government at the lower price. At the same time, small farmers receive a higher price for whatever quantity of foodgrains they sell on the open market because procurement removes a portion of grains from the open market. Because the volume of procurement in Kerala was small after the mid-1970s, 1974/75 is an appropriate year to analyze the effects of procurement on producers. Total production and the incidence of levy during 1974/75 are shown in Table 30.

In order to determine income gains to farmers as a result of abolishing rationing, farm incomes with and without rationing are obtained. The estimated income gain to farmers is defined as

$$W_p = n (q_{1i} + q_{2i}) P_{f0} - q_{1i} P_f - q_{2i} P_1,$$

where

$$q_{1i} = \text{quantity sold in the open market,}$$

$$q_{2i} = \text{quantity procured by the government as levy,}$$

$$P_{f0} = \text{farm price in the absence of rationing,}$$

$$P_f = \text{actual farm price, and}$$

$$P_1 = \text{actual levy price.}$$

The size of the gains corresponding to production and price levels during 1974/75 indicates that farmers in Kerala would have incurred losses if rationing had been abolished. Farmers with small holdings would have felt the incidence of this loss much more than large farmers (see Table 31).

Consumer gains in Kerala during 1974/75 as a result of rationing are obtained as the difference between consumer expenditures with and without rationing.

$$W_c = R (P_r - P) + q (P_0 - P),$$

where

- R = quantity of rice distributed through ration shops,  
 $P_r$  = ration rice price,  
P = market price in the absence of rationing,  
q = quantity purchased from the open market, and  
 $P_0$  = retail price in the open market.

The value of  $W_c$  during 1974/75 came to Rs 404.54 million. Thus net gains of public distribution in Kerala to producers and consumers during 1974/75 came to Rs 664.91 million. Obviously this is much larger than the implied central government subsidy on rice distribution in Kerala.

The total gains from rationing in Kerala can be divided into two components, one representing the effect of movement restrictions on foodgrains from outside the state and the other representing the effect of sale of foodgrains through the public distribution system. The estimation of the size of these effects indicates that the movement restriction effect on farm income is more than six times greater than the absolute value of the rationing effect. Consumer savings on account of rationing are more than double the consumer loss from the movement restrictions (see Table 32).

Table 29--Estimated consumption of rice in the absence of rationing, Kerala

Income Group	Actual Weekly Consumption	Estimated Weekly Consumption	Decline from Actual Consumption
(Rs)	(kilograms)		(percent)
600 or less	8.40	6.91	17.7
601-1,200	9.43	7.72	18.1
1,201-2,400	13.47	11.54	14.3
2,401-3,600	13.89	13.26	4.3
3,601-4,800	12.00	11.74	2.2
More than 4,800	13.42	13.16	1.9

Source: Estimated by P. S. George.

Table 30--Estimated production, marketed surplus, and levy on producers, for paddy, Kerala, 1974/75

Size of Holdings	Production	Levy	Open Market Sales
(acres)	(1,000 metric tons)		
Less than 2	1,399	...	113.2
2-4	430	28.9	155.4
5-10	144	23.9	53.8
More than 10	28	7.5	17.4
Total	2,001	60.3	339.8

Source: Estimated by P. S. George.

Note: The ellipses indicate a negligible amount.

Table 31--Loss to farmers as a result of elimination of rationing, Kerala, 1974/75

Size of Holdings	Loss on Paddy Sold in the Open Market	Gains on Levy Sales	Total Loss
(acres)	(Rs million)		
Less than 2	103.01	...	103.01
2-4	141.41	23.41	118.00
5-10	48.96	19.36	29.60
More than 10	15.83	6.07	9.96
Total	309.21	48.84	260.37

Source: Estimated by P. S. George.

Note: The ellipses indicate a negligible amount.

Table 32--Movement restrictions and rationing effects of public distribution, Kerala, 1974/75

Source	Movement Restriction Effect	Rationing Effect	Total
(Rs million)			
Farm income	309.21	-48.84	260.37
Consumer savings	-336.46	741.00	404.54
Total gains	-27.25	692.16	664.91

Source: Estimated by P. S. George.

## 6. PUNJAB

Its substantial improvement in agricultural production since the mid-1960s has contributed to the emergence of Punjab as the principal supplier of foodgrains in the country. Its comfortable position regarding overall foodgrain availability and relatively low retail prices have reduced the relevance of public distribution in the state. At the same time, as the major supplier of foodgrains for public distribution, Punjab has an unusual role in the maintenance of the public distribution system in other states.

The coverage of the public distribution system was limited to wheat flour, sugar, rice, palm oil, kerosene, and controlled cloth. In 1981 a targeted distribution system was introduced. It included about 450,000 people whose annual family income was less than Rs 3,600 and some state employees. Wheat flour, palm oil, and two types of pulses were distributed at subsidized prices. After operating this scheme for about a year, the subsidy on wheat flour was discontinued, and after December 1982 only two types of pulses were distributed under the subsidy scheme. In view of this, only the procurement aspect will be reviewed here.

