

Foodgrains Policy and Management in India

Responding to Today's Challenges and Opportunities

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Usual disclaimers apply.

Executive Summary

Indian public foodgrains management, perhaps still motivated by the experiences of the 1960s to attain and maintain self-sufficiency in foodgrains to achieve food security, has outlived its' usefulness. The government successfully used foodgrains price stabilization as a major policy instrument when it embarked on promoting the Green Revolution. However, times have changed: policies and public agencies that may have been appropriate forty years ago are not necessarily optimal today. Private markets and institutions have strengthened significantly – or could be strengthened significantly – and should be entrusted with many of the functions that parastatals, or other government agencies, have traditionally performed. Holding on to old practices delays reaping the benefits that changing current policies have to offer.

1. Indian foodgrains policy can be traced back to World War II, when a series of food price control conferences were held by the colonial British administration in response to a sharp rise in foodgrains prices. The Bengal Famine of 1943 accelerated the scope of public intervention.
2. Today's foodgrains policy had its origins in 1965 when the need to disseminate high-yielding varieties and ensure low-priced food to consumers led to the creation of the Food Corporation of India (FCI) and the Agricultural Prices Commission (APC). Unprecedented consecutive severe droughts in 1965-66 and 1966-67 necessitated massive emergency food aid imports and subsequently expanded the scope of the FCI to include monopoly control over imports, mandatory levies on rice, and preferential credit and transportation access to the public sector.
3. These actions, combined with successful dissemination of Green Revolution varieties supported by committed government development investments (and we stress the importance of government commitment), significantly improved food security in the country and paved the way for today's successful development.
4. Even as supply of foodgrains improved and the country turned self-sufficient, demand has not been keeping pace, due both to a decline in the share of expenditure on food and to the dietary diversification towards non-grain food items, both of which are to be expected with rising income levels.
5. Simultaneously, there has been a sea change in the overall economic policy environment, both globally and domestically. Following the Uruguay Round of

- trade negotiations and the setting up of the World Trade Organisation the global trade regime is far more liberal today.
6. India too has liberalised its trade policies significantly, both as part of her international commitments but probably more on her own as part of the overall economic reforms that the country has embarked upon. Underlying these reforms is recognition of the role and importance of market forces and the private sector, and the need to reduce and re-orient government's role in order to achieve a higher, sustainable, and more-inclusive growth rate.
 7. While trade policies became liberal, domestic foodgrains management continues to remain the same, dominated by public intervention. Over time, the costs of the stabilization policies and the institutions implementing the policies have risen and the benefits have declined. The costs for procuring, distributing, and buffer-stocking foodgrains have sky-rocketed, reaching Rs.262 billion in 2005/06. Increasing budget demands for price stabilization are crowding out investments in areas of higher economic return.
 8. Yet the government continues to offer price support at a level that guarantees high returns for wheat and rice. Guaranteed high returns for wheat and rice and their assured procurement discourage diversification – the alternative – for which both production and price risks are high. The dominance of the public sector discourages the development of the private marketing sector which can promote diversification.

Experiences of Punjab and Andhra Pradesh:

9. The Punjab provides one example of the benefits and costs of the public market intervention (and subsidies) from which lessons can be learned. Spurred by industrious farmers and benefiting from extensive irrigation (90 percent of cropped area compared to 40 percent for all-India), high fertilizer use (double all-India average), high tractor density (104 per thousand ha compared to 22 at all-India level), abundant roads (twice the all-India density), good markets (during harvest, farmers can typically find a purchase centre for foodgrains within 8-10 kilometers, by far the best market density in the country), and increasing communications (especially cell phones and computers), the state has increased wheat and rice production. Despite comprising less than 2 percent of the country's area, the Punjab contributed over 20 percent of national wheat production and over 10 percent of national rice production in 2003-04 and a significant portion (57 per cent for wheat and 38 percent for rice) of grains to the central pool for public

distribution. However, costs have skyrocketed (during 1996-2000 the difference between the minimum support price (MSP) and C2/full costs¹ averaged 36 and 26 percent respectively for wheat and rice), water and fertilizers are being used above economic levels, yields are stagnating (rice) or slowing perceptively (wheat), and environment deterioration is growing. The degradation is largely due to early sown paddy cultivation, groundwater levels are falling at a rate of almost one-quarter meter per year in the central zone; large areas are being lost to salinity and water logging, especially in the south-western cotton zone; fertilizer, especially nitrogen, is being used at levels exceeding recommendations, contributing to imbalances among nutrients (too much N relative to P and K), micro-nutrient deficiencies are becoming more serious (48% of necessary zinc), and the result is low marginal returns to fertilizer (2 kg of grain to one kg of fertilizer) – thus, the sustainability of agriculture is being threatened. All incentives are stacked in favor of wheat and rice which cover over three-quarters of cropped area and account for 85 percent of gross value of crop output. It is not yet a crisis situation. But incomes will stagnate in the near-term. In the longer-term, changing demand and deteriorating environment will lead to progressively decreasing incomes.

10. Andhra Pradesh, a rice surplus state, provides another example of benefits and costs of the public market intervention (and subsidies) from which lessons can be learned. AP contributes roughly 10% of the rice production in the country. Rice production in AP is concentrated in the coastal regions and in some parts of Telangana, where abundant water resources are available and extensive irrigation facilities have been developed. Water availability enabled spread of High Yielding Variety (HYV) seeds, and with strong support from the government, rice production rose from 7 million tons to about 12.5 million tons between 1980-81 to 2000-01, mainly due to a 50% rise in yields during this period. Though rice yields in AP are about 45% higher than the national average, cost of production remained comparatively higher in AP than in Punjab, Uttar Pradesh, and all the eastern states. As a result, profit margins from paddy cultivation are one of the lowest in the country. With the gap between the MSP for rice and C2 costs in AP being negligible, clearly the paddy producers in the state did not benefit much from the MSP. Nevertheless, AP accounts for between 15-19% of the total rice procurement in the country. With an increase in the number of regulated markets, and about 40% of FCI's storage capacity being located in the state, the entire supply chain in rice is dominated by government agencies. As a result nearly 70% of the marketed

¹ These cost concepts have been defined in the subsequent chapters

surplus in Coastal Andhra and about 35% in the Telangana region is sold to government. Studies have found that it is this assurance of procurement rather than the procurement price per se that influences farmers' decision to sell rice to the government. The dominance of the government, armed with a whole host of self-serving regulations and preferential access to credit and rail transport services, in the supply chain has inhibited private sector participation in grain management in the state, even though available evidence points to cost-efficiency of the latter.

Historic rationale:

11. The historic rationales for the all-pervasive public intervention in foodgrains included a) limited market integration across space and time, b) protecting farmers from the risks inherent in promotion of new technologies, c) limited institutional infrastructure to deal with volatile world foodgrains markets, and d) severe foreign exchange constraints. Underlying increased public intervention was distrust of traders to curb perceived speculative activities.
12. None of these conditions, which earlier justified aggressive public intervention, hold good today. Infrastructure, roads and communications, have improved over time. Studies show that foodgrains markets are integrated in the long-run and disintegration, when occurring over the short-run, is associated with government - imposed movement and storage restrictions. Given that high-yielding varieties now cover almost all cropped high-potential area under wheat and rice, it is difficult to argue that price supports are required to promote such varieties. World wheat and rice markets are now larger and more robust; international price volatility has become relatively small. And India has accumulated large foreign exchange reserves, many times the amount needed to import any conceivable shortfalls in demand. Clearly it is now time to allow the private sector to carry out the tasks of procuring and distributing foodgrains, and re-orient public intervention towards where it is acutely needed.

Simulation studies:

13. Studies that examined the potential impacts of trade reforms show that India is unlikely to lose in any big way from liberalizing its trade regime, whether done unilaterally or as part of a multilateral effort. If anything, there could be some small welfare gain at the national level, and significant gains for unskilled labour in the form of higher wages and cheaper consumer goods. As these studies do not

capture dynamic efficiency gains from trade reforms arising from re-allocation of resources across sectors, the overall gains from trade reforms are likely to be much higher than what these studies predict. The other major message from these studies is that comprehensive domestic reforms that boost investment and productivity have far greater positive impact on welfare and growth than trade reforms alone. This only highlights the need to dovetail domestic policies with a liberal trade regime.

14. Counter-factual simulations using a multi-market spatial equilibrium model suggest that replacing the existing public procurement-stocking-distribution system with one combining (a) a fully liberal on international trade regime, (b) a targeted public distribution system (TPDS) that excludes the non-poor, (c) eliminating levies on rice, and (d) reducing procurement and stock limits to a level required for the TPDS, will lower prices, making net wheat and rice producers worse off (assuming farmers continue to grow wheat and rice rather than diversify to high-value commodities which would give higher incomes) and net consumers better off. These effects vary across states depending on the demographics, concentration of poverty, and agricultural specialisation. Overall, the results suggest that reforms will lead to a redistribution of income from non-poor to poor, and from surplus states to deficit states, even as urban households everywhere gain from lower prices.

International experience:

15. Lessons also can be learned from other countries. Indonesia reinforces the argument that public price stabilization policies combined with strong government commitment toward development can lead to success. However, that country is also an example of where public intervention, without adjustment, has out-lived its usefulness. The Philippines, on the other hand, has under-achieved in its economic development efforts despite having an active foodgrains price stabilization program, largely because of erratic and declining public commitment. Bangladesh, although perhaps benefiting from favorable circumstances, has utilized the private market with great success in its' price stabilization efforts.

Reforming food policy:

16. The changing scenario demands a much different role for government in the future than it has exercised in the past. Food security is much more than foodgrains

availability alone and more than the responsibility of a few surplus states like Punjab or Andhra Pradesh. Economic forces, led by market demand – domestically and globally – if allowed to operate, will drive the road to diversification. The private sector will provide the leadership. Increased incentives can contribute to “get prices right”. Strengthened institutions can change the rules of the game in addition to the organizations in which they are embedded, for example prices will never truly be effective allocators of resources if markets are not effective, so the challenge is also to “get markets right”. Increased investment can provide the physical infrastructure and technologies to create and move inputs, services, and commodities.

17. In the changing environment, it is as important to specify what government should not do as well as what it should do. It is equally important to present policies as a package in order to provide tradeoffs to gain the necessary political support. The role of government, therefore, should be to provide 1) public goods – particularly infrastructure and research – and 2) policies to facilitate, guide, and monitor an inclusive process so that the pace of transition accelerates and benefits are distributed widely.
18. Unbundling the government objectives and instruments / institutions for public intervention is required to improve the efficiency of the current system of foodgrains management and to enhance the government’s capacity for meeting its distributional goals for welfare improvement.
19. The key to successful reforms of the food management system is to decouple the government’s consumer welfare objectives from producer protection objectives. Holistic reforms of the existing welfare programmes are required not just to ensure better delivery of safety nets to the poor, but also to enable critical reforms to the current system of public intervention in foodgrains markets along the entire supply chain. Producer interests should be protected not through public price stabilization programmes, but by allowing a free play of market forces. Accordingly:
 - a) The Targeted Public Distribution (TPDS) should be strengthened and it should cater only to the poor. Over time, the current system of consumption subsidy in the form of physical entitlements should be replaced by a system of food coupons that would allow the poor to purchase their food requirements from the market itself at prevailing market prices. These coupons may be of a certain value, which could be periodically adjusted in line with price movements so as to offer a real income transfer. This move would reduce the need for large scale public intervention in procuring, storing and distributing

foodgrains, and enable downsizing the scale of public intervention in foodgrains markets. Eventually, employment generation programmes and innovative income transfer programmes should replace consumption subsidy programmes for the poor, since income transfers are welfare superior to commodity specific consumption subsidies.

- b) Private marketing should be strengthened through reform of the Agricultural Produce Marketing Committees (APMC) Act, abolishing the Essential Commodities Act (ECA), permitting direct purchases from farmers, eliminating movement and storage controls, facilitating warehouse receipts, strengthening futures markets, and opening imports and exports to the private sector.
- c) Decouple MSP as protection against price risk (support prices) from using it to augment income. The MSP should be set at A2/paid-out-cash-cost levels to mitigate farmers against the risk of precipitous fall in prices.
- d) Market prices should be stabilised based on transparent rules in an open economy environment (i.e., free of movement, storage and trade restrictions) somewhere within a band bordered by c.i.f. and f.o.b. prices by using a variable tariff policy consistent with World Trade Organization (WTO) rules (within the bound rates).
- e) When domestic prices tend to reach the upper (c.i.f.) level of the band, tariffs may be lowered enabling greater imports and also buffer stocks may be released, both of which will help lower the prices.
- f) When domestic prices tend to reach the lower (f.o.b.) level of the band, tariffs may be increased to curtail imports and additionally the government may also procure grains at market prices to boost demand.
- g) Futures markets for grains are an useful institution that can give guidance about the future direction of change of the band itself; that is, whether there will be secular rise or fall in the band. It is, therefore, important to integrate tariff-setting in line with the movements in the futures prices. Institutional arrangements for monitoring the price movements and carrying out tariff changes would have to be developed.
- h) As long as the lower level of this band (including tariffs) remains above the A2 cost levels, all public procurement of foodgrains for safety net policy needs and / or for buffer stocks should be at market prices.

- i) The MSP at A2 cost level should become operational only when the lower level of the band, even after raising the tariffs to the maximum permissible bound rates, goes down below the A2 cost level. During such instances, government should invoke “special safeguards mechanisms” to impose temporary quantitative restrictions on imports to eliminate arbitrage opportunities.²
- j) Improve the efficiency of FCI (in part, by making it compete with the private sector on a level playing field) and progressively down-size it as well. Downsizing FCI should be effected in the current surplus states such as Punjab where FCI operations have ceased to bear any benefits and instead re-orient FCI operations to the eastern states where public support for market development is direly needed. Public procurement along lines described above for meeting the TPDS requirements, as well any buffer stock requirements, should be from the eastern states that have immense potential and cost advantages in rice cultivation.
- k) Bring about organisational and other institutional changes within the FCI (and other government agencies involved in procurement) that would facilitate FCI officials to procure / offload grains on a commercial basis at a (non-MSP) market price, adjust tariffs, etc. which would vary from time to time, without fear of being subjected to criminal prosecution. A market committee involving prominent persons of repute and knowledge and a professional staff with analytical capabilities may be formed, which would meet on a regular basis to monitor movements in prices and the action to be taken (similar to the market committees of the Federal Reserve of the USA to monitor interest rates).

² Such special safeguards are currently not available to India (and other developing countries) under the current WTO regime, but future trade negotiations should be directed towards ensuring that such options are available to the country.

Table of Contents

Acknowledgement.....	i
Executive Summary.....	ii
List of Tables.....	xii
List of Figures.....	xiv
Acroynms.....	xv
1. Introduction.....	1
1.1. Foodgrains Management System in India – A Stylised Characterization.....	4
1.2. The Changed Conditions and the Need to Re-think Policies.....	6
1.3. Objectives and Organization of the Report.....	11
2. Review of the Existing System.....	13
2.1. Evolution of Foodgrain Management Policies in India	13
2.2. Policies to Facilitate Price Stabilization Programs	16
2.2.1 <i>Monopoly Control Over International Trade</i>	16
2.2.2 <i>Restrictions on Movement of Foodgrain</i>	18
2.2.3 <i>Credit Facilities to FCI</i>	19
2.2.4 <i>Restrictions on Private Storage</i>	20
2.2.5 <i>Restrictions on Processing</i>	20
2.3. The Dynamics of Public Intervention in Grain Management	21
2.3.1 <i>The Degree of Intervention</i>	21
2.3.2 <i>The Scale of FCI's Operations</i>	23
2.4. The Cost Implications	24
2.4.1 <i>Reported Costs and Subsidies</i>	24
2.4.2 <i>Indirect Costs of Intervention</i>	28
2.5. Impact of Current Pricing Policies on Supply	32
2.6. The Punjab Experience	34
2.6.1 <i>Components of the Grain Management System in Punjab</i>	37
2.6.2 <i>Costs of the Public Grain Management System in Punjab</i>	41
2.6.3 <i>Impact of Public Intervention on Punjab Agriculture</i>	43
2.7. The Andhra Pradesh Experience.....	45
2.7.1 <i>Supply Chain of Rice</i>	47
2.7.2 <i>Determinants of Rice Procurement</i>	49

2.7.3	<i>Price Trends</i>	50
2.7.4	<i>Grain Marketing in Andhra Pradesh</i>	52
2.7.5	<i>Storage and Warehousing Capacity</i>	53
2.7.6	<i>Costs of the Public Grain Management System in Andhra Pradesh</i>	55
2.8.	Concluding remarks	60
Annexure to Chapter 2		62
3.	Providing Food Security to the Poor: Public Distribution System Versus Other Social Safety Net Programs	66
3.1.	Brief Characterization of Selected SSNs	68
3.1.1	<i>Subsidized Food Distribution Programs</i>	70
3.1.2	<i>Public Works Programs</i>	71
3.1.3	<i>Nutrition Programs</i>	72
3.2.	Evaluation of Pre- and Post-Reform Public Distribution System.....	73
3.2.1	<i>The Degree of PDS Dependence</i>	77
3.2.2	<i>The Extent of Income Gains</i>	79
3.2.3	<i>The Poverty Impacts</i>	83
3.2.4	<i>The Targeting Efficiency</i>	84
3.3.	Overall Cost Effectiveness of Selected Programs.....	86
3.4.	Summary and Implications	88
4.	Rationale for Reforming the Foodgrain Management Policies	90
4.1.	The Changed Context	90
4.1.1	<i>Infrastructure and Information Flow</i>	91
4.1.2	<i>Risks Mitigation and Technology Promotion</i>	94
4.1.3	<i>Thinness and Volatility of Global Food Markets</i>	95
4.1.4	<i>Ability to Participate in the International Market</i>	98
4.1.5	<i>Broad Based Economic and Trade Reforms</i>	101
4.2.	World Trade Regime and India.....	102
4.3.	Distributional Consequences of Pricing Policy Changes: A Spatial Equilibrium Analysis	104
4.4.	Experiences of Other Countries	111
5.	Reform Measures Initiated to Promote Private Participation	113
5.1.	National Policy on Grain Handling, Storage & Transportation.....	114
5.2.	Stock and Movement Restrictions (Essential Commodities Act).....	114

5.3.	Agricultural Marketing Reforms.....	115
5.4.	Forward Contract (Regulation) Act, 1952	116
5.5.	Negotiable Warehouse Receipt System	118
5.6.	Decentralized Procurement and Distribution.....	118
5.7.	Summing Up.....	119
6.	Towards an Efficient and Welfare-Improving System of Foodgrains Management.....	120
6.1.	The Vision.....	120
6.2.	Reforming Safety Net Programs	122
6.3.	Promoting Private Sector Participation in Foodgrain Management	125
6.4.	Pricing Policy Reforms	128
6.5.	Parastatals Reforms.....	130
	Reference.....	132

List of Tables

Table 2.1 – Regulatory Support to Facilitate FCI’s Operations.....	17
Table 2.2 – Comparison of gross bank credit (outstanding) in priority sectors in India.....	20
Table 2.3 – Public procurement and distribution as percentage of production.....	23
Table 2.4 – Trends in the total food subsidy.....	25
Table 2.5 – FCI’s Expenses and Economic Costs (Current Prices)	25
Table 2.6 – Diversion of Foodgrains from PDS (%)	30
Table 2.7 – MSP, C2, A2+FL costs and subsidy rates for Punjab and all-India, 2004/05.....	37
Table 2.8 – Procurement and production of rice and wheat in the Punjab	39
Table 2.9 – Percentage of consumption obtained from the PDS in 1999-2000	40
Table 2.10 – Costs of wheat operations of FCI and private traders in Punjab (1999-00).....	42
Table 2.11 – Costs of rice operations of FCI and private traders in Punjab (1999-00)	43
Table 2.12 – Area and production of wheat and rice in the Punjab	43
Table 2.13 – Yield levels and growth rates of paddy and wheat in Punjab, 1970-2004	44
Table 2.14 – Minimum Support Price and Cost (C2) of Paddy in Selected States	47
Table 2.15 – Regression Results of Rice Procurement in Andhra Pradesh	50
Table 2.16 – Average Wholesale Price of Rice (Rs/quintal)	51

Table 2.17 – Pair wise Granger Causality Tests involving Procurement, wholesale and Retail Price of Rice in Andhra Pradesh (period: 1970/71-1999/00).....	52
Table 2.18 – Agricultural marketing charges and taxes in Andhra Pradesh	53
Table 2.19 – Consolidated Grain Storage Tariffs (Rs.) in APSWC (w.e.f. 1/4/2002).....	54
Table 2.20 – State-wise Covered Storage Capacity (lakh ton, as on 31-3-2005)	54
Table 2.21 – Earnings & Distribution Pattern of APSCSCL, 1999-2000.....	55
Table 2.22 – Implication of Subsidised Rice in APSCSCL Transactions, 1999-2000	56
Table 2.23 – Indicators of FCI and Private Trading Margin in Rice in Andhra Pradesh	58
Table A2.1 – Cost of production concepts used by the CACP	62
Table A2.2 – Public Infrastructure for Food Procurement and Distribution by State	63
Table A2.3 – State-wise Market Arrival of Rice as Percentage of Production.....	64
Table A2.4 – Growth of Agricultural Marketing in Andhra Pradesh	65
Table 3.1- Statewise Allocation and Offtake of Rice and Wheat from the PDS	75
Table 3.2 – Allotment of rice and wheat to population above poverty line (APL) under the TPDS.....	76
Table 3.3 – Per capita monthly purchase of rice and wheat (kgs) from PDS, 1986-87 and 1999-00	78
Table 3.5 – State-wise concentration of poverty and income gain from PDS (Rice and Wheat)	82
Table 3.6 – Reduction in poverty due to income transfer through PDS rice and wheat	84
Table 3.7 – Estimates of targeting errors in Public Distribution System (PDS).....	85
State level estimates*	85
Table 3.8 – Costs of income transfer in various social safety net programs, 1999-00.	88
Table 4.1 – Indicators of Indian Infrastructure	91
Table 4.2 – Progress in Rural Telecommunications and Transport Infrastructure	91
Table 4.3 – Recent Market Integration Studies in India	94
Table 4.4 – Percentage of Area Sown to Modern Rice and Wheat Varieties by State	95
Table 4.5 – Capacity to participate in international markets, 1961-2002	100
Table 4.6 – Aggregate results: Change from base scenario	106
Table 4.7 – State price results: percentage change from base scenario	108
Table 4.8 – Net welfare effects from alternative policies: aggregate regions and household results	109

Table 5.1: Salient recommendations of government committees relevant to grain management	113
Table 5.2 – List of agricultural commodities allowed for Futures Trading (2003)	117
Table 5.3 – Value of Trading in Agricultural Commodities.....	117

List of Figures

Figure 1.1 – Buffer Stocks of Cereals with Central Pool in India	3
Figure 1.2 – Food Subsidy	4
Figure 1.3 – Foodgrains Management System in India	7
Figure 2.1 – Components of FCI's Costs (Triennium Ending 2003-04)	27
Figure 2.2 – Supply chains for wheat in India	38
Figure 2.3 – MSP and C2 Cost of Rice in Andhra Pradesh	47
Figure 2.5 – Procurement, Wholesale and Retail Price of Rice (Common) in Andhra Pradesh	51
Figure 3.1 – General Typology of Social Safety Net Programs	69
Figure 4.1 – Alternative foodgrains demand projections for year 2020	96
Figure 4.2 – Alternative foodgrains output projections for year 2020.....	97
Figure 4.3 – Cereal import values as percent of foreign exchange reserves, 1965-2001.....	99
Figure 4.4 – Agricultural exports and imports.....	100
Figure 4.5 – Net welfare gains from rice, all scenarios	107
Figure 4.6 – Net welfare gains from wheat, all scenarios	107
Figure 4.7 – Net welfare effects of households: scenario III, Rice.....	110
Figure 4.8 – Net welfare effects on various households groups: scenario III, Wheat	110

Acroynms

APL	Above Poverty Line
APMC	Agricultural Produce Marketing Committees
APRS	Andhra Pradesh Rice Scheme
APSCSCL	Andhra Pradesh State Civil Supplies Corporation Limited
APSWC	Andhra Pradesh Warehousing Corporation
ASCI	Administrative Staff College of India
BICP	Bureau of Industrial Costs and Prices
BPL	Below Poverty Line
CACP	Commission on Agricultural Costs and Prices
CAP	Cover and Plinth
CGE	Computable General Equilibrium
CIF	Cost including Freight
CIMMYT	Centro Internacional de Mejoramiento de Maiz y Trigo
CWC	Central Warehousing Corporation
DDA	Doha Development Agenda
EAS	Employment Assurance Scheme
ECA	Essential Commodities Act
EGS	Employment Guarantee Scheme
FAO	Food and Agricultural Organization
FCI	Food Corporation of India
FL	Family Labor
FMC	Forward Market Commission
FOB	Free on Board
FPS	Fair Price Shop
FPS	Fair Price Shops

GDP	Gross Domestic Product
GOAP	Government of Andhra Pradesh
GOI	Government of India
GOP	Government of Punjab
GTAP	Global Trade Analysis Project
HYV	High Yielding Varieties
ICDS	Integrated Child Development Scheme
IRRI	International Rice Research Institute
JRY	Jawahar Rozgar Yojana
MARKFED	Punjab State Cooperative Supply and Marketing Federation
MCA	Ministry of Consumer Affairs
MCX	Multi Commodity Exchange
MOA	Ministry of Agriculture
MSP	Minimum Support Price
NA	Not Available
NBOT	National Board of Trade Limited
NCDEX	National Commodities and Derivatives Exchange
Neg	Negligible
NMCE	National Multi-Commodity Exchange of India
NREGS	National Rural Employment Guarantee Scheme
NREP	National Rural Employment Programme
PAFC	Punjab Agro Foodgrain Corporation
PAIC	Punjab Agro Industries Corporation
PDS	Public Distribution System
PSWC	Punjab State Warehousing Corporation
PUNGRAIN	Punjab State Grain Procurement Corporation
PUNSUP	Punjab State Civil supplies Corporation

RBI	Reserve Bank of India
RLEGP	Rural Labor Employment Guarantee Programme
SCC	Selective Credit Control
SEBI	Securities Exchange Board of India
SGRY	Sampoorna Garmeen Razgar yojana
SOE	State Owned Enterprises
SPS	Sanitary and Phytosanitary
SSN	Social Safety Net
SWC	State Warehousing Corporation
TE	Triennium Ending
TECS	Tata Economic Consultancy Services
TINP	Tamil Nadu Integrated Nutrition Programme
TPDS	Targeted Public Distribution System
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USDA-FAS	United States Department of Agriculture-Foreign Agricultural Service
VINAFOOD	Vietnam Central Food Corporation
WB	World Bank
WDI	World Development Indicators
WPI	Wholesale Price Index
WTO	World Trade Organization

Foodgrains Policy and Management in India: Responding to Today's Challenges and Opportunities

1. Introduction

Indian food policy has evolved through various tests of time, including one of the worst famines in known history, repeated bouts of droughts, and constant challenge of feeding a vast and growing population. The country's journey from being a chronically food deficit country to becoming a foodgrains exporter is marked by waves of policy thinking, ranging from increasing public interventions in the early decades of independence to partial liberalization in the 1990s and a host of other experiments in between. At the centre of it all has been the agricultural price policies, implemented through the Food Corporation of India (FCI), the country's food logistic parastatal agency, with a panoply of control over both domestic and international trade.

The government follows a dual pricing policy in the agricultural sector, setting two prices – a procurement price at which it would purchase grains from farmers, and a ration price (lower than the retail price) at which it would sell limited quantities of grains as entitlement to households through Fair Price Shops (FPS). Such a system was thought to be the best way to balance the conflicting interests of farmers (who would want higher prices) and consumers (who would want cheap food). The government took upon itself the task of procurement, storage and distribution, by dominating the entire marketing chain, with several self-serving controls on the private sector over both domestic and international trade.

The policy makers were convinced and, given the importance of food in the country's political stability, government pursued this policy with strong commitment that was fuelled by every sign of success in the early years of Green Revolution. The FCI grew quickly under a variety of regulatory supports and greater control over foodgrains markets. And the country became a "poster child" for the proponents of dual pricing and price stabilization policies.

Along with this success, however, came the very problems that the opponents of price stabilization policies had predicted.³ FCI operations were becoming increasingly expensive, they were being dictated by special interests, and too much emphasis on

³ For details on the arguments of opponents, see Newbery and Stiglitz (1981); Behrman (1987); Bigman, Newbery, and Zilberman (1988); and Braverman et al. (1993).

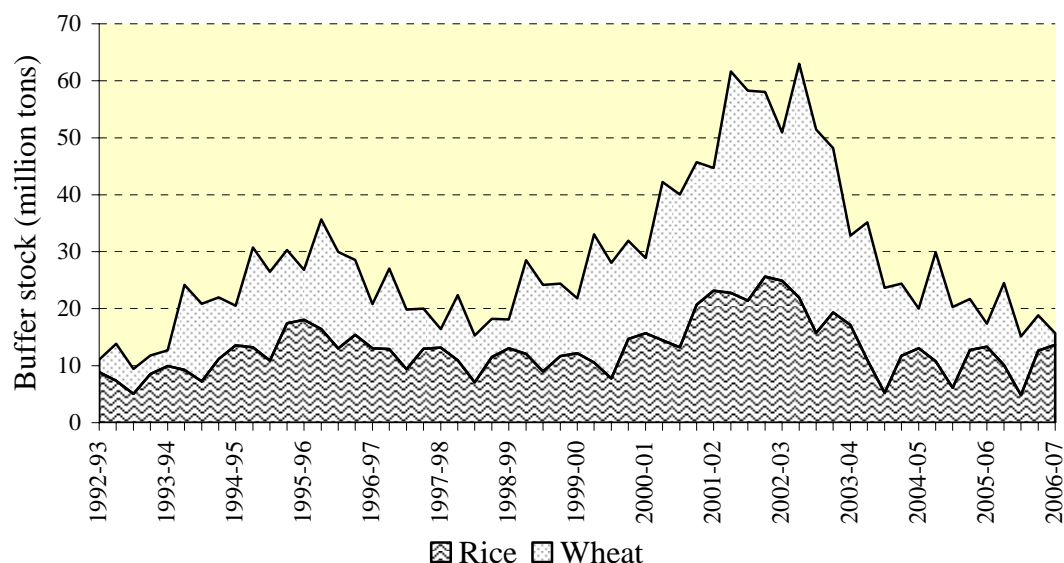
rice and wheat was inhibiting the key elements of market development, such as the processes of commercialization and diversification.⁴

Amidst this, the mid-1990s witnessed partial liberalization of the foodgrains trade policies. In 1994-95, the government decided to open up rice export as a process of gradual liberalization. Within a year, India's rice export jumped from less than one million tons to about five million tons. Encouraged by the success of rice export liberalization, export of wheat was liberalized in 1995; and again the initial success was remarkable. However, as exports picked up, domestic prices of wheat rose and the government, fearing unrest, put a ban on wheat export and eliminated import duty.

Meanwhile the world price of cereal took a dramatic down turn in the late-1990s, especially from 1998, but at the domestic level, the minimum support price (MSP) offered by the government kept rising. As a result, exports became uncompetitive while sales to the government became lucrative and, given the open-ended public procurement policy, this led to significant increase in public procurement. Faced with mounting fiscal deficit due in part to rising food subsidies, the government increased the ration prices resulting in a fall in demand from FPS. This combination of increasing procurement and declining public distribution resulted in an unprecedented accumulation of public foodgrains stock that reached as high as 63 million metric tons by July 2002 (Figure 1.1). In the subsequent years, the government had to subsidize export at a price that was 50 percent lower than the government's procurement costs. As a result, stocks have plummeted to just 16 million tons by April 2007. The case of wheat is particularly sharp, from about 41 million tons in July 2002 to just 2 million tons in April 2007.

⁴ Gulati and Mullen (2003)

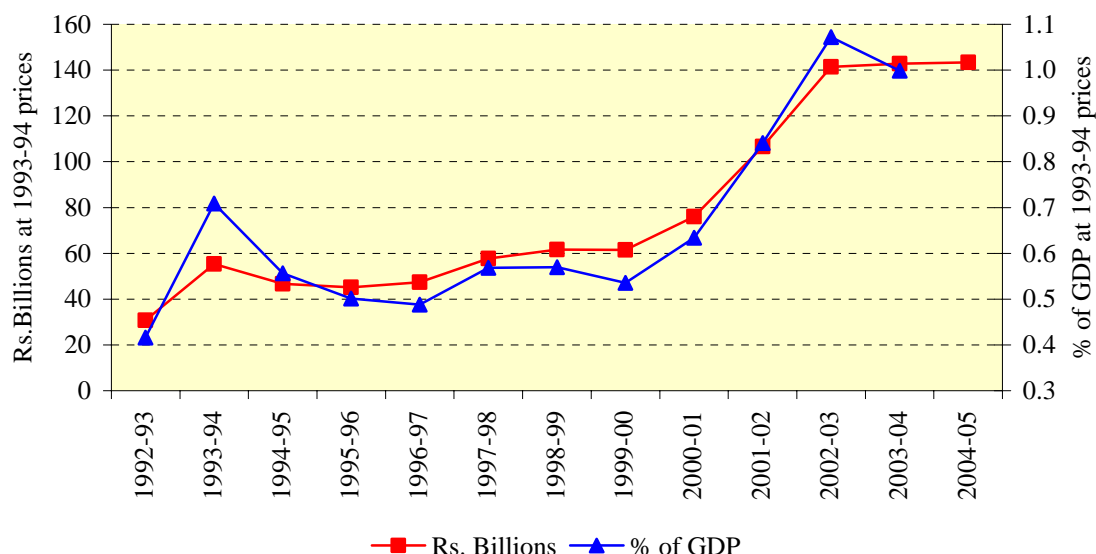
Figure 1.1 – Buffer Stocks of Cereals with Central Pool in India



Notes: For each financial year, stocks as on 1st of April, July, October, and January are shown.
 Source: Ministry of Agriculture, Govt. of India.

The inadequacy of the existing food policy regime is reflected in the wild swings in the foodgrains stock, showing that a stable buffer is not being maintained. Maintaining the existing policy regime involves huge amount of expenditure on food subsidies by the Central Government (Figure 1.2). Food subsidies as a percentage of gross domestic product have more than doubled over the last decade and half. The growth in food subsidy is all the more sharp considering that during this period the Indian economy has witnessed a fairly high growth rate. The policies and instruments that served well during the 1960s, 1970s and 1980s, are proving to be ineffective in responding to the challenges and opportunities that this country faces. Comprehensive reforms of the food policy regime and the way foodgrains marketing is managed today are urgently required to ensure sustainability and vibrancy of the foodgrains sector.

Figure 1.2 – Food Subsidy



Source: Economic Survey 2005-06, Ministry of Finance, Govt. of India.

1.1. Foodgrains Management System in India – A Stylised Characterization

The existing system of foodgrains management is characterized by the dominant presence of the government in all the basic aspects of marketing viz., procurement, storage, transport and distribution, with all these operations being bundled and carried out by the FCI, the nodal parastatal agency. The FCI procures the foodgrains in the form of wheat or paddy directly from farmers and in the form of rice from rice millers.⁵ The price at which it procures is the procurement price (wheat / paddy) or the levy price (rice). The procurement / levy price is set by the Commission for Agricultural Costs and Prices (CACP) based on considerations of cost of production and includes a “fair” return to land and family labour of the farmers. It is essentially a system of open-ended procurement under which the FCI is obligated to buy all the grains that farmers offer to sell at the prescribed procurement price as long as the grains meet a certain quality standard. Although, in principle the system is applicable to the country as a whole, effectively the system operates primarily in a few surplus states such as Punjab, Haryana, Uttar Pradesh and Andhra Pradesh. In these states at

⁵ More details about the marketing channels for paddy/rice and wheat are provided in the next chapter.

least this open-ended procurement system effectively renders the procurement price to be a support price below which the prices do not fall. With regard to rice, the millers are obligated to sell a certain fraction of their produce to the FCI at the levy price, which makes it essentially a tax on the millers. The operations of the FCI is aided by a whole paraphernalia of self-serving legislations, rules and guidelines, most important amongst which are the monopoly control over international trade in foodgrains, and internal movement and storage restrictions on private traders. The former insulate the government from movements in world prices and allow it to pursue a domestic price policy of its own will. The latter, by not allowing any other options to farmers, enables the FCI to procure grains from the surplus states. The grains so procured are used by the government to maintain a buffer stock and to meet the needs of the public distribution system (PDS) and various other welfare programmes that it runs. The PDS involves a network of over 485 thousand FPS through which grains (and a few other commodities) are sold at a subsidized price. The FCI is responsible for storing, transporting and distributing the grains to the FPS. As will be seen in subsequent chapters, the FCI and other state-level parastatal agencies involved in foodgrains management have been observed to be highly inefficient.