Punjab is a major wheat-producing area. With the introduction of fast-growing varieties of paddy, there is an increasing tendency among farmers to grow a first crop of paddy before the wheat season. The production of paddy increased from 1.4 million tons in 1971/72 to 5.7 million tons by 1981/82. Because Punjab is predominantly a wheat-consuming area, a large proportion of its paddy enters the market. The marketed amount of paddy was more than 90 percent of the total production, while the marketed amount of wheat accounted for only about half the total production.

The quantities procured by government agencies for public distribution accounted for most of the marketed amount of paddy and wheat. For all years except 1974/75 the entire market amount of paddy was procured by government agencies. When there was a levy on wheat, about 97 percent of the marketed amount was handled by procurement agencies.

Movement restrictions helped control the farm price. In many years the farm price of paddy remained below the procurement price. Without a favorable environment for taking rice out of the state, there was no incentive for local traders to increase the farm price. Though the farm price of wheat was higher than the procurement price,

the gap between the farm price and the procurement price remained somewhat low. Thus the procurement operations in Punjab act as an aid to the price support policy.

There is no agreement on whether procurement adversely affects farm income. The view that procurement is harmful to farmers is based on the premises that farm prices in the surplus area would have gone up in the absence of procurement and the increased price would have provided incentive for more farm investment. The other view is based on the argument that farm prices would have actually declined without procurement, especially during years of surplus production. Though it is possible to find advocates of either view at any given time, it is difficult to provide empirical verification for large areas over an extended period. At the same time data on cost of production provide a basis for determining farm income and profitability under existing price situations. Data on the cost of production of wheat in Punjab indicates that the procurement price provided enough incentive for wheat growers.

## 7. TAMIL NADU

The former state of Madras from which Tamil Nadu was formed in 1956 was a food-deficit area. During the Second World War rationing was introduced, but it was withdrawn in 1952. From 1957 on, Tamil Nadu was part of the Southern Food Zone, which also included Andhra Pradesh, Kerala, and Mysore. Among these states, Andhra Pradesh had a food surplus, Kerala was highly deficit, and Mysore was marginally deficit.

According to the normal trade pattern at the beginning of the 1960s, about 200,000 tons of rice would flow from Tamil Nadu to the Kerala market, while about 100,000 tons of Andhra Pradesh rice would arrive at the Tamil Nadu market. During September 1964 Andhra Pradesh introduced informal restrictions on movement of rice to Tamil Nadu; consequently in October 1964 Tamil Nadu was made a separate zone. A system of distribution through family ration cards was introduced in urban areas in deficit districts, and arrangements were made for procurement from surplus areas to support distribution in deficit areas. Interstate movement of foodgrains on private account was banned, and the Tamil Nadu Civil Supplies Department assumed responsibility for procurement and distribution. Rice distributed through ration shops was collected from inside the state through levy procurement from producers, traders, and millers. The central government supplied wheat for distribution through fair price shops. A network of cooperatives, retail outlets of the Tamil Nadu Civil Supplies Corporation, and private traders were involved in food distribution. The nature of rationing, the area covered, eligibility, and the maximum quantity available through ration shops over the years followed the pattern in Table 33.<sup>40</sup>

In 1978 the Tamil Nadu government launched a scheme called "one village, one shop" under which a fair price shop was opened in every revenue village. Those with a population of less than 500 were to have a part-time shop open three days a week and those with larger populations were to have a shop open six days a week. The Tamil Nadu cooperative department was assigned responsibility for opening shops in 10 districts, and the Civil Supplies Corporation in 4 districts.

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<sup>40</sup>For further details, see T. Prabha, "Public Distribution and Rice Procurement in Tamil Nadu," Ph. D. dissertation, Kerala University, Trivandrum, 1983.

Table 33--Ration quantity, income group eligible, and area under rationing, Tamil Nadu, 1965-76

Period	Type of Rationing	Area Covered	Income Group Eligible	Quantity of Ration Rice Allotted	
				Adults	Children
			(Rs)	(grams/week/person)	
1965-69	Statutory	City of Madras, towns of Coimbatore and Singanallur, and Perur Panchayat	Not specified	1,400	700
1970	Informal	Perur Panchayat	Less than 300	1,000	500
1970	Informal	Perur Panchayat	Less than 300	800	400
Nov. 1971	Informal	Perur Panchayat	Less than 300	600	300
Jan. 1972- May 1974	Issue at economic rates	Town of Coimbatore, and border talukas, Kanyakumari district	Less than 300	1,000	500
June 1974	Informal	Entire state	Less than 500	1,250	625
				(kilograms/week/family)	
April 1975	Informal	Entire state	More than 500	2	...
Nov. 1976	Informal	Other districts	Not specified	6	...
				(kilograms/week/person)	
Nov. 1976	Informal	City of Madras, town of Coimbatore, and their surrounding areas	Less than 500	1 1/2	1
Nov. 1976	Informal	Border talukas, Kanyakumari	Less than 500	2	1
Nov. 1976	Informal	Nilgiris	Not specified	3	2

Source: Information supplied by the Office of the Commissioner of Civil Supplies, Madras.