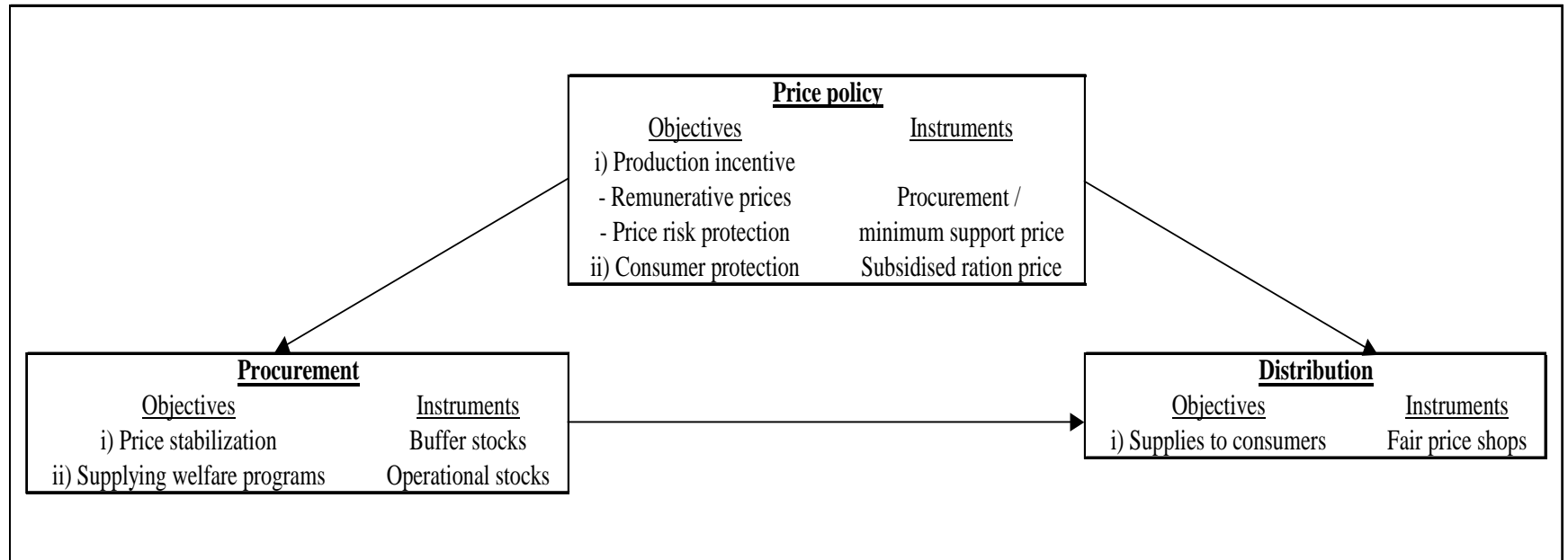
The existing system of foodgrains management not only bundles several operations with the FCI, but also several objectives (Figure 1.3). In terms of the objectives, the existing system seeks to be simultaneously (a) an incentive mechanism to farmers for promoting modern technologies for achieving self-sufficiency in foodgrains supply, (b) a consumption subsidy scheme for consumers through the operations of the PDS, (c) an income support scheme for farmers by offering a minimum support price (MSP) that now includes a certain minimum return to farmers, and (d) a price and supplies stabilization programme through procurement and buffer stock operations. Objectives (c) and (d) above are really to counter the production and price volatility natural to agriculture. The procurement operations of the FCI aim to meet objectives (a) and (c) above, while the storage and distribution operations of the FCI aim to meet objectives (b) and (d) above. Satisfying the conflicting objectives of farmers (who want higher prices) and consumers (who want cheap food) is not an easy task, especially given the uncertainties in predicting the swings in output and prices. Past experience shows that, the government, faced with resource constraints, often compromises on one or other of its objectives.

1.2. The Changed Conditions and the Need to Re-think Policies

Historically, the government's food policies are rooted in the experience of the Bengal Famine and subsequently in the frequent scarcities that India witnessed during the first three decades since independence. At that time the foodgrains sector was characterized by: (a) lack of market integration due to inadequate public goods, such as roads, telecommunications, and other marketing infrastructure; (b) absence or inadequacy of risk-mitigating institutions, such as insurance and credit; (c) high volatility and thinness of the world grain markets; and (d) international liquidity constraints faced by the country, provided the broad rationales for public intervention in foodgrains markets. However, today the conditions both within and outside the country have changed so drastically that each of the above rationales which earlier justified public intervention, are no longer valid today. These changes will be discussed in detail in Chapter 4.

Figure 1.3 – Foodgrains Management System in India

International trade barriers



Infrastructure and information flow have improved dramatically since 1970. Improvement in transport and communication infrastructure has led to spatially more integrated markets since the mid-1980s. The widespread adoption of modern technologies in the country suggests that farmers have mastered the technology, thereby removing the need for a price guarantee to promote technology.

Attaining self-sufficiency and reducing reliance on international markets was considered desirable given the thinness and volatility of global food markets forty years ago. These arguments are no longer valid today on the following counts: First, there is clear evidence that demand for food on a per capita basis is declining in the country, which is a natural phenomenon when income levels increase and this trend can be expected to continue in the future. Forecasts of supply and demand for foodgrains for the year 2020 suggest that India is likely to be a net exporter of foodgrains and not a sustained large net importer in the foreseeable future. Second, global foodgrains markets too have matured since the 1950s in terms of traded volume, measured in percentage of total global production and consumption, and price volatility has decreased significant decline in the past two decades, particularly in the 1990s.

Finally, foreign currency reserves today are no longer a constraint on the country's ability to participate in the international markets as they were in the 1960s. While the total cereal import value exceeded foreign currency reserve in India for most of the years till the mid-1970s, calculations for the year 2004 show that India could have bought all the 25 million tons of rice that was available in the world market by using just 4 percent of its foreign currency reserves.⁶

Above all, the change in the overall economic environment both at the global level and within India that places greater stress on market forces and private enterprise makes the strongest case against public intervention in the foodgrains sector. At the global level, two major developments (amongst others) that has considerably transformed the economic environment are (i) the wave of trade liberalisation⁷ following the Uruguay Round of trade negotiations that led to the establishment of the World Trade Organisation (WTO); and (ii) the rapid growth in the volume, speed and scope of global capital flows. Being a signatory to the WTO agreements, India can no longer follow restrictive trade policies in general, including in the foodgrains sector. Indeed, the global trade regime today, despite all its imperfections, provides an opportunity for India's agriculture to flourish as the limited experience of the mid-1990s suggest. Moreover, with India witnessing large scale capital inflows since the mid-1990s, it is critical that the country maintain and move further with

⁶ See Chapter 4 for a detailed assessment of all these factors.

⁷ Some consider it as partial / limited in its scope.

market-friendly policies to ensure that there are no sudden reversals of capital flows with disastrous consequences as experienced by some other nations.

Indeed India embarked on a broad based economic reform process since 1991, even prior to the setting up of the WTO. Underlying these reforms is recognition of the role and importance of market forces and the private sector, and the need to reduce and re-orient government's role in order to achieve a higher and sustainable growth rate that eventually would help reduce poverty in the country. These reforms are noteworthy for (at least) two reasons: (i) the broad consensus in its favour cutting across most of the political spectrum giving the process a degree of certainty and credibility; and (ii) unleashing a high growth process that is now considered by most experts to be sustainable as seen in the over 15 years of high growth rate (in excess of 5%) witnessed by the country resulting in a perceivable rise in incomes and reduction in poverty. As part of this economic process, and subsequently as part of her commitments to the WTO, India liberalised its trade policies significantly. But, standing in contrast to the liberal trade regime and market-friendly policies seen in most sectors of the economy today are the public intervention policies with regard to foodgrains management. Indeed one may argue that the vast amount of resources that are locked up in running the public intervention programmes can be put to better use, both within and outside of agriculture, and the government is actually constraining the growth of the economy in general and agriculture in particular. Reforming the foodgrains management system is thus a necessity today. While the objective of stabilizing food price and supplies is not in question, it is the means to achieve the objective that needs rethinking.

The experiences of trade liberalization in other countries, particularly Bangladesh and Vietnam, also support the contention that reduced public intervention can contribute to efficiency gains and market development. Countries in Asia that have pursued this route have been able to allocate more resources to development and anti-poverty projects, increase competition in domestic markets, maintain price stability, and enhance overall social welfare. It is time for India to learn from the reformers and recognize the fact that public funds have alternative uses. The returns to some alternative investments are high – perhaps much higher than the returns to public price stabilization as currently practiced (Roumasset 2003, Fan and Gulati 2005).

The current system of public intervention through the FCI, it was pointed out, bundles several operations as well as objectives. As will be seen in greater detail in subsequent chapters, the system has over time become extremely inefficient and weak in meeting the welfare goals. Unbundling the government objectives and instruments / institutions for public intervention is required to improve the efficiency of the current system of

foodgrains management and to enhance the government's capacity for meeting its distributional goals for welfare improvement.

The key to successful reform of the food management system is to decouple the government's consumer welfare objectives from producer protection policies. Holistic reforms of the existing welfare programmes are required to ensure better delivery, especially to the poor. Employment generation programmes and innovative income transfer programmes should eventually replace direct food distribution programmes for the poor such as through the PDS. Not only would this help achieve higher welfare but it would also enable critical reforms to the current system of public intervention in foodgrains markets along the entire supply chain.

As a part of the reforms, operations of the FCI must be unbundled to allow the private sector to compete at each level so that the overall costs are reduced and efficiency promoted. Private traders and agro-processors should be allowed to compete with the FCI in procuring grains directly from farmers at the farm gate. To achieve this, the government (meaning the FCI) must vacate some space by reducing its market operations. Income support to farmers through procurement at MSP must be stopped and FCI procurement should be at market prices so that farmers facing alternative buyers would get a better price. Greater competition should be fostered in the trading activity as a whole, between the FCI and private traders and amongst the private traders themselves, so that trading costs and margins come down. Lower trading margins would result in higher price realization for the farmers and lower retail prices for the consumers. For this it is important to allow private sector to participate in storage, transportation and distribution of grains by removing all existing storage and movement restrictions on the private sector. The regulatory framework should be changed and strengthened to enable it check uncompetitive trade practices by a few large traders. Unbundling storage and ownership of foodgrains through a system of negotiable warehouse receipts would foster greater competition and restrict the ability of a few large traders to manipulate the markets. These domestic market reforms should be complemented by a liberal international trade regime in foodgrains, to help in smoothening supply shocks and stabilize domestic prices. Government intervention for price stabilization should primarily be through a variable tariffs policy along with buffer stock operations carried out at market prices. This would reduce the need for very large government price stabilization programmes such as the current system to protect farmers' interests. New market institutions such as futures markets should be allowed a free play so that they generate appropriate market signals for decision making by farmers, traders and consumers. These new institutions can also help the government in monitoring the supply and price situation and in setting tariffs, and responding through buffer stock operations.

To be fair, there is considerable degree of recognition within the government of the need for such holistic reforms of the food policies, as is evident from the Ninth and Tenth Five Year Plan Documents, and also from the reports of various Government Committees, as well as the limited reforms measures that have already been carried out.⁸ What is needed is a big push to reform the foodgrains policies and institutions to achieve greater efficiency and improve welfare of the poor.

1.3. Objectives and Organization of the Report

The objective of this report is to examine in detail the foodgrains management system covering public procurement, storage and distribution with a view to suggest reforms to make it more efficient and responsive to the food security needs of the poor.

The report reviews in detail the existing food policy framework, the dynamics of public intervention in terms of the functioning of the FCI, the cost implications of the intervention, and its impact on supply response in the country. As the procurement operations of the FCI are highly concentrated in the surplus states such as Punjab and Andhra Pradesh, the impacts of the public intervention on agriculture, particularly foodgrains sectors, in those two states are also examined to draw more detailed inferences on the functioning of the current system.

Since the safety net programs, especially the Public Distribution System (PDS) are closely related to the foodgrains markets and the functioning of the FCI, reforms to the foodgrains marketing system cannot be undertaken in isolation. Hence, this report reviews the functioning of the PDS and other safety net programs as well with a view to suggest holistic reforms to the foodgrains management system.⁹

Following these two reviews, it presents several arguments, supported with data wherever possible, that justify the need to reform the existing pricing policies and grain management policies. A status report of the reforms to the food policy framework carried out so far is then undertaken, before presenting our view of a reformed foodgrains management system that is efficient and welfare improving.

Although, this report joins a long list of studies that have examined the foodgrains management in India, its uniqueness is in spelling out the details of reform measures that

⁸ See Chapter 5 for details.

⁹ In these reviews, the report draws extensively from five detailed studies conducted by IFPRI on the food price policies in India (Rashid, Dev, Thomas and Gulati, 2005, and Cummings Jr., Rashid and Gulati, 2006), on agriculture in Punjab, specifically foodgrains management in that state (Kaur, 2004, and Cummings Jr., Gulati and Joshi, 2006), on foodgrains management in Andhra Pradesh (Deb, 2006), and on social safety nets in India (Dev et al., 2004). Besides these studies, the report draws upon several other studies and research reports from reputable sources and government documents.

are required, something that has been described only in broad terms in most of the earlier studies on this issue.

The rest of the report is organized as follows: Chapter 2 reviews the existing system of public intervention in foodgrains markets and its impacts, with particular reference to Punjab and Andhra Pradesh. Chapter 3 is a review of the PDS and other safety net programs in place in the country. The rationale for reforming the existing system is developed in detail in Chapter 4, while Chapter 5 takes stock of the reform measures so far carried out. The final chapter presents a vision for a reformed foodgrains management system that is more efficient and responsive to the food security needs of the poor. Details of what needs to be done to achieve this vision is also spelt out covering safety net programs, promoting the role of private sector in foodgrains management, pricing policy, and finally the parastatals.

2. Review of the Existing System

2.1. Evolution of Foodgrain Management Policies in India

Indian food policy has its origins during World War II, when a series of food price control conferences were held by the colonial British administration in response to a sharp rise in foodgrains prices. The Bengal Famine of 1943 accelerated the scope of public intervention. The commission tasked with determining its causes concluded that poor infrastructure, limited information, and inadequate private marketing prevented the distribution of grain from surplus areas to Bengal. Subsequently, the newly established Food Department was given the responsibility of controlling all foodgrains activities, including buffer stock maintenance, procurement, import, price regulation, and storage. (Chopra 1981).

Government intervention in foodgrains markets since independence was and still continues to be haphazard with policy changes typically being reactive to the consequences of past policy actions. In the early-1950s, rationing and procurement programs were scaled down and by 1954 the government had fully withdrawn from grain marketing. However, price rises in the following year led to the re-imposition of controls. The Foodgrains Enquiry Committee in 1957 recommended the creation of a government organization that would conduct the activities of the erstwhile Department of Food and act as a trader in the market, with an aim to stabilize prices and supplies and curb perceived speculative activities by traders. By 1965, these objectives plus the need to disseminate high-yielding varieties and ensure low-priced food to consumers led to the creation of the Food Corporation of India (FCI) and the Agricultural Prices Commission (APC). Droughts in 1965-66 and 1966-67 necessitated massive emergency food-aid imports from the United States. This experience galvanised the political class to commit to a strategy of promoting modern high yielding hybrid varieties (Green Revolution) through a policy package, in which public procurement at support / procurement prices was a major element. These actions combined with the successful dissemination of Green Revolution varieties significantly improved food security in the country.

The overall objective of the foodgrains management policies in India since the mid-1960s have been to (i) ensure a reasonable support price which will induce farmers to adopt improved methods of cultivation for increasing production; (ii) ensure that consumer prices do not rise unduly; (iii) avoid excessive price fluctuations and reduce the disparity of prices between States; and (iv) build up sizeable buffer stocks of wheat and rice from imports and internal procurement (GOI, 1965). The basic instrument to achieve these

objectives has been through public procurement by the FCI and other state agencies, at procurement / support prices set by the APC.

The APC was set up in January 1965 for undertaking scientific and continuing examination of the level of agricultural prices specifically of foodgrains. It recommends the minimum support price (MSP) and the procurement price for foodgrains, with a view to (i) provide incentive to the producer for adopting improved technology to the widest possible extent and for maximizing production; (ii) encourage optimum utilization of land; (iii) achieve as near a balance as possible between the expected supply and demand conditions of different crops, taking into account the import and export possibilities as well as the likely effect of the price policy on the rest of the economy, particularly on the cost of living, level of wages, industrial cost structure, etc.¹⁰ The APC was renamed as the Commission for Agricultural Costs and Prices (CACAP) in 1985. The CACAP recommends support prices after considering the cost of production, changes in input prices, input/output price parity, trends in market prices, inter-crop price parity, demand and supply situation, parity between prices paid and prices received by the farmers, etc. But the weight given to each of these criteria is not explicitly stated¹¹. With regard to production costs, the CACAP takes into account the actual paid out costs on purchased inputs including purchased labour and some imputed value for land and family labour (the so-called C2 cost), and some value (at the rate of 10% of the C2 cost) for the farmer's managerial input.¹² The C2 plus the value for managerial input forms the so-called C3 cost, which forms the basis for the support price recommended by the CACAP.

The Charter of the FCI stipulated that the Corporation would undertake purchase, storage, movement, transport, distribution and sale of foodgrains and other foodstuffs. The foodgrains stocks procured by the FCI consist of operational stocks and buffer stocks. The operational stocks are used for distribution through the Public Distribution System (PDS) and for various welfare schemes. Essential commodities were supplied through 485,174 Fair Price Shops (FPS) as on 31st July 2006. In addition since 1978, foodgrains are being provided for various employment programs such as the Food-for-Work programme, National Rural Employment programme (NREP), the Rural Labour Employment Guarantee programme (RLEGP), the Jawahar Rozgar Yojana (JRY), etc.

The grain management system began to receive criticism in the 1980s on account of costs, movement controls, restrictions, urban bias in public distribution, and the need to liberalize the agricultural sector to enhance agricultural development (Krishna and

¹⁰ Government of India, Department of Agriculture, 1965. Report of the Jha Committee on Foodgrain Prices for 1964-65.

¹¹ For details, see Gulati, 1987 and Sharma, 1994.

¹² See Annexure Table A2.1 for details of the various cost definitions used by the CACAP.

Raychowdury 1980; 1981; Radhakrishna et al. 1997; Gulati 1989; Gulati et al. 1990). Reforms were implemented in the 1980s, including some state-level reforms of movement controls and a restructuring of the PDS to extend distribution to areas with high incidence of poverty. A macroeconomic crisis faced by India in the early-1990s and a series of influential policy studies provided the guise for the liberalization of agriculture. Private rice exports were allowed in 1994-95 resulting in exports of 1 million tons in 1994 and 5 million tons in 1995. Liberalization of wheat exports soon followed (Gulati and Mullen 2003).

With the dramatic downturn in the world price of cereal in the late-1990s, especially from 1998, exports were no more attractive and there was clamour for protecting farmers from the downswing in prices. In response, the government raised the MSP to producers sharply during the late-1990s over and beyond the levels recommended by the CACP.

At the same time, several studies on the functioning of the PDS clearly showed that the benefits accruing to the poor was negligible even as the food subsidy bill was mounting and that there was a dire need to improve the targeting efficiency of the PDS. This propelled the government to further revamp the PDS and the Targeted Public Distribution System (TPDS) was introduced. The TPDS distinguished foodgrains allocations on the basis of households being above the poverty line (APL) or below the poverty line (BPL), which it was hoped would improve the targeting of subsidy payments to those who needed it most and reduce the food subsidy bill.

The combination of these policies led to a significant rise in procurement and fall in food distribution, resulting in a massive accumulation of foodgrains stocks. Stocks of rice and wheat increased to about 63 million tons in the summer of 2002, with food subsidies reaching Rs.175 billion in 2001/02. The buffer stock component of the food subsidy bill alone accounted for Rs.59 billion (Ministry of Finance 2003, 2004). In October 2000, the government exported two million tons of wheat at a price 50 percent below the government's cost of acquisition. The volume of subsidized exports of rice and wheat rose further in 2001-02 and 2002-03. Objections by trading partners challenged the legality of such a policy under World Trade Organization (WTO) obligations and the policy was stopped in 2002. Leakages continued to rise during 2003-05 including greater off-takes from the PDS.

By early-2006, the net effect of the government's grain management policies has been a significant reversal of the situation just four years earlier. Buffer stocks, once at record high levels, are now at record-low levels and there are significant concerns on the ability of the government to meet government norms on stocks. Market prices for wheat were well above MSP and imports of wheat were authorized in February 2006 (USDA-FAS 2006).

2.2. Policies to Facilitate Price Stabilization Programs

Historically, a range of government regulations has supported the FCI to play its part in the food intervention programs. The FCI's procurement operations have been facilitated by empowering it with monopoly control over international trade, providing it with cheap credit and preferential access to rail transportation, and perhaps more importantly by imposing restrictions on internal movement of foodgrains from surplus to deficit states. Table 2.1 presents a summary of all facilitating regulations.

2.2.1 Monopoly Control Over International Trade

The monopoly control over international trade has been justified on two grounds: (i) to keep administrative control over the use of scarce foreign currency reserves and (ii) to realize the benefits of scale economies (government as natural monopoly). According to the first argument, a mechanism was needed to monitor and regulate food imports, which accounted for major shares of limited foreign currency reserves. It was assumed that having monopoly control would allow the government to optimize the use of scarce foreign currency reserves. According to the second argument, the government, as a large buyer facing many sellers in international markets, would have a higher bargaining power than small private importers and hence be able to negotiate lower import prices.

Table 2.1 – Regulatory Support to Facilitate FCI’s Operations

Regulations / Restrictions	Origin and Current status	Enforcement Details
I. International Trade		
<i>Export Monopoly / restrictions</i>		
Year introduced.	1965	Adjustable quantitative ceiling (currently 0.10 million tons) on export of wheat and coarse grains; strict licensing requirement for paddy export; and other grain exports are subject to registration of contracts.
Still enforced?	Partially	
<i>Import Monopoly/restrictions</i>		
Year introduced.	1965	FCI retains full monopoly control over import of common paddy, fine variety rice, wheat, and coarse grain. Wheat import by roller flourmills is allowed under certain conditions.
Still enforced?	Yes	
II. Movement restriction		
Year introduced	1941 (during British rule)	Officially lifted in 1977, but has been enforced sporadically across India until recently. Now enforced in selected states
Still enforced?	Yes, partially	
III. Credit concession to FCI		
Year introduced?	1973-74	Interest rate was 7 % lower than market rates during 1972/73 – 1982/83, 5-6 % lower until mid-1990s, 2-3 % lower since 1997.
Still enforced?	Yes,	
IV. Restrictions on Trade Credit		
Year Introduced.	1955 under RBI’s Selective Credit Control Act.	Enforced at all India level; RBI restricts private traders access to credit by setting limits on working capital borrowing and interest rates.
Still enforced?	Yes	
V. Preferential transportation		
Year introduced.	1965	FCI gets priority in railway transportation over private traders all over India
Still enforced?	Yes	
VI. Restrictions on Storage		
Year Introduced?	1955 under Essential Commodities Act	Imposes stock quantity limits. Lifted by the center, but frequently revised and sporadically enforced in recent years at the state level
Still enforced?	Yes	
VII. Restrictions on processing		
Year Introduced.	1958 under Rice Milling Industry Act	Forces rice millers to deliver certain proportion of output (levy) to FCI at fixed processing margins; restricts open market sales until levy commitment is fulfilled. Enforced in most states.
Still enforced?	Yes	

Source: Rashid et al (2005).

How valid are these arguments today? Since the value of cereal imports is a tiny fraction of India's total foreign currency reserves, the first argument is no longer valid unless current trends reverse and the country reverts to the late-1960s and early-1970s' situation.¹³ With regards to the second argument of achieving lower import prices, historical data suggest a reality contrary to expectations: in most years, India has actually imported at a time when prices were higher. Would the private sector have done better? This question cannot be answered because data on which to base the comparison do not exist in India, where private sector imports are not allowed. However, the experience of Bangladesh can shed some light on this matter. During the devastating flood of 1998, both, the government of Bangladesh and the private sector imported foodgrains to address the food crisis due to crop damage. Although the size of government imports (average consignment of 82,000 tons) was much larger than that of the private sector (average consignment of 300-400 tons), the government of Bangladesh paid higher prices and took much longer time to complete each of the transactions (Ali and Jahan 2003). Given the level of bureaucracy in India, one would probably expect the same pattern here too if private sector imports were allowed alongside government imports. Thus, both the above arguments used to justify state monopoly control over international trade are not valid any more. Nevertheless, there is reluctance to let loose the control and allow private sector participation except in an ad hoc manner.

2.2.2 Restrictions on Movement of Foodgrain

The policy of movement restrictions originated during the colonial rule in the early-1940s. It was designed with the dual objective of preventing hoarding and building stocks for distribution in major urban centres. In the foodgrains surplus regions, these restrictions brought down the market prices to the level of the procurement price that the government offered, thus enabling the FCI to procure sufficient grain for its buffer stocking and public distribution operations. Historically, the policy has never been conducive to efficient resource allocation and market development. Past experiences clearly suggest that it has hindered private trade, bred corruption, and contributed to poor integration of markets.¹⁴ Policy makers realized its failure officially and lifted the restriction in 1977. However, restrictions kept reappearing until the 1990s. Even today, India enforces movement restrictions in selected states on the ground of preventing smuggling to neighbouring countries.

¹³ More on this aspect later.

¹⁴ The policy was counter-productive even in the early years in India. After the central government gave power to the provinces to control movement, every province, every district, every *taluk* (smallest administrative unit) in eastern India had become a food republic unto itself, destroying the trade machinery for the distribution of foodgrain (Chopra 1981).

2.2.3 Credit Facilities to FCI

The government's credit policy in India has favoured FCI in many ways. Three of them are worth noting. First, although interest rates have been adjusted periodically, the FCI has enjoyed preferential credit access since early-1970s. Compared to market rates, the interest rates on FCI credit (food procurement credit) was about seven percentage points lower during 1972/73 to 1982/83, 5-6 percentage points lower until 1995/96 (Gulati and Kahkonen 1996), and 2-3 percentage points lower since 1997 (Jha and Srinivasan 2004). Second, unlike other trade credit, there is no payoff deadline attached to FCI's credit. Third, under the Selective Credit Control (SSC) policy, the Reserve Bank of India (RBI) has restricted private traders' working capital borrowing. In addition, RBI frequently revises interest rates and credit ceiling under this policy creating uncertainties for the private sector.

What implications do these policies have on markets and the economy? There are at least three important economic consequences. First, FCI has historically obtained very large volume of credit for its operation, reducing credit availability for other sectors. Second, cheap credit to FCI discourages private traders as their transaction costs become higher relative to FCI's or other affiliated agencies. Finally, as Timmer (1989) argues, when prices become stable, public food agency's credit demand becomes unstable; and the instability can impose significant adjustment costs to the rest of the economy, whether the food logistic agency is increasing or decreasing its use of credit.¹⁵

Where does Indian policy stand today? With some periodic adjustments and revisions, the broad credit policies toward FCI continue; and the evidence of crowding out is perhaps stronger than in any other countries that pursued similar policies. Total volume of food credit in India has always been high and constituted a significant proportion of credit to other priority sectors, such as agriculture and small-scale industries (Table 2.2). By international standards (20-30 percent of agricultural credit in most other countries), these numbers are staggering. Except in 1988-90, food credit has consistently accounted for predominant percentages of agricultural credit, reaching as high as sixty-five and eighty percent in 1982-84 and 2000-02, respectively. During 2000-02, when public stock skyrocketed, total outstanding food procurement credit to FCI averaged 470 billion rupees (more than US\$ 10 billion), which was almost the same as the total outstanding credit to both agriculture and small scale industries, and an incredible two and half times

¹⁵ Timmer (1989) elaborates this point when he writes, "when credit demand rise (say after a good harvest), interest rates rise or government loans are rationed, budgets of other agencies are cut, investment project delayed, or the deficit is financed by increasing the money supply, with attendant potential for inflation. On the other hand, when loan is unexpectedly repaid, money and purchasing power is withdrawn from the economy, with potential recessionary impact".

the credit received by the wholesale trade sector in the country. These statistics constitute the strongest evidence of credit to FCI crowding out other sectors / activities.

Table 2.2 – Comparison of gross bank credit (outstanding) in priority sectors in India

Period	Gross Credit to Priority Sectors (million \$US)				Food Procurement Credit as % of		
	Agriculture	Small Scale Industries	Wholesale Trade ¹	Food Credit ²	Agriculture	Small Scale Industries	Wholesale Trade
1979-81	4,365	3,895	2,446	2,396	57	63	98
1982-84	5,947	5,157	2,309	3,907	65	75	171
1985-87	8,312	7,287	2,564	3,402	43	49	136
1988-90	9,631	9,327	3,291	1,416	15	15	43
1991-93	6,898	7,054	2,375	2,529	37	36	107
1994-96	8,193	9,486	3,387	2,992	37	32	90
1997-99	9,682	11,806	3,586	4,428	45	37	123
2000-02	12,053	12,126	4,098	10,036	83	83	244
2001-03	13,963	12,217	4,473	10,738	77	88	240
2002-04	18,158	13,936	5,238	9,346	51	67	178

Notes: 1 Wholesale trade credit excludes the credit disbursed for food procurement.

2 Food credit refers to total food procurement credit.

Source: Rashid et al (2005).

2.2.4 Restrictions on Private Storage

A common perception about traders that has dominated food policy in India is that traders are speculators who profit by “*hoarding*”, artificially increasing prices. Although other policies included regulations to prevent this trade behaviour, a more direct and deliberate policy was outlined under the Essential Commodities Act 1955, which set specific limits on the level of foodgrains stock a trader can have at any given point in time. Although officially lifted by the central government, this policy continues to be invoked sporadically by many states.

2.2.5 Restrictions on Processing

The restrictions on sales of milled rice in India started under the Rice Milling Industry Act 1958, seven years before the formation of FCI. Again, the idea was to increase procurement for government’s buffer stocking and distribution through ration channels. Under this Act, rice millers are forced to supply a certain proportion (levy) of processed rice to the FCI at a fixed processing margin. The levy rates and processing margins, both of which vary across states, seriously hinder millers’ profitability. In the four surplus states—Andhra Pradesh, Haryana, Punjab, and Uttar Pradesh—where FCI procures more than eighty percent of rice, millers have to supply 60-75 percent of the total processed rice to FCI at prices that are 30-40 percent lower than the market price.¹⁶ The processing

¹⁶ This, combined with the fixed processing margin, naturally depresses the price that paddy farmers eventually get compared to what they might get in the absence of levy procurement of rice.

margins (levy price minus rice equivalent MSP) also vary widely across these states. For example, the margin in Punjab has been significantly high, sometimes as high as twice the margins in other states. The combination of varying levy rates and processing margins across states can distort investments in rice processing activity and affect the choice of location of processing plants.

The adverse effects that rice levies have on the markets are obvious: they discourage rice millers' investment, increase private traders' transactions costs, breed corruption, and create rents for special interests. Since millers are not allowed to sell in the open market until levy requirement is met and that the market price is normally higher than levy price, it creates various avenues of corruption in the foodgrains marketing chain. Millers have the incentives to sell their rice to open market, which, understandably, will require bribing the food and law enforcement officials. Similarly, the FCI officials have the incentive to delay procurement (on a number of possible grounds) and ask for "extra" to expedite the procurement. And all the "extra" payments and transactions add up to inefficiency-induced social costs that Indian people have to bear.

2.3. The Dynamics of Public Intervention in Grain Management

Under the above policy framework for public intervention in grain management, the degree of market intervention and the scale of FCI's operation have grown rapidly. Alongside, the costs and subsidies involved in sustaining public intervention have ballooned too. As will be seen, this ballooning of the public intervention has been in scant regard for the changing economic environment within the country and globally.

2.3.1 The Degree of Intervention

Available data show that the degree of market intervention – represented by public procurement, stock, and distribution as percentage of total production – has increased significantly over the past forty years (Table 2.3). Compared to early years of the Green Revolution public procurement of both rice and wheat has expanded several times. The degree of market intervention is more pronounced in the surplus states. For instance, according to records of the Food and Supplies Department of Punjab, private traders' market share has consistently been low at less than 10 per cent in the case of wheat and about 20-40 per cent in the case of paddy. This is not surprising given procurement in Punjab accounted for a significant proportion of total government procurement in the country, ranging from 32-53 percent in case of rice and 48-72 percent in case of wheat over the last two decades.

These numbers, however, do not reflect the full degree of intervention. First, they do not capture the inter-linkages among pricing, stocking, and other regulations that facilitate

price stabilization programs.¹⁷ Second, a more accurate measure would have been to express the degree of intervention as the share of government's market share of marketable surplus (total production minus home consumption, seed, feed and precautionary storage.) Estimates of marketable surplus are available only for a few years. They range between 62-74% of production for rice and 48-63% for wheat during 1999-00 to 2001-02 (MOA, 2004). These would imply that the degree of public intervention as a percentage of marketed surplus are indeed even higher than the figures reported in Table 2.3.¹⁸ Finally, it is interesting to note that government's market shares increased at a time when farmers were being net taxed¹⁹, unit costs of FCI operation were going up, and Indian people were being burdened with an increasing food subsidy bill. In the years when farmers did benefit from the policy, i.e., the 1960s and 1970's, public procurement was only around ten percent of production.

¹⁷ To illustrate this point, consider two scenarios, A and B, involving pricing and movement restriction. In scenario-A, the government set procurement prices below average cost of production, but meets its procurement target by enforcing restrictions on movement of grain. In scenario-B, procurement prices are set much higher than the average cost of production and the producers and traders voluntarily sell to the government. Now, if government is able to procure the same amount under these alternative scenarios, the degree of intervention measured by the government's shares in the market will be identical although the two scenarios have very different implications in terms of the nature of intervention.

¹⁸ At the all India level in 2001-02, public procurement, storage and distribution were 41%, 83% and 12% of marketed surplus, respectively in the case of wheat and 29%, 32% and 14%, respectively in the case of rice.

¹⁹ Net-taxation of rice and wheat farmers was essentially through the protectionist trade regime that kept the domestic prices low in comparison to the world market prices by preventing exports. Such net-taxation continued up to 1999, after which the sharp rise in MSP raised the domestic prices above the world market prices, again made possible through trade barriers that kept imports away.

Table 2.3 – Public procurement and distribution as percentage of production

Period ¹	Wheat		Rice	
	Procurement	PDS offtake	Procurement	PDS offtake
1967/68	4.04	55.93	8.99	10.87
1973/74	20.10	26.07	7.69	8.02
1976/77	15.42	22.25	11.17	8.14
1982/83	17.13	19.21	13.14	12.99
1985/86	20.45	16.92	15.07	11.97
1988/89	16.46	17.90	13.27	14.79
1995/96	19.70	8.53	15.50	11.03
2001/02	24.60	7.20	21.55	10.26
2002/03	28.9	38.0	26.5	34.6
2003/04	21.9	33.7	23.5	28.3
2004/05	24.5	26.6	28.9	27.9
2005/06	21.3	24.7	29.5	27.5

Notes: 1Triennium Ending.

Source: Dev (forthcoming).

2.3.2 *The Scale of FCI's Operations*

As the degree of intervention increased, the size of the FCI's workforce increased over the years. In 1965, FCI started its operation with only 3,904 employees, quickly increased to about 29,000 by 1970, to 50,000 by 1980, and about 70,000 in the 1990s. FCI reports about 55,000 regular employees and more than 170,000 casual workers enlisted with its procurement centres and warehouses across the country in 2004.²⁰

FCI's employees have not only increased in numbers but also in political and lobbying powers. This is reflected in FCI employees being able to negotiate higher salaries and wages than what they would have earned in the private sector. According to a recent study, the wage rates of FCI's regular employees are 4-5 times higher than market rates; and the casual workers' daily wage is double the wage rates of rural Indian labourers (Chand 2003). In addition, the rents they derive from the system would inflate their net income above the value of their productivity.

In addition to FCI's staff and employees, Indian food policy has also created a large group of stakeholders including close to half a million ration shops, nearly 225 million ration cards, more than 6000 state marketing and regulatory agencies (including mandi boards) directly involved with public intervention programs (Annexure Table A2.2).

In Punjab for example, there are five state agencies that carry out foodgrains procurement on behalf of FCI. In 2001, total procurement by these agencies accounted for 70.1 percent

²⁰ The World Bank (1999) reported 65,000 regular employees and 175,000 casual workers.

of market arrivals in the state. Consequently, the stakes are high for state governments to maintain India's dual pricing policy resulting from FCI's operations.

2.4. The Cost Implications

Recent trends in the costs of maintaining India's "procurement-stocking-distribution" paradigm seem to echo some of the very problems that opponents of price stabilization policies had predicted through their theoretical models.²¹ The system has become wastefully expensive, is dictated by special interests, has hindered development of private trade, and consequently imposed an increasing burden on society. In recent years, not only have direct operational costs increased, but stories of rent-seeking, diversion of government foodgrains, and undue influence of FCI's operations by special interests are making national headlines as well. The following sub-sections attempt to analyze the trends, and synthesize available narrative evidence of various cost components of maintaining the current price stabilization system.

2.4.1 Reported Costs and Subsidies

Public costs of maintaining price stabilization in India have been increasing for years, but sent a wake up call to the policy makers at the turn of the 21st century. By 2002, public foodgrains stock reached about 63 million tons, equivalent to about 50 percent of total world trade volume in a given year. Total food subsidy bills jumped from Rupees 79 billions (at current prices) in 1997-98 to about 258 billions in 2004-05 (Table 2.4). During the three years between 1999-2000 to 2002-03, food subsidies grew steeply at annual rates of 28, 45 and 38 per cent, respectively. To put these numbers in perspective, in 2003-04 the food subsidy bill was equivalent to about 1 percent of national gross domestic product (GDP), 4.2 percent of agricultural GDP, 5.3 percent of the Central government's total expenditure, and about 23 percent of its capital expenditure. Only a decade ago these numbers were barely half of what they are today. A major reason for the sharp rise in food subsidy is the rise in buffer stocks during this period. Share of subsidies allocated to public storage nearly tripled between 1997-98 to 2001-02. While recent data on the share of storage in the total food subsidy bill are unavailable, recent declines in buffer stocks would suggest that it would have declined. Though the total food subsidy bill has continued to increase in the wake of greater offtake from the PDS in recent years, the annual growth rate in food subsidy has come down sharply to 4.1 per cent during 2003-04 and is expected to further decelerate to 2.5 per cent in 2004-05 (Government of India, 2006).

²¹ All references from Timmer (1996).

Table 2.4 – Trends in the total food subsidy

Year	Total food subsidy (Nominal prices, Rs. Billion)	Total food subsidy (Constant 1993/94 prices, Rs. Billion.)	Percentage share of food subsidy on storage
1997/98	79.00	57.77	12.49
1998/99	91.00	61.65	17.84
1999/00	94.34	61.49	19.06
2000/01	120.60	75.96	35.24
2001/02	174.99	106.60	33.62
2002/03	241.76	141.35	NA
2003/04	251.60	142.84	NA
2004/05	258.00	NA	NA

Source: Economic Survey, 2005-06 and Indiastat

Underlying the rise in the food subsidy is rapid rise in FCI's total expenses (absolute) as well as its per unit costs of procurement, distribution and storage operations (Table 2.5).²² While all of them have witnessed dramatic rise in recent times, the carrying cost of buffer stock is worth some comments. The carrying cost of the buffer stock rose from 21.3 percent of the total value of the buffer stock in 1999-2000 to nearly 75 percent in 2003-04. To hold high buffer stock, the central government is spending more than what it spends on agriculture, rural development and on irrigation and flood control taken together (GOI 2002).

Table 2.5 – FCI's Expenses and Economic Costs (Current Prices)

Years	Total Expenses (Rs. million)	Economic costs (Rs. / quintal)			Total Distribution Cost	Total Carrying Cost (Rs. / quintal)
		Total Procurement Cost				
		Wheat	Paddy	Rice		
1981-82	7839.8	22.3	19.7	9.5	38.0	42.0
1984-85	12353.1	26.3	29.2	17.3	52.0	43.0
1989-90	15180.8	40.3	37.3	18.1	76.0	53.0
1994-95	40250.2	88.3	73.0	46.9	102.0	125.0
1999-00	61074.2	117.1	116.4	41.4	194.0	168.0
2003-04	93516.6	138.2	127.1	18.4	192.0	289.0

Source: Annual reports of the FCI.

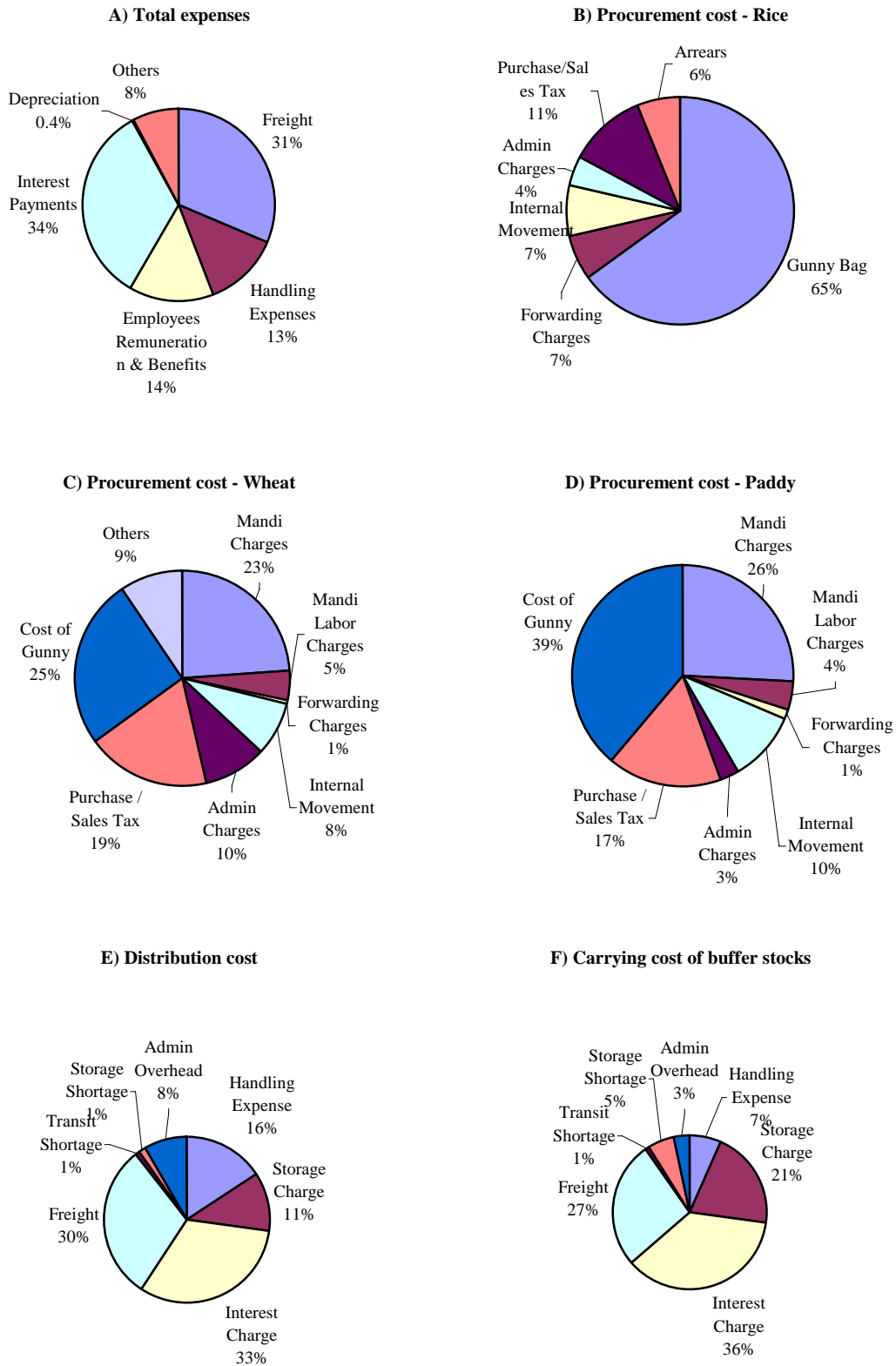
The break-up of FCI's total expenses and its per unit costs of procurement, distribution and storage operations for the triennium ending 2003-04 are shown in Figure 2.1. It is observed that interest payments, freight expenditure and handling expenses constitute

²² The economic cost comprises of (a) procurement costs (which includes the procurement price (MSP) paid to the farmers, statutory charges like mandi charges, purchase tax, etc., and non-statutory charges like mandi labour and carry-over charges), and (b) distribution costs (which includes costs incurred on freight, handling, storage, losses during transit, interest and administrative charges). Carrying costs is the cost of holding buffer stocks.

major items of FCI's total expenditure (Figure 2.1, Panel A). All the expenditure heads have registered quantum increase in recent years. The share of interest payments rose to more than 40% in 2000-01 and 2001-02, before declining later on. The freight expenditure has increased due to increased grain movement in recent years.²³ Similarly, the expenditure on employee's remuneration and benefits has recorded increase due to the departmentalization of contractual labour in FCI depots.

²³ FCI undertakes grain movement keeping in mind the fresh procurement, stock, allocation and off-take levels. According to the recent Annual Report, the grain movement by FCI has increased from 29.72 million tons in 2003-04 to 33.92 million tons in 2004-05. Further, the grain movement on inter-state account has significantly increased as compared to the previous years.

Figure 2.1 – Components of FCI's Costs (Triennium Ending 2003-04)



Source: Based on annual reports of the FCI.

The procurement costs include mandi charges, mandi labour charges, forwarding charges, internal movement costs, custody and maintenance charges, interest, administrative expenses, purchase/sales tax, cost of gunny bags and guarantee fees. Amongst these the mandi charges, gunny cost and statutory levies like purchase/ sales tax, cess, etc., are obligatory expenses and they account for roughly two-third, four-fifth and three-fourth of the procurement costs of wheat, paddy and rice, respectively (Figure 2.1, Panels B, C and D). Most of these obligatory expenses, except that on gunny bags, being determined by the government itself and hence can be modified through policy changes, are beyond the control of FCI. With regard to gunny (jute) bags, its use by FCI is mandated by the government to generate demand for jute farmers, and FCI does not have the option of using cheaper synthetic bags. The efficiency of the FCI's procurement cost can be judged from: (i) cost incurred on *mandi* labour, forwarding and internal movement by the FCI; and (ii) charges paid by the FCI to other procurement agencies on account of establishment, storage, interest, guarantee fee, arrears, etc. These charges relate from the procurement of the foodgrains till the time the stocks are taken over by the FCI. Among these charges, cost of internal movement is relatively higher.

The distribution costs as well as the carrying cost of buffer stocks consist of handling expenses, storage charges, interest, freight, administrative overheads and storage & transit shortages. Interest charges and freight cost²⁴ account for 63% of both total distribution cost as well as the carrying costs of buffer stocks (Figure 2.1, Panels E and F). This is despite the fact that FCI gets cheap and unlimited credit with no time deadline on repayment and also preferential access to rail transport. FCI annual reports suggest that rail freight costs formed well over 80 percent of the total freight costs (Deb 2006). There are reports of multiple movements of the same stock, which adds up the cost of distribution (ASCI 2001). Handling expenses is another major item of distribution cost and carrying cost of buffer stocks, whose share has increased over time. One of the factors that has contributed to this rise was the departmentalisation of contract labour, who are preferred to hired labour and are also paid more relative to the latter. Administrative overheads are the other major item of cost.

2.4.2 Indirect Costs of Intervention

In addition to direct operational costs, maintaining the current system imposes various forms of hidden costs to society, including costs due to policy-induced market distortions, costs of providing regulatory supports, and the inefficiency of the *parastatals* and other organizations entrusted with implementing the policies. Providing estimates of all these components of costs is beyond the scope of this study, but key messages can be

²⁴ This cost comprised of rail, road & steamer freight, transportation subsidy paid to the hill states.

highlighted by drawing on existing studies and conducting some simple analyses. The discussion here covers three aspects: (i) system leakage, (ii) special interests, and (iii) inefficiencies.

Leakage and Diversion of Government Foodgrain

All available estimates, including the GOI's own, suggest that the leakage from the system of public distribution is high. A recent study by M/s Tata Economic Consultancy Services (TECS) cited in MCA (2002a) reports that, at the national level, 36 percent of rice and 31 percent of wheat never reaches the intended beneficiaries; and that the rate of leakage varies widely across states, from an average of 17 percent in the state of Andhra Pradesh to about 63 percent in the state of Assam. Estimates of the leakage from PDS across states for 2003-04 are shown in Table 2.6. There are disputes about the methodology used in this study, especially with regards to wide variations across states. However, even the Planning Commission's estimates suggest that the leakage would fall within the range of 32-40 percent and 27-35 percent for wheat and rice, respectively.²⁵

²⁵ See Dev et al. (2004) for further details.

Table 2.6 – Diversion of Foodgrains from PDS (%)

State	Rice	Wheat
Arunachal Pradesh	64.1	96.2
Assam	37.2	100
Manipur	97.7	100
Meghalaya	61.3	100
Mizoram	52.6	100
Nagaland	88.6	100
Sikkim	Neg	100
Tripura	3.8	N.A.
Bihar	14.7	44.7
Chattisgarh	33.4	71.4
Dadra & Nagar Haveli	48.5	69.4
Delhi	10.5	25.1
Goa	42.9	N.A.
Gujarat	16.2	24.4
Haryana	N.A.	74.2
Himachal Pradesh	58.2	34.1
Jammu & Kashmir	64.3	13.5
Jharkhand	Neg.	37.5
Kerala	Neg.	42.6
Madhya Pradesh	48.3	44.7
Maharashtra	Neg.	25.6
Rajasthan	N.A.	59
Uttar Pradesh	32.4	59.1
Uttaranchal	53.3	58
West Bengal	34.9	86.6
All India	39	53.3

Source: Lok Sabha Starred Question No 123, dated 27.2.2006, as reported in Indiastat, referring to (undated) study conducted by ORG Marg, New Delhi.

Even if the accuracy of these estimates is questionable, the fact that leakage is high is apparent from various sources like reports in national newspapers, as well as in reports of independent watchdogs. According to an August 18, 2004 article in Rediff.com (2004), on August 15, 2004, officials of the Department of Civil Supplies and Tamil Nadu government seized 2,400 tons of rice loaded in 40 railway wagons, each containing 1,176 bags weighing 50 kilogram each. The rice had been diverted from distribution under the PDS in Tamil Nadu. The sheer scale of this scheme suggests that it was not the first time that the alleged companies (and perhaps many others) attempted such a diversion.

Special Interests

With such a large system of grain management, and such complex set of regulations, the scope for special interests is obvious. Many reports indicate that the politicians and farmers in the surplus states have recently been able to influence the MSP in India (Dev

et al. 2004). The vested interests are not hard to understand: higher support prices mean more secured markets for farmers, larger procurement for the FCI, and higher tax revenues for the politicians in the states. Guaranteed markets make farmers, especially the larger ones, happy and the happier the farmers the greater are the chances for politicians to get re-elected. Rashid et al (2005) illustrate the nexus between politicians and farmers, especially in surplus states, by comparing the rise in support prices for wheat and rice with changes in land allocation pattern. They show that although area under rice increased by about 4 percent at the national level, it increased by 27 percent in Haryana, 21 percent in Punjab, and about 15 percent in Andhra Pradesh during 1995/96-2000/01. In case of wheat, land allocation has increased by about 10 percent at the national level, 26 percent in the state of Andhra Pradesh, 17 percent in Haryana, 16 percent in Madhya Pradesh, 50 percent in Maharashtra, and five percent each in the states of Punjab and Uttar Pradesh (Rashid et al, 2005). Such a price policy distorts the incentive structure in agriculture, and in fact slows down the natural process of diversification away from cereals to high value agriculture.

The Efficiency of Public Grain Marketing

To examine the efficiency of FCI's operation, some recent studies have compared its per unit costs of distribution with that of the private sector (Gulati and Khakonen 1996; Jha and Srinivasan 1999 and 2004; Chand 2002). They conclude that despite enjoying various preferential treatments, FCI operates at higher costs than the private sector. Gulati and Khakonen (1996) estimate that, while private traders earn 9-10 percent profits on sales, FCI losses as a percentage of sales ranged between 29 percent in case of rice to 68 percent in case of wheat. Similarly, Chand (2002) suggests that FCI's per unit trading cost is twice as much as private traders in case of wheat and about twenty percent higher in case of rice. More strikingly, Jha and Srinivasan (2004) reports that not only have FCI's unit cost been larger, the gap between the two has been widening.

Proponents of the "procurement-stocking-distribution" paradigm argue that FCI's costs are not comparable to those of the private sector because, unlike private traders, FCI has a social mandate, a large part of its costs are "policy determined" (e.g., procurement prices and distribution prices are centrally decided), FCI has to transport its grain over long distance in order to reach the most remote parts of the country (MCA 2002b). However, the facts do not support these claims. The system has not been successful in transferring income to the intended beneficiaries. "Policy determined" variables are found to be dictated by special interests, and some of the readily comparable FCI cost items have been larger than private sector. For examples, available estimates suggest that, compared to private sector, FCI's per unit storage costs is 30 percent higher; per unit labour costs is almost four times higher in case of rice and seven times in case of wheat;

and interests payments are four times higher in case of rice and two and a half times in case of wheat due to longer storage periods.²⁶

2.5. Impact of Current Pricing Policies on Supply

One of the stated objectives of the public intervention in grain management is to ensure a reasonable support price which will induce the farmer to adopt improved methods of cultivation for increasing production. What has been the impact of the current pricing policies on the supply responsiveness of rice and wheat? Given the level of government intervention it is important to understand the relative importance of each of the key policy variables in the long run price formation and supply response of these two major grains.

A review of the literature on supply response in India suggest that by and large output responds less than proportionately to changes in output prices for most crops, including rice and wheat. However, one finds that the estimates of supply elasticity in India vary widely among the available studies, depending upon the level of aggregation at which the analysis is carried out (such as national level or at the state level), time period covered, specification of the model and the estimation procedure used. For example, the estimates for wheat varies from as low as 0.09 (Jha and Srinivasan 1999; Srinivasan and Jha 2001) to as high as 0.92 (Krishna and Chibber 1983) with many other estimates in between.²⁷ It must be noted that these estimates are somewhat dated as they are based on data that at best cover the period up to the mid-1990s only.

Two recent studies that have estimated supply response with data covering the entire 1990s and early-2000s are by Mythili (2006) And Rashid et al (2005). Mythili (2006) examines the effect of broad based economic reforms of 1991 on farm supply responses for several major crops using a Nerlovian adjustment cum adaptive expectations model. Crop-wise panel data sets over the period 1970-71 to 1999-2000 across states are used to estimate acreage and yield response models separately using dynamic panel techniques. These acreage and yield functions are then combined to generate short- and long-run supply elasticities. In the case of rice the panel data are across 10 major rice growing states, while in the case of wheat they are over 6 states. Her estimates show that (i) the supply elasticities with respect to price have not changed significantly between pre-reform (1971 to 1990) and post-reform (1991 to 2000) periods for most crops including rice and wheat, and (ii) the long-run supply elasticities with respect to price are 0.50 and 0.82 for rice and wheat, respectively. A major methodological short-coming of her analysis is the absence of forward looking prices (or price expectations) in the acreage

²⁶ All numbers are Chand's (2002) as reported in Jha and Srinivasan (2004).

²⁷ For example, many other estimates fall between 0.2 and 0.59; see Gulati and Kelly (1999, p.278) for a list of studies with various estimates.

allocation models. Moreover, from the perspective of this report, the study by Mythili (2006) does not examine the effect of MSP and public procurement on supply.

Rashid et al (2005) analyse the magnitude and significance of the foodgrains policy variables such as the MSP on the overall price formation and supply response by (i) estimating the long-run supply response of rice and wheat, and (ii) examining the relative importance of one of the key policy levers, the minimum support price, in long-run price formation by estimating common trend coefficients. Their study, covering the period 1970 to 2001, varies from that of the other studies through the use of Johansen's multivariate maximum likelihood cointegration methods to examine both the supply and the dynamics of policy intervention. As a by-product of this exercise they also carry out econometric tests to determine whether public pricing has been consistent with overall common trend structure of the prices and the costs of production.²⁸ Their main findings with regard to supply response of rice and wheat show that (i) the long run responsiveness of outputs of these two crops to prices are 0.38 and 0.52, respectively and (ii) technology (proxied by irrigated area as percentage of total area) has been the most important determinant of the output supply. In particular, their estimates suggest that output responded to irrigation almost one-to-one in case of rice and more than one-to-two in case of wheat. Their analyses of the relative importance of MSP in the long run price formation suggest that: (a) the MSP and the C2 costs of production have large influence on the long run price formation, and (b) the MSP and the C2 costs of production did not move in tandem in the long run. The implications of their findings are that, while MSP plays a significant role in price formation, price has at best only moderate influence on supply.

The studies by Mythili (2006) and Rashid et al (2005) vary substantially in their analytical framework, the data sets used, and estimation techniques, which could be a major reason behind the difference in their estimates of the supply elasticities. Nevertheless, two overarching conclusions emerge from the above (old and recent) studies on supply response in the Indian context. One, the response of output of rice and wheat to price incentives are less than proportionate and are most likely to be of moderate size only, which raises the prospects for crop diversification away from rice and wheat in the medium to long run. The second finding that comes out strongly from all these studies, whether dated or recent, is that non-price factors are more important determinants of supply response than price factors. The non-price factors cited in the literature include rainfall, technology (measured in terms of seed variety used, irrigation, fertilizer, pesticides, mechanization, etc.), education level of the farmer, agricultural extension (the

²⁸ For details see Rashid et al (2005).

latter two as factors that influence technology choice), farm size, credit, infrastructure, market access, etc.

From the perspective of this report, the main implication of the findings of this vast literature is that price incentives have much less impact on output than investments (public and/or private) in technology, which undermines the rationale for government's price intervention policies in the grain markets as a tool for inducing production of these two cereals. These results have important implications for the ongoing policy debate in the country, particularly in the context of revising the methods of estimating the C2 costs, which now include total costs plus a mark-up, and repeated increase in the MSP. Adjusting these two policy levers downward can have significant positive impact on the markets.²⁹

The above studies on supply response brought out the limited impact of price incentives on supply. They, however, mask various other important negative side-effects that the public intervention in grain markets has at the ground level. Farmers, being assured of a certain minimum price that guarantees a minimum return, would not be compelled to use inputs such as water, fertilizer, etc., efficiently which will have adverse impact on the natural environment. Besides, they can also be major disincentives for farmers to diversify into other crops. Extensive public interventions can be major disincentives for private traders from participating in grain markets. The experience of public procurement in the surplus states of Punjab and Andhra Pradesh amply bring out many of these negative effects in great detail. In the following two sections, we document the experience of public intervention in Punjab and Andhra Pradesh, respectively.

2.6. The Punjab Experience³⁰

The State of Punjab has become the breadbasket of India. Agriculture is the prime mover here and contributes almost 40 percent to the state gross domestic product in contrast to only 20 percent at the national level. Agriculture is dominated by rice and wheat that now cover over three-quarters of the cropped area and account for 85 percent of the gross value of crop output. Despite comprising less than 2 percent of the country's area, Punjab accounted for over 10 percent of national rice production and over 20 percent of national wheat production in 2003-04 and a significant portion (38 percent for rice and 57 percent for wheat) of grains to the central pool for public distribution. It has very high density of tractors (104 per thousand ha compared to 22 at all-India level), irrigation (90 percent of

²⁹ It must be noted here that the C2 cost of production, which includes paid out costs on material inputs and hired labour plus imputed returns to land and family labour, is itself heavily influenced by government policies with regard to farm input subsidies, as well as the CACP's norms for imputing value to land and family labour.

³⁰ This section draws extensively from Cummings Jr. et al (2006).

cropped area compared to 40 percent at all-India level) and fertilizer use (double all-India average) with a cropping intensity of 194 percent (compared to all-India average of 135). It has good infrastructure – roads (twice the all-India density), markets (during harvest, farmers can typically find a purchase centre for foodgrains within 8-10 kms of their village, by far the best market density in the country), and communications (especially cell phones and computers).

Punjab was one of the first states to intervene in foodgrains markets. The state Department of Food and Supplies was established in 1942, with monopoly procurement beginning in 1945. Since the late-1940s, the foodgrains management system of Punjab has been characterized by the creation of zones, imposition of movement restrictions at various levels, and licensing of dealers.

Significant movement restrictions, even at the district level, were established in 1957. Exports of rice/paddy were banned. Shortfalls in rice production led to requiring licensed dealers to sell 75 percent of the quantity of rice held as stocks to the government. Additional movement controls included banning of Punjabi wheat exports in 1964 and paddy exports (without a permit) in 1968. Movement controls of the 1960s and 1970s were gradually relaxed in the 1980s and 1990s. Such trends were accompanied by a decrease in the mandatory levy of rice to be sold to the government (from 90 percent to 75 percent).

The FCI was joined by a number of state-level agencies in the procurement of wheat in the early-1970s and rice in the late-1970s, with increased total procurement leading to greater state agency participation. The Punjab State Civil Supplies Corporation (PUNSUP) was established in 1974 to procure, store, and deliver wheat and paddy to the central pool. The Punjab State Cooperative Supply and Marketing Federation (Markfed) also began to procure wheat for the central pool in 1967, despite its main mission of promoting cooperatives and distributing fertilizers. Similarly, the Punjab State Warehousing Corporation (PSWC) and Punjab Agro Industries Corporation (PAIC) began procuring foodgrains in the 1990s, with procurement by the latter shifting to its subsidiary, the Punjab Agro Foodgrain Corporation (PAFC), in 2002. The Government of Punjab approved the creation of PUNGRAIN (the Punjab State Grain Procurement Corporation) in March 2003 to procure foodgrains in place of the Food and Supplies Department of Punjab. This was motivated by the removal of food credit from the State budget and streamlining the repayment of food credit to commercial banks.

The government (FCI and state-level organizations) procures wheat and paddy at the MSP that it announces. For wheat and paddy, the MSP constitutes the guaranteed price at which the government will purchase all the produce that is offered for sale provided it

meets the prescribed specifications.³¹ As mentioned earlier, though the MSP recommended by the CACP are based on the C3 cost of production, in practice the MSPs finally announced by the central government were significantly higher than the CACP recommendations, especially in the late-1990s. At the same time, Punjabi farmers have benefited from “drought relief” bonuses in recent years that were imposed by the central government, despite the fact that most farmers in the state have ample access to water (World Bank 2004). Moreover, while the MSP is pan-territorial, C2 costs (and its two components, viz., the A2 cost (total cash costs on purchased inputs including hired labour and leased in land) and the FL cost (imputed costs of family labour)) vary by state, implying that the subsidy provided to farmers can vary significantly. A comparison of MSP, C2, and A2+FL levels for 2005 between Punjab and all-India (Table 2.7) demonstrates that the Punjabi farmers receive a significant windfall from government support programs relative to the rest of the country. Indeed, because A2 costs (which are a more revealing measure of cost of production) are much lower in the Punjab than the national average, the implicit subsidies received by Punjabi farmers are much higher than the national averages and, combined with the high yields, give them very high returns on wheat and rice.

³¹ The government, in practice, “contracts” with farmers for wheat and rice production.

Table 2.7 – MSP, C2, A2+FL costs and subsidy rates for Punjab and all-India, 2004/05

Item	Punjab		All-India	
	Paddy	Wheat	Paddy	Wheat
MSP (Rs./qtl)	560	640	560	640
C2 costs (Rs./qtl)	442	487	531	516
A2+FL costs (Rs./qtl)	287	294	384	343
Procurement (million tons)	10.044	9.258	17.427	16.8
Subsidy at C2 costs (Rs. Million)	11,852	14,165	5,054	20,832
Subsidy at A2+FL costs (Rs. Million)	27,420	32,033	30,672	49,896
Percentage of subsidy at A2+FL costs	195%	217%	145%	187%
Percentage of subsidy at C2 costs	127%	131%	105%	124%

Source: Ministry of Consumer Affairs, Food and Public Distribution, Govt. of India; Commission for Agricultural Costs of Production, <http://dacnet.nic.in/cacp> (Reports on Price Policy, Kharif/Rabi 2004/05); Punjab Department of Food Supplies, <http://foodsuppb.nic.in/proc.htm>

2.6.1 Components of the Grain Management System in Punjab

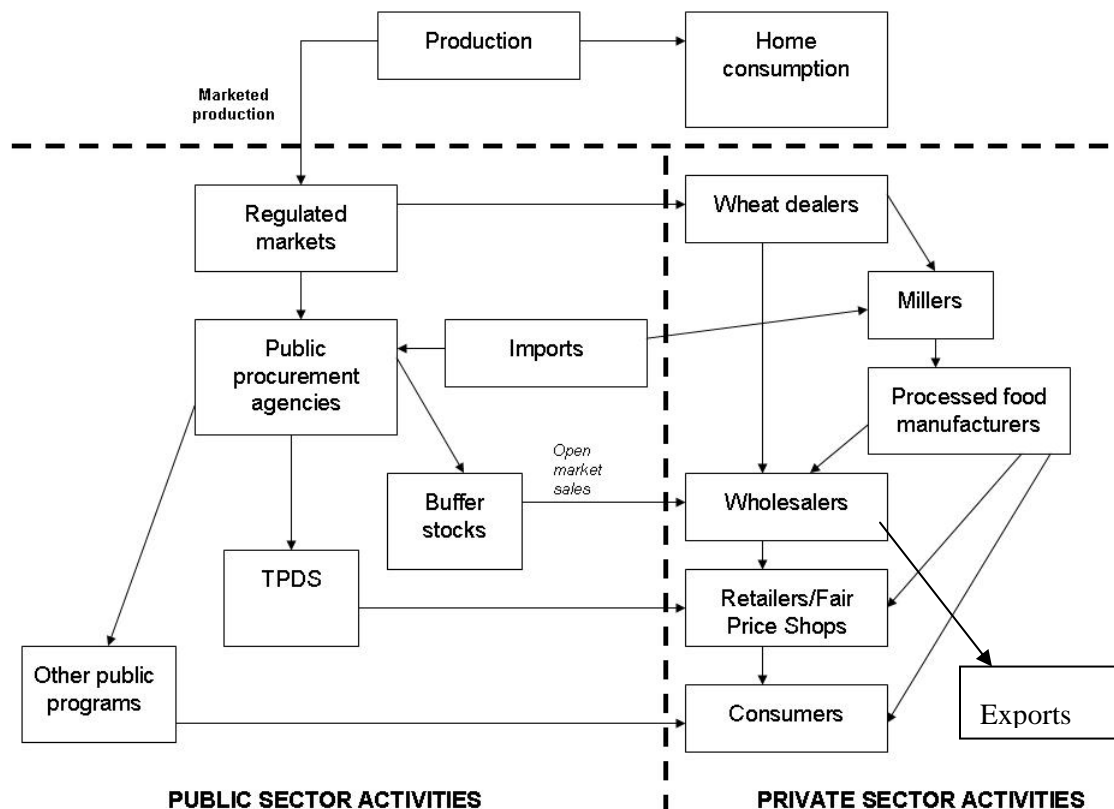
Procurement

The distribution channel for wheat is shown in Figure 2.2. A significant proportion of production is consumed on-farm, with marketed production accounting for 75 to 85 percent of production during the years 1999-00 to 2001-02 (MOA 2004). Home consumption is milled informally. All marketed consumption is sold through regulated markets, mandis, with most (until 2006) procured by the public sector and a small fraction sold to private wheat traders. Public sector procurement supports welfare programs such as the TPDS, other specialized programs, and public buffer stocks. Portions of public buffer stocks are sold on the open market to wholesalers depending on whether prevailing market prices are high and/or to dispose of surplus grain. TPDS grain is sold by FPS that administer the sale of grain to consumers at subsidized rates, adjusted to whether they fall above or below the poverty line. Imports are generally made by the public sector. The private sector purchases are sold to wholesalers, retailers, millers, or consumers.

The distribution channel for rice is generally the same. There are two means by which rice arrives at the central pool: levy rice procured directly by the government and “custom-milled” rice (CMR) that is milled under custom-milling arrangements from paddy procured by FCI and other public agencies. However, there are two important exceptions in the case of Punjab. First, almost all the rice produced in Punjab is marketed. Secondly, Punjab is unique among Indian states in that a high proportion of procurement is paddy. Public procurement agencies contract with private millers to custom mill state-

procured paddy for distribution or storage under state control. In addition, a variable proportion of rice purchased by millers must be sold to public procurement agencies in the form of a levy system. Of the paddy that is bought by millers, a statutory levy is imposed that mandates a fixed portion (75 percent in the case of Punjab) of the milled rice be sold to the government. The average conversion ratio of rice from paddy is taken as 0.67. The levy price is based on average processing costs and the conversion ratio. However, rice that is produced for export by export-oriented units or in export processing zones is exempted from the levy for the quantity that is exported (Government of Punjab, Department of Food and Supplies).

Figure 2.2 – Supply chains for wheat in India



Source: Adapted from World Bank (1999)

The level of procurement as a percentage of production has increased during the last five years for both rice and wheat (Table 2.8). In 2003/04, 8.6 million tons of rice and 8.9 million tons of wheat were procured, representing 89 percent and 62 percent of total production, respectively. The Punjab contributes a significant amount of rice and wheat to the Central Pool. In 2003/04, the state accounted for 57 percent of national

procurement of wheat and 38 percent of total rice (The Punjab's contribution of rice peaked in 2002/03 at 49 percent).³² MARKFED and PUNSUP account for 45 percent of the wheat procured in the Punjab in 2004/05, while over two-thirds of paddy was procured by MARKFED, PUNSUP, and FOODSUP.

Table 2.8 – Procurement and production of rice and wheat in the Punjab

Year	Rice			Wheat		
	October-September			April-March		
	Production (million tons)	Procurement (million tons)	% procured	Production (million tons)	Procurement (million tons)	% procured
1999/00	8.7	6.787	78%	15.9	7.831	49%
2000/01	9.2	6.935	75%	15.6	9.424	60%
2001/02	8.8	7.283	83%	15.5	10.560	68%
2002/03	8.9	7.940	89%	14.2	9.880	70%
2003/04	9.7	8.662	89%	14.5	8.938	62%

Source: Economic survey 2005-06; Agricultural Statistics at a Glance, 2000 and 2005; Indiatat; Bulletin of Food Statistics (various issues); CMIE 2005.

Wheat and paddy are procured in designated purchase centres or mandis. Over the years, the number of such purchase centres has grown rapidly. While there were 966 purchase centres for wheat and 841 centres for paddy in 1993-94, their number rose to 1,549 during the rabi season for wheat and 1,463 during the kharif season for paddy in 2004-05 (Government of Punjab, Department of Food & Supplies). The Punjab State Agricultural Marketing Board (commonly referred to as the “Mandi Board”) regulates its purchase centres through 145 Market Committees. The objective of this Board is to establish markets with infrastructure such as cemented or brick-lined auction platforms, metalled roads, electricity, water supplies, sewerage and drainage systems, and shelters for the farmers. The Board imposes a market fee of 2 percent on all purchase or sale transactions of agricultural products. In addition, it also collects a Rural Development Fund fee of 2 percent that is levied by the State government. All transactions relating to the sale and purchase of foodgrains are undertaken in these regulated markets only.