The Cooperative Department opened 10,540 consumer shops and the Civil Supplies Corporation, 4,728. The Civil Supplies shops had a variety of consumer items in addition to the foodgrains distributed under the public distribution system.

#### RATION OFFTAKE AND PRICE

Between 1965/66 and 1977/78 the average annual offtake ranged from 86,000 tons to 741,000 tons. The per capita annual offtake varied widely from 2 to 18 kilograms.

The share of wheat in the total offtake varied from 4.6 percent to 43.3 percent. Wheat offtake was high during 1974/75 and 1975/76. The people of Tamil Nadu are predominantly rice eaters. During the period 1965-69 when there was statutory rationing, the ration offtake was more than 6 million tons. When statutory rationing was abolished in 1970, the offtake from ration shops declined to less than 0.1 million tons. Since 1974 the offtake from ration shops has increased.

The per capita annual offtake was the highest during 1968/69. Between 1970 and 1974 it declined to about 3 kilograms, reaching its lowest level--2 kilograms--during 1972/73 but increasing to 16.3 kilograms in 1976/77.

During the period of statutory rationing, normal trade operations were nonexistent. Whatever trade existed consisted of distribution through controlled channels and sales from producers to consumers. After 1970 there was a dual price system: consumers could buy a certain quantity from fair price shops, which they supplemented with purchases from the open market. A comparison of the open market price and prices at fair price shops (control price) indicates that during two years, 1969 and 1976, the open market price of rice was less than the price charged at fair price shops. The gap between the open market price and the control price was the highest during 1975. This was the result of a severe drought in 1974/75 (see Table 34).

#### PROCUREMENT

When the state government decided on a statewide policy of year-long procurement in 1965, interdistrict movement restrictions were imposed. A maximum quantity of up to 10 liters could be moved without a valid permit from one district to another for individual consumption. In addition, district collectors could impose restrictions on moving rice within the district. The state government was the sole wholesale trading agency.

These restrictions were relaxed in January 1970. A system of procurement through a levy on traders and on producers was introduced.

Table 34--Rice prices, Tamil Nadu, 1965-81

Year	Open Market Price	Control Price	Gap Between Open Market and Control Price	Ratio of Open Market Price to Control Price
		(Rs/kilogram)		(percent)
1965	n.a.	0.69	n.a.	n.a.
1966	n.a.	0.77	n.a.	n.a.
1967	n.a.	0.75	n.a.	n.a.
1968	n.a.	0.76	n.a.	n.a.
1969	0.77	0.85	-0.08	n.a.
1970	1.03	1.02	0.01	91
1971	1.13	1.08	0.05	101
1972	1.15	1.10	0.10	105
1973	1.20	1.10	0.89	105
1974	2.29	1.40	1.06	109
1975	2.76	1.70	1.06	164
1976	1.80	1.90	-0.10	162
1977	1.87	1.60	0.27	95
1978	1.80	1.60	0.20	117
1979	2.10	1.60	0.50	112
1980	2.80	1.75	1.05	131
1981	3.00	1.75	1.25	160
				170

Source: Information supplied by the Office of the Commissioner of Civil Supplies, Madras.

Note: During 1965-69 no rice was traded on the open market; n.a. means not available.

Procurement operations were limited to four surplus districts. Movement of paddy and rice from these districts was allowed only with valid permits. The levy on traders continued until 1974. During 1975 and 1976 the government resorted to monopoly procurement of the entire marketed surplus. In the second half of 1976, movement restrictions between districts were lifted.

During the period 1965/66-1978/79 procurement of rice varied from 43,000 tons to 890,000 tons. The average volume of procurement was 414,000 tons annually. The quantity procured represented about 20 percent of total production in the state during the late 1960s, but this ratio declined in subsequent years. This indicates that in many years local procurement was substantially higher--even twice as high--as the nation offtake by consumers.<sup>41</sup>

The procurement price of paddy, which was based on prices fixed by the central government, was Rs 39.50 per quintal in 1964/65, rising to Rs 74.00 within 10 years. In addition to the procurement price, farmers were provided with an incentive bonus of Rs 10 per quintal and a transport allowance of Rs 5 above the procurement price announced by the central government during 1974/75 and 1975/76, but these extra payments were eventually stopped.

The procurement price was below the farm harvest price. During 1966/67-1968/69 when the government was the only buyer, there was no difference between the farm harvest price and the procurement price. When procurement through levy was instituted, farmers could sell quantities remaining after meeting levy requirements on the open market. Similarly, when a levy was imposed on traders, they could buy from the open market at the prevailing price and hand over the levy portion at the procurement price. The loss on levy sales was normally recovered from the sale of the remaining portion in the open market.

The state government anticipated an expenditure of Rs 40 million each year on the public distribution system. The actual amount of subsidy is determined on the basis of the economic cost of the rice distributed by fair price shops and the amount realized from consumers. The economic cost price at retail is obtained by making allowances for all expenditures and margins incurred from the stage of procurement of paddy until rice is distributed through retail outlets. The nature of costs and the method of computing the subsidy can be seen in Table 35.

An attempt is made to relate the volume of procurement to production, the ratio of the farm harvest price to the procurement

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<sup>41</sup>For further details, see T. Prabha, "Public Distribution and Rice Procurement in Tamil Nadu."

Table 35--Cost of public distribution of paddy and rice, 1979/80

Commodity/Cost Item	Medium Quality	Fine Quality
	(Rs/quintal)	
Paddy		
Basic price	89.00	94.00
Incidentals		
at point of sale	1.10	1.10
Procurement expenses	1.65	1.65
Transport and handling	2.50	2.50
Storage		
(for 2 months)	1.00	1.00
Loss (1 percent)	0.95	0.95
Storage loss		
(1 percent)	0.95	0.95
Depreciation		
of gunny sacks	0.65	0.95
Interest		
(for 2 months)	1.79	1.89
Final cost of		
1.52 quintals,		
equivalent to		
1 quintal of rice	150.89	158.77
Rice		
Hulling	4.25	4.25
Transport	3.55	3.55
Transit loss (1 percent)	1.59	1.66
Storage	2.50	2.50
Gunny sacks	5.60	5.60
Storage loss (1 percent)	1.68	1.76
Interest		
(for 2 months)	7.79	8.15
Administrative overhead	3.56	3.58
Economic cost		
at wholesale point	182.00	190.00
Retailer's margin	4.00	4.00
Economic cost price	186.00	194.00
Issue price	160.00	185.00
Difference	26.00	9.00
Quantity distributed		
(metric tons)	87,935.00	72,311.00
Subsidy		
(Rs million)	22.86	6.52

Source: Information supplied by the Office of the Commissioner of Civil Supplies, Madras.

Note: The total subsidy is Rs 29.4 million.

price, the method of procurement, and the existence of movement restrictions. The estimated regression equation is<sup>42</sup>

$$Y = 5.01 + 0.04 x_1 - 0.05 x_2 + 4.49 x_3 + 1.14 x_4;$$

$$R^2 = 0.91,$$

(0.06)      (0.4)      (1.82)      (2.02)

where

- Y = procurement volume (100,000 tons)
- x<sub>1</sub> = output of rice (100,000 tons)
- x<sub>2</sub> = ratio of the farm harvest price to the procurement price,
- x<sub>3</sub> = dummy variable for procurement method  
(from producer or trader), and
- x<sub>4</sub> = dummy variable for movement restrictions.

Although results show a positive correlation of procurement to output, it is not statistically significant. The volume of procurement declined as the gap between the open market price and the procurement price increased, and it was positive when procurement was direct from producers. Further, there was a positive relationship between procurement volume and existence of movement restrictions.

#### IMPACT OF RATIONING ON CONSUMERS

To study the effects of rationing on consumers, a cross-sectional survey was conducted in a surplus district (Thanjavur) and a deficit district (Madurai) in Tamil Nadu.

##### Thanjavur District

There are two harvests in this district, the first from September to November and the second from February to March. The information on ration cards of 60 sample households indicated that during 1980, 65 percent did not make any purchases from ration shops. The average annual consumption in 1980 was only 2.39 kilograms. During 1981, the percentage of households not making purchases from ration shops declined to 16.7 percent and the average annual consumption rose to 18.46 kilograms.

Most purchases were made during the lean months from May to September. During 1980 purchases were made only from August to October. In both years more purchases were made in September than in any other month. Though there were some months when sample households did not take any rations, there were some open market sales in each month.

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<sup>42</sup>T. Prabha, "Public Distribution and Rice Procurement in Tamil Nadu."

It may be noted that 1981 was a drought year in Tamil Nadu, and there was a fall in production in Thanjavur District. The gap between the open market price and the ration price was wider in 1981 than in 1980. The gap between the two prices narrowed during the harvest period and widened in lean months. The offtake of rice from ration shops during 1980 and 1981 indicates that the level of offtake was related to the gap between the open market price and the ration rice price (see Table 36).

Data on the source of rice supplies for sample households during 1981 indicate that more than three-fourths came from each household's own production, and all with annual incomes exceeding Rs 6,000 met their consumption requirements from their own production (see Table 37).

#### Madurai District

The ration offtake in Madurai District was 4,719 tons of rice in 1980, and this rose to 41,501 tons by 1981. As in the Thanjavur District the gap between the open market price and ration price in 1981 was higher than the gap in 1980. In spite of the increase in the ration price during 1981, the gap between the open market price and the ration price even doubled in some years (see Table 38).

The survey indicated that among sample households 63 percent had not purchased any rice from the ration shops during 1980. However, during 1981 only 18 percent did not purchase from ration shops. The average monthly household purchase of rice during 1980 was 1.56 kilograms, which rose to 20.56 kilograms in 1981. Whereas purchases in 1980 were concentrated between September and December, those in 1981 were concentrated between July and September. Peak purchases came in either August or September.