Purchases are made in regulated markets by auction with a view to encourage competition, enhance transparency, and give higher returns to farmers. The Market Committees appoint auctioneers and resolve disputes, if they arise. The foodgrains are

³² The analysis in the previous section 2.5 discussed the impact of procurement on supply response in the country as a whole (even though the study by Mythili (2006) uses state-level data). It remains an open question whether those national level findings hold good at the state level for Punjab. Unfortunately, the two reports on Punjab (by Kaur 2004, and Cummings et al 2006) do not report any state-level supply response estimates. Nor are we aware of any other study that reports such state level elasticities. However, in the next section on Andhra Pradesh, we report the analysis by Deb (2006) on the role of MSP as a determinant of procurement (not supply).

purchased from the commission agent or the kutcha arhtia, who is to safeguard the interests of the seller. It is his responsibility to get the foodgrains unloaded, cleaned, and graded according to variety, moisture content, and foreign matter. The kutcha arhtia receives a commission for the services rendered by him, which is determined by the Mandi Board and is payable by the purchaser. All kutcha arhtias must obtain a license from the Market Committee. As their commissions are uniform, they compete with each other by providing services like the provision of short-term credit for purchase of inputs or for meeting the consumption or social needs of the farmer.

Procurement bottlenecks are common during harvest, due to inadequate facilities at mandis for storage and handling. The World Bank (1999) reports that at harvest time in Amritsar and Jalandhar, farmers wait up to 17 hours outside the mandi to sell a tractor load (2.4 tons) of grain and an additional 14 hours to sort out handling and payment. Storage is limited at mandi yards -- just over 10 percent have covered facilities and just over 20 percent have concrete platforms to hold grain (World Bank 1999).

Distribution

Punjab is a net surplus state for both rice and wheat. Moreover, a significant proportion of production is consumed on-farm, with marketed production accounting for 75 to 85 percent of production during 1999-00 to 2001-02) as mentioned earlier. As a result of both these factors, the distribution component of the public grain management system is relatively of minor importance in Punjab. The PDS in the Punjab is represented through 13,645 FPS throughout the state. The PDS does not represent a significant source of consumption (well under 2 percent) for Punjabi households (Table 2.9).

Table 2.9 – Percentage of consumption obtained from the PDS in 1999-2000

State	Rural		Urban	
	Rice	Wheat	Rice	Wheat
Punjab	1.3	0.5	0.9	1.4
All-India	12.1	4.9	12.9	7.0

Source: Kaur (2004)

Storage

Foodgrain storage in India consists of either warehouse (godowns) or cover-and-plinth (CAP) in which bagged foodgrains are piled outside on a cement platform in a pyramid and covered with a plastic covering (World Bank 1999). In the Punjab, the total storage capacity was 6.67 million tons as of January 31st, 2006. The majority of storage in the state is owned either by FCI or hired from state-level government agencies. The share of the private sector in foodgrains storage is small, with the private sector share of total storage capacity in the state at just over 6 percent.

In case of paddy, state agencies do not hire storage space, as the paddy is stored in the premises of the rice mill allotted to the agency for custom-milling of paddy. The allocation of rice mills is undertaken by the State Department of Food and Supplies based on the milling capacity of the rice mill. The pace of delivery of both custom-milled and levy rice is guided by the milling capacity of the rice mills and the allocation of storage space by FCI. The FCI hires godowns for the storage of rice unlike other state procuring agencies. Once the stocks are delivered to the FCI, the role of the other state agencies ceases.

Neither type of storage (covered or CAP) is very efficient from the standpoint of stock management. All paddy and wheat is stored in 95 kg jute bags, rather than using cheaper synthetic bags or bulk storage, which adds to handling costs and storage losses. The World Bank (1999) reports storage losses that are five times those of Indonesia, double those of Australia, and quadruple those of Canada. Stocks generally do not adhere to “first-in, first-out” rules of management. Rather, stocks are moved into CAP storage last, but removed from CAP storage first to minimize losses from weather, pests, etc. Grain stocks are routinely fumigated every 15 days (adding to health risks) and in the past, stocks have been kept for lengthy periods. For example, the World Bank (1999) reported that 50 percent of stocks were at least 2 years old, with some grain stored for up to 16 years.

2.6.2 Costs of the Public Grain Management System in Punjab

The sharp rise in the costs of grain management at the national level was noted earlier (Section 2.4.1). It was pointed out that rising volumes of buffer stocks at the turn of the century was an important reason. Leakages from the PDS are another major reason for the spiralling costs. Estimates suggest that about 36 percent of wheat and 31 percent of rice was diverted from the PDS in the country as a whole (MCA 2002a). The situation in Punjab is perhaps worse on this count, where 69 percent of wheat and 40 percent of rice were reportedly diverted.

The efficiency of FCI’s operations and that of private traders at the national level were compared earlier. It was observed that FCI’s per unit costs are higher than the private sector, despite significant advantages in handling, freight, and credit available to it. A similar comparison at the state level for Punjab shows that procurement and distribution costs of private traders are about 73 percent of those incurred by FCI in the case of wheat, with particular savings on distribution costs (68 percent, Table 2.10). In terms of economic costs, the private sector enjoys a 10 percent cost savings over FCI (Table 2.10). In the case of rice, all elements of costs incurred by private traders except freight and mandi charges were lower (Table 2.11), with the private sector incurring economic costs that are 90 percent of FCI’s when the recovery of rice bran and husk is accounted for.

Lower distribution costs arise through economizing on handling expenses and storage charges. While the private sector faces a disadvantage in terms of paying higher interest rates, shorter storage periods limit total interest costs. When freight costs are excluded, the cost advantages of the private sector are even larger (83 percent of FCI's costs for wheat and 84 percent for rice), as the private sector has to rely on more costly road transport. At the same time, the quality and reliability of service by private road transport makes up for some of the added costs, particularly when the problems encountered by FCI in rail transport (missing wagons, unconnected wagons, wagons reaching the wrong station, and railways charging diversion fees for sending them to the right destination) are considered.

Table 2.10 – Costs of wheat operations of FCI and private traders in Punjab (1999-00)

Element of Cost	FCI (Rs. per qtl.)	Private Trade (Rs. per qtl.)	Private costs as % of FCI costs
Procurement Costs	125.49	101.50	80.9
Distribution Costs	193.97	131.67	67.9
Total costs	319.46	233.17	73.0
Economic cost	869.46	783.17	90.1
<i>Total economic cost excluding freight</i>	<i>795.80</i>	<i>663.17</i>	<i>83.3</i>

Source: Kaur (2004)

Table 2.11 – Costs of rice operations of FCI and private traders in Punjab (1999-00)

Element of Cost	FCI (Rs. per qtl.)	Private Trade (Rs. per qtl.)	Private costs as % of FCI costs
Procurement Costs	149.59	112.05	74.9
Distribution Costs	191.51	145.00	75.7
Milling charges (paddy)	13.8	14	
Recovery from sale of bran/husk	0	29.6	
Economic cost of rice (one quintal)	1,086.24	972.79	89.6
<i>Economic cost of rice excluding freight</i>	<i>1,012.58</i>	<i>852.79</i>	<i>84.2</i>

Source: Kaur (2004)

2.6.3 Impact of Public Intervention on Punjab Agriculture

As mentioned above, under the prevailing A2 costs (which is a more revealing measure of cost of production), high yield levels, and the MSP offered by the government, the implicit subsidies on inputs such as for fertilizer, irrigation, and power, received by Punjabi farmers are much higher than the national averages. Thus, the very high implicit subsidies, combined with the high yields, give them very high returns on wheat and rice. As a result, wheat and rice accounted for three-quarters of the gross cropped area in 2003/04. While the area under wheat cultivation has remained relatively stable, production is now nearly triple that of the level in 1970-71, owing to significant yield improvements engendered by Green Revolution varieties. (Table 2.12). There has been steady growth in both gross cropped area and yields in rice.

Table 2.12 – Area and production of wheat and rice in the Punjab

Years	Wheat			Rice		
	Area '000 Ha	% of GCA	Production Mil tons	Area '000 Ha	% of GCA	Production Mil tons
1970-71	2,299	40.49	4.9	390	6.87	0.7
1980-81	2,812	41.58	7.7	1,183	17.49	3.2
1990-91	3,273	43.63	12.2	2,015	26.86	6.5
2000-01	3,408	42.95	15.6	2,612	32.92	9.2
2003-04(P)	3,444	43.57	14.5	2,614	33.07	9.7

Source: Punjab Statistical Abstract, Various Years

Much of the gains in rice have come at the expense of other crops, such as cotton (cultivated area down by almost half since 1990-91), oilseeds, maize (cultivated area down by half since 1980-81), and millets. In value terms, wheat and rice now contribute to over 85 percent of the value of aggregate production of crops compared to less than 50 percent three decades earlier. Particularly, the share of rice as a percentage of total crop value has soared since the mid-1970s. Arguably, the current output and input pricing

policies that are loaded in favour of rice and wheat have contributed to the lack of diversification within Punjab agriculture (Cummings Jr. *et.al.* 2006).

Despite the support given to agriculture, particularly rice and wheat, the rate of growth in yields for both commodities has declined over the last decade (Table 2.13). In the case of wheat, annual growth rates for yields were well over 2 percent during the 1970s and 1980s, but fell to 1.96 percent during the 1990s and even further since then. The annual growth rate of yield for paddy fell from nearly 4 percent during the 1970s to 1.3 percent during the 1980s and 0.02 percent during the 1990s but has had a slight recovery since then.³³ Consequently, agricultural growth rate in Punjab, largely driven by the performance of wheat and rice, which averaged 4 percent per annum in the 1970s and 5 percent in the 1980s (more than twice the corresponding national averages), has declined significantly to 2.6 percent in the 1990s (compared to the all-India average of 3.2 percent), only buoyed up by the continuing strong performance of the livestock sector. The crop sector grew by only 1.3 percent per annum in the 1990s, down from 4.8 percent in the 1980s.

Table 2.13 – Yield levels and growth rates of paddy and wheat in Punjab, 1970-2004

Average Yields (kg/ha)		
	Rice	Wheat
TE 1982-83	2,942	2,888
TE 1989-90	3,148	3,600
TE 1999-00	3,322	4,293
TE 2003-04	3,583	4,313
Exponential Growth of Yield (%)		
	Rice	Wheat
1970's*	3.84	2.42
1980's	1.29	2.96
1990's	0.02	1.96
2001-04	1.47	-3.20

Notes: * Calculated from different, although comparable, data series.

Source: CMIE 2005

At the same time, Punjab is experiencing increasing stress on natural resources. Largely due to (especially early sown) paddy cultivation, groundwater levels are falling at a rate of almost one-quarter meter per year in the central zone. Large areas are being lost to

³³ The World Bank (2003) notes that the available evidence – zero trend growth in rice yields in 1990s – suggests that average yields in rice may indeed have plateaued at around 3500 kg/ha with the available technology (and statistical tests confirm a significant break in trend of rice yield in the 1990s from the 1970s and 1980s.). In wheat moderate gains (2 percent per annum yield growth in the 1990s) are still occurring largely due to the continuous release of higher yielding varieties. In both crops, though, average state yields are about 80 percent of yields realized by scientists in demonstration plots using the best available technology, a very low yield gap, by even developed country standards.

salinity and water-logging, especially in the south-western cotton zone. Fertilizer, especially nitrogen, is being used at levels exceeding recommendations, contributing to imbalances among nutrients (too much N relative to P and K), micro-nutrient deficiencies are becoming more serious (48% of necessary zinc), and the result is low marginal returns to fertilizer (2 kg of grain to one kg of fertilizer). Thus, the dominance of rice and wheat in Punjab's landscape, aided by the prevailing output and input pricing policies are again at the root of the environmental degradation being seen in Punjab, that is now threatening the sustainability of agriculture in that state with attendant implications for the food security situation in the country (see Cummings Jr.*et.al.*(2006) and the references cited therein).

2.7. The Andhra Pradesh Experience³⁴

Andhra Pradesh is characterized by foodgrains based agriculture. Of 12.52 million hectares of total cropped area, about 63 percent was under foodgrains crops during 2004-05 (Statistical Abstract, Andhra Pradesh, 2005). However, area under foodgrains is gradually declining in most parts of the state except in the rice-dominated areas. Rice is the most important crop of the state; occupying around 30 percent of total cropped area, and contributing about 33.36 percent in the total value of crop output in 2001-02.³⁵ Rice area in the state between 1980-81 and 2002-03 has fluctuated between 3.2 and 4.3 million hectares depending upon the rainfall. However, there was a noticeable decline in area under coarse cereals, namely sorghum, pearl millet, and finger millet between 1980-81 and 2002-03, while the area under groundnut and cotton has modestly increased and of pulses marginally.

The state contributes roughly 10 percent of total rice production in the country. Rice production in the state increased from 7.01 million tons in 1980-81 to a record level of 12.5 million tons in 2000-01 but fell to 11.4 million tons in 2001-02 and further dipped to 7.2 million tons in 2002-03 due to fall in rice area mainly because of drought conditions. The rise in production primarily came from increase in yield, which increased by 53 percent from 1944 kgs/ha in 1980-81 to 2980 kgs/ha in 2001-02 and declined later to 2621 kg/ha in 2002-03. Rice yields are about 45 percent higher than the all-India averages but lower than Punjab, Tamil Nadu and Haryana (GOI 2004). There is considerable untapped yield reservoir which needs to be harnessed through improved management practices. Most of the districts in coastal region³⁶ and few districts in

³⁴ This section draws extensively from Deb (2006).

³⁵ The state accounts for only 6.83 percent area of the total rice area in the country in 2002-03.

³⁶ These districts are West Godavari, Nellore, Krishna, East Godavari, Srikakulam, and Guntur.

Telengana region³⁷ dominate a large part of rice area in the state. The yield rates are distinctly higher in these districts compared to rest of the districts in the state.

The cost of cultivation of paddy in all the major rice producing states of India for specific years between 1980/81 and 2000/01 are provided in Table 2.14. The following four observations are drawn from the table: (i) the C2 cost, which includes all actual expenses in cash and kind, remained comparatively higher in Andhra Pradesh as compared to Punjab or Uttar Pradesh during the last two decades; (ii) all the eastern states (Assam, Bihar and West Bengal) have cost advantages in paddy cultivation over Andhra Pradesh; (iii) the profit margins from paddy was higher in states like Punjab and Uttar Pradesh, and remained lower in Andhra and Haryana; and (iv) the profit margins from paddy cultivation remained one of the lowest in Andhra Pradesh as compared to other rice producing states. It is interesting to note that unlike other states, the C2 cost of paddy production in Andhra Pradesh was often higher than the MSP during the last two decades (Figure 2.3).

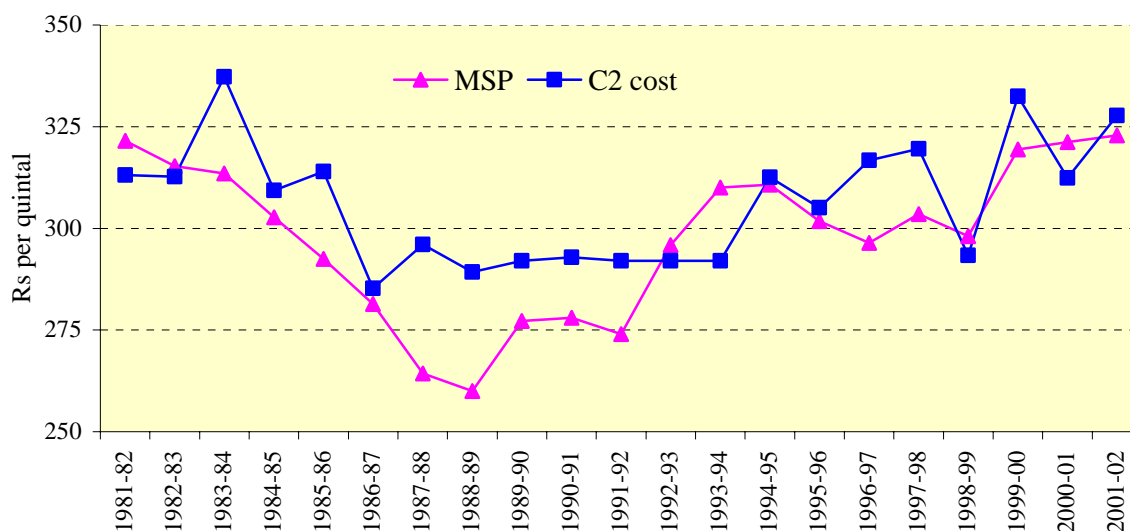
³⁷ Important districts are Nalgonda, Karimnagar and Hyderabad

Table 2.14 – Minimum Support Price and Cost (C2) of Paddy in Selected States

Year	1981-82	1984-85	1990-91	1994-95	1999-00	2000-01
MSP	115.0	137.0	205.0	340.0	490.0	510.0
Andhra Pradesh	112.0	140.0	216.0	342.0	510.0	497.0
Assam				327.6	468.0	470.0
Bihar	103.0		221.0		426.3	452.0
Haryana		139.0	213.0	413.0	573.0	558.0
Punjab	102.0	137.0	195.0	290.0	385.0	386.0
Tamil Nadu					555.6	509.6
Uttar Pradesh	117.0	110.0	203.0		406.0	414.8
West Bengal	122.0	126.0		315.0	490.0	

Source: GOI (2005), CACP Report. Indiatat website

Figure 2.3 – MSP and C2 Cost of Rice in Andhra Pradesh



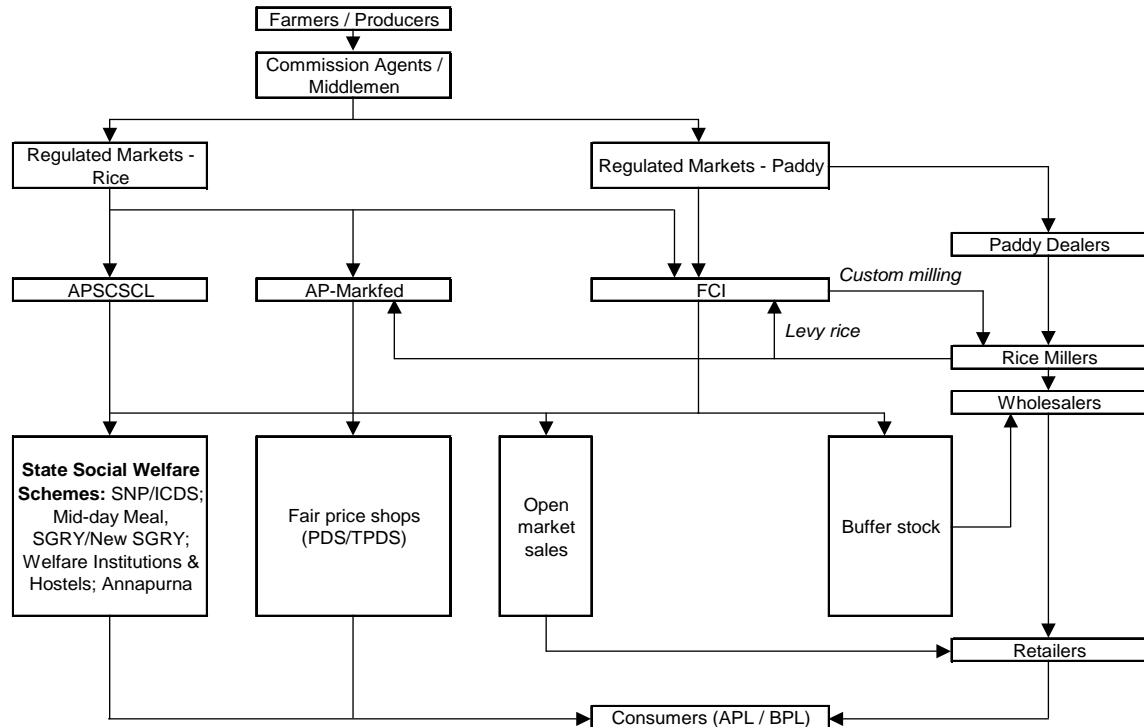
Source: Deb (2006).

2.7.1 Supply Chain of Rice

The entire supply chain of rice is dominated by government intervention. Most of the activities in the supply chain from procurement of rice (and paddy) till its distribution to the consumers are managed by government agencies. Figure 2.4 shows the supply chain and the key agencies involved for undertaking various activities. Both central and state governments play important roles in the supply chain. The supply chain has four broad components: (i) procurement, (ii) rice milling, (iii) stocking, and (iv) distribution to FPS

or government social net schemes. The structure of grain marketing in the state is determined by the central policies including the MSPs, procurement levy of rice, open market sale at fixed prices, buffer stocking of rice and wheat and central issue prices for cereals under PDS.

Figure 2.4 – Supply Chain of Paddy/Rice in Andhra Pradesh



Source: Deb(2006).

While the central government is mainly (though not solely) responsible for the procurement-handling-storage of grains and making them available to states, the responsibility for distributing to consumers through the FPS rests with the state governments. Besides the FCI procurement for the central-pool, the Andhra Pradesh State Civil Supplies Corporation (APSCSCL) and the AP MARKFED carried out paddy procurement in recent times. The FCI undertakes procurement of mill levy rice from Andhra Pradesh at MSP, and the APSCSCL procures additional quantities from the rice millers at the negotiated price. It may be noted that the share of the FCI in total procurement has grown from 12.8 percent in 2000-01 to 50.3 percent in 2003-04, while that of the APSCSCL declined proportionately. Such a trend is contrary to other states where the share of state agencies in procurement is rising while that of FCI is declining.

As high as three-fourths of paddy production is marketed in Andhra Pradesh. The state is next to Punjab in procurement of rice. During 2003-04, the state accounted for about 18.53 percent of total rice procurement in the country; its share dipped to 15.82 percent in 2004-05. The rice arrival and procurement in Andhra Pradesh increased substantially during the last two decades (Annexure Table A2.3).

2.7.2 Determinants of Rice Procurement

A major objective behind various grain market intervention schemes of the government during initial years was to procure sufficient foodgrains to carry out the public distribution activities and also build up the buffer stock. The procurement demands of the government gave rise to the view that a higher procurement price is necessary for maintaining the farmer's production incentives. Subsequently, it was often argued that the government procurement volume could be boosted by maintaining an attractive procurement price. Deb (2006) tried to assess the determinants influencing the procurement of rice in Andhra Pradesh by regressing procurement on the production level, procurement price, market price proxied by the wholesale price index (WPI) of rice, and the ratio of procurement price to the WPI of rice. The results (based on the Cochrane Orcutt procedure correcting for serial correlation) show that the production level of paddy in Andhra Pradesh was the significant determinant for rice procurement in the state (Table 2.15). Surprisingly, the procurement price of rice did not have any significant role in rice procurement in Andhra Pradesh. Earlier findings by Radhakrishna and Indrakant (1987) during 1970-71 and 1985-86 also came out with similar conclusions. However, procurement prices played a key role in procurement of important commodities during 1965-66 and 1975-76 (Krishna and Raychowdury 1980). The contribution of procurement prices gradually decelerated during 1970-71 and 1985-86 (Gulati and Sharma 1990). The chronology clearly reveals that during the early period of procurement, price policy contributed to the extent of procurement but gradually the role has disappeared. It appears that it is "assured procurement" rather than the procurement prices per se that influences the decision of farmers' to sell rice to the government agencies.

Table 2.15 – Regression Results of Rice Procurement in Andhra Pradesh

Explanatory variables	Dependent Variable: Rice Procurement in Andhra.			
	OLS	Cochrane-Orcutt (AR-3)	OLS	Cochrane-Orcutt (AR-3)
Constant	-7.30 (-0.89)	1.18 (0.25)	-35.77 (-5.10) *	6.99 (1.39)
Rice Production Level	1.02 (1.78) *	0.55 (1.74) *	3.16 (7.22) *	0.52 (1.71) *
Rice Procurement Price	-0.87 (-1.14)	1.10 (1.60)	-	-
WPI of Rice	1.80 (2.22) *	-0.27 (-0.38)	-	-
Procurement-WPI Ratio	-	-	-0.52 (-0.50)	0.26 (0.36)
Summary Statistics				
R ²	0.84	0.93	0.69	0.93
R-bar ²	0.82	0.91	0.67	0.90
DW-Statistics	0.65	2.12	1.11	2.01
F-Statistics	39.63 *	39.79 *	26.63 *	42.34 *

Notes: * indicates statistical significance at 10% level. Estimation period is 1970-71 to 1999-00.

Source: Deb(2006).

2.7.3 Price Trends

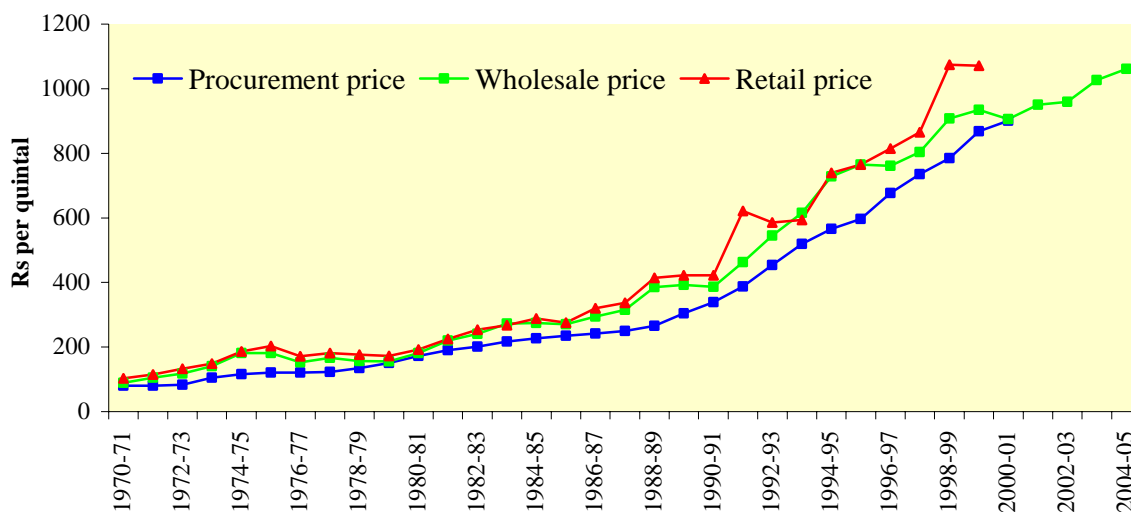
Wholesale prices of two important markets in Andhra Pradesh show that with some exceptions the wholesale prices in Kakinada were relatively higher than the national averages, while these were lower in Nizamabad (Table 2.16). The movements in the procurement price of levy rice, wholesale and retail price of rice (common variety) in Andhra are plotted in Figure 2.5.³⁸ It is evident that the movements and deviations in these three price series remained alike during the period from 1970/71 to 2004/05, i.e., the retail price remained higher than wholesale price, which in turn stayed higher than the procurement price.

³⁸ The wholesale price of rice in the state is derived by taking average of the WPI of common variety of rice in 5 important rice markets of the state. The markets (with varieties in the parentheses) are: Kakinada (Akkulu), Vijayawada (Coarse), Nizamabad (Coarse), Bhimavaram (Akkulu) and Tadapaligudem (Akkulu). Similarly, the retail price of rice in the state is interpreted as the average of 2 markets, viz., Kakinada and Hyderabad. The source of the basic wholesale and retail price data are "Agricultural Prices in India" (DES, Ministry of Agriculture).

Table 2.16 – Average Wholesale Price of Rice (Rs/quintal)

Year	Andhra Pradesh		All India
	Kakinada	Nizamabad	
1996-97	623	672	623
1997-98	665	646	610
1998-99	735	607	615
1999-00	673	630	694
2000-01	575	610	656
2001-02	632	604	632
2002-03	640	667	603

Source: Indiastat website

Figure 2.5 – Procurement, Wholesale and Retail Price of Rice (Common) in Andhra Pradesh

Source: Deb (2006).

With the government linking the MSP, its main instrument of intervention in grain markets, to the C2 costs, which in Andhra Pradesh was higher than the MSP in most of the years, it is then pertinent to understand how the central / MSP prices influence the open market price of rice in Andhra Pradesh. Towards this Deb (2006) conducts pairwise Granger causality tests to discern the cause and effect of fluctuations in procurement price, wholesale price and retail price. Results suggest that a statistically significant unidirectional causality runs from procurement to wholesale price of rice (Table 2.17). The causality between procurement and retail rice prices seems to operate in both ways, implying a case of bi-directional causality. Overall, the results indicate that the

procurement price of levy rice is the initial recipient of shock that bears a significant impact on the market rice price, which in turn would imply that the procurement price provides the lead and act as a floor to the wholesale rice price in Andhra Pradesh.

Table 2.17 – Pair wise Granger Causality Tests involving Procurement, wholesale and Retail Price of Rice in Andhra Pradesh (period: 1970/71-1999/00)

Null Hypothesis	Lag	F-Statistics
Procurement price does not influence WPI	2	9.20 *
WPI does not influence procurement price		0.75
Procurement price does not influence retail price	2	4.28 *
Retail price does not influence procurement price		7.61 *

Notes: * indicates statistical significance at 5% level.
Source: Deb (2006).

2.7.4 Grain Marketing in Andhra Pradesh

Rice marketing is controlled under the Agricultural Produce and Market Committee (APMC) Act. According to the Act the sale/purchase of notified commodities, including rice, outside the market yard is prohibited and all market functionaries are licensed.³⁹ The marketing charges, commission and taxes on agricultural commodities are given in Table 2.18.^{40,41} The number of agricultural markets in the state has expanded due to the growth in production and rise in marketable surplus. The majority of the markets (about 82%) belonged to the Coastal and Telengana region (Table A2.4). However, the picture in terms of the market penetration (area served per market) is truly dismal in the state. In every district, except West Godavari, each market serves over 10,000 hectares. Rough estimates revealed that about 70% of the marketed surplus of rice/paddy in Andhra is handled by the village commission agent in Coastal districts and about 35 percent in the Telengana region.⁴²

³⁹ The marketing staff prescribes the system of sale, which could either be an auction or tender system and the weighing is done under the supervision of market committee.

⁴⁰ There are other states in India where commission is borne by the buyer of the produce and in some cases there are no commissions at all.

⁴¹ A single-point market-fee system is prevalent in Andhra, under which market fee is collected by APMC on the sale of the produce arriving for the first time in the markets of the state. No market fee is realized from the buyer/seller on subsequent transaction of the produce in other markets of the state. The 1 percent market fee levied on the purchaser and the license fees form the major source of income to the market committee.

⁴² Predominance of agricultural produce sale at village level arises due to the farmer's reliance on village moneylenders/traders and absence of proper marketing and transport facilities. The produce may be sold to traders, who in turn transport it to the marketing centre for resale, or commission agents may act as an intermediary between the producer and buyer.

Table 2.18 – Agricultural marketing charges and taxes in Andhra Pradesh

Market Fee	License Fee (Rs./annum)	Marketing Charges (Rs./unit)	Commission Charges	Sales Tax
All Produce: 1% Fish: 0.5%	Traders: A: 125 B: 75 C: 50 D: 25	Weighing: 0.50-0.75 Unloading: 0.50-0.75 Hamali: 0.50-0.75 (Labor charges) Cleaning: 0.50-0.75 Loading: 0.50-0.75	Fruit & Veg: 4% Others: 1-2 %	All produce (except Maize, Sorghum, finger millet, pearl millet): 4%

Source: Ministry of Agriculture, GOI.

2.7.5 Storage and Warehousing Capacity

The Andhra Pradesh State Warehousing Corporation (APSWC)⁴³ was established in 1959 with the objectives of developing scientific storage facilities to assist orderly marketing and price support and providing a *negotiable instrument* by way of warehouse receipt to secure credit from the banks. Under the Warehouse Act, any person can store notified commodities by paying the charges, and the warehouse receipt may serve as a collateral security for the purpose of getting credit.⁴⁴ Foodgrains are stored chiefly in general warehouses that are owned by the private sector or public agencies.⁴⁵ The private warehouses are owned by individuals, large business houses or wholesalers, and are used for storage of own as well as outside stocks. The public warehouses are owned by government and are meant for storage of goods owned by the government and private operators.⁴⁶ The recent storage charges for foodgrains, which are provided in Table 2.19, indicates that APSWC follow a *block pricing rule*, viz., charge different tariffs for different bag-weights of rice storage. This indicates that APSWC encounters scale economies in its operations resulting in declining average and marginal costs in large-scale storage.

⁴³ Presently, the APSWC offers storage services for foodgrains, fertilisers, food products, pulses, food stuffs, oilseeds, oils, fibre, seeds, feed & fodder, tea & coffee, and miscellaneous items.

⁴⁴ Foodgrains accepted at the warehouse are preserved scientifically with periodic dusting and fumigation and are also protected from rodents and infestations. The warehouse receipt (warrant) mentions the name/location of the warehouse, date of issue, description of the commodity including the grade, weight, approximate value of commodity based on the present price. Withdrawal of commodity from warehouse is allowed in full or in part after paying the charges.

⁴⁵ There are special commodity warehouses meant for the storage of specific commodities (viz., cotton, tobacco, wool, and petroleum products) or refrigerated warehouses meant for vegetables, fruits, fish, egg and meat. For instance, the CWC run cold storage unit is situated at Hyderabad.

⁴⁶ The government has additionally set up licensed bonded warehouses, which are constructed near sea port or air port to accept imported goods for storage awaiting the custom duty clearance.

Table 2.19 – Consolidated Grain Storage Tariffs (Rs.) in APSWC (w.e.f. 1/4/2002)

Commodity	Type	Weight (Kg)	Standard Rate	High Rated- II	High Rated-I
Rice	Bag	50	2.30	2.50	2.60
		51-75	2.50	2.75	2.95
		100	3.00	3.30	3.65
Paddy	Bag	75	2.80	3.00	3.30
Pulses	Bag	100	3.20	3.55	3.80
All Food grains	Bag	85-101	3.00	3.20	3.30

Source: Andhra Pradesh State Warehousing Corporation (APSWC).

Presently, there are three agencies in the public sector which are engaged in building large scale storage/warehousing capacity namely, the FCI, the Central Warehousing Corporation (CWC) and 17 State Warehousing Corporation (SWCs). The storage capacity with the FCI is used mainly for foodgrains storage, whereas that with the CWC and SWCs is used for storage of foodgrains and other items. The dominant presence of FCI in storage services is apparent in all the states, including Andhra Pradesh. The state network in storage/warehousing (viz., SWC) is somewhat broad-based in Andhra Pradesh, Haryana, Punjab and Uttar Pradesh. It is found that Andhra Pradesh holds about 13 percent of the total FCI storage capacity in the country. Similarly, share of state in CWC and SWC was 16.7 and 27.3 percent respectively (Table 2.20). Foodgrain storage in the state increased from about 17 percent of total foodgrains production in 1980-81 to nearly 23 percent in 2001-02.

Table 2.20 – State-wise Covered Storage Capacity (lakh ton, as on 31-3-2005)

State	FCI	CWC	SWC	Others	Total
	33.75	13.95	22.76	12.85	83.31
Andhra Pradesh	(40.5)	(16.7)	(27.3)	(15.4)	(100)
	23.02	4.37	16.27	15.90	59.56
Haryana	(38.7)	(7.3)	(27.3)	(26.7)	(100)
	79.26	7.84	59.88	60.67	207.65
Punjab	(38.2)	(3.8)	(28.8)	(29.2)	(100)
	15.65	14.93	12.12	13.69	56.39
Maharashtra	(27.8)	(26.5)	(21.5)	(24.3)	(100)
	25.71	11.40	28.71	14.95	80.77
Uttar Pradesh	(31.8)	(14.1)	(35.5)	(18.5)	(100)
	10.69	6.68	2.50	1.31	21.18
West Bengal	(50.5)	(31.5)	(11.8)	(6.2)	(100)
	73.13	40.85	49.56	51.23	214.77
Other States	(34.1)	(19.0)	(23.1)	(23.9)	(100)
	261.21	100.02	191.80	170.60	723.63
(All-India)	(36.1)	(13.8)	(26.5)	(23.6)	(100)

Notes: Figures within brackets represent the respective agency's share in the total state capacity.

Source: Department of Food and Public Distribution.

2.7.6 Costs of the Public Grain Management System in Andhra Pradesh

As mentioned earlier, public intervention in rice markets in Andhra Pradesh involves not just the FCI, but state agencies as well. Data on the FCI's costs are available only in the aggregate; i.e., over its entire operations over the country as a whole. The overall cost structure of the FCI has been analysed earlier. Hence, in this section, only the costs of state level agencies are analysed. Further, an attempt will be made to compare the public and private costs in grain management, within the limitations of the available data.

APSCSCL Costs

The Andhra Pradesh State Civil Supplies Corporation (APSCSCL) is entrusted to deal with the procurement as well as carry out distribution of rice (subsidised and non-subsidised), wheat and maize in Andhra Pradesh.⁴⁷ The earnings of APSCSCL in 1999-2000 and its distribution pattern are provided in Table 2.21. It is seen that the cost of purchase of PDS items constitute about 98% of its total expenditure and about 55% of its total earnings are met out of state subsidy.

Table 2.21 – Earnings & Distribution Pattern of APSCSCL, 1999-2000.

How the Earnings are Made (%)		How the Earnings are Distributed (%)	
Sales	44.39	Cost of Purchase	97.67
Subsidy	54.86	Remuneration & Benefit	1.13
Commission	0.52	Interest	0.47
Other Income	0.23	Depreciation	0.03
		Others	0.38
		Profit	0.32
Total	100	Total	100

Source: Annual Report, APSCSCL, GoAP

It is alleged that the magnitude of the Andhra subsidised rice scheme is enormous. Table 2.22 provides total financial transactions of APSCSCL along with the item-wise particulars involved in the item of subsidised rice. It is observed that subsidised rice accounts for about 88 percent of the total trading expenses and 99.5 percent of total APSCSCL subsidy. This reiterates that the financial implication of subsidized rice scheme is considerable in APSCSCL's financial accounts. It is observed from the operational cost components on subsidised rice that cost of rice paid to FCI constitutes the largest part of APSCSCL's total expenditure. The costs on freight-expenditure and administrative-expenses have increased so that their share in the total cost has gone up in

⁴⁷ Besides cereals, APSCSCL handles petroleum products, kerosene, levy sugar, imported edible oils, etc.

recent years. The costs due to interest on borrowed capital indicated some variations.⁴⁸ The structure of storage cost in terms of shares of various components remained more or less same during last ten years.⁴⁹ In addition to the above, APSCSCL also pays 1 percent market fee in respect of allotment and 4 percent VAT on the economic cost of FCI.

Table 2.22 – Implication of Subsidised Rice in APSCSCL Transactions, 1999-2000

Particulars	Subsidy (million Rs)	
	Rice	All commodities)
1.1 Sales	7536.19	8920.57
1.2 Subsidy on PDS	10965.15 (99.5%)	11023.76
1.3 Income on Claims	0.08	2.19
1.4 Commission Received	-	109.16
1.5 Other Trading Incomes	1.42	31.71
1. Trading Income:	18502.83	20087.39
2.1 Purchase	17765.70	19224.21
2.2 Trading Expenses	535.38 (88.1%)	608.04
2.3 Opening Stock	-	75.57
2.4 Less Closing Stock	-	174.31
2. Trading Cost	18301.08 (92.7%)	19733.51
3. Gross Profit	201.76	353.88
4. Administrative Expenses	201.76	269.24
5. Net Trading Profit	-	84.64

Notes: Figures in brackets indicate percentage of rice in total transaction of APSCSCL.

Source: Annual Report, APSCSCL, GoAP.

Comparing FCI and Private Cost of Operation

Comparing the operational margin of FCI with private traders remains difficult because, unlike the FCI margins, information on private grain trading margin remain limited. Thus, while trends in open market (wholesale and retail) grain prices have often been used to capture the private margin (Tyagi 1990, Gulati and Sharma 1991, Gulati, Kahkonen and Sharma 2000), some estimate of cost elements involved in private trading operations have at times been utilized in the analysis (BICP 1990, World Bank 1999, Chand 2003).

Deb (2006) compared the FCI operational margin with the profit margin earned by private trading in rice handling operations in Andhra Pradesh. The FCI margin is

⁴⁸ The interest cost burden of APSCSCL is based on a concessional rate of interest granted under *food credit*. According to the available information, the Corporation received food credit to the tune of Rs.80 Crores from the RBI for the purchase of PDS requirements during 1999-2000 at 12.34% rate of interest, by way of the state government providing guarantee and APSCSCL hypothecating the grain stock.

⁴⁹ Storage costs to APSCSCL arise due to the hiring of storage capacity in case its own capacity falls short. The APSCSCL's own godowns are located at Medak, Vizianagram, Kurnool, Guntoor, Visakhapatnam, East Godavari, West Godavari, Ranga Reddy and Chittoor districts. The corporation also utilizes hired storage capacity of APSWC, CWC as well as godowns taken on rent from DCMS and others.

calculated as: (economic cost – procurement price) ÷ (procurement price). Two indicators are used for the procurement price of rice, one, the rice equivalent value derived from the all-India procurement price of rice (common variety), and two, the procurement price of levy rice (common variety) in Andhra Pradesh. Similarly, two different indicators are used to capture the private trading margin of rice trade. First, is a measure based on the calculation of: (WPI of rice – procurement price of levy rice) ÷ (procurement price of levy rice) in Andhra. The second assumes that the difference between the wholesale and retail price of rice (common variety) over a period of time can provide some indication of the profit margin earned by the private rice trading. The results of this Deb's analysis are provided in Table 2.23.

Table 2.23 – Indicators of FCI and Private Trading Margin in Rice in Andhra Pradesh

Year	Paddy procurement price (Rs./Qtl.)	Rice equivalent value (Rs./Qtl.)	Procurement price of levy rice (Rs./Qtl.)	WPI of rice (Rs./Qtl.)	Retail price of rice (Rs./Qtl.)	FCI's Economic Cost (Rs./Qtl.)	FCI Margin (%)		Private Trading Margin in AP (%)	
							(7)	(8)	(9)	(10)
	(1)	(2)	(3)	(4)	(5)	(6)				
1980-81	323.5	483.8	531.5	559.6	593.8	595.6	22.7	12.1	5.3	6.1
1981-82	324.3	486.4	532.5	615.0	630.1	625.4	28.6	17.4	15.5	2.5
1982-83	315.3	472.9	521.0	623.0	656.9	643.7	36.1	23.6	19.6	5.4
1983-84	313.5	470.2	516.1	646.7	635.8	654.5	39.2	26.8	25.3	-1.7
1984-85	302.7	453.0	502.5	607.0	637.0	660.4	45.5	31.4	20.8	5.0
1985-86	292.5	438.7	484.6	558.0	567.0	628.8	43.3	29.7	15.1	1.6
1986-87	281.4	422.1	465.6	567.8	616.5	614.2	45.5	31.9	21.9	8.6
1987-88	264.3	396.4	440.9	554.7	593.6	577.2	45.6	31.0	25.8	7.0
1988-89	260.0	390.0	432.4	626.2	-	600.8	54.0	39.0	44.8	7.5
1989-90	277.2	415.8	455.8	588.6	633.1	627.2	50.8	37.6	29.1	7.6
1990-91	278.0	417.0	459.2	524.2	572.2	620.4	48.8	35.1	14.2	9.2
1991-92	274.0	411.0	461.8	552.0	739.9	592.1	44.1	28.3	19.5	34.1
1992-93	295.9	443.8	497.8	597.3	642.2	641.4	44.5	28.9	20.0	7.5
1993-94	310.0	465.0	518.9	615.4	594.0	665.1	43.0	28.2	18.6	-3.5

1994-95	310.7	466.1	516.8	665.6	675.3	634.8	36.2	22.9	28.8	1.5
1995-96	301.7	452.6	499.8	641.4	640.8	639.3	41.3	27.9	28.3	-0.1
1996-97	296.4	444.7	528.0	593.7	635.8	667.8	50.2	26.5	12.4	7.1
1997-98	303.5	455.2	537.6	588.0	632.6	685.4	50.6	27.5	9.4	7.6
1998-99	298.1	447.2	531.8	615.2	727.6	674.3	50.8	26.8	15.7	18.3
1999-00	319.4	479.1	565.8	609.2	698.4	700.6	46.2	23.8	7.7	14.6
2000-01	321.2	481.8	567.1	570.5	-	743.5	54.3	31.1	0.6	-

Notes: Col 7 = $(6-2/2)*100$, Col 8 = $(6-3/3)*100$, Col 9 = $(4-3/3)*100$, Col 10 = $(5-4/4)*100$.

Source: Deb (2006).

It may be noted that the first measure of FCI margin has an all-India perspective, while all other measures capture the trading in Andhra Pradesh. These estimates show clearly that FCI's margins are substantially higher than private traders' margins (Table 2.23, Columns 8 and 10) Further, the spread between economic cost and MSP have remained more or less the same during the last two decades even as the economic cost (consisting of procurement price plus procurement incidental and distribution costs) has escalated rapidly (Table 2.23, Columns 1 and 6). On the other hand, the private margin has remained below 20 percent during most of the twenty year period.

The private margin is even lower if it is interpreted by the spread between retail and wholesale price. These findings point at two pertinent claims: (i) the public cost of procurement-stocking-distribution is much higher than what an efficient (private) enterprise would have incurred, and (ii) the private grain trading margin has become smaller over time. The implication that flow from these is that considerable saving on the subsidy burden can be achieved if the public agencies source grain supplies from open market.

2.8. Concluding remarks

Food policy in India has been motivated by the experience of the Bengal famine and subsequently by the frequent scarcities that this country witnessed during the first three decades since independence. The main objectives of public intervention in foodgrains marketing have been to ensure (a) farmers receive a reasonable income through procurement and price support operations, and (b) adequate availability of, and improved access to, foodgrains by consumers at reasonable prices through public distribution of subsidized foodgrains and price stabilization / buffer stock operations. Towards this, the government has created an entire marketing system that parallels (replaced) the private marketing system, with the FCI being the nodal implementing parastatal agency.

This system came in handy during the mid-1960s when the government went for the Green Revolution, and facilitated the spread of modern technology that eventually helped the country achieve food self-sufficiency. However, the benefits have been limited mainly to a few foodgrains surplus states such as Punjab, Haryana, and parts of Andhra Pradesh, Tamil Nadu and Uttar Pradesh. The cost of public intervention too has ballooned over the last decade and a half. The system of public procurement, storage and distribution is plagued by several inefficiencies that no longer justify wasting scarce resources in sustaining it at the current levels. The available evidence shows that the private sector is relatively more cost-efficient than the public sector. Moreover, the system of procurement at a MSP in combination with subsidies for

inputs such as fertilizer, irrigation, power, etc., has resulted in inefficient use of resources leading to environmental degradation in these surplus states threatening the sustainability of agriculture in those areas. All these arguments suggest, as mentioned earlier, that the system of foodgrains management in the country needs immediate reforms.

Annexure to Chapter 2

Table A2.1 – Cost of production concepts used by the CACP

Cost concept	Items included
Cost A1	Value of purchased material inputs (seed, insecticides and pesticides, manure, fertilizer), hired human labour, animal labour (hired and owned), hired farm machinery, depreciation on farm implements and farm buildings, irrigation charges, land revenue cesses and other taxes, and interest on working capital.
Cost A2	Cost A1 + rent paid for leased-in land.
Cost B1	Cost A1 + interest on value of owned fixed capital assets (excluding land).
Cost B2	Cost B1 + rental value of owned land (net of land revenue) and rent paid for leased-in land.
Cost C1	Cost B1 + imputed value of family labour.
Cost C2	Cost B2 + imputed value of family labour.
Cost C2*	Cost C2 + Additional value of human labour based on the maximum of statutory wage rate or the actual market rate (this is an intermediate concept).
Cost C3	Cost C2 + 10% of Cost C2* to account for managerial input of the farmer.

Source: Cost of Cultivation

Table A2.2 – Public Infrastructure for Food Procurement and Distribution by State

States	Fair Price	Ration	Fair Price	Ration	State Food	Storage
	Shops	Cards ¹	Shops	Cards	Agencies	Facilities
	1977	2004	1999/2000	2003		
	Units	('000)	Units	('000)	Units	Units
Andhra Pradesh	20,238	9,119	40,688	15,920		142
Assam	16,635	2,827	33,229	5,337		38
Bihar	26,821	9,808	41,818	12,384	11	43
Delhi	2,248	1,078	3,121	3,511		11
Gujarat	9,335	5,889	14,284	10,967		34
Haryana	4,674	1,778	7,228	4,489	204	170
Himachal Pradesh	2,662	734	4,043	1,344		15
Jammu & Kashmir	1,082	399	3,927	1,830		16
Karnataka	14,920	5,308	20,575	11,649		53
Kerala	11,784	4,318	14,135	6,374		31
Madhya Pradesh	15,700	6,966	18,688	13,431	2,626	70
Maharashtra	28,609	10,809	49,921	22,099		52
Manipur	481	260	2,551	317		3
Meghalaya	1,374	258	4,297	290		5
Nagaland	48	18	290	199		5
Orissa	12,086	4,157	23,579	7,901	42	52
Punjab	12,070	2,865	13,874	5,471	1,493	545
Rajasthan	8,967	4,737	20,391	12,402	12	78
Sikkim	13	6	1,071	132		2
Tamil Nadu	9,287	10,562	27,995	16,830		28
Tripura	654	353	1,432	725		7
Uttar Pradesh	26,891	15,206	74,788	38,079	1,696	156
West Bengal	17,800	8,923	20,441	16,011		47
Other States ²	1,257	553	33,530	11,204		130
All India	245,636	106,931	475,896	218,896	6,084	1,733

Notes: 1 These estimates assume same 2004 household size.

2 Include Andaman and Nicobar Islands, Arunachal Pradesh, Chandigarh, Dadra and Nagar Haveli, Delhi, Goa, Daman and Diu, Lakshadweep, Mizoram, and Pondicherry.

Source: Rashid et al (2005).

Table A2.3 – State-wise Market Arrival of Rice as Percentage of Production.

Year	Andhra Pradesh	Haryana	Punjab	Tamil Nadu	Uttar Pradesh	All India
1979-80	39.1	85.6	97	33.6	29.4	31.4
1980-81	41.4	93.2	93.1	36.1	29.6	30.2
1981-82	41.9	92.7	84.8	34.1	29.1	30.7
1982-83	42.8	91	93.2	35.8	20	32.8
1983-84	43.3	90	86	34.9	29.5	30.3
1984-85	42.3	92.1	88.3	36.4	28.7	31.6
1985-86	42.2	85	85.8	35.9	29.2	31.2
1986-87	44.5	82.3	83.9	36.9	29.4	32.2
1987-88	47.2	80.9	85.6	37.4	28.9	32.3
1988-89	40.3	71.7	87.7	35.5	28.3	29.7
1989-90	42.5	69.6	82.6	34.6	29	30.7
1990-91	44.2	70.8	84.1	33.3	28.2	30.9
1991-92	39.4	71.9	82.5	32.3	28.9	29.8
1992-93	59.1	86.6	85.8	40.8	35.6	38.3
1993-94	59.1	91.7	88.2	35.7	40.5	44.8
1994-95	58.7	83.4	81.4	33.1	38.1	37.7
1995-96	67.7	88.3	81.3	44.6	37.1	39.7
1996-97	68	86.3	83.2	43	37.1	42.3
1997-98	66.6	80.6	82.5	42.6	38.2	41.1
1998-99	69.6	75	80.8	38.5	40.6	39
1999-2000	76.7	76.4	85.2	49.6	41.6	44.5

Notes: Rice also includes paddy converted into rice

Source: Derived from Data provided by Directorate of Economics and Statistics

Table A2.4 – Growth of Agricultural Marketing in Andhra Pradesh

Districts	No. of AMC		Number of Markets		Area Served per Market (Thousand Hectares in 2002)	No. of Markets having Sites in 2002	No. of Markets Developed (2002)	
	1981	2002	1981	2002			Functional	Non-Functional
Srikakulam	11	13	30	45	13	21	6	5
Vizianagaram	7	9	18	47	14	23	6	2
Vishkhapatnam	7	8	27	49	25	17	11	6
East Godavari	11	14	32	50	20	17	7	8
West Godavari	8	16	32	41	2	20	3	15
Krishna	10	16	30	37	25	28	7	12
Guntur	11	16	32	45	25	28	9	14
Prakasam	9	14	36	39	50	25	6	17
Nellore	9	11	26	31	50	21	1	18
Coastal Andhra	83	117	263	384	25	200	56	97
Kurnool	12	12	19	27	50	17	7	8
Anantapur	11	12	23	49	33	19	11	7
Cuddapah	10	12	21	28	50	17	7	9
Chittoor	13	17	31	52	33	23	18	3
<i>Rayalaseema</i>	46	53	94	156	50	76	43	27
Ranga Reddy	8	9	12	18	50	14	9	2
Hyderabad	1	1	3	10	33	6	6	-
Nizamabad	7	9	20	26	33	18	6	6
Medak	7	10	18	26	33	11	8	3
Mahbubnagar	14	16	29	39	50	23	17	5
Nalgonda	12	19	40	52	25	31	13	16
Warangal	9	13	22	43	33	33	12	11
Khammam	9	12	18	33	50	20	3	7
Karimnagar	8	19	29	50	25	27	16	7
Adilabad	10	16	26	33	50	22	12	7
Telangana	85	124	217	330	33	205	102	64
Andhra	213	294	574	870	33	481	202	179

Source: Directorate of Marketing, Hyderabad, Note: State figures are derived by summing over districts.

3. Providing Food Security to the Poor: Public Distribution System Versus Other Social Safety Net Programs

It is widely accepted that food security of any household is a matter of economic access to food, and that it is the poor with low purchasing power who are most food insecure due to their low income levels. Providing access to food to the poor through Social Safety Net programs (SSN) is thus a valid policy intervention, irrespective of liberalization, functioning of markets, or even the level of development of a given country. Access of the poor can be improved either by providing food at a subsidised price and / or through improving their incomes through employment programs. The Indian government has been trying to do both over the decades. It runs several ‘food based’ as well as ‘cash based’ (employment / income generating) SSNs.⁵⁰ Amongst the food based programs, the Public Distribution System (PDS) and its later reformed version – the Targeted Public Distribution System (TPDS) – is the most important, accounting for about 73 percent of total government food distribution between April to December 2005.⁵¹

Foodgrains for the PDS (and other food based SSNs) come primarily from the Food Corporation of India (FCI), the parastatal agency primarily responsible for implementing the government’s procurement, storage and distribution policies. Thus, the PDS also serves as an outlet for offloading the food stock that government procures under its price support programs. Given these close links between the PDS and the agricultural price support, procurement and storage policies, any market liberalization or price policy reforms that changes the current procurement-stocking-distribution paradigm will have serious implications for the functioning of the PDS and other food based SSNs. If the restrictions on market are withdrawn and floor prices are adjusted, the government may not be able to procure the food stock necessary to run the PDS and other food based SSNs. In fact, this fear of possible disruptions to the functioning of the PDS is often used as an argument to stifle reforms in the government’s foodgrains policies. Therefore, successful foodgrains policy reforms will critically depend on devising alternative mechanisms for supplying the SSNs, which could involve fundamental reforms to the SSNs themselves.

The need for devising alternative mechanisms to supply SSNs is all the more important in a vibrant democracy such as India where political sensitivity to reforming

⁵⁰ Some of the employment generation programs also involve a food component.

⁵¹ Note that the share of PDS was about ninety percent of total government distribution in the early 1990s, which came down after the introduction of the TPDS in 1997.

food subsidy programs has manifested in more than one way in the 1990s and early-2000s. Furthermore, India's *Right to Food* campaign is perhaps one of the most proactive in the developing world and has drawn widespread respect and attention in recent years, particularly when it led to several interim orders by the Supreme Court of India to expand and strengthen various SSN programs.⁵² In this political milieu, reforming the foodgrains policies cannot be carried out in isolation of reforms of the PDS and other SSNs themselves, for which it is essential to evaluate the relative performance of the PDS and other SSNs.

Against this background, this chapter undertakes an assessment of the PDS and other SSNs and attempts to draw implications for future directions of the SSNs. Two sets of analysis are carried out here. First, the PDS's accessibility, effectiveness in transferring income to the poor, its poverty reducing impacts and targeting efficiency are assessed. The assessment of the first three aspects makes use of the estimates by Radhkrishna et al. (1997) for the year 1986-87, and Dev et al. (2004) for the year 1999-00. Both these studies have used the large scale household survey data of the National Sample Survey Organisation (NSSO), for the respective years. It may be mentioned here that the estimates of Radhkrishna et al. (1997) pertains to the period when the PDS was universal, while those of Dev et al. (2004) correspond to the period when TPDS is in operation. Thus, a comparison of these two estimates would help in assessing the impacts of moving from PDS to TPDS.

The targeting efficiency of the PDS and TPDS is assessed by examining the available state-level estimates for 1993-94 from Dutta and Ramaswami (2001) based on NSS data and some village level estimates from Dev et al. (2004). The village level estimates are based on a recent survey of six villages in Andhra Pradesh jointly conducted by the International Food Policy Research Institute (IFPRI) and the Centre for Economic and Social Studies, Hyderabad, India, in 2002.

Second, the overall cost-effectiveness of five different SSNs, viz., the PDS, the Andhra Pradesh Rice Scheme, the Maharashtra Employment Guarantee Scheme, the Jawahar Rozgar Yojana and the Integrated Child Development Services, are assessed.

⁵² The "Right to Food Campaign" is an informal network of organisations and individuals committed to the realisation of the right to food in India. The campaign statement mentions that "*everyone has a fundamental right to be free from hunger and undernutrition. Realising this right requires not only equitable and sustainable food systems, but also entitlements relating to livelihood security such as the right to work, land reform and social security. We consider that the primary responsibility for guaranteeing these entitlements rests with the state. Lack of financial resources cannot be accepted as an excuse for abdicating this responsibility. In the present context, where people's basic needs are not a political priority, state intervention itself depends on effective popular organisation. We are committed to fostering this process through all democratic means.*" Right to Food Campaign (2005).

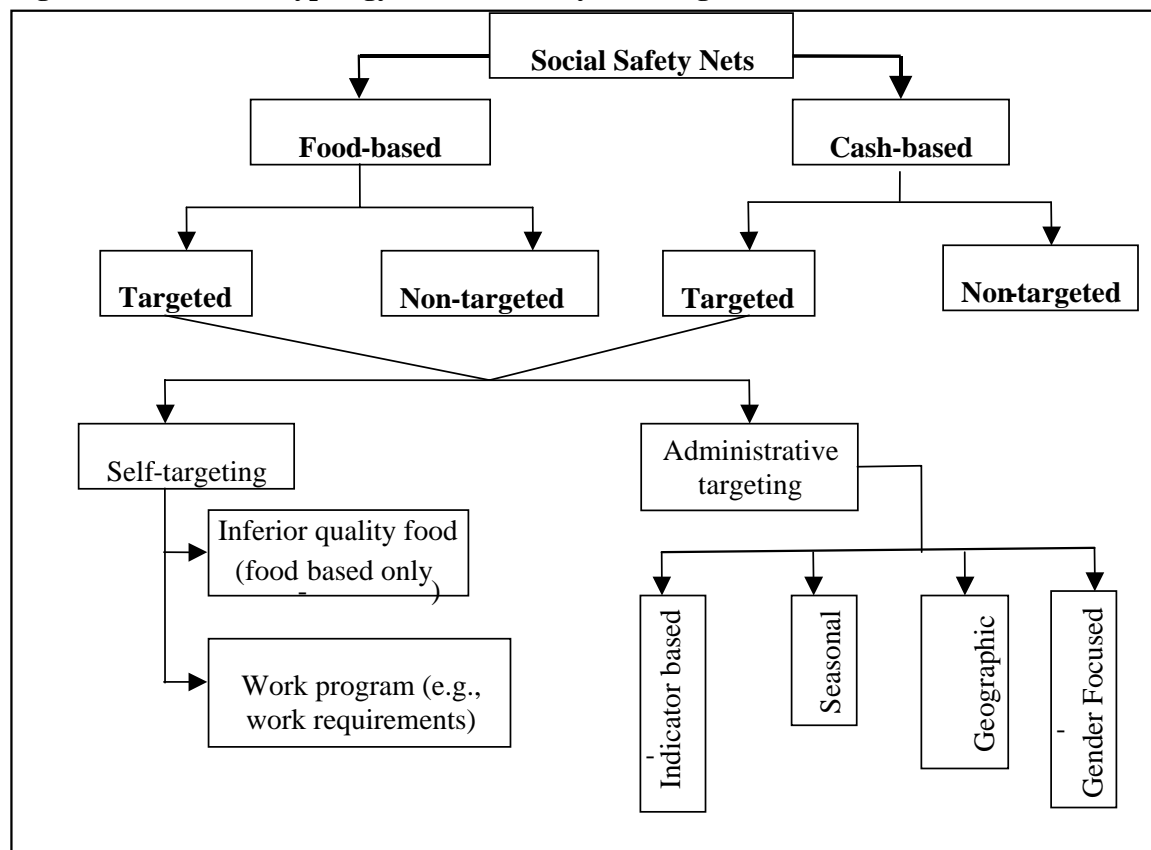
Here too we draw upon the estimates from Dev et al. (2004), to evaluate the cost of transferring one Rupee worth of benefits to the intended beneficiaries.

The rest of the chapter is organized as follows: the next section provides an overview of the existing SSNs, which is followed by a section that evaluates the performance of the PDS, and a section on the cost-effectiveness of the SSNs. The chapter concludes with a summary of the key results and their implications for the future direction of social safety net programs.

3.1. Brief Characterization of Selected SSNs

Rashid et al. (2005) categorize SSN programs into two broad types: “food-based” and “cash-based” depending upon whether the program seeks to transfer food or income to the beneficiary (Figure 3.1). Both these types of SSNs can be further classified into “targeted” and “non-targeted” (universal) programs depending upon the nature of targeting mechanism involved. The targeted programs can be further sub-classified into “self-targeting” or “administrative targeting” varieties. In general, self-targeting programs (such as those that require work participation) are considered to be superior in terms of delivery as only those in need of assistance would opt to participate in those programs.

Figure 3.1 – General Typology of Social Safety Net Programs



Source: Rashid et al (2005).

In India, the SSNs have largely been food-based, and even those that are cash based typically involve a food component (i.e., income transfer is supplemented with food transfers also). The largest of the SSNs is the PDS, which until 1997 was untargeted or universal. With the transformation of the PDS to TPDS, it has now become an administratively targeted program that uses an income criterion for targeting the poor. Most of the employment generation programs run by the government have some elements of both self-targeting and administrative targeting. Besides these, India also operates several nutrition programs that are targeted at children, which can also be considered as administratively targeted. The rest of this section provides a brief overview of five programs under three broad headings: (i) subsidized food distribution programs, (ii) public works (employment) programs, and (iii) nutrition intervention programs.

3.1.1 Subsidized Food Distribution Programs

Subsidized food distribution programs run by the Central and State governments are aplenty in India. The PDS is obviously the most important of them all. At the state level, the subsidized rice scheme of Andhra Pradesh is one of the largest of its kind that has been in operation for a long time. We focus on these two important subsidized food distribution programs.

The Public Distribution System

Started against the backdrop of the Second World War and the Bengal Famine in 1943, PDS operations were limited to major urban centres until 1970s. The welfare role of the PDS was recognized in the Sixth Five Year Plan, following which rural areas were covered from 1980s onwards. As of July 2006 the PDS involves a network over 485,000 Fair Price Shops (FPS) through which commodities worth more than Rs.300 billion annually are distributed to about 160 million families, and is perhaps the largest program of its kind in the world.

Over the years the PDS has undergone two major changes. In 1992, the program was re-structured and renamed as the Revamped PDS (RPDS). The main change was an increase in subsidy for people in tribal, drought-prone, and desert areas. The system, however, remained an untargeted / universal program. In 1997 the entire system was restructured as the Targeted PDS (TPDS), and there was a serious attempt at targeting the program for the poor. Under the TPDS special cards were issued to families below poverty line (BPL) who were then entitled to receive foodgrains at a lower price than the families above the poverty line (APL). Initially, each BPL family was entitled 10 kilograms of foodgrains per month at a specially subsidized price, which was increased in April 2000 to 20 kilograms per month at half the price of FCI's economic costs of procuring and distributing grains. The price of grains for the APL population was initially fixed at 100% government's economic costs, which effectively was close to the market (retail) price of grains. Following the build-up of stocks in early-2000s, in July 2001, the government raised the BPL entitlement to 25 kilograms per month, and also reduced the APL price to 70 percent of the economic costs.

The Andhra Pradesh Rice Scheme

The Andhra Pradesh Rice Scheme (APRS) was initiated in 1983 in order to improve the nutritional status of the poor (Rediff 1996). At the time of its inception, households were entitled to 25 kilograms of rice at Rs.2 per kilogram (Mooij, 2003). Over time, the entitlements and prices have been changed several times, and it is now reported to cover about 11.3 million households in the state, who are entitled to receive 20

kilograms of rice at a highly subsidized price, which costs about 10 billion Rupees per year to the state government (Rashid et al., 2005).

3.1.2 Public Works Programs

Public provision of employment in India has been extensively used as a tool of entitlement protection for many centuries. From the fourth century BC when the ancient Indian political economist, Kautilya, wrote *Arthashastra* (the book of economics), there has been an emphasis on public relief works, particularly at times of famines, and employment from public works later became the main and most effective element of strategies for famine prevention (World Bank, 1990).⁵³ After independence in 1947, many schemes were sponsored by the central government, beginning with the Rural Manpower program in 1960, which subsequently expanded at both national and state levels in various forms. The following is a brief description of the various national level employment generation programs, and one important state level program, viz., the Maharashtra Employment Guarantee Scheme.

Employment Generation Programs at the National Level

At the national level, two important employment programs started in the early-1980s were the National Rural Employment Program (NREP) and Rural Landless Employment Guarantee Program (RLEGP). In 1989, these two programs were merged and became the Jawahar Rozgar Yojana (JRY). In 1993 the government launched the Employment Assurance Scheme (EAS) in order to create additional wage employment during periods of acute shortage of wage employment through manual work for the rural poor. A notable feature of these programs is that village *Panchayats* are directly involved with the implementation of these programs. In particular, the allocated funds are disbursed directly to the *panchayats* that are also involved in the selection of projects. In terms of person-days of employment created, India's rural public works programs are the largest in the world. The JRY alone has created around a billion person-days of works since its inception. Total annual expenditure for the program was around Rs.350 billion during 1989-2001. The JRY was transformed to Jawahar Gram Samridhi Yojana (JGSY) in 1999, which was then combined with Employment Assurance Program (EAS) to form the Sampoorna Grameen Rozgar Yojana (SGRY) in 2001. The merger was motivated by three objectives: (i) to address the need of rural infrastructure in all the states, (ii) to provide focused attention in areas facing endemic

⁵³ In recent years, there is a growing recognition, in both theoretical and empirical literature, about the impacts of public works (workfare) programs on poverty alleviation (see Dreze and Sen 1990; Ravallion 1991; Besley and Coate 1992; Besley and Kanbur 1993; Sen 1995). The essential argument is that workfare can enable the social planner to separate the non-poor from the poor by connecting income transfers to participation in public works (self-targeting).

poverty, and (iii) to respond to natural calamities. In December 2004, the National Rural Employment Guarantee (NREG) Bill was passed, which promises at least 100 days of work to poor rural households whose adult members volunteer to do unskilled manual work, with an estimated cost of about one percent of GDP. This Bill intends to provide a safety net by enhancing livelihood security; and committing 1 percent of GDP for these programs is a clear reflection of government commitments to strengthen the country's social safety net programs.

Maharashtra Employment Guarantee Scheme (EGS)

Introduced in 1972, the EGS is perhaps one of the most researched and discussed state level public works programs in India and commended by the United Nations Development Program (UNDP 1993) as one of the largest and most successful of its kind in the developing world. It is a particularly interesting example of public work programme because of its unprecedented feature of guaranteed rural employment at a defined wage, which makes it a model for other states in India and throughout the developing world. Agriculture in Maharashtra does not generate sufficient employment and therefore requires government intervention. The EGS is one such attempt to enlarge the scope of employment in order to alleviate poverty in the state. In developed countries such a security is offered by the state in terms of unemployment insurance, which is financed by a payroll tax on the working population. A Program such as the EGS acts as proxy unemployment insurance, and indeed is financed by a payroll tax at the state level in Maharashtra. During 2000-01, the scheme generated 111 million work days of employment at a cost of Rs.5.7 billions (Rashid et al., 2005).

3.1.3 Nutrition Programs

Malnutrition remains a major problem in India despite the substantial progress made over the last four decades on the health front. India is home to about 40 percent of the world's malnourished children. More than half of Indian children under five years of age are moderately or severely malnourished, 30 percent of newborns have low birth weight, and 60 percent of Indian women are anaemic. The cost of malnutrition to India's gross domestic product (GDP) in the form of productivity loss has been estimated to be at least US\$ 10 billion in 1996, which exceeds the total GDPs of Nepal and several countries of Sub-Saharan Africa (Measham and Chatterjee 1999). Recognizing this serious problem, several state governments operate nutrition programs, amongst which the Tamil Nadu Integrated Nutrition Programs (TINP) is probably the most well known. At the national level, the Integrated Child Development Services (ICDS) is a major nutrition programs.

The ICDS is perhaps the largest of all the food supplementation programs in the world. The program offers a package of nutrition, health, and early child development services through supplemental feeding and training. It was started in 1975-76 on an experimental basis in 33 blocks only and the initial success led to substantial expansion in the subsequent years. Today several bilateral and multilateral development agencies participate in the ICDS in various ways. By September 1999, about 371 thousand *Anganwadi* workers were providing supplementary nutrition to about 26 million children, 5.16 million mothers, along with pre-school education to 12.69 million children (Dev et al. 2004). During the 8th Five Year Plan, another 1,346 centrally sponsored ICDS projects were added, bringing the total number of projects to 5,546 (general). Since the beginning of 1990s, both the World Bank and CARE, with support from the United States Agency for International Development (USAID), have been involved in improving aspects of ICDS programs in selected states through training and distribution of blended food (Rashid et al., 2005).

3.2. Evaluation of Pre- and Post-Reform Public Distribution System

As mentioned above, the PDS was universal up to 1997, when it was converted into the TPDS under which a distinction was made between the people below and above poverty line for better targeting of food subsidies. Has this limited reforms of the PDS improved its performance in terms of its effectiveness as an SSN for the poor? At an aggregate level one can obtain some idea on the performance of the PDS / TPDS by examining the allotment and offtake of grains across states. We examine three aspects, viz., whether (a) the allocation of grains across states is in line with poverty concentrations, (b) offtake of grains as a percentage of allocation has increased for the BPL families, and (c) whether the allocation to APL population has fallen over time. Table 3.1 reports data on state-wise shares in poverty, and allocation of grains, as well as the state-wise offtake as a percentage of allocation.

Looking first at the allocation of grains across states, it is seen that in 1993-94 when universal PDS was in operation, there are several instances of mismatches in the share of poverty and share in grain allocation. Indeed the correlation between poverty shares and grain allocation shares across states was only 0.36. With the introduction of the TPDS things have improved dramatically. The allocation of grains to the BPL population in 1999-00 as well as in 2005-06 is now more or less in line with the state-wise shares in poverty, and the correlation between the two stood at 0.94 and 0.98 for 1999-00 and 2005-06, respectively. In other words, there has indeed been a major correction in the way grains are being allocated to different states.

Turning to the offtake of grains by states, in 1993-94 when universal PDS was in operation, the offtake percentage was low in most states except Andhra Pradesh and Tamil Nadu. Strikingly, offtake was below 50% of the allocation in Bihar, Madhya Pradesh, Maharashtra, Uttar Pradesh and West Bengal, each of which had large concentrations of poor in the country. With the shift to the TPDS, things seem to have improved in most states, especially for the BPL population. In 1999-2000 (and also in 2005-06) almost all states including the ones with large poverty concentrations had very high offtake percentages (exceeding 75%) for the BPL population. Bihar is the only state with a large poverty concentration that witnessed a reduction in the offtake percentage in 2005-06 for the BPL population after witnessing an improvement in 1999-00. Thus, on this aspect too, there is a definite improvement in the situation for BPL following the move from universal PDS to TPDS.