Purchases from ration shops accounted for only about 2 percent of total household consumption during 1981. Open market purchases accounted for about 37 percent, and the rest came from the household's own production (see Table 39). Procurement from ration shops accounted for only about 4 percent of household consumption among those with an annual income of less than Rs 2,000.

Table 36--Open market price, ration price, and ration offtake of rice, Thanjavur District, Tamil Nadu, 1980 and 1981

Year/Month	Open Market Price	Ration Price	Price Difference	Ration Offtake
1980	(Rs/kilogram)			(metric tons)
January	1.90	1.60	0.30	1,137
February	1.80	1.60	0.20	340
March	1.90	1.60	0.30	185
April	2.00	1.60	0.40	197
May	2.00	1.60	0.40	553
June	2.00	1.60	0.40	711
July	2.30	1.60	0.70	1,241
August	2.10	1.60	0.50	2,128
September	2.10	1.60	0.50	2,195
October	2.20	1.60	0.60	856
November	2.30	1.60	0.70	478
December	2.20	1.60	0.60	2,534
1981				
January	2.20	1.60	0.60	1,349
February	2.40	1.75	0.65	1,740
March	2.30	1.75	0.55	1,330
April	2.30	1.75	0.55	1,470
May	2.40	1.75	0.65	2,056
June	2.60	1.75	0.85	597
July	2.60	1.75	0.85	4,971
August	2.50	1.75	0.75	7,270
September	2.50	1.75	0.75	4,840
October	2.30	1.75	0.55	4,475
November	2.20	1.75	0.45	2,997
December	2.20	1.75	0.45	2,214

Source: T. Prabha, "Public Distribution and Rice Procurement in Tamil Nadu," Ph.D. dissertation, Kerala University, Trivandrum, 1983, p. 189.

Table 37--Household consumption of rice by source of supply, Thanjavur District, Tamil Nadu, 1981

Annual Income	Percentage of Households	Annual Average Consumption	Source of Rice Consumed		
			Ration Shops	Open Market	Home Grown
(Rs 1,000)		(kilograms)		(percent)	
Less than 2	23.3	548.8	3.67	79.53	16.80
2-3	35.0	741.3	2.84	26.15	71.01
4-5	23.3	741.7	2.19	17.61	80.20
6-7	5.0	663.1	...	...	100.00
8-10	8.3	693.5	...	...	100.00
More than 10	5.0	669.2	...	...	100.00
Total	100	685.0	2.71	19.91	77.39

Source: T. Prabha, "Public Distribution and Rice Procurement in Tamil Nadu," Ph.D. dissertation, Kerala University, Trivandrum, 1983, p. 191.

Note: The ellipses indicate a negligible amount.

Table 38--Open market price, ration price, and ration offtake of rice, Madurai District, Tamil Nadu, 1980 and 1981

Year/Month	Open Market Price	Ration Price	Price Difference	Ration Offtake
	(Rs/kilogram)			(metric tons)
1980				
January	1.85	1.60	0.25	1,021
February	1.85	1.60	0.25	258
March	1.90	1.60	0.30	114
April	1.95	1.60	0.35	126
May	2.00	1.60	0.40	79
June	2.10	1.60	0.50	179
July	2.30	1.60	0.70	382
August	2.25	1.60	0.65	245
September	2.15	1.60	0.55	336
October	2.10	1.60	0.50	411
November	2.25	1.60	0.65	740
December	2.20	1.60	0.60	829
1981				
January	2.20	1.75	0.45	772
February	2.60	1.75	0.85	1,166
March	2.60	1.75	0.85	2,072
April	2.60	1.75	0.85	2,336
May	2.65	1.75	0.90	3,061
June	2.70	1.75	0.95	963
July	2.75	1.75	1.00	5,526
August	1.00	1.75	1.25	7,524
September	3.00	1.75	1.25	5,767
October	2.80	1.75	1.05	4,524
November	2.80	1.75	1.05	3,703
December	2.70	1.75	0.95	4,087

Source: T. Prabha, "Public Distribution and Rice Procurement in Tamil Nadu," Ph.D. dissertation, Kerala University, Trivandrum, 1983, p. 201.

Table 39--Household consumption of rice according to source of supply, Madurai District, Tamil Nadu, 1981

Annual Income	Households	Average Annual Consumption	Source		
			Ration Shops	Open Market	Home Grown
(Rs 1,000)	(percent)	(kilograms)	(percent)		
Less than 2	31.7	665.6	4.3	74.6	21.1
2-3	30.0	965.2	2.8	42.6	54.6
4-5	11.7	1,063.1	2.8	28.9	68.3
6-7	13.3	962.7	2.1	27.9	70.0
8-10	10.0	1,012.9	...	100.0	
More than 10	3.3	1,140.6	...	...	100.0
Total	100	909.8	2.26	36.70	61.0

Source: T. Prabha, "Public Distribution and Rice Procurement in Tamil Nadu," Ph.D. dissertation, Kerala University, Trivandrum, 1983, p. 202.