The picture, however, is not all that rosy in terms of allotment of grains to the APL under the TPDS (Table 3.2). Only two states, Jammu & Kashmir and Kerala, have seen reductions in the allotment to the APL both in absolute and in percentage terms. In all other states and in the country as a whole, the allotment to APL population has increased in absolute terms. This may not be bad in itself if it is only to accommodate growth in population. It, however, turns out that in several states the allotment to APL population has increased in percentage terms as well. Notable amongst these are Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh and West Bengal, which together account for 61% of all poverty in the country.

Table 3.1- Statewise Allocation and Offtake of Rice and Wheat from the PDS

	1993-94			1999-00			2005-06			
	State's share (%)		Offtake % of allocation	State's share (%)		Offtake % of allocation	State's share (%)		Offtake % of allocation	
	Poverty	Allocation (Total)	Total	In poverty	Allocation to BPL	BPL	Total	Allocation to BPL	BPL	Total
Uttar Pradesh	19.2	7	42.1	20.8	15.6	100.5	58.7	16.2	87.7	37.3
Bihar	15.7	4.7	50.3	16.7	13.5	85	65.4	14.9	36.7	29.3
Maharashtra	9.7	8.4	60.9	9	9.5	92.6	89.2	10	86	33.7
Madhya Pradesh	9.5	4.6	44.6	11.7	8.4	84	69.3	9	101.5	44.2
West Bengal	8.1	9.1	68.9	8.4	7.2	82.1	73.2	7.5	89.4	45.5
Tamilnadu	6.4	5.2	97.2	5.1	7.2	97.4	90.7	7.3	99.6	63.7
Orissa	5.1	3.4	55.4	6.7	11.4	93.7	66.3	6.6	63.2	47.6
Karnataka	5	5.2	75.9	4.1	4.5	100.6	78.7	4.6	99.9	64.2
Andhra Pradesh	4.9	11.4	93.3	4.7	5.9	95.6	99.3	5.7	101.4	81
Rajasthan	4.1	5.7	48.6	3.2	3.4	74.1	37.9	3.1	79.1	26.4
Gujrat	3.4	4.9	51.8	2.7	3.1	102.9	44.9	3.2	76.2	23
Assam	3.1	3.6	83.6	3.7	3	94.4	84.5	3.3	95.2	69.6
Kerala	2.4	10.1	87.1	1.6	2.4	98.8	65	2.3	98.1	39.1
Haryana	1.4	0.8	50.6	0.7	1.1	91.3	53.7	1.3	80.5	21.6
Punjab	0.8	1.2	7	0.6	0.7	5.1	3.7	0.9	43.3	5.9
Jammu & Kashmir	0.7	3.1	40.6	0.1	1	93.3	48.7	1.1	102.5	85.3
Himachal Pradesh	0.5	0.9	91.6	0.2	0.7	47.2	41.4	0.6	81.9	62.6
All India	100	89.3	67.2	100	98.5	91.3	70.3	97.5	81.5	43.4

Notes: Universal PDS was in operation during 1993-94; Targeted PDS (TPDS) is in operation since 1997.

BPL and APL refer to "Below Poverty Line" and "Above Poverty Line" beneficiaries.

Poverty estimates are not available for years later than 1999-00.

Source: Poverty estimates are from Radhakrishna et al (1997) and Rashid et al (2005).

Data on allocation and off-take are from (a) Government of India (2002) for 1993-94; (b) Indiatat website for 1999-00; and (c) Website of Department of Food and Public Distribution, Government of India.

Table 3.2 – Allotment of rice and wheat to population above poverty line (APL) under the TPDS

State	1999-00			2005-06		
	APL		Total	APL		Total
	(000 Tons)	(% of total)	(000 Tons)	(000 Tons)	(% of total)	(000 Tons)
Andhra Pradesh	1988.0	81.4	2441.4	2266.7	57.1	3973.1
Assam	655.2	74.1	883.9	955.1	54.4	1755.7
Bihar	337.6	24.7	1368.4	2507.8	40.8	6152.5
Gujrat	792.0	76.7	1032.0	2787.6	76.1	3664.4
Haryana	68.6	43.8	156.6	1014.2	75.5	1342.8
Himachal Pradesh	238.1	82.3	289.2	348.9	66.1	527.8
Jammu & Kashmir	723.7	90.7	797.8	447.7	59.2	756.8
Karnataka	975.0	73.9	1320.0	2035.0	61.3	3319.1
Kerala	2012.3	91.6	2196.5	1808.9	73.5	2461.6
Madhya Pradesh	276.0	30.1	916.1	3581.2	58.7	6098.3
Maharashtra	1245.1	63.2	1970.6	4700.9	63.1	7445.2
Orissa	715.1	45.0	1589.9	1155.6	40.5	2852.3
Punjab	21.5	29.4	73.1	1473.2	88.2	1669.8
Rajasthan	388.7	59.9	649.1	2763.8	74.8	3697.2
Tamilnadu	1625.3	74.7	2174.8	3788.0	65.0	5830.4
Uttar Pradesh	1071.8	47.2	2269.1	6828.0	59.3	11522.0
West Bengal	1031.1	65.3	1579.7	4089.2	67.0	6099.7
All India	16240.7	68.0	23900.0	44353.3	61.9	71621.5

Source: (a) Indiatat website for 1999-00; and (b) Website of Department of Food and Public Distribution, Government of India.

Thus, it appears that the TPDS has a very long way to go in terms of targeting, even though there has been some improvement in the delivery to the poor in terms of allocation to poorer states and offtake as a percentage of allocation. Has this improvement in delivery resulted in higher incomes / greater welfare for the poor? To answer this question one needs to examine micro level data for households. The rest of this section examines the changes in four aspects of PDS performance using micro level information from NSS Surveys: (i) the degree of PDS dependence, (ii) the extent of income gain, (iii) impacts on poverty, and (iv) targeting errors in implementation. Dev et al (2004) provide estimates on each of these indicators for the year 1999-00 based on NSS data, when the TPDS was in operation, and these are compared with similar estimates from other studies (notably Radhkrishna et al. 1997) based on NSS

data for 1986-87 and 1993-94 when the universal PDS was in operation. We summarize below the findings from these studies.

3.2.1 The Degree of PDS Dependence

The extent of PDS dependence of a typical household is measured as the shares of PDS grain (rice and wheat) in total grain consumption. The PDS dependence seems to have increased between 1986-87 and 1999-00 across majority of the states and at the all-India level (Table 3.3). At the all-India level, the

Table 3.3 – Per capita monthly purchase of rice and wheat (kgs) from PDS, 1986-87 and 1999-00

STATES	1986-87 NSS data						1999-2000 NSS Data					
	RURAL			URBAN			RURAL			URBAN		
	Rice	Wheat	Cereals	Rice	Wheat	Cereals	Rice	Wheat	Cereals	Rice	Wheat	Cereals
Andhra Pradesh	2.51	0	2.51	2.13	0.3	2.43	2.32	0.01	2.33	1.22	0.4	1.62
Assam	0.67	0.03	0.7	1.26	0	1.26	0.7	0.04	0.74	0.6	0.01	0.61
Bihar	0.01	0.04	0.05	0.01	0.25	0.26	0.11	0.15	0.26	0.04	0.07	0.11
Gujrath	0.49	0.63	1.12	0.32	0.58	0.9	0.38	0.56	0.94	0.19	0.27	0.46
Haryana	0.01	0	0.01	0.08	0	0.08	0.02	0.04	0.06	0	0.03	0.03
Himachal Pradesh	-	-	-	-	-	-	1.67	1.26	2.93	0.8	0.8	1.6
Jammu & Kashmir	1.64	0.25	1.89	6.24	0.55	6.79	2.4	0.71	3.11	4.38	1.01	5.39
Karnataka	0.75	0.22	0.97	1.29	0.39	1.68	1.2	0.3	1.5	0.83	0.3	1.13
Kerala	4.07	0.39	4.46	3.68	0.56	4.24	4.18	0.45	4.63	3.58	0.58	4.16
Madhya Pradesh	0.12	0.24	0.36	0.25	0.27	0.52	0.22	0.15	0.37	0.08	0.1	0.18
Maharashtra	0.39	0.67	1.06	0.67	0.81	1.48	0.47	0.66	1.13	0.26	0.3	0.56
Orissa	0.03	0.02	0.05	0.03	0.31	0.34	1.53	0.05	1.58	0.92	0.34	1.26
Punjab	0	0.01	0.01	0.04	0	0.04	0	0.01	0.01	0	0	0
Rajasthan	0.01	0.82	0.83	0.03	0.22	0.25	0.01	0.19	0.2	0	0.15	0.15
Tamil Nadu	1.18	0.11	1.29	0.93	0.25	1.18	3.18	0.16	3.34	2.14	0.36	2.5
Uttar Pradesh	0.12	0.1	0.22	0.14	0.17	0.31	0.11	0.14	0.25	0.09	0.09	0.18
West Bengal	0.5	0.44	0.94	1.53	1.78	3.31	0.19	0.14	0.33	0.13	0.37	0.5
All India	0.62	0.24	0.86	0.84	0.48	1.32	0.82	0.21	1.03	0.64	0.27	0.91

Source: Radhakrishna et al. (1997) for 1986-87 and Dev et al (2004) for 1999-00.

share of PDS grain in total grain consumption has increased from 6.8 percent to 8.8 percent for the rural poor and from 13.64 percent to 16.66 percent for the urban poor. For the non-poor, the PDS dependence has increased in the rural areas, but declined among the urban households. At the state level, significant increase in PDS dependence is observed in Assam, Karnataka, Kerala, Orissa, Tamil Nadu and the West Bengal. As far as the dependence of the rural poor is concerned, Kerala continues to top the list followed by Tamil Nadu and Karnataka (42 percent). The downside, however, is that share of the non-poor has increased as well, notably in Karnataka, Kerala, Orissa, and Jammu & Kashmir.

3.2.2 The Extent of Income Gains

The NSS data contain information on both PDS and open market purchases that allows computing the implicit market price at the household level—the price that a household has actually paid for rice and wheat. Using this, income gains from PDS can be measured by computing the difference between the values of PDS grain at market price and at subsidized PDS price, as a percentage of total per capita monthly expenditure.⁵⁴ Estimates of the income gain by Dev et al. (2004) for 1999-00 and Radhakrishna et al. (1997) for 1986-87 are provided in Table 3.4. These results suggest that although income gains through PDS continues to be small, it has shown significant increase for both rural and urban poor following the introduction of the TPDS in 1997. In 1999-00, income gains at All-India level accounted for about two percent of total per capita expenditure of rural poor, twice its share in 1986-87 when PDS was universal. At the state level too there is improvement in all the states except for Jammu & Kashmir and Rajasthan. Nevertheless, even the highest income gains by the rural poor in any state is only 7.7% (in Tamil Nadu).

Table 3.5 compares the income gains across states with the concentration of poverty measured as the total number of poor in a given state as percentage of total Indian poor. These figures show that the benefits to the poorer states seem to show a significant increase over the years. For instance, while only about 20 percent of the Indian poor lived in the four southern states (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu) their share in total income gains from PDS rose from 65.5 percent in 1986-87 to 74.6 percent in 1993-94, before declining to 47 percent in 1999-00 (along with a reduction in their combined share of poverty to 15.5 percent). On the other hand, the combined shares of income gain in the three poorest states (Bihar, Uttar Pradesh, and Madhya Pradesh) have increased from a low 2.2 percent of expenditure in 1986-87 to 12.2 percent of expenditure in 1999-00. This is also reflected in the

⁵⁴ For more on the theoretical aspects of this measure see Dev et al (2004).

correlation coefficient between the state-wise poverty shares and income gains. The correlation between the two was close to zero (just 0.01) in 1986-87, and in fact turned marginally negative (-0.07) suggesting that the situation had turned somewhat regressive by 1993-94 when universal PDS was still in operation. The introduction of the TPDS seems to have corrected this and by 1999-00 the correlation between the poverty concentrations and income gains across states rose to 0.15.

Table 3.4 – PDS income transfer as percentage of consumer expenditure, 1986-87-1999-00

STATES	1986-87 NSS estimates						1999-2000 NSS estimates					
	RURAL			URBAN			RURAL			URBAN		
	Poor	Non-poor	All	Poor	Non-poor	All	Poor	Non-poor	All	Poor	Non-poor	All
Andhra Pradesh	4.3	1.73	1.99	3.52	1.02	1.56	5.49	2.62	3.1	4.09	1.09	1.24
Assam	1.16	0.45	0.64	1.31	0.47	0.56	1.82	0.64	0.96	1.94	0.24	0.35
Bihar	0.04	0.03	0.03	0.05	0.06	0.06	0.31	0.22	0.25	0.36	0.05	0.09
Gujarath	1.07	0.42	0.52	1.1	0.28	0.49	1.74	0.74	0.87	0.94	0.23	0.25
Haryana	0.03	0.01	0.01	0.07	0.03	0.03	0.08	0.04	0.04	0	0.01	0.01
Himachal Pradesh	-	-	-	-	-	-	3.07	0.5	0.64	0.66	0.31	0.32
Jammu & Kashmir	1.92	0.62	0.81	5.27	3.07	3.29	1.2	0.8	0.79	0.11	1.92	1.9
Karnataka	1.76	0.89	1.06	1.72	0.99	1.16	2.79	1.7	1.96	1.29	0.56	0.6
Kerala	6.42	2.49	3.08	5.3	1.47	2.38	5.42	2.08	2.26	5.03	1.68	1.81
Madhya Pradesh	0.13	0.06	0.08	0.19	0.08	0.11	0.56	0.21	0.28	0.17	0.05	0.06
Maharashtra	0.67	0.34	0.43	1.25	0.48	0.63	1.79	0.73	0.93	0.59	0.26	0.28
Orissa	0	0.02	0.02	0.07	0.06	0.06	4.3	1.64	2.38	2.97	0.91	1.06
Punjab	0	0	0	0.06	0.02	0.02	0	0.01	0.01	0	0	0
Rajasthan	0.71	0.16	0.24	0.05	0.04	0.04	0.26	0.09	0.1	0.26	0.05	0.06
Tamil Nadu	2.29	0.99	1.29	1.72	0.6	0.86	7.7	4.31	4.82	6.84	2.05	2.3
Uttar Pradesh	0	0.01	0	0.09	0.06	0.07	0.38	0.08	0.11	0.18	0.06	0.07
West Bengal	0.73	0.35	0.45	2.12	0.72	0.9	0.88	0.3	0.38	0.93	0.15	0.19

Source: Radhakrishna et al. (1997) for 1986-87 and Dev et al (2004) for 1999-00.

Table 3.5 – State-wise concentration of poverty and income gain from PDS (Rice and Wheat)

STATES	1986-87		1993-94		1999-00	
	Income Gains	State's share poverty (%)	Income Gains	State's share poverty (%)	Income Gains	State's share poverty (%)
Uttar Pradesh	0.39	17.75	1.88	19.24	4.89	20.83
Bihar	0.55	13.93	1.04	15.70	3.82	16.73
Maharashtra	9.42	9.80	4.15	9.72	8.00	8.96
West Bengal	11.01	9.38	3.18	8.10	5.09	8.39
Madhya Pradesh	1.22	8.75	1.55	9.50	3.53	11.73
Tamil Nadu	16.23	7.65	28.19	6.43	22.78	5.13
Orissa	0.05	5.49	0.87	5.11	17.90	6.65
Andhra Pradesh	19.58	5.31	21.20	4.90	12.69	4.68
Karnataka	9.00	5.25	8.61	4.98	6.38	4.10
Rajasthan	2.37	4.73	3.34	4.09	0.60	3.22
Gujarat	4.56	4.05	3.91	3.35	2.65	2.67
Kerala	20.66	2.93	16.63	2.43	5.41	1.61
Assam	3.29	2.51	2.12	3.07	5.51	3.72
Haryana	0.04	0.84	0.07	1.40	0.03	0.68
Punjab	0.02	0.83	-0.01	0.80	0.00	0.57
Jammu & Kashmir	1.61	0.56	1.76	0.67	0.14	0.14
Himachal Pradesh	0.00	0.25	1.50	0.50	0.57	0.20
All India	100.00	100.00	100.00	100.00	100.00	100.00

Source: Radhakrishna et al. (1997) for 1986-87 and Dev et al (2004) for 1999-00.

3.2.3 *The Poverty Impacts*

The impacts of income transfer on poverty for the years 1999-00 (Dev et al. 2004) and 1986-87 (Radhakrishna et al. 1997) are presented in Table 3.6.⁵⁵ Two conclusions emerge from these estimates. First, looking at the head count measures of poverty, the impact of TPDS on poverty reduction in 1999-00 though small in magnitude, has increased somewhat compared to the impact of universal PDS in 1986-87. The other two poverty indicators too exhibit similar pattern, though the magnitudes are smaller. Second, there is considerable variation in the poverty reducing impacts across states, with the four southern states and Orissa showing much larger impact than the national average. Nevertheless, even the highest impact is just 5.2% in Tamil Nadu.

⁵⁵ Dev et al. (2004), following Radhakrishna et al. (1997) measure the impacts of income transfer on poverty as follows: First, the extent of poverty in a state is measured against a bench mark poverty line through head count, the poverty gap and the Foster- Greer-Thorbecke (FGT) procedures using the NSS data. Next, household expenditures as reported in the data are corrected for the income gain from the PDS, and poverty is re-calculated. The difference in the two sets of poverty estimates is considered to be the poverty impact of PDS. Table 3.6 reports these differences for the three poverty indicators. For more details on the methodology see Radhakrishna et al. (1997) and Dev et al. 2004).

Table 3.6 – Reduction in poverty due to income transfer through PDS rice and wheat

STATES	1986-87 NSS data			1999-2000 NSS data		
	Poverty Head Count	Poverty Gap	FGT	Poverty Head Count	Poverty Gap	FGT
Andhra Pradesh	2.21			4.35	1.09	0.33
Assam	0.77	0.36	0.15	1.33	0.51	0.2
Bihar	0.04	0.02	0.01	0.37	0.12	0.05
Gujarat	1.18	0.43	0.19	1.11	0.27	0.08
Haryana	0.01	0	0	0.03	0	0
Himachal Pradesh	--	--	--	-0.24	0.2	0.07
Jammu & Kashmir	1.28	0.39	0.13	0.59	0.08	0.01
Karnataka	0.95	0.45	0.22	2.32	0.67	0.22
Kerala	4.08	1.55	0.67	2.23	0.47	0.1
Madhya Pradesh	0.08	0.04	0.02	0.43	0.12	0.03
Maharashtra	0.46	0.22	0.11	1.06	0.44	0.19
Orissa	0.01	0	0	2.29	1.42	0.68
Punjab	0	0	0	0	0	0
Rajasthan	0.3	0.15	0.07	0.16	0.04	0
Tamil Nadu	1.25	0.68	0.37	5.2	1.38	0.44
Uttar Pradesh	0	0	0	0.21	0.06	0.02
West Bengal	0.5	0.24	0.12	0.55	0.16	0.06
Other States	--	--	--	1.13	0.22	0.03
All India	0.61	0.25	0.12	1.27	0.41	0.14

Notes: Decline in poverty measures multiplied by 100 are reported.

Source: Radhakrishna et al. (1997) for 1986-87 and Dev et al (2004) for 1999-00.

3.2.4 The Targeting Efficiency

It is often claimed that policy makers in general have a good understanding of the levels of poverty across space, but identifying the poor continues to be a challenging task in much of the developing world. A recent empirical study on the targeting effectiveness, which reviewed programs in 47 countries, has demonstrated that there is a considerable variation in targeting performance of SSN programs, and that more than a quarter of the SSN programs are actually regressive (Coady, Grosh, and Hoddinott 2002). A major difficulty often is in identifying and addressing transient poverty, and in India this issue forms the basis for arguments for reverting from TPDS to universal PDS (MCA 2001; Swaminathan 2003). This section discusses some of the available estimates of targeting efficiency from Dutta and Ramaswami (2001) and Dev et al. (2004).

Targeting efficiency is typically measured as Type 1 error (inclusion of non-poor in the PDS) and Type 2 error (exclusion of poor from the PDS).⁵⁶ Dutta and Ramaswami (2001) provide estimates of targeting errors at the state level for Andhra Pradesh and Maharashtra using NSS data for the year 1993-94. Dev et al. (2004) provide village level estimates for six villages – two each from the three regions Telangana, Rayalaseema and Coastal Region of Andhra Pradesh – based on the CESS-IFPRI household survey conducted in 2002. Table 3.7 reports these two sets of estimates.

Table 3.7 – Estimates of targeting errors in Public Distribution System (PDS)

State / Village	Inclusion Errors (Type-I)	Exclusion Errors (Type-II)
State level estimates*		
Maharashtra		
Rural	11.30	49.90
Urban	4.12	51.34
Total	6.92	49.61
Andhra Pradesh		
Rural	22.35	20.42
Urban	4.29	36.40
Total	14.35	22.29
Village level estimates from Andhra Pradesh**		
Gandhinagar	53.3	26.2
Mamidigudem	53.4	27.8
Veerapuram	60.9	46.1
Kadapagunta	31.8	38.4
Klpuram	43.9	25.3
Patharlagadda	60.5	29.9
All villages	50.2	32.1

Source: * State level estimates are from Dutta and Ramaswami (2001).

** The village level estimates by Dev et al. (2004) based on the IFPRI-CESS micro survey, 2002.

The estimates by Dutta and Ramaswami (2001), which pertain to the period when universal PDS was in operation, show that targeting errors are large with substantial variation across geographic locations. Strangely, however, they also show that in general inclusion errors are smaller compared to exclusion errors (except in rural Andhra Pradesh), when in fact one would expect the converse to be true under universal PDS. The village level estimates by Dev et al. (2004) for year 2002 when the TPDS is in operation shows that exclusion errors are smaller than inclusion errors

⁵⁶ Formally, the Type 1 (T_1) and Type 2 (T_2) errors can be written as, $T_1 = \left(1 - N^{pb}/N^b\right) \times 100$ and $T_2 = \left(1 - N^{pb}/N^p\right) \times 100$, where N^{pb} is the number of poor beneficiaries, N^b the total number of beneficiaries, and N^p the total number of poor in the sample.

(except in the village Kadapagunta), which is as expected, though both inclusion and exclusion errors are very large in general compared to the state level estimates by Dutta and Ramaswami (2001) for 1993-94.

3.3. Overall Cost Effectiveness of Selected Programs

One finding that has echoed repeatedly in recent studies is that the food subsidy bills have been rising for many years. If the programs are efficient – that is, benefits reaches the intended beneficiaries – then an increase in the subsidy due to an expansion in the program and / or the magnitude of the transfer, may be justified. However, if the programs are inefficient in the sense that it is expensive to transfer benefits to the intended beneficiaries, then any increase in subsidy bills would imply wastage of scarce public resources, which can have higher social returns in alternative investments. It is therefore critical to evaluate the cost effectiveness of the various SSNs in India in order to identify the most efficient mechanisms for transferring incomes to the poor. This section summarizes the findings of the study by Dev et al. (2004) who estimated the overall cost-effectiveness of five different social safety net programs in the country, viz., the PDS, APRS, EGS, JRY and ICDS, for the year 1999-00.

Dev et al. (2004) define cost-effectiveness as the public costs of transferring one Rupee worth of benefits to the beneficiaries, which is the ratio of total public expenditure on a program to total income gains to the target group. The public expenditure data are available from government budgetary documents and income gains were computed from survey data. Income gains to poor households from the PDS and the APRS computed from the NSS household surveys were discussed earlier. Since the NSS surveys do not cover other SSNs Dev et al. (2004) adopt an indirect approach to estimate the income gains from these programmes. Details of the methodological steps, assumptions and parameters used in these calculations, etc., can be found in Dev et al. (2004). Here we confine to discussing their estimates of the cost-effectiveness of various SSNs and their policy implications.

PDS and APRS

Considering the case of the PDS, total annual public spending in 1999/00, on rice and wheat subsidy was Rs.73.16 billion and total population in urban and rural India were 20.23 and 54.52 million, respectively. From NSS data and population statistics, the weighted average income gain for India as a whole is estimated to be Rs.10.95 billion. Thus, cost of transferring Rs.1 worth of benefits is simply $73.16 \div 10.19 = 6.68$. Dev et al. (2004) also carry out a counter-factual estimation of the costs of transferring benefits under perfect targeting, which turns out to be 75 percent lower at Rs.1.52

only. Similar estimations for the APRS turn out a figure of Rs.6.46 (actual) and Rs.1.59 under perfect targeting.

JRY and EGS

In 1999-00, the year for which Dev et al. (2004) have estimated the cost effectiveness of SSNs, the JRY was the major national level employment program in operation. As already indicated, Dev et al (2004) adopt an indirect approach to estimate the cost-effectiveness of these programs, as household survey data were not available to calculate the income gains from the programs. They combine the readily available information on government expenditure on these programs, with two other pieces of information from secondary sources, viz., (i) percentage of total expenditure that goes as wage payment to the employees, and (ii) percentage of poor employees in these programs, which other studies suggest is about 82 percent. They accordingly make adjustments for the presence of non-poor in the program, and work out the costs of transferring Rs.1 worth of benefits through the JRY to be Rs.2.28. Similar calculations for the Maharashtra EGS works out to be Rs.1.85.

ICDS

Computing the cost effectiveness of ICDS as a ratio of total government expenditure to income gains is problematic for at least three reasons. First, unlike other programs, ICDS combines training, nutrition, and education for which long term welfare implications are more important than immediate income gains. Second, the program also receives contributions notably in the form of training and supplying nutritionally enriched food from foreign donors and non-government organizations. That is, neither costs nor benefits can arguably be computed without bias in one way or the other. Finally, there are no reliable survey data or concurrent evaluations of the actual transfer in the food component of the program. As an alternative, Dev et al. (2004) calculate the cost of transferring Rs.1 worth of transfer as the ratio of total administrative costs to the market value of the food transferred, which turns out to be Rs.1.44.

Table 3.8 summarizes these estimates of the cost-effectiveness of alternative SSN programs.⁵⁷ The main message that emerges from these estimates is that self-targeted programs such as the nutrition programs (ICDS) and employment programs (EGS and JRY) are more cost-effective than universal or administratively targeted food transfer

⁵⁷ It may be noted here that the estimates by Dev et al (2004) are close to those by Dutta and Ramaswami (2001) for Maharashtra and Andhra Pradesh for the year 1993-94.

programs (such as the PDS or APRS). A similar conclusion was reached earlier by Radhkrishna et al. (1997) and Dutta and Ramaswami (2001).

Table 3.8 – Costs of income transfer in various social safety net programs, 1999-00.

Programs	Total program costs (billion Rs.)	Cost of transferring 1 Rupee to the poor	
		Actual	If targeting was perfect
Public Distribution Systems (PDS)*	73.16	6.68	1.52
Andhra Pradesh Rice Scheme (APRS)	10.63	6.46	1.59
JRY (public works)**	1.18	2.28	--
Maharashtra Employment Guarantee Scheme		1.85	--
ICDS (Integrated Child Development Services)	8.8	1.44	--

Notes: * Due to the unavailability of state level data, total spending on PDS represents only the subsidies by the central government. This implies that the estimates of income transfer costs would have been larger if the state subsidies had been added. ** Jawahar Rozgar Yojana

Source: Dev et al (2004).

3.4. Summary and Implications

The objective of this chapter has been to (a) to evaluate the PDS / TPDS in terms of its accessibility, effectiveness in transferring income, reducing poverty, and its targeting efficiency; and (b) to examine overall cost-effectiveness of various social safety net programs. Three important messages emerge from the analysis here. First, compared to 1986-87 when universal PDS prevailed, the access, income gains, poverty impacts and targeting efficiency of the TPDS in 1999-00 is better. This goes against the recommendations made in the Report of the High Level Committee on Long-term Grain Policy (MCA 2002a) for reverting back to universal PDS. Second, the targeting errors, inclusion of non-poor and exclusion of poor, are both large with substantial variations across states, implying that there is significant scope for improvement. Finally, the estimates of overall cost-effectiveness indicate that self-targeted programs are more cost-effective than universal food subsidy programs. The cost of transferring one Rupee worth of benefits is found to be the lowest for the ICDS (1.44) followed by the EGS (1.85) and the JRY (2.28). With estimates of 6.68 and 6.35, respectively, the PDS and APRS appear to be much more expensive than the other programs.

The broad policy message from the chapter is that, although there is room for improving efficiency, targeted SSNs are more cost-effective in transferring benefits to the poor. The self-targeted programs, such as EGS and ICDS, not only provide the poor with access to food but also contribute to overall development by building rural infrastructure and providing health and nutrition education, which help increase productivity and build a healthy labour force. Thus, a move in the future that lays increasing importance to self-targeting employment programs even while de-

emphasizing the role of untargeted or administratively targeted food based SSNs such as the PDS / TPDS would be both welfare improving as well as efficient. Besides, such a move will also reduce the need for government intervention in food markets for procuring, storing and supplying foodgrains to PDS and other such food based SSNs. This would enable the country to carry out reforms to the foodgrains policy regime and move away from *parastatal*-led price stabilization to market-led price stabilization regime.

4. Rationale for Reforming the Foodgrain Management Policies

Food policy in India has been motivated by two important concerns, viz., the need to stabilize foodgrains supplies and prices *over time* and *across regions*. Underlying these two concerns is the need to ensure food security for the teeming millions of the poor that live in this country. While supplies have improved and the country has turned self-sufficient in foodgrains, incidence of poverty and food insecurity continues to haunt this country. Along with that is the continuing need for food price and supplies stabilization. While the objective is not in question, it is the means to achieve it the objective that needs a rethink. The previous chapters have demonstrated the adverse effects resulting from continuing with public intervention in foodgrains procurement, storage and distribution. These include the government incurring huge subsidies, high cost of interventions like PDS and little gain reaching the actual intended beneficiaries, i.e. the poor people of the country. There is also the penalty being paid in terms of inefficiency as a result of the crowding out of the private sector due to the dominating presence of the government. In this chapter, we present several arguments that justify the need to extend the reforms to the existing pricing policies and grain management polices.

4.1. The Changed Context

At the time of independence from British rule and for the first few decades subsequently, four major factors provided the rationale for public intervention in foodgrain management in India. These were (a) lack of market integration due to inadequate public goods, such as roads, telecommunications, and other marketing infrastructure; (b) absence or inadequacy of risk-mitigating institutions, such as insurance and credit; (c) high volatility and thinness of the world grain markets; and (d) international liquidity constraints faced by the country. During the earlier decades, infrastructure facilities such as roads and communications network were grossly inadequate; farming was essentially a gamble with the weather and farmers operated under uncertain market conditions; the country was a large grain importer in an era when the world market was very thin and highly volatile; formal risk mitigating institutions (credit and insurance) were virtually non-existent in rural areas; and the country was severely constrained by international liquidity. Under those conditions, public interventions in grain markets were theoretically consistent as they addressed various sources of market failure. However, the present day conditions are drastically different, and it is important to assess whether the above rationales that earlier justified public intervention are valid today.

4.1.1 Infrastructure and Information Flow

Transport and communication infrastructure are critical factors that affect flow of market information and commodities across space and are key determinants of market integration. In the 1960s, when India embarked on Green Revolution, these infrastructure facilities were absent or very limited across the Indian states. As a result, *arbitrage failures* manifested as localized supply shortages and price hikes frequently, and posed a major challenge to policy makers. The conditions, however, have changed over time. All indicators of infrastructure and information flow in India – roads, telephone, radio, and television densities – have shown dramatic improvement since 1970 (see Tables 4.1 and 4.2).

Table 4.1 – Indicators of Indian Infrastructure

Period	Paved Road	Ground Line Telephones	Cellular phones	Televisions	Radios	Ground Line Telephones	Cellular phones	Televisions	Radios
	(in 000 km)	(per 1000 people)				(per household) ^b			
1960s		1.45	--	--	--	0.007	--	--	--
1970s	334 ^a	2.7	--	0.051	31.051	0.014	--	0	0.155
1980s		4.37	--	7.32	61.52	0.022	--	0.037	0.308
1990s		16.124	1.332	57.25	103.96	0.081	0.007	0.286	0.52
2000	1,363	32.039	3.533	78.03	120.53	0.161	0.018	0.39	0.603
2001		37.523	6.262	82.76		0.188	0.031	0.414	
2002	1,902	39.756	12.178			0.199	0.061		
2003		46.284	24.747			0.231	0.124		

Notes: a – 1970; b – assuming 5 people per household.

Source: Rashid et al (2005).

Table 4.2 – Progress in Rural Telecommunications and Transport Infrastructure

Year	Transport access index ^a	Road availability index ^b	Teledensity ^c	Telephone penetration ^d	Telecommunication availability index ^e
1991	3.64	57.04			
1992	3.46	57.48			
1993	4.01	52.99	0.18	0.98	3.8
1994	4.27	58.98	0.23	1.26	5.0
1995	4.23	59.96	0.35	1.91	7.1
1996	4.77	59.12	0.42	2.30	7.9
1997	5.00	60.31	0.51	2.81	8.2
1998			0.67	3.67	8.5
1999			0.84	4.63	9.0

Notes: a – Transport access index – Number of tractors per 100 people, b – Road availability index – Rural road length per 100 sq.km, c – Teledensity – Number of direct exchange lines per 100 people, d – Telephone penetration – Number of direct exchange lines per 100 households, e – Telecommunication availability index – Number of exchanges per 100 sq.km

Source: NCAER (2007).

Between 1970 and 2000, paved road network has more than quadrupled from 334 thousand kilometres to 1,363 thousand kilometres (Table 4.1), which Rashid et al. (2005) point out, is a significantly higher growth than in some of India's neighbours (Pakistan and Bangladesh), or even East Asian countries like Indonesia and the Philippines. According to a recent report on rural infrastructure in India published by the National Council of Applied Economic Research (NCAER) "the proportion of villages connected by rural roads has gone up considerably during the past 15 years. In all, 13 states and union territories have village connectivity of 85 percent or more, 5 states have 60-85 percent connectivity, and 14 states and union territories have less than 60 percent connectivity" (NCAER, 2007). The increased road availability has certainly improved the transport access in rural areas (Table 4.2).

Similarly, indicators of access to information have improved as well during this period. In 1970, only one household in 74, 4000, and 6 households owned a telephone, television, and radio, respectively.⁵⁸ By contrast in 2000 almost every 5th household had access to phone line, every 3rd household owned a television set, and every other household could listen to a radio. As of December 2004, 85 percent of India's 6 million villages had at least one village public telephone, and there were 13.04 million direct exchange telephone lines (NCAER, 2007). Other measures of rural telecommunication infrastructure, such as teledensity, telephone penetration and telecommunication availability index also show rising trend in the 1990s (Table 4.2).⁵⁹ The most remarkable improvement is the spread of mobile phones, from around one per 2420 households in 1995 when they were introduced in India, to one per just 8 households in 2003. While the density of mobile phone in rural areas is still low, the culture of sharing (or using for a fee) has meant that it is no longer uncommon for a foodgrains trader to carry a mobile phone and stay in touch with traders in distant locations. As a result, price information now gets transmitted in minutes and traders in various locations are better linked than ever before in the country.

Did the improvement in transport and communication infrastructure translate into better performance of domestic markets? A review of the available studies on this

⁵⁸ All household level calculations are based on the assumption that an average household consisted of five members and that the ownership distribution is normal.

⁵⁹ Though in comparison with other countries these values are still very low.

question show mixed conclusions, though none of these studies suggest that Indian foodgrains markets are spatially disintegrated from mid-1980s onwards. Four out of six studies conclude that the markets are integrated in the long run, but not in the short run (Table 4.3). The other two studies find that Indian foodgrains markets are integrated both across states and various market locations within the states. These studies also seem to suggest that government regulations on movement of foodgrains within and across states, and not lack of infrastructure, could be the reason for the lack of integration in the short-run. For instance, a World Bank study reports “transportation of foodgrains by road requires passage through a large number of checkpoints that increase costs and reduce private traders’ profitability due to inordinate delays and payment of *speed money*” (World Bank 1999).

Table 4.3 – Recent Market Integration Studies in India

Country / Study	Geographic Coverage	Time Period	Key Findings
Gosh, M. (2003)	Wheat markets in Bihar, Haryana, Punjab, Rajasthan, Uttar Pradesh	1984-97	Wheat markets within and across states are spatially integrated;
Kumar & Sharma (2003)	Rice in regional markets in Haryana		Integrated in the long run, but not in the short run
Jha et al. (1998)	All India, state to state price transmission analyses	1984-97	Wheat markets are integrated across states
Palaskas & Hariss-White (1993)	Rice in three regional markets in West Bengal	1988-90	Integrated in the long run, but not in the short run
Puri (1997)	All India level analyses of rice and wheat	1985-95	Most markets integrated in the long run, but not the short run
Baulch & Jariath (1997)	Wheat in seven regional markets in Rajasthan	1992-96	Not integrated in the short run

Source: Rashid et al (2005)..

4.1.2 Risks Mitigation and Technology Promotion

In mid-1960s, when India embarked on the Green Revolution, the challenges of promoting new technologies were real. Domestic markets were poorly integrated, insurance and credit markets were either missing or incomplete, and farmers operated in a highly uncertain production and marketing environment, all of which only increased the risks of adopting the new technology. Even the government was not adequately prepared to handle the huge spurt in production that these technologies unleashed. In 1967, the first year of large-scale cultivation of High Yielding Variety (HYV) seeds, wheat output jumped from 12 to over 17 million tons. That the country was not prepared for the additional 5 million tons is clear from the fact that many schools in rural Punjab were closed in order to store the grains. The policy response to this challenge was to establish a floor price guarantee and to invest in storage capacity.

The policy, implemented firmly by a committed government, worked in the subsequent years and received wide spread public support.⁶⁰

However, times have changed. HYVs now cover more than eighty percent of all area sown to wheat and rice at the national level (Table 4.4), while in the main surplus states of Punjab and Haryana, the coverage reached 90 percent by the 1980s itself. Considering that provision of irrigation, which is a critical input for HYVs but not for traditional varieties, is only a little over 40 percent at the national level, the large scale adoption of HYVs clearly suggests that Indian farmers have mastered the new technology, and may not need price guarantees to overcome technology risks.

Table 4.4 – Percentage of Area Sown to Modern Rice and Wheat Varieties by State

Years	RICE					WHEAT				
	Andhra Pradesh	Punjab	Uttar Pradesh	West Bengal	All India	Haryana	Madhya Pradesh	Punjab	Uttar Pradesh	All India
1966-68	8.43	5.29	4.09	2.67	4.88	---	---	---	---	17.96
1969-71	18.35	40.40	16.09	11.30	15.34	55.80	---	69.12	---	35.38
1972-74	54.16	81.68	24.83	14.92	25.97	---	---	---	---	57.93
1975-77	62.09	89.84	42.01	23.29	35.39	88.66	---	---	---	69.62
1978-80	69.49	93.44	45.78	33.82	42.56	91.89	---	98.04	---	70.09
1981-83	82.82	95.15	51.18	35.88	50.10	---	---	---	---	75.83
1984-86	87.50	95.31	65.38	39.36	56.92	94.88	---	---	---	---
1987-89	85.29	92.62	71.14	50.52	60.09	---	---	---	---	---
1990-92	90.58	93.45	81.88	58.59	65.17	98.00	64.32	100.00	96.43	87.77
1993-95	90.13	93.22	84.03	65.98	70.92	96.82	67.29	99.91	98.13	90.16
1996-98	95.79	94.61	89.54	76.06	76.92	96.77	73.73	100.00	96.95	88.91
1999-01	88.75	95.35	91.91	72.57	80.27	97.78	74.10	100.00	---	86.32

Notes: --- means data not available.

Sources: Rice statistics are from IRRI (2004: Tables 8 and 35). Wheat statistics are from MOA (2005a).

4.1.3 Thinness and Volatility of Global Food Markets

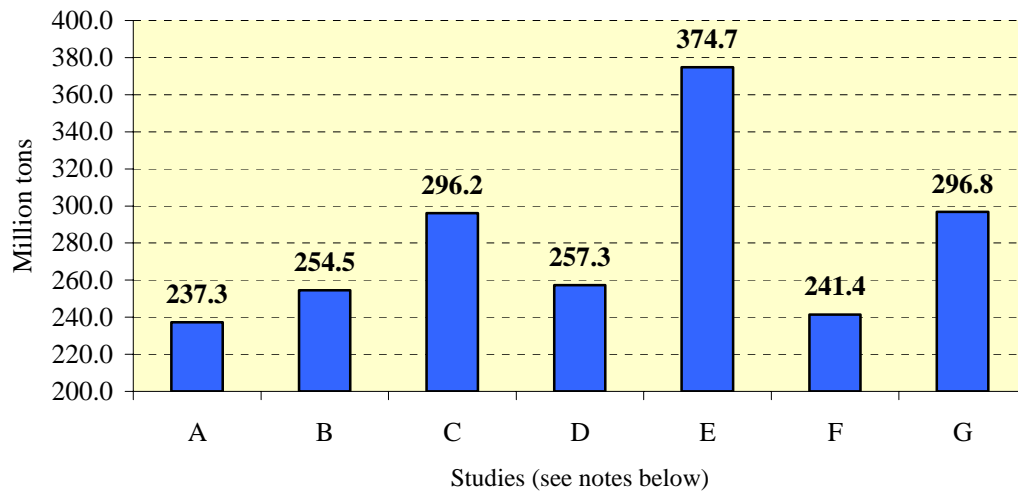
Attaining self-sufficiency and reducing reliance on international markets have been an overarching objective of Indian food and agricultural policies. These objectives might have been justified in the early decades following independence when (i) India was a large-scale importer of foodgrains, and (ii) the world market was too thin and highly volatile. The general perception was that as a large country, India could destabilize the world market by becoming an active buyer, and reliance on thin and volatile world markets would only jeopardize national food security. However, during the last two decades the situation has changed on both counts.

⁶⁰ Later literature view this policy response as a variant of forward-pricing, one that would avoid issues of moral hazard and adverse selection, which are common challenges in instituting futures markets in developing countries (Stiglitz 1986 and Islam and Thomas 1996).

On the basis of production trends and future demand projections, the second argument is no longer valid. Total foodgrains production has more than quadrupled since India's independence, from about 50 million tons in 1950/51 to about 210 million tons in 1999/00, rendering the country net exporter of grain (Dev 2003). A number of studies have attempted to project future demand and supply of foodgrains in India⁶¹. The projected demand and supply for the year 2020 are shown in Figures 4.1 and 4.2, respectively. As can be seen, these projections vary wildly depending upon the model and parameters (elasticity) specifications, as well as assumptions about the future path of the economy in general and production characteristics within agriculture in particular. It must be mentioned here that none of these studies have attempted to validate their model performance by tracking the past data before forecasting for the year 2020. Thus, tremendous uncertainty shrouds these projections. Further, given the large variations in both demand and supply projections any attempt at assessing the demand-supply gap is fraught with tremendous uncertainty. With this cautionary note, we attempt to evaluate the position at the (i) mean, and (ii) median values of the projected demand and supply. It turns out that the country would be a net exporter at both the mean and median values of these projected demand and supply. At the mean value of the projected demand and supply, net-exports are likely to be about 5.7 million tons, while at the median value net-exports would be about 22.1 million tons. If this assessment is at all worthwhile, then it implies that the country is likely to be a net seller of foodgrains in the world market and not a net buyer in the foreseeable future.

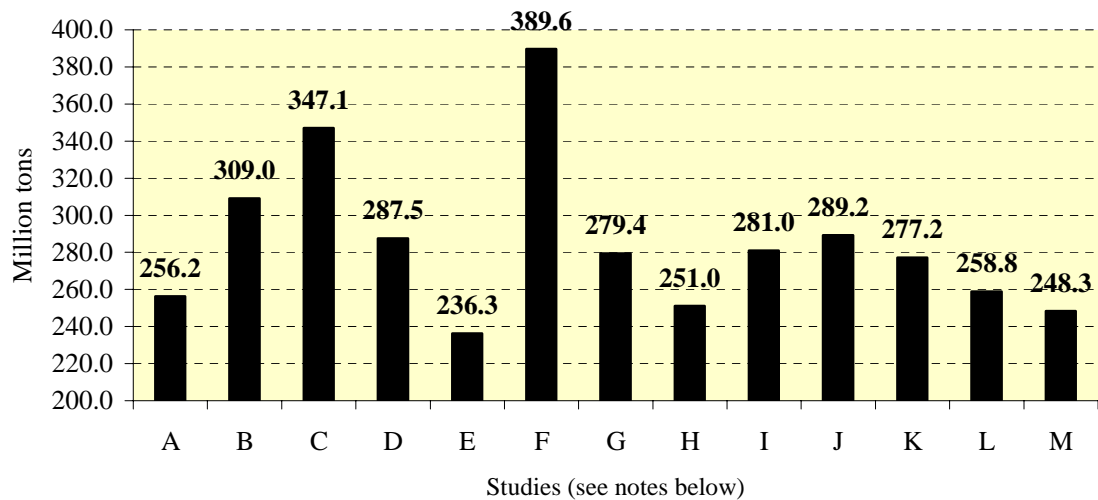
Figure 4.1 – Alternative foodgrains demand projections for year 2020

⁶¹ For demand projections for the year 2020 see Rosegrant et al (1995), Bhalla and Hazell (1997), Bhalla et al. (1999), Kumar (1998), Bansil (2003) and Chand (2006), while for supply projections see Rosegrant et al (1995), Kumar and Rosegrant (1997), Bhalla et al. (1999), and Kumar and Mittal (2003).



Notes: A - Rosegrant et al (1995) - IMPACT Baseline; B - Kumar (1998); C - Bhalla et al (1999) - Baseline (3.7% growth in per capita income); D - Bhalla et al (1999) - 2% growth in per capita income; E - Bhalla et al (1999) - 6% growth in per capita income; F - Bansil (2003); G - Chand (2006).

Figure 4.2 – Alternative foodgrains output projections for year 2020



Notes: A - Rosegrant et al (1995) – IMPACT Baseline; B - Kumar and Rosegrant (1997); C - Bhalla et al (1999) – Time trend; D - Bhalla et al (1999) – Fertilizer use at agronomic optimum; E - Bhalla et al (1999) – 100% irrigation potential achieved; F - Bhalla et al (1999) – Most optimistic (fertilizer & irrigation); G - Bhalla et al (1999) – 1/2 of most optimistic; H - Bhalla et al (1999) – 1/4 of most optimistic; I - Bhalla et al (1999) – 1/4 of most optimistic + improved seeds & productivity; J - Kumar and Mittal (2003) – Baseline; K - Kumar and Mittal (2003) – Baseline without TFP growth; L - Kumar and Mittal (2003) – Baseline without area growth; M - Kumar and Mittal (2003) – Baseline without TFP and area growth.

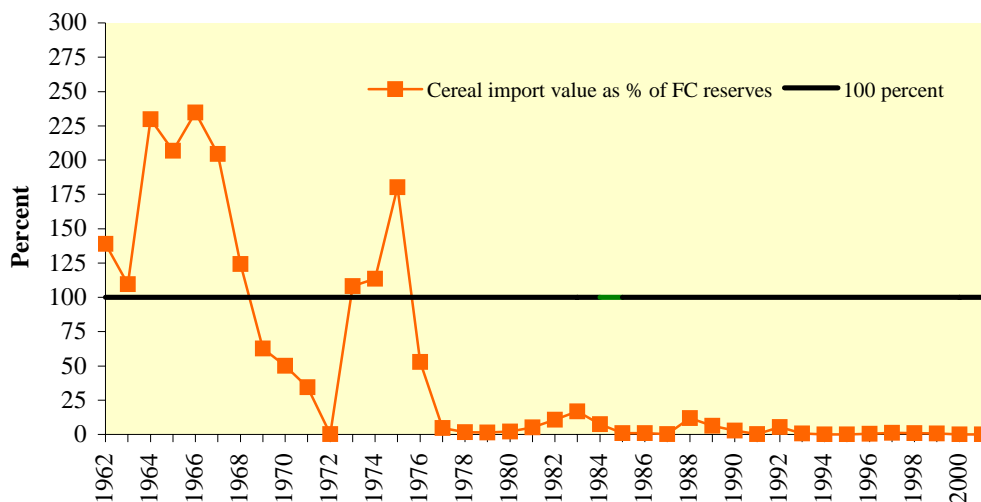
Even if the country were to become an importer of foodgrains, thinness and volatility of world grain market are not such major concerns in present times as they were forty years ago. Global foodgrains markets have matured in terms of traded volume, measured in percentage of total global production and consumption, and volatility has decreased (Rashid, et al. 2005). Although higher than domestic markets, world price volatility of both rice and wheat has shown significant decline in the past two decades, particularly in the 1990s. The world rice market has grown from about seven million tons in the late-1960s to more 25 million tons in recent years and the average change in absolute value of annual rice prices has declined from 24 percent during 1965-1981 to just 11 percent during 1985 to 1998 (Dawe 2004). In the case of the global wheat market, which has historically been robust, not only has volatility declined, but the real price has declined as well for more than two decades (CIMMYT 2001).

4.1.4 Ability to Participate in the International Market

A major macroeconomic driver of Indian food policy was the foreign exchange constraints that the country faced continuously in the first few decades following independence. As a result, India's ability to participate in the international markets was limited, and the country had to depend heavily on its political relationship with food-aid donors and their goodwill. The severity of the problem is shown in Figure 4.3, which plots the value of cereal imports as a percentage of foreign currency reserves.⁶² Three-year averages show that, except for the period 1970-72, the total cereal import value exceeded foreign currency reserve in India until about mid-1970s (Table 4.5).

⁶² Cereal import value includes government import, food aid, and other commercial imports. Foreign currency reserve does not include gold value, special drawing rights (SDR) and fund with the IMF .

Figure 4.3 – Cereal import values as percent of foreign exchange reserves, 1965-2001



Source: Authors' calculations

Examining the trends in the country's foreign exchange reserves and import capacity (defined as the export value of goods and services deflated by import price index) reveals a dramatic change in the situation over the past three decades. For example, in June-July 2004, total foreign currency reserve in India was US\$120 billion and rice was selling in the world market at \$185 per ton. This implies that, *ceteris paribus*, buying all the 25 million tons of rice available in the world market would take only four percent of the Indian foreign currency reserves – quite a contrast to the situation of the mid-1960s!

The dramatic improvement in the country's import capacity is not just in terms of its overall foreign exchange reserves, but also in terms of the net-trade position within agriculture. Trends in agricultural exports and imports show that Indian agriculture has been generating trade surplus of about US\$ 2-5 billions consistently since 1991 (Figure 4.4). In other words, Indian agriculture can itself pay for any food imports that the country might need occasionally.

Table 4.5 – Capacity to participate in international markets, 1961-2002

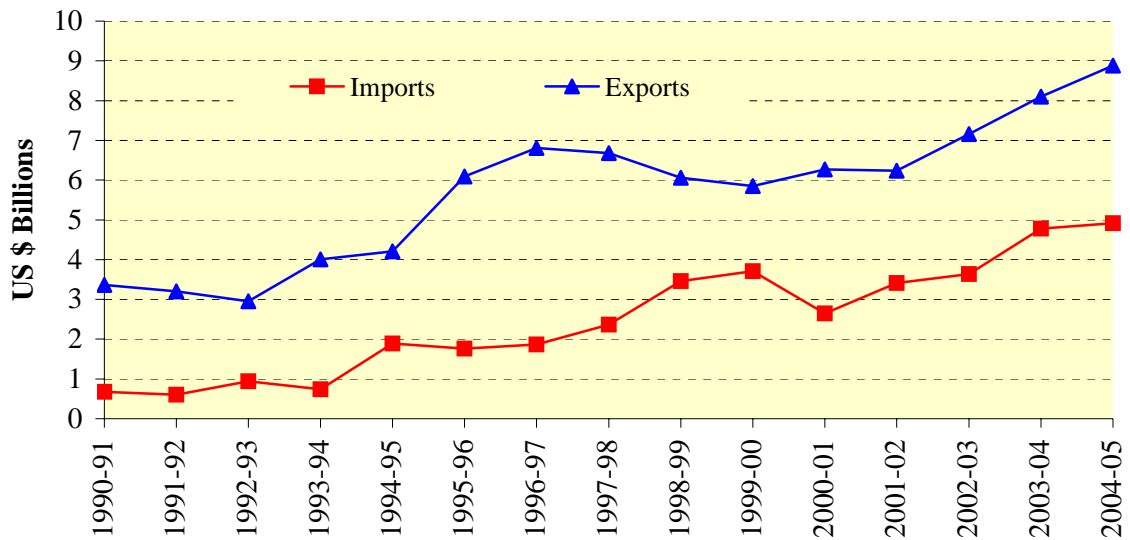
Period	Cereal Imports Value (Millions of US\$)	Foreign Exchange Reserve ¹	Cereal Imports as Share of Foreign exchange Reserves (In percent)	Capacity to Import Index ² 1995=100
1961-63	369	313	124.25	---
1964-66	698	312	223.81	---
1967-69	610	514	130.44	---
1970-72	224	654	33.03	22.81
1973-75	949	679	133.97	23.74
1976-78	557	4,435	19.68	30.14
1979-81	140	5,513	2.92	31.84
1982-84	491	4,297	11.61	38.36
1985-87	39	5,532	0.70	46.70
1988-90	240	2,819	7.01	58.36
1991-93	120	6,283	2.06	75.34
1994-96	40	18,865	0.20	98.68
1997-99	255	27,758	0.94	128.46
2000-02	4	41,258	0.01	171.08
2003-04	2	112,959	0.002	197.41

Notes: 1 Excludes SDRs, Gold, and IMF fund;

2 Current price value of exports of goods and services deflated by the import price index.

Sources: Authors' calculations based on data from FAOSTAT (2004) and WDI (2003).

Figure 4.4 – Agricultural exports and imports



Sources: Authors' calculations using (a) trade data from MOA (2005), and (b) exchange rate from GOI (2006).

4.1.5 Broad Based Economic and Trade Reforms

Above all these specific changes that no longer support the earlier rationales for public intervention in the grains market, is the change in the overall economic environment both in the global context and in the domestic context.

At the global level, two major developments (amongst others) that has considerably transformed the economic environment that countries now face are (i) the wave of trade liberalisation that followed the Uruguay Round of trade negotiations leading to the establishment of the World Trade Organisation (WTO); and (ii) the rapid growth in the volume, speed and scope of global capital flows. Foreign capital can in principle be beneficial to a country in relaxing the savings constraint it faces in boosting investment, improving technology and productivity, employment, income and thereby reducing poverty. The experiences of several countries suggest that global capital tends to flow to countries that have market-friendly economic policies and institutions. India too has witnessed large scale capital inflows since the mid-1990s that while easing the foreign exchange constraint it has historically faced, requires the country to follow a market-friendly policy to ensure that there are no sudden reversals of capital flows with disastrous consequences.

The WTO agreements have been a landmark development on several counts. First, they laid a foundation for widespread trade reforms cutting across all the sectors, both in developed countries and in the developing countries. Arguably, trade reforms became a global policy agenda – not just confined to a handful of reforming countries. Second, for the first time agricultural trade became subject to rule-based trading principles. As part of this, quantitative restrictions were replaced with tariff equivalents, which along with export subsidies eventually had to be reduced as per agreed formulae. This has considerably liberalised agricultural trade globally compared to the pre-WTO era, though there is still a long way to go. Three, it unleashed a rule-based system covering diverse aspects of international trade, such as standards (the Sanitary and Phyto-Sanitary measures), anti-dumping procedures, dispute settlement mechanisms, etc. Against this background, India can no longer follow trade restrictive policies in general, including in the foodgrains sector.

Indeed, India embarked on a broad-based economic reforms process since 1991 even prior to the setting up of the WTO. Underlying these reforms is recognition of the role and importance of market forces and the private sector, and the need to reduce and re-orient government's role in order to achieve a higher and sustainable growth rate that eventually would help reduce poverty in the country. These reforms are noteworthy

for (at least) two reasons: (i) the broad consensus in its favour cutting across most of the political spectrum giving the process a degree of certainty and credibility; and (ii) unleashing a high growth process that is now considered by most experts to be sustainable as seen in the over 15 years of high growth rate (in excess of 5%) witnessed by the country resulting in a perceivable rise in incomes and reduction in poverty. As part of this economic process, and subsequently as part of her commitments to the WTO, India liberalised its trade policies significantly. Standing in contrast to the liberal trade regime seen in most sectors of the economy today are the public intervention policies with regard to foodgrains management. The current grain management policies are incompatible with the market-friendly policies that the government has brought forth in most other sectors of the economy. Reforming the foodgrains management system is thus a necessity to bring them in line with today's overall market-friendly economic regime in the country.

4.2. World Trade Regime and India

The Uruguay Round negotiations ushered in a degree of discipline to world trade in agriculture. Quantitative barriers to agricultural trade have been replaced by tariff equivalents in most of the countries. Bounds were set on tariffs and some degree of tariff reductions was also achieved. Similarly, disciplines were brought upon export subsidies and domestic subsidies, and some reductions were also achieved. Sanitary and phytosanitary (SPS) measures are also now subject to WTO rules. The dispute settlement mechanism of the WTO provides the ways and means to resolve trade related disputes. Nevertheless, the world trade regime today is far from being truly liberal. Tariffs and export subsidies continue to be high for all practical purposes despite the reductions. So too are domestic subsidies for agricultural producers in several developed and developing countries. The SPS regime is far from conducive to trade in agriculture. Several other issues of market access continue to plague the system. Against such a background, what can India expect from trade liberalisation measures, whether carried out unilaterally or as part of a multilateral effort? What will be the impacts on agriculture, the food sector and welfare in general? Several studies have examined the issue of trade reforms in world agricultural trade.⁶³ Here we assess the findings of some of these studies from the Indian perspective.

Hertel and Keeney (2006) examine the potential implications of global trade reforms for different countries / regions of the world using a variant of the Global Trade

⁶³ The recent books by Ingco and Nash (2004), Ingco and Winters (2004), Aksoy and Beghin (2005), Anderson and Martin (2006), and Hertel and Winters (2006) contain several studies, which amongst them provide a fairly exhaustive coverage of the various issues relating to world agricultural trade, especially from a developing countries' perspective.

Analysis Project (GTAP) model, which is a computable general equilibrium (CGE) model of the world. They estimate the potential welfare gains from various agricultural and trade policy reforms scenarios under the Doha Development Agenda (DDA) of the WTO. Their results for India show that full global merchandise trade reforms involving the elimination of all tariffs, export subsidies and domestic subsidies, would result in a rise in both imports of agricultural products, textiles and apparel and other merchandise by 89%, 119% and 54%, respectively, over the baseline and the exports of these products by 88%, 31% and 57%, respectively. Compared to agriculture, the gains for India from liberalisation of non-agricultural sectors are less. A decomposition of the welfare gains for India shows that it is driven by efficiency gains, which are offset to a considerable extent (nearly two-thirds) by terms of trade losses.

Anderson et al. (2006) carry out a similar analysis of the impact of world free trade in merchandise for the year 2015 using the World Bank's recursive dynamic model known as LINKAGE. Their results for India show somewhat muted gains for India, with real income being higher by just 0.4% over the baseline case, though aggregate real exports and real imports rise by about 64% and 57%, respectively. Agricultural and food products exports rise by 53%, while their imports rise by 165%, resulting in an output loss of about 3.7%. Nevertheless, the country's food self-sufficiency levels remain more or less intact. Under these aggregate welfare results, however, lie significant welfare gains for the unskilled labourers and farmers in India who form the majority of the poor. Real wages of unskilled labour rise 2.8%, which coupled with a fall in consumer price index of about 6% improves their welfare substantially. It must be noted here that the above two studies are both essentially multilateral focused, from which we have summarized the findings for India.

A study with a clear focus on India is by Ganesh-Kumar et al. (2006) who analyzed the potential impacts of trade and investment related reforms in agro-processing and agricultural sectors, unilaterally by India and in the context of global trade reforms, using the GTAP model. Their results too show the impacts of trade reform *per se* to be small. A major finding of this study is that comprehensive domestic reforms in the agro-processing and agriculture sectors relating to investment that result in productivity improvements in both these sectors are more critical than trade reforms *per se*. And finally, unilateral reforms by India, especially those that improve productivity in agro-processing and in primary agriculture, are more important to India than multilateral trade reforms in general.

The main message from these studies is that India is unlikely to lose in any big way from trade reforms, whether done unilaterally or multilaterally. If anything there could

be some small gain at the national level, and significant gains for unskilled labour, who constitute the majority of the poor. It must be noted here that the underlying models used in these studies do not capture dynamic gains from trade reforms arising from re-allocation of resources across sectors that results in efficiency gains. If this is properly accounted for, the overall gains from trade reforms are likely to be much higher than what these studies predict. The other major message from these studies is that comprehensive domestic reforms that boost investment and productivity have far greater positive impact on welfare and growth. This only highlights the need to dovetail domestic policies with a liberal trade regime.

While these studies report on the impacts of trade reforms at an aggregate level, they remain silent on the distributional consequences of reforms across different sections of the population and across different regions. We examine this issue in the next section.

4.3. Distributional Consequences of Pricing Policy Changes: A Spatial Equilibrium Analysis

We have so far presented several arguments, supported with data where possible, against maintaining a highly interventionist grain management policies. It has been shown that the conditions that earlier justified the interventionist policies no longer hold, and in fact the situation is completely in contrast with that prevailing during the 1960s. But any change from the current system would have implications for the welfare of both consumers and producers. What would be the distributional effects of liberalizing the domestic and international markets of rice and wheat across various regions of India, which is a large and heterogeneous country with populations of various income classes, and especially on the poor? Rashid et al (2005) examine this issue through a partial-equilibrium multi-market (spatial) model. In this section, we summarize the findings of their study.⁶⁴

⁶⁴ The model used by Rashid et al (2005) is a partial equilibrium multi-market model, which specifies supply, demand, and income equations for two commodities, rice and wheat, 18 regions (States) and 20 income groups (income deciles for rural and urban areas). On the supply side, producers' respond to the good's own price in each region and by deciles. The demand set describes consumers' response to the good's own price, the other good price, and income in each region and by deciles. Nominal per capita income is the sum of rice and wheat value of production (which varies with changing conditions), and other income (which is fixed). The model allows for international trade in both rice and wheat depending upon the domestic- international price relatives, adjusted for transport costs, port charges, and trade tariffs or subsidies. Taking the large country assumption, the model specifies an export demand equations for both goods, where the world price is determined endogenously. The model assumes a national market of goods, which determines equilibrium quantities and prices. Regional prices are determined relative to the national price level to which they are linked by fixed margins. Within each state, regional prices are adjusted to represent the effects of the procurement and distribution system. The model solves for production, consumption, and nominal income simultaneously for each income group in each region. The data used in the model pertains to year 2000-01.

Aggregate results: Under scenario I, the elimination of stock accumulation due to lower procurement requirement exerts a downward pressure on prices, resulting in adjustments in both quantities and prices across regions. The price level decreases by 9 percent for rice and nearly 17 percent for wheat. (Table 4.6) Consequently, aggregate supply decreases by 4 percent for rice and 9 percent for wheat, while aggregate demand increase by 8 and 13 percent for rice and wheat, respectively. Per capita income decreases by nearly 2 percent due to lower prices and lower production. The net effects, highlighted by the net welfare effects, are positive and amount to nearly 25 and 30 billions rupees for rice and wheat, respectively. As domestic prices drop, exports become more profitable and they increase by 5 and 25 percent for rice and wheat, respectively, but they remain under the quota. The world price adjusts to increased exports but by less than domestic prices. Imports remained unchanged as the import border price is still above the domestic price making imports too expensive.

The trade liberalization (scenario II) experiment results are very small in magnitude. Even after removing the import tariff, the import parity of rice is still above domestic prices making it too expensive to import. On the export side, the impacts on wheat are relatively larger because in 2000/01 wheat was subjected to more interventions than rice such as export quota and export subsidies. The subsidy is the main factor of change as the quota is not a constraint, and wheat exports decrease by nearly 59 percent. Effects on welfare are positive but relatively small.

Scenario III combines scenario I and II. Not surprisingly, we observe similar changes, but more pronounced in the case of domestic changes because both scenarios move in the same direction. On the other hand international trade effects from domestic and international liberalization counteract each other and the net effects are similar to the second scenario but smaller. Consumer welfare effects are positive and outweigh producer negative effects in all three scenarios resulting in positive net welfare. There is a slight synergy occurring as the combined effects are slightly larger than the sum of the first two scenarios.

For further details on the model structure, data sources, elasticities used, etc., see Rashid et al (2005). Using this model, they carry out the following three simulations:

- *Minimum Support Price, procurement, and stock policy reforms (Scenario I)*. Under this scenario public distribution to non-poor households (above the poverty line households) are eliminated, and procurement requirement is reduced to the level of public distribution targeted to poor households only (below-the-poverty-line households), and accumulation of stocks is not allowed.
- *International trade liberalization (Scenario II)*: Under this scenario, government's interventions in international trade such as import tariffs, quota, and export subsidies are removed.
- *Domestic market and international trade reforms (Scenario III)*: Domestic liberalization (scenario I) is implemented under a free trade environment (scenario II).

Table 4.6 – Aggregate results: Change from base scenario

	Domestic Policy Change Scenario I		International Trade Change Scenario II		Domestic Policy and International Trade Scenario III	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
	(in percent)					
Supply	-4.24	-8.79	-0.02	-0.43	-4.25	-9.35
Consumption	8.15	12.71	-0.01	0.66	8.14	13.52
Price	-9.12	-16.94	-0.03	-0.81	-9.16	-17.96
<u>International trade</u>						
Export	4.55	25.47	0.00	-58.49	4.55	-48.11
Import						
Export parity price	-9.12	-16.94	-0.03	-0.81	-9.16	-17.96
Import parity price	0.00	0.00	-38.58	-29.65	-38.58	-29.65
Per capita Income	-1.74		-0.05		-1.79	
	(in million Rs.)					
<u>Welfare Effects</u>						
Consumption	81,108	83,084	314	3,675	81,530	88,452
Production	-56,254	-53,396	-209	-2,760	-56,499	-56,539
Net effects	24,855	29,688	104	915	25,031	31,912

Source: Simulation results from Rashid et al (2005).

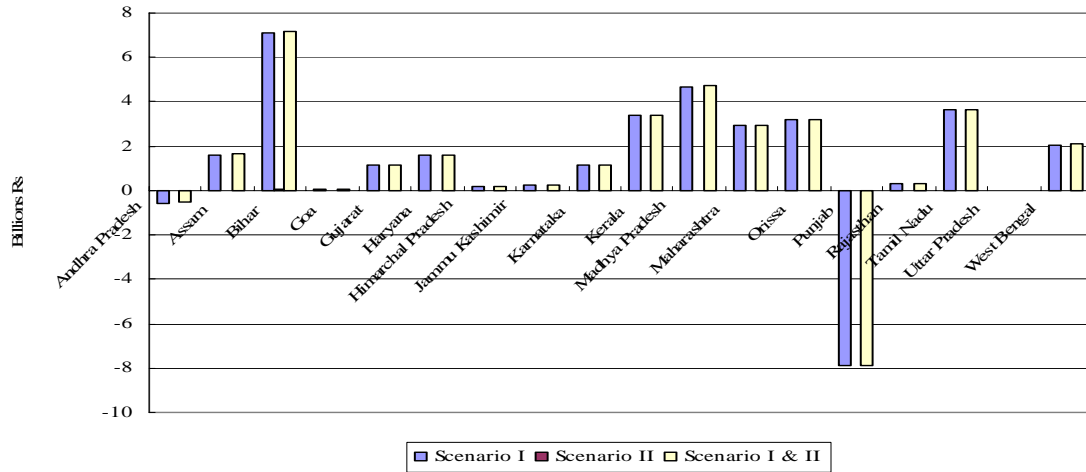
Regional results: The effects on the 18 regions are illustrated in Figures 4.5 and 4.6. In the case of rice, net welfare effects are positive in all regions except for Andhra Pradesh and Punjab (-1/2 and -8 billion Rupees, respectively). Although both states are surplus states, and experience the same drop in producer prices (above 11 percent, Table 4.7), in Andhra Pradesh, which is a large consuming state, the consumer benefits almost balance out producer losses, while in Punjab, where rice consumption is low, net effects are dominated by producers losses.⁶⁵

The big winners are Bihar and Madhya Pradesh (deficit regions), followed by Kerala, Maharashtra, Orissa and Tamil Nadu. While most states benefit from gains to consumers (which outweigh producer losses), Haryana producers benefit from higher producer prices (nearly 5 percent, Table 4.7), an indication that the procurement system acted like a tax on producers in that state. In the case of wheat, the net welfare

⁶⁵ While these results may appear somewhat disturbing, it must be noted here that the model used by Rashid et al (2005) is a partial equilibrium model, which captures only the first round (direct) effects on rice and wheat farmers. Faced with these losses, one may expect the rice and wheat farmers in Andhra Pradesh and Punjab to diversify to other high value agriculture (which is feasible given the rich water resources in both these two states). The gains from such diversification would dampen the losses from rice and wheat farming, and the net effects could be a much smaller loss or even an overall gain. These general equilibrium impacts are not captured in the simulations by Rashid et al (2005).

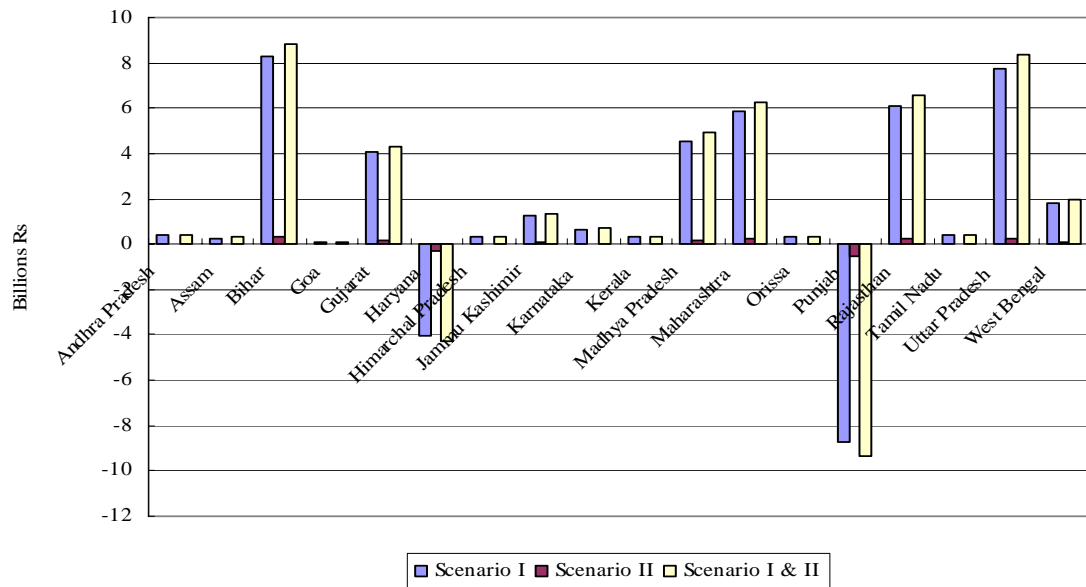
effects are positive for all states except Haryana and Punjab (-4 and -9 billions Rupees, respectively). Bihar, and Uttar Pradesh are the big winners (above 8 billions rupees) followed by Maharashtra and Rajasthan. The trade liberalization effects, although small in magnitude, are in the same direction as the domestic liberalization effects.

Figure 4.5 – Net welfare gains from rice, all scenarios



Source: Simulation results from Rashid et al (2005).

Figure 4.6 – Net welfare gains from wheat, all scenarios



Source: Simulation results from Rashid et al (2005).