## 8. WEST BENGAL

The history of public distribution of food in West Bengal can be traced to the Bengal famine of 1943. The partition of Bengal in 1947 meant that the availability of food was reduced at the same time that demands on supplies from the public distribution system were increased by refugees. Moreover, there was a shift in the cropping pattern from paddy to jute immediately after the partition. All these factors tended to raise foodgrain prices and public distribution was a way of keeping them under control.

The average size of holdings in the state was about 1 hectare. About 60 percent of the cropped area was sown in rice, 7 percent in wheat, 7 percent in pulses, and about 1 percent in other food crops. During 1978/79 per capita production of all cereals was 133 kilograms, which implies that about 23 percent of the total availability came from outside the state.

Public distribution included both statutory and modified rationing. Under a statutory rationing system the state is obligated to distribute foodgrains and other essential items through ration shops to inhabitants of a designated statutory rationing area at a specified price. Under a modified rationing system there is no commitment on the part of the government to distribute essential items in a designated area. The government may supply foodgrains as necessary and feasible, and consumers are free to buy from other sources.

At the beginning of 1983, there were 2,750 statutory ration shops and 15,783 modified ration shops, an increase of 82 statutory ration shops and 3,206 modified ration shops during the decade. The number of persons covered by the shops differed in statutory and modified rationing areas. Whereas the average number covered by each shop in the statutory rationing area was about 3,000, the number in the modified rationing area was about 1,000. In statutory rationing areas the number of persons per shop remained virtually constant over the years, but there were substantial variations in the number per shop in modified rationing areas.

### OFFTAKE AND RATION PRICE

Rice and wheat were distributed through ration shops. Between 1972/73 and 1981/82 the per capita annual offtake of rice in statutory rationing areas varied between 27 and 50 kilograms. The per capita

offtake of wheat in statutory rationing areas varied between 30 and 65 kilograms. Whereas wheat offtake was larger than rice offtake during the early part of the 1970s, from the mid-1970s onward rice offtake exceeded wheat offtake. The average annual offtake of rice was 366,900 tons and that of wheat was 468,340 tons.

In modified rationing areas the average annual offtake of rice was 381,450 tons and that of wheat was 328,390 tons. Although the offtake of rice in modified rationing areas accounted for about 51 percent of the total rice offtake, the per capita offtake was below that of statutory rationing areas because the coverage in modified areas was much larger. This was also true for wheat consumption. The amount of wheat distributed in modified rationing areas accounted for about 41 percent of the wheat offtake in the state. However, the per capita offtake in modified rationing areas was less than half the per capita offtake in statutory rationing areas. Further, annual variations in the per capita offtake of rice in modified rationing areas were much higher than variations in the per capita offtake in statutory rationing areas.

Changes in offtake from statutory rationing areas, particularly in the composition of rice and wheat, partially reflect changes in the scales of cereals distributed under statutory rationing. In 1971 the maximum offtake per person allowed from statutory ration shops was 1 kilogram of rice and 1.65 kilograms of wheat per adult per week. By 1982, the rice ration had risen to 3 kilograms. The quantity of wheat entitlement increased to 2.25 kilograms during 1977-79 and to 1 kilogram in 1982.

In statutory rationing areas most of the rice supplied was procured from within the state, but in modified rationing areas most was imported from outside the state. Between 1972 and 1982 the price of Bengal rice increased from Rs 1.20 per kilogram to Rs 2.15 per kilogram, and during the same period the price of non-Bengal rice increased from Rs 1.26 per kilogram to Rs 2.11 per kilogram. The price of wheat supplied by ration shops doubled between 1972 and 1982.

Though the open market price of rice remained above the ration price in every year, the gap between the open market price and the ration price varied from year to year. In some years the open market price was more than 50 percent of the ration price, but in many years the gap was not substantial. The gap between the open market price and the ration price of wheat was also small.

#### PROCUREMENT

The quantity of rice received from the central pool was about 0.65 million tons during 1970/71, dropping to only 0.24 million tons in 1974/75, and increasing to about 1.2 million tons by 1981/82. Wheat and wheat products received from the central pool varied between

0.54 million tons in 1978/79 to 1.05 million tons in 1974/75. Supplies from the central pool accounted for about 30 kilograms of foodgrains per capita annually. The quantity received from the central pool accounted for about 20 percent of the foodgrain availability in the state, the balance being the quantity available from production within the state.

The maximum quantity of rice made available through local procurement was about 0.3 million tons during 1975/76. The procurement volume in many years was less than this. A levy on rice mills was the most important procurement method. Though a graded levy on producers with more than a certain minimum area of land was imposed in some years, it was not uniformly adopted. From time to time the procurement prices of paddy and rice were made consistent with the prices fixed by the central government. The farm price of paddy was often much higher than the procurement price. The farm price per quintal in 1974/75 was Rs 247, in 1978/79 it was Rs 180, and in 1979/80 it was Rs 203.

#### EFFECTS OF RATIONING

During the period 1972/73-1981/82, on average, about 54 percent of cereals distributed through the public distribution system was allotted to areas under statutory rationing, which accounted for 17.3 percent of the 1981 population of the state. About 49 percent of total rice and 59 percent of total wheat were distributed in statutory rationing areas. The average quantity of cereals for the 10 years came to a daily per capita distribution of 243 grams--107 grams of rice and 136 grams of wheat.

Modified rationing areas accounted for 46 percent of the cereals. About 39.5 percent of the population was excluded from statutory rationing areas. They accounted for 51 percent of the rice and 41 percent of the wheat distributed through the public distribution system. The implied per capita coverage was 109 grams per day, consisting of 59 grams of wheat and 50 grams of rice.

In 1981 the total population of the state was 54.5 million, of which 27.2 million were covered under statutory and modified rationing. In other words, about half the population received no grains from the public distribution system. Even among those who were covered, the per capita supply was only 243 grams per day in the statutory rationing area and 109 grams per day in the modified rationing area.

Among the 45 million people outside the statutory rationing area, the one-third who belonged to households with a cultivated area of more than 2.5 acres were considered self-sufficient in food. Therefore, to ensure complete coverage, modified rationing needed to

cover a population of 30 million. The actual coverage of 17.8 million people accounted for about 59.3 percent of the eligible population, leaving 40.7 percent of those eligible with no access to the public distribution system.

## APPENDIX: THE FOOD CORPORATION OF INDIA

The Food Corporation of India (FCI) was set up on January 1, 1965, in accordance with the 1964 FCI Act of the Government of India. Since its inception, work relating to imports, procurement from within the country, sales, storage, movement, and distribution have been gradually handed over to FCI.

Its main objectives are to ensure that the primary producer obtains the minimum price set by the government and to protect the consumer from the vagaries of speculative trade; to take up state trading in foodstuffs on an appreciable scale and to build up buffer stocks gradually; to engage primarily in the purchase, storage, movement, distribution, and sale of foodgrains and other foodstuffs; and to secure for itself a strategic and commanding position in the foodgrain trade of the country.

## PROCUREMENT

FCI is the sole agency for procurement of foodgrains at support or levy prices on behalf of the Government of India and some state governments. It also accepts deliveries for the central pool from state governments and makes commercial purchases for the Army Purchase Organisation.

The quantity of wheat, rice, and coarse grains purchased by FCI from 1974/75 to 1979/80 was about 10 percent of total production. While wheat procurement ranged from 7.3 percent to 23.9 percent of production, the percentage of rice procured ranged from 5.9 to 11.3. Only a small quantity of coarse grains was procured.

Whereas FCI procured about 10 percent of total production, its share of the total marketed surplus was much larger. For example, during 1976/77 market arrivals of wheat accounted for about 31 percent of production, and about 60 percent of this was procured by FCI. During the same year, the marketed surplus of rice was estimated at 27 percent of production, and FCI's share was 41.8 percent of the marketed surplus (see Table 40).

The following procurement methods are generally adopted by FCI. Rice, by and large, is purchased under a levy on licensed millers or traders. Paddy is purchased under various methods according to government policy. These include price support, levy on producers, levy on traders, and monopoly procurement. Finally, wheat and coarse

Table 40--Procurement and production of foodgrains, India, 1974/75-1979/80

Crop/Year	Procurement by FCI	Production	Procurement as a Share of Production
	(million metric tons)		(percent)
<b>Coarse grains (bajra, jowar, and maize)</b>			
1974/75	.031	19.2	0.16
1975/76	.041	22.5	0.18
1976/77	.010	22.7	0.04
1977/78	.006	22.8	0.03
1978/79	.011	23.2	0.05
1979/80	.022	20.9	0.11
<b>Rice</b>			
1974/75	2.320	39.6	5.90
1975/76	4.230	48.7	8.70
1976/77	4.730	41.9	11.30
1977/78	4.060	52.7	7.70
1978/79	5.700	53.8	10.60
1979/80	3.840	42.2	9.10
<b>Wheat</b>			
1974/75	1.770	24.1	7.30
1975/76	3.830	28.8	13.50
1976/77	5.420	29.0	18.70
1977/78	5.290	31.8	16.60
1978/79	5.770	35.5	16.30
1979/80	7.540	31.6	23.90
<b>Total foodgrains</b>			
1974/75	4.120	82.9	5.00
1975/76	8.100	100.0	8.10
1976/77	10.160	93.7	10.80
1977/78	9.350	107.2	8.70
1978/79	11.480	112.5	10.20
1979/80	11.400	94.7	12.00

Source: Compiled from the procurement data in Food Corporation of India, Annual Report (New Delhi: FCI, various years); and production data in India, Ministry of Agriculture and Irrigation, Directorate of Economics and Statistics, Indian Agriculture in Brief, various issues (New Delhi: Controller of Publications, various years).

grains are purchased under a price support scheme. The manner of actual procurement is determined by state governments, and FCI has little control over this.