Table 4.7 – State price results: percentage change from base scenario

	Domestic Policy and International Trade Scenario III		Domestic Policy and International Trade Scenario III	
	Producer Price		Consumer Price	
	Rice	Wheat	Rice	Wheat
Andhra Pradesh	-11.35	-17.97	-7.67	-17.40
Assam	-9.16	-17.95	-9.45	-17.91
Bihar	-9.21	-17.96	-9.34	-18.21
Goa	-9.16	-17.96	-7.79	-17.00
Gujarat	-9.16	-17.95	-10.75	-18.93
Haryana	4.73	-15.87	-10.27	-18.06
Himachal Pradesh	-9.13	-17.94	-9.83	-18.11
Jammu Kashmir	-9.16	-17.96	-9.48	-17.89
Karnataka	-9.27	-17.94	-8.63	-18.13
Kerala	-9.16	-17.95	-9.13	-14.73
Madhya Pradesh	-9.27	-17.51	-9.39	-18.39
Maharashtra	-9.28	-17.95	-9.98	-18.69
Orissa	-12.04	-17.96	-9.48	-17.95
Punjab	-11.30	-16.57	-9.14	-17.95
Rajasthan	-7.19	-17.77	-12.45	-18.36
Tamil Nadu	-10.51	-17.95	-9.46	-17.89
Uttar Pradesh	-10.82	-18.19	-9.81	-18.26
West Bengal	-9.50	-17.95	-9.42	-19.92

Source: Simulation results from Rashid et al (2005).

Household results: In order to simplify the results, region deciles have been aggregated into four groups: urban poor, rural poor, urban non-poor, and rural non-poor. Results at the household level reflect regional results. In all rice surplus states except Haryana, the rural non-poor lose because they are net producers (Table 4.8). Deficit states, where producers are net consumers, all household groups gain. In wheat surplus states, Haryana, Punjab and Uttar Pradesh, the pattern is the same, rural non-poor are negatively affected by the liberalization with net welfare losses ranging from 2 billions Rupees in Uttar Pradesh to 10 billions Rupees in Punjab. The other three

household groups show net welfare gains, particularly the rural poor even in losing states like Andhra Pradesh. Rural poor in Bihar and Uttar Pradesh are the big winners with net welfare gains ranging from 6.4 billion rupees in Uttar Pradesh to 7.7 Billion rupees in Bihar from both rice and wheat (Figures 4.7 and 4.8).

In short, liberalizing the food management system would result in a redistribution of income, from non-poor to poor households and from surplus to deficit states. Results also show that international trade liberalization will have marginal effects at the state level but they will tend to emphasize the effects of domestic markets liberalization. Removing import tariffs do not affect imports in spite of the resulting drop in import parity. It must be noted that the benefits from the above scenarios have not taken into consideration (a) the savings to the Indian government food subsidy budget from reducing the size of the current procurement-storage-distribution system and removing the subsidy on wheat exports or (b) from diversification, both of which could be considerable.

Table 4.8 – Net welfare effects from alternative policies: aggregate regions and household results

	Domestic Policy Change Scenario I		International Trade Change Scenario II		Domestic Policy and International Trade Scenario III	
	Rice	Wheat	Rice	Wheat	Rice	Wheat
	(in millions Rs.)					
<u>Region 1</u>						
Urban poor	338	1,361	1	55	340	1,455
Rural poor	1,592	4,769	6	198	1,600	5,093
Urban non-poor	1,024	5,762	4	257	1,029	6,129
Rural non-poor	-9,205	-16,947	-42	-1,018	-9,253	-17,908
<u>Region 2</u>						
Urban poor	768	22	3	1	772	24
Rural poor	4,207	55	15	2	4,229	60
Urban non-poor	5,048	436	23	20	5,078	464
Rural non-poor	-6,973	274	-11	12	-6,979	293
<u>Region 3</u>						
Urban poor	1,499	1,920	5	75	1,506	2,057
Rural poor	13,121	9,946	47	406	13,188	10,632
Urban non-poor	8,782	12,210	34	538	8,828	13,007
Rural non-poor	4,654	9,879	20	369	4,692	10,608

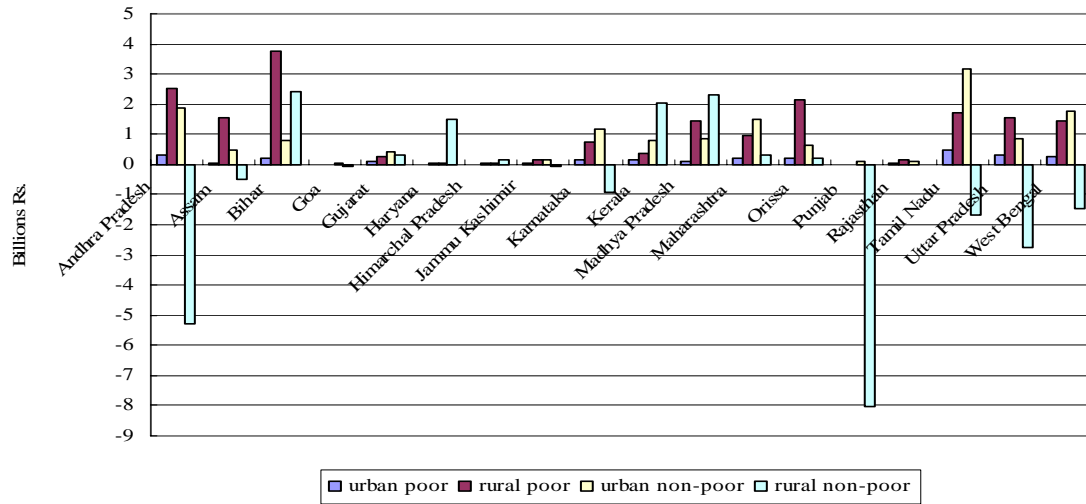
Notes: Region 1 includes Haryana, Punjab, and Uttar Pradesh and is a surplus region in both rice and wheat.

Region 2 includes Andhra Pradesh and Tamil Nadu, is a surplus region in rice and deficit in wheat.

Region 3 includes the remaining thirteen states and is deficit in rice and wheat.

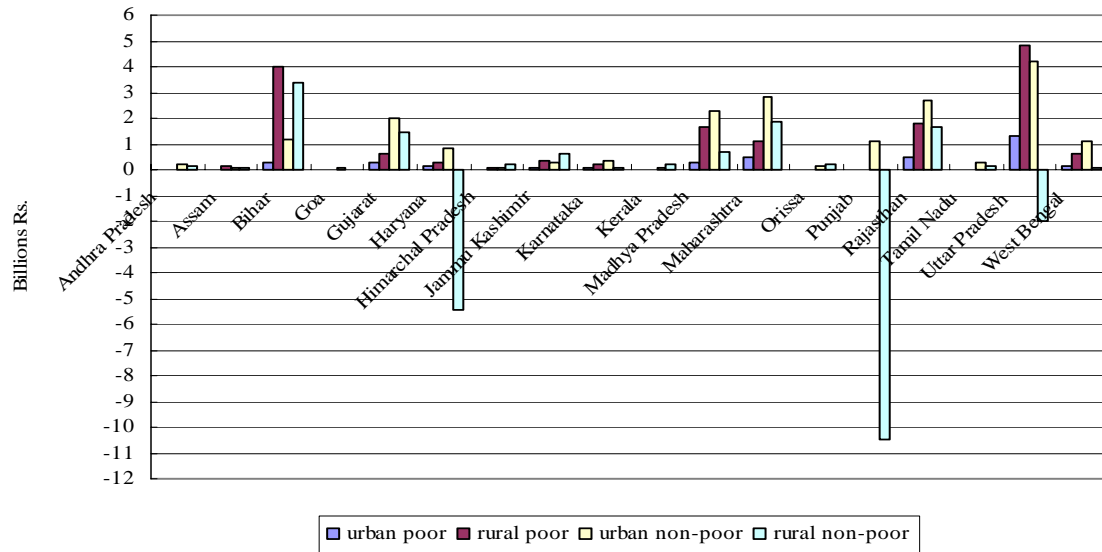
Source: Simulation results from Rashid et al (2005).

Figure 4.7 – Net welfare effects of households: scenario III, Rice



Source: Simulation results from Rashid et al (2005).

Figure 4.8 – Net welfare effects on various households groups: scenario III, Wheat



Source: Simulation results from Rashid et al (2005).

4.4. Experiences of Other Countries

The experiences of trade liberalization in several other countries also support the contention that reduced public intervention can contribute to efficiency gains and market development. Countries in Asia that have pursued this route have been able to allocate more resources to development and anti-poverty projects, increase competition in domestic markets, maintain price stability, and enhance overall social welfare.

Bangladesh has been able to allocate more resources to development and anti-poverty projects, increase competition in domestic markets, maintain price stability, and enhance overall social welfare. In Bangladesh, the share of public food in anti-poverty and development programs has increased from as low as 32 percent during pre-reform period (1971-1991) to as high as 85 percent during post-reform period (1992/93 to 2002/03); private sector participation in international trade has resulted in reducing the government's costs by an estimated US\$190 million per year; and more importantly, despite distributing larger proportion of food to the poor, annual food subsidy bills have declined from US\$122 million in the 1980s to about US\$65.4 million in the 1990s (Ali and Jahan 2003; Ahmed et al. 2000).

In Vietnam, where *parastatals* had absolute control over production and distribution of agricultural products until 1981, market liberalization has greatly contributed to increasing production, enhancing technology adoption, and improving overall social welfare. Rice production grew at a rate of 5.6 percent between 1988 and 1995, transforming Vietnam from being a chronic food deficit country to a leading exporter of rice in Asia (Goletti and Minot 1997, and Minot and Goletti 1998).

Not only did liberalization reduce subsidies and save public resources, it contributed to strengthening private markets too. In Bangladesh, the number of traders has risen by ten-fold between the 1970s and 1990s. The number of millers doubled from 6,155 in the 1960s, to 11,592 in the 1970s, and then increased more than fourfold by the 1990s to nearly 51,000. The liberalization of rice and wheat imports in the early-1990s, the removal of the import tariff on rice, and expediting clearance of price sector foodgrains imports in early 1998 have provided clear signals of government support for private traders in grain marketing. As a result, wholesale markets for both rice and wheat are spatially integrated, with over 80 percent of price changes transmitted between pairs of markets within two weeks (del Ninno et al.2001).

The number of private traders in Vietnam increased at an amazing rate after market liberalization. Tens of thousands of traders handle millions of tons of rice every year, channelling it from surplus farmers to urban consumers, rural rice-deficit areas, and exporters. The channels are numerous and differ from one area to another. Although

monopoly status of VINAFOOD and export quota are argued to be mechanisms to ensure adequate domestic supply and price stability, the country does not have price stabilization in conventional sense. In particular, SOEs / public agencies neither procure any significant amount from the farmers nor do they respond to seasonal and spatial price swings (Son et. al. 2003).

The experiences of these countries have demonstrated that there is much to gain – in terms of saving public resources and enhancing market development – by reducing public intervention in foodgrains markets. It is time for India to learn from the reformers and recognize the fact that public funds have alternative uses. The returns to some alternative investments are high – perhaps much higher than the returns to public price stabilization as currently practiced (Roumasset 2003, Fan and Gulati 2005).

5. Reform Measures Initiated to Promote Private Participation

The need to free the grain trading system in India from a plethora of outdated laws and institutions, which are actually suitable for a situation of scarcities, has been strongly felt even within the government. Indeed a number of official reports and studies sponsored by the government have recommended various reform measures to improve the efficiency of grain management (Table 5.1). Broadly, these recommendations involve removing the restrictive provisions of the law with regard to grain trading, liberalizing the grain marketing system in the country and improving the efficiency of the parastatals involved in grain management.

Table 5.1: Salient recommendations of government committees relevant to grain management

Study	Major suggestions/recommendations
Expenditure Reforms Commission's Report on Food Subsidy (2000):	Greater involvement of the state government and private sector in the procurement and storage operations, Rationalize the tax/levy structure on procurement from different states.
Cost of Acquisition & Distribution of Food grains by FCI, ASCI (2001) commissioned by Ministry of Consumer Affairs, Food and Public Distribution.	Restructure FCI, Federalise FCI among states.
Working Group on PDS and Food Security for the X th 5 Year Plan (2001 a)	Decentralized PDS, MSP in line with cost of cultivation, Review Essential Commodities & APMC Act.
Excess Food Stocks, PDS and Procurement Policy (2001 b):	State government and private sector's participation in procurement and storage, Decentralized PDS.
Long Term Grain Policy (2002):	Universal PDS, MSP in line with cost of cultivation, Improve FCI's performance, larger private participation.
Buffer Stock Policy for the X th 5 Year Plan (2003)	Lower buffer norms, Allocation to states according to previous off-take pattern
Report on Central Government Subsidies in India (2004):	Reduction of MSP, Replace the present 2-tier system of APL-BPL issue price with food-coupons for BPL.

Source: Deb (2006).

From Table 5.1, it can be discerned that the government foresees a change in the role of the FCI's from *the major buyer* to a *buyer of the last resort* and simultaneously

paves the way for private participation in the grain trade. This requires comprehensive changes to the legal provisions that currently inhibit private participation, and also the creation of new institutions that would enable effective participation of the private sector in grain marketing. The Central government has already taken some major steps in this direction. This chapter provides a brief overview of the salient features of important reform measures that the government has so far carried out.⁶⁶

5.1. National Policy on Grain Handling, Storage & Transportation

The National Policy on Handling, Storage and Transportation of Foodgrains (2000) was initiated to minimize the storage and transportation costs and improve the grain storage practices. The policy envisaged public-private partnerships to create infrastructure for bulk handling, storage and transportation on the models of Built-Own-Operate (BOO) basis. Under the BOO model, a private company is granted the right to develop, finance, design, build, own, operate and maintain a project. Consultation and active participation of the railways and other rail agencies has been encouraged while deciding upon the locations of these bulk handling and storage facilities in producing and consuming areas. Another salient feature of this policy is the development of infrastructure facility at ports.

5.2. Stock and Movement Restrictions (Essential Commodities Act)

The Essential Commodities Act (ECA), 1955, is a major piece of legislation from which most of the movement and storage restrictions on private traders emanate. It has been cited as an important reason for the lack of development of agricultural markets in general, and particularly in the context of foodgrains, and has been a stumbling block for private sector initiatives in developing agro-processing sector within the country. In 2002-03, the government attempted to remove the controls on farm produce that emanate from the ECA by using the following order: Removal of (Licensing Requirements, Stock Limits and Movement Restrictions) on Specified Foodstuffs Order, 2002 issued under the ECA dated 15/2/2002 with an amendment dated 16/6/2003. By this order, any dealer can freely buy, stock, sell, transport, distribute, dispose, acquire, use or consume any quantity of wheat, paddy/rice. Coarse grains, sugar, edible oilseeds edible oil, pulses, gur, wheat products, and hydrogenated vegetable oil or vanaspati shall not require any license or permit thereof. In addition, issue of any control order by the states under the delegated powers for regulating by licenses, permits or otherwise, the storage, transport, distribution, etc. of the specified

⁶⁶ We draw upon Deb (2006) for the material covered here.

commodities would henceforth require the prior concurrence of the Central government (Deb (2006)).

The government has also proposed certain amendments to the Act, viz., restricting the ECA to specific sectors (drugs, edible oils, and edible oilseeds, petroleum and petroleum products, seeds of food crops, fruits, vegetables, cattle fodder, jute seeds, wheat, paddy rice, sugar and sugarcane), and empowering the central government to add or remove any item from the list. To prevent the misuse of powers, it is suggested that the power be exercised only by the central government in the interest of the public. Thus, the cross-border movement of two PDS grains (rice and wheat) may continue to be restricted but the centre will reserve the right to free their movement (at times of plenty) across borders through notification.

Despite these changes to the ECA, the clamour for control has raised its head repeatedly from several state governments, and occasionally from sections within the central government also, which gives rise to uncertainty regarding policy matters.

5.3. Agricultural Marketing Reforms

Agriculture marketing in India is regulated under the Agricultural Produce and Marketing Committee (APMC) Act. It must be noted that that the APMC Act is a state level legislation and its features / details vary across states. Overall, two important features of this Act are that (a) sales and purchases outside the market yard are prohibited, in order to allow the government to control and regulate the markets; (b) it specifies that agro-processors procure raw materials only from the notified markets. These provisions meant that a few “licensed” or “registered” participants / agents / traders effectively controlled the markets and the Act essentially became a deterrent for the development of a competitive marketing system in the country. Moreover, inter-state variations in the Act posed additional problems for the development of a nation-wide integrated market for agricultural commodities.

To overcome these problems, a ‘Model Act on Agricultural Marketing’ has been prepared by the central governments. This model act contains provisions that (i) enable private and cooperative sectors to establish and operate (including levy of service charges) agricultural marketing infrastructure and supporting services, (ii) allow direct marketing of agricultural commodities from production point, without the necessity of going through licensed traders and regulated markets, (iii) permit *contract farming programs* by processing and marketing firms with the legal support provided by the APMC and granting tax concessions on account of market fee, cess, duties, taxes under the contract farming program, (iv) rationalize the market fee structure, and (v) promote marketing infrastructure development projects. It is expected that the state

governments would amend their respective APMC Acts and make them conform to this model Act. Yet most of the state governments, with few exceptions, have not yet come forward to reform their existing marketing acts.

5.4. Forward Contract (Regulation) Act, 1952

The benefits of future and forward trading in agriculture were restricted to very few commodities, primarily stemming out of the belief that it was speculative and that it hurts farmers and consumers while benefiting only the traders. Apart from the direct bans on forward trading, several other government interventions on storage and movement restrictions effectively stifled forward trading in agricultural commodities. In recent times, however, there is better appreciation of the vital role played by the forward market in price discovery, and in price risk mitigation. In 2001, the government set up an Expert Committee on Forward and Futures Markets, which made two key recommendations: (i) more commodities should be permitted for forward and futures trading to facilitate the competitive and free marketing system, and (ii) government efforts should be directed at strengthening the commodity exchanges by instilling confidence and awareness among market players.

Accordingly, the removal of prohibition on future trading was notified for a number of agricultural commodities in 2002-03. The items include foodgrains, pulses, edible oilseeds and oils and spices (Table 5.2). Futures trading in these commodities can now be organized through recognized commodity Exchanges, subject to the rules and regulatory procedures prescribed by the Forward Market Commission (FMC) that was established under the Ministry of Consumer Affairs, Food and Public Distribution. Currently, future commodity trading in agriculture involves several regulatory authorities, viz., FMC, Reserve Bank of India (RBI) and Securities Exchange Board of India (SEBI). Four commodity exchanges have been authorized in India, viz., National Multi-Commodity Exchange of India (NMCE), National Commodity and Derivatives Exchange (NCDEX), National Board of Trade Ltd. (NBOT), and Multi-Commodity Exchange (MCX). Of these, the NMCE, MCX and NCDEX are operational, and market-based tools for risk management are now available for farmers to hedge their exposures. Presently trading takes place in about 50 commodities at 22 exchanges/associations. The volume of trading in these exchanges has expanded (Table 5.3), but is still low compared to the production levels in India.

Table 5.2 – List of agricultural commodities allowed for Futures Trading (2003)

Foodgrains and Pulses: Wheat, Gram, Jowar, Bajra, Maize, Ragi, Small Millets (Kodan Kulti, Kodra, Korra, Vargu, Sawan, Rala, Kakun, Samai, Vari & Banti), Tur (Arhar), Urad (Mash), Mung, Moth, Masur, Kulthi, Peas, Lakh (Khesari), Barley, Guar, Rice or Paddy, Arhar Chuni, Mung Chuni, Tur Dal (Arhar Dal), Urad dal, Mung dal, Gram Dal, Khandsari Sugar.
Oliseeds, oils and Oilcakes: Linseed oil, Linseed Oilcake, Celeryseed, Cotton pods, Cotton Yarn, Cotton Cloth, Art Silk Yarn, Raw Jute (including Mesta).
Spices: Methi, Coriander seed, Aniseed, Pepper, Betelnuts, Cardamom, Chillies, Cinnamon, Cloves, Ginger, Nutmegs.

Source: Deb (2006).

Table 5.3 – Value of Trading in Agricultural Commodities

Exchange	Value of Trade (till Nov, 2004) (Rs. Crore)
National Commodity and Derivatives Exchange (NCDEX), Mumbai	91470
Multi Commodity Exchange (MCX), Mumbai	4384
National Multi Commodity Exchange (NMCE), Ahmedabad	9325

Source: Ministry of Consumer Affairs

There are also reports that the NCDEX is preparing to start off the spot-trading of agricultural commodities in 2006. This will not only provide the farmers an alternative to the traditional *mandis* for disposing the farm produce, but will also generate some competition with the existing state controlled APMCs. This will however require that the states amend their respective APMC Act. The turn-over from the spot markets are expected to be much bigger than the future market in agricultural commodities. Further, the NCDEX is arranging to introduce the *options contract* in the agricultural commodity trading exchanges in India, whereby, the farmer will have the option of switching-over to spot market if the spot-market prices are higher than the future-market. The growing trading volume of the commodity future markets is expected to effect additional employment and income opportunities in the Indian economy.

5.5. Negotiable Warehouse Receipt System

A major feature of the commodity derivatives market is that the physical delivery takes place alongside cash-settled deliveries, at the choice of both the buyer and seller. In fact, it is argued that the delivery process in the commodity futures market provides the equilibrating mechanism between the future demand and present supply, and also prevents any swings arising out of the mismatch between the two. The market, on the contrary, believes that the system of only purely cash-settled contract may lead to speculative trade. Thus, the availability of modern warehouse facility, a system of quality certification and the transferability and negotiability of the warehouse receipts backed by legal provisions are crucial for the growth of agricultural future markets.

A modern warehousing industry works as a key element specifically for the growth of future trading in voluminous commodities (such as rice and wheat). The warehousing system would accept goods, verify the grade, and issue a receipt to the customer. If this warehouse receipt is negotiable, it then becomes a tradable instrument and can change many hands till it reaches the end-user. A system of negotiable warehouse receipts also has other benefits, viz.; it becomes easier for banks to lend to the agricultural sector by using the warehouse receipts as collaterals. Further, it reduces the cost of public support and expenditures necessary for maintaining the existing agricultural marketing infrastructures. More importantly, the transaction costs in agricultural marketing operations get eliminated and the price risks to the farmers are reduced to a great extent. It is expected that increased volume of transaction would be a potential source of generating employment opportunities. All of these can potentially make the agricultural sector more responsive to market opportunities and more competitive in the world market.

Unfortunately, at present, banks are not allowed to participate in the commodity business (physical or derivatives) apart from bullion and spices. The bank financing of the commodity trade will initiate once the warehouse receipts can be used as collaterals. The banks are willing to finance against receipts once these become transferable through endorsement under Sale of Goods Act. This will allow banks to operate on behalf of the farmers in the market, which will lead to greater private investment in agriculture. The government is considering the amendment of the Negotiable Instrument Act 81 to make warehouse receipts a negotiable instrument.

5.6. Decentralized Procurement and Distribution

It is argued that a decentralized governance system helps to enhance efficiency, lower transaction costs involved in service provision, encourage innovation by activating intergovernmental competition and ensure greater participation of people from local

levels (Breton 1996). The decentralisation of governance and the devolution of decision-making process to local levels have remained in the agenda since the launch of major economic reforms program in India. The CACP in recent years has recommended that the Department of Food and Public Distribution should consider setting up a committee to evaluate the performance of decentralised procurement system and identify measures to make the system effective in all the states. Along with the de-centralization of procurement operations, the functioning of PDS should be a responsibility of the states with greater participation from the Panchayati Raj Institution (PRI), which is expected to make the functioning of the TPDS more transparent and accountable .

5.7. Summing Up

The government is concerned with improving the functioning of the grain sector. A number of high-level committees have been constituted, and several studies have been sponsored to seek alternative ways for managing foodgrains sector. Most of the recommendations of the various committees suggested greater participation of private sector in grain management. In the past the private sector participation in grain management was inhibited by several administrative and legislative controls and orders. To overcome the problems steps have been initiated by relaxing some of the controls. These were towards encouraging private sector to undertake bulk handling, storage and transportation. Steps were also taken towards futures trading, and warehouse receipts. Similarly, the APMC Act and Essential Commodities Act have been amended. The impact of these initiatives on private sector participation is yet to be seen.

6. Towards an Efficient and Welfare-Improving System of Foodgrains Management

In the previous chapters, we reviewed the existing system of foodgrains management in India covering procurement, stocking and distribution. As the data and arguments indicate, there appears to be a strong case for reforming the government's food policy and the system of foodgrains management in the country to reflect the changing circumstances of India's food security status.

Despite the changes in the global and domestic scenario, poverty and food insecurity continue to haunt millions of Indian citizens. With about 30% of the population being poor and about 20% of the population being under-nourished, the need for ensuring food security for all remains of paramount importance. Along with that is the continuing need to stabilize food price and supplies as a means to achieve household level food security. The changed circumstances of today provide opportunities to design new instruments for a more efficient and welfare-improving foodgrains management system, in which consumers benefit from stable prices even as the interests of the farmers do not suffer.

What are the elements of current food policy that need to be changed? What new policies and instruments need to be put in place? This chapter attempts to provide an answer to these questions. We begin in the next section by outlining our vision for a reformed food management system and its implications for different aspects of food policy. This is followed by detailed policy suggestions on each element of food management covering distribution, promoting the role of private sector, pricing and procurement policies, and parastatals.

6.1. The Vision

The existing system of public intervention through the FCI bundles several operations as well as objectives, as mentioned earlier. Operationally, the FCI (aided by several other state-level agencies) carries out procurement, storage, transport, and distribution of foodgrains. In each of these operations, the FCI and other state-level parastatal agencies have been observed to be inefficient, as noted earlier in Chapter 2. In terms of the objectives, the existing system seeks to cater to farmers' interests (production incentives, and price risk protection) and simultaneously consumer interests (consumption subsidy, and price stabilization) using one set of policy instruments.

Given the conflicting goals of farmers (who want higher prices) and consumers (who want cheap food), meeting both their objectives above is a delicate dance by itself. The uncertainties in predicting the swings in output and prices only complicate the

matter more. By bundling both producer income protection goals and consumer subsidy goals into the operations of the FCI, the government, faced with resource constraints, is often forced to compromise on one or other of its objectives. To improve the efficiency of the current system of foodgrains management and to enhance the government's capacity for meeting its distributional goals for welfare improvement, it is then of critical importance to unbundle the operations of the FCI and to allow the private sector to compete at each level so that the overall costs are reduced.

At this stage, it is imperative to outline a long-term vision for an efficient and welfare improving system of foodgrains management in India before proceeding to suggest changes to the food policy.

- Our long-term vision is of a liberalized market environment in which the private sector participates extensively in performing the primary roles of marketing, distributing, exporting and importing foodgrains.
- The regulatory framework should foster participation and competition amongst private agents by providing safeguards against unfair and anti-competitive practices.
- A well-regulated and well-functioning foodgrains futures market, along with a competitive spot market, would provide the necessary signals to farmers, traders, consumers and the government to take appropriate decisions on resource allocation for production and marketing and to take appropriate actions to minimize risks associated with temporary shocks to foodgrains availability.
- Such a well-functioning, efficient, and competitive foodgrains market, we believe, will deliver the desired volumes and quality where and when needed, at the lowest marketing margins, with producers facing attractive prices and consumers facing affordable prices.
- The liberal foodgrains market policies are complemented with a set of effectively targeted safety net programs to protect the poor from price and income shocks.
- Government follows a clearly articulated and transparent price stabilization policy, primarily through a variable tariffs policy, and direct and temporary quantitative interventions are resorted to only when the supply shocks are extreme.

At its core, this vision for the foodgrains sector involves a gradual reduction of public intervention in procurement, storage and distribution of foodgrains even as private sector participation is encouraged. But given that there is close interdependence of foodgrains markets, public distribution and FCI operations, it is critical that reforms

follow an integrated approach covering not just the operations of the FCI, but also the safety net programs . To put it in simple terms, for private sector to participate in foodgrains markets, the government (meaning the FCI) has to vacate some space by reducing its market operations.

The government should move away from providing income support to farmers through procurement at MSP by the FCI. It should not be in the business of determining farm incomes as the current system of MSP does, and should instead let the market determine the returns to various crops. The government should limit its role to stabilizing prices in order to promote food security of the poor. Price stabilization in a band bordered by the c.i.f. and f.o.b. prices can be pursued by a combination of variable tariffs, and through procurement and offload operations at market prices and by maintaining buffer stocks by the FCI. Only when there is a precipitous fall in prices below even the variable costs of production, a price support may be provided to farmers at a level that is just adequate to recover the variable input costs. The FCI's procurement, storage and distribution operations should accordingly be scaled down. For the FCI to reduce its procurement operations, the demand on the PDS has to be reduced first by effectively targeting the subsidy to the needy. Eventually the current system of physical entitlements of grains under the PDS has to be replaced by a system of real income transfer that allows the beneficiary to purchase their food requirements from private retailers at the prevailing market price. Overall, the government should move away from the current highly interventionist policy regime, to one in which it concentrates on building the necessary infrastructure and institutions to make the market work.

There is indeed recognition within the government itself of the need for such an integrated approach to reforming the foodgrains marketing system as is evident from the Ninth and Tenth Five Year Plan Documents, and also from the reports of various Government Committees. The limited reforms measures already carried out (described in the previous chapters) such as the introduction of the Targeted Public Distribution System (TPDS), changes to the Essential Commodities Act, introduction of futures markets, etc., are also testimony to this. What is required is a greater and more vigorous thrust to these reforms. In what follows we spell out details of what still remains to be done in order to achieve the above vision of an efficient and welfare improving foodgrains management system in India.

6.2. Reforming Safety Net Programs

Ensuring food security of the poor is an indisputable social objective. As is widely recognized, food security of a household depends primarily on its economic access to

food; i.e. its ability to purchase the amount of food it needs at the prevailing price. For the poor, inadequate real income is the main reason for food insecurity. What is required is additional real income in the hands of the poor so that at the prevailing price they are able to afford all the food that they need for leading a healthy and productive life. As is well-known, additional real income for the poor can be provided through a consumption subsidy such as through the PDS, which seeks to provide food to the poor at a lower than market price, and / or through an income transfer scheme such as through employment programs that seek to provide additional wage income for the poor. The Government of India has been trying to do both over the decades.

Under the PDS, households are entitled to a certain quantity of foodgrains through Fair Price Shops (FPS) at a lower than market price fixed by the government. Since this is a system of quantity entitlements, it requires physical quantities of grains be made available to the FPS. As seen earlier a large part of FCI operations are geared towards meeting the needs of the PDS. In order to reduce the level of public intervention by FCI, it is therefore essential to downsize the demand on the public distribution and target the subsidy involved to those who really need it. The TPDS (described in Chapter 3) introduced in 1997 was a step in the right direction. It helped reduce the number of beneficiaries and hence the demand on the system. Though there are several issues of targeting and governance that plagues the TPDS, the solution is to improve upon it and not a move backwards to a universal PDS as is being argued by some. On the contrary, the next step in reforms should be to restrict the TPDS only to people below the poverty line (BPL). As on 2005-06, if the TPDS had been restricted only to the BPL population the volume of grains distributed through the TPDS machinery would be only 38% of the current levels.⁶⁷ This would greatly reduce the size of public distribution, and hence the need for public procurement and storage, and public intervention in grain markets in general.

Nevertheless, the TPDS also being a system of quantity entitlements still involves physical storage and movement of grains in the process of providing consumption subsidy. The cost of storing and moving the grains specifically for this is a dead-weight loss on the society. Innovative ways are required to effectively target the consumption subsidy to the poor. It is in this context that food stamps are widely considered to be better instruments for providing consumption subsidy.

Food stamps are essentially a type of monthly entitlement paper coupon / card that a poor household would collect from prescribed distribution centers, which would permit the purchase of a set of “specified” food items in limited quantities at a

⁶⁷ See Chapter 3, Table 3.2.

discounted price, in principle from any shop (private retailer or government FPS). The beneficiary household would give the food stamp to the retailer at the time of purchase, and the latter would then be reimbursed directly by the government. While this permits better targeting of the consumption subsidy, its other attraction is it does not require physical storage / movement of grains specifically for the purpose of providing consumption subsidy. The retailer would do so as part of normal trading operations. It would thus reduce the requirements for public procurement, storage and distribution even beyond what the TPDS can achieve. Hence, a move from physical entitlements such as under the TPDS to food stamps would improve the overall efficiency of the foodgrains management system and also be welfare improving.

Both the TPDS and Food Stamps, however, suffer from one weakness. Namely, that they are “specific” subsidy – specific to the items for which the subsidy is provided. To the extent, a household’s preferences are such that it does not fully utilize its ration quantity entitlements / food stamps, it foregoes some of the real income transfer implicit in these consumption subsidy programs. Direct income transfer programs are better in the sense that they allow full choice to the household on their consumption decisions, and would hence be welfare improving.

Employment programs that provide a wage income to the beneficiaries thus stand out to be a better form of real income transfer than consumption subsidies. Besides, as mentioned earlier in Chapter 3, several studies have pointed out that in the Indian context, the self-targeting nature of employment programs such as Maharashtra’s Employment Guarantee Scheme (EGS) make them better suited for ensuring benefits reach the poor. Based on the lessons of the EGS, the Government of India has recently launched a National Rural Employment Guarantee Scheme (NREGS) under which the government guarantees to provide 100 days of wage employment every year to one adult member of every rural household who is willing to do unskilled manual work, at a minimum daily wage of Rs.60. A unique feature about this scheme is that an unemployment allowance would be provided in case the government is unable to provide a job. Initially the programme covers 200 of India’s poorest districts, but is slated to cover the entire country by 2010. While it is too early to evaluate the performance of this programme, in principle this is a better way of providing income transfer to the poor, and its scope must be extended to cover the entire country as planned. Further, the benefit should not be restricted to one member per household as is the case currently, but to anyone willing to work under the scheme (Ganesh-Kumar et al 2004).

Since the nature of employment in this scheme is manual labor, the old and the physically challenged among the poor are likely to be left out of the scheme. For them a system of income coupon along the lines of food stamps should be designed.

Reducing the size of the PDS and expansion of NREGS should go on simultaneously. Eventually, safety net for the poor should be through income transfer schemes such as NREGS, income coupons, etc., that enables the poor to meet their food requirements from market purchases at the prevailing market prices. These safety nets should be subjected to periodic social audit to improve their governance and ensure targeting errors are minimized. In this the media and the civil society at large have an important role to play, and the government should facilitate them to carry out regular social audits. In this context, the recently enacted Right to Information Act that allows anyone to access information available with the government / its agencies is a step in the right direction.

At this juncture some thoughts on the extensive network of FPS that has been established as part of the PDS are required. The reforms of the safety net programs envisaged above would diminish the need for such a network of FPS. To ensure greater political acceptability of these reforms, it is therefore critical to de-link the FPS from the safety net programs at a very early stage of the reforms process, and help them re-orient as full-fledged private traders dealing in more than just foodgrains and other items currently handled by them, such as through one-time credit assistance. There is already an example in Gujarat where the state government is facilitating FPS to turn into regular retail stores.⁶⁸ Such a scheme has to be extended to cover the entire country.

6.3. Promoting Private Sector Participation in Foodgrain Management

Government policies with regard to trading, transport, storage, processing and distribution of rice and wheat, effected through several legislations such as the Essential Commodities Act (ECA), Storage Control Orders, Jute Packaging Materials Act, Agricultural Produce Market (APMC) Acts, several other State level legislations,

⁶⁸ The Gujarat Government plans, in public-private partnership, to open or upgrade around 1,000 FPS into new-look retail stores by March 2007, and another 2,200 in the next financial year. This new scheme is a multi-level plan to make FPS into viable business centres that would also continue to perform their original duty, viz., supplying essential commodities to the BPL ration card holders at subsidised rates. Once upgraded, these FPS will be in the larger format of a modern retail store, selling a wider variety of goods and services than ever offered by these shops such as mobile phone recharge vouchers, SIM cards, handsets, non-subsidised cooking gas cylinders, cosmetics, certified seeds, all packaged-goods, toiletries, fertilisers, iodised salt, biscuits, batteries, pulses, ghee, ice-cream, postal supplies, etc. Already, nearly 400 FPS have been upgraded as the State Government facilitated bank loans of Rs.200,000, without any collateral security, and at 9 per cent rate of interest to the licensees for setting up new shops in a larger format. Once implemented, the FPS shopkeeper's income is expected to increase up to Rs.30,000 per month from the current official commission of between Rs.1,500 and Rs.3,000 per month (Business Line, 2006).

etc., have stunted private sector participation in foodgrains management in India. Besides, in several aspects of foodgrains management such as with regard to access to rail transport services and credit there is a strong pro-FCI bias in the policies, as noted earlier in Chapter 2, which has also contributed to this situation