FCI issues foodgrains to the public distribution system based on allocations made by the Government of India. The corporation also supplies grains to state governments for special schemes such as food-for-work and for relief measures during floods and cyclones.

Domestic sales of wheat and rice accounted for about 13 million tons during 1979/80 and 1980/81. Though exports of wheat and rice accounted for about 1 million tons during 1979/80, they declined during 1980/81. The fluctuations in the stock position and offtake of foodgrains from the central pool depends largely on production, availability, and prices of foodgrains, as well as the procurement and distribution pattern.

#### BUFFER STOCK

To meet situations arising out of crop failure and to maintain distribution commitments, the Government of India through FCI maintains a buffer stock in addition to the operational stocks required for normal running of the public distribution system. The sizes of the buffer and operational stocks held by FCI from the end of 1977/78 to 1979/80 were

<u>Year</u>	<u>Buffer Stocks</u>	<u>Operational Stocks</u>
	(million metric tons)	
1977/78	9.61	3.67
1978/79	11.09	3.29
1979/80	7.72	4.37

#### STORAGE

In 1981, FCI had an annual storage capacity of about 7.7 million tons covered and 1.2 million tons CAP (cover and plinth). Besides its own godowns, FCI also rented storage space from public and private agencies. The storage accommodations available as of March 31, 1981, were

		(million metric tons)
Covered accommodations owned by FCI		7.757
Accommodations hired from:		
State government		0.676
Central Warehousing Corporation		0.812
State Warehousing Corporation		0.761
Others		5.763
Total		15.769
CAP	Owned	1.238
	Hired	3.783
	Total	20.790

Utilization of storage capacity depended largely on the procurement and distribution policy of the Government of India and the availability of infrastructure facilities like transport and labor in the states.

The average cost of storage was Rs 3.00 per ton per month during 1979/80 and Rs 3.60 per ton per month during 1981/82. The storage loss during 1979/80 was about 1.5 percent of the quantity sold. There was a gradual increase in storage loss from about 0.3 percent in 1975/76. Cyclones and floods and longer periods of storage to meet buffer stock requirements mainly contributed to this increase.

In addition, each year a certain amount is rendered unfit for human consumption. The CAP storage system adopted after 1976 to cope with heavy purchases has been mainly responsible for this damage (see Table 41). Because of insufficient permanent storage space, FCI built platforms on which bags of foodgrains were stacked and covered with plastic. Unfortunately, the covering proved to be inadequate protection from the elements, insects, and rodents, thus resulting in heavy losses.

#### COSTS AND SUBSIDY

Purchases and issues are made at prices fixed by the central government. The expenses incurred by FCI in handling foodgrains for the public distribution system consist of incidentals at the time of

Table 41--Storage loss of the Food Corporation of India, 1975/76-1979/80

Year	Storage Loss		Damaged		Value	
	Quantity	Share of Quantity Sold	Quantity	Share of Quantity Sold	Storage Loss	Damaged
	(1,000 metric tons)	(percent)	(1,000 metric tons)	(percent)	(Rs million)	
1975/76	26	0.3	...	...	34.3	...
1976/77	68	0.7	44	0.45	97.2	36.9
1977/78	125	0.9	47	0.34	167.9	32.4
1978/79	100	1.0	101	1.01	158.5	85.0
1979/80	203	1.5	70	0.50	315.1	57.1

Source: Food Corporation of India, Annual Report (New Delhi: FCI, various years).

Note: The ellipses indicate a negligible amount.

procurement and those incurred through movement, storage, and distribution of grains. The average procurement costs of wheat and rice incurred between 1977/78 and 1980/81 were about Rs 200 per ton for wheat and about Rs 100 per ton for rice.

Distribution incidentals (storage, movement, and distribution costs) consisted of freight, interest, transit and storage loss, storage charges, handling expenses at godowns, and administrative overhead. Distribution overhead increased from Rs 148.3 per ton during 1977/78 to Rs 234.1 per ton during 1980/81. The issue price fixed by the central government does not cover the full costs incurred by FCI in procurement, movement, storage, and distribution. The difference between the economic cost of foodgrains and their issue price is reimbursed to FCI as subsidy. Also, costs of carrying buffer stocks are reimbursed by the government. Table 42 shows that the subsidy per ton of wheat was relatively higher than the subsidy for rice because the gap between the procurement price and the issue price was wider.

Table 42--Consumer subsidy received by the Food Corporation of India, 1977/78-1980/81

Year	Consumer Subsidy		Cost of Carrying Buffer Stock	
	Amount	Rate	Amount	Rate
	(Rs million)	(Rs/metric ton)	(Rs million)	(Rs/metric ton)
1977/78	2,999.5	271.9	2,630.0	236.2
1978/79	2,954.5	297.8	2,627.7	245.8
1979/80	3,241.5	246.8	2,653.0	250.1
1980/81	4,550	...	1,780.2	...

Source: Food Corporation of India, Annual Report (New Delhi: FCI, various years).

Note: The ellipses indicate a negligible amount.

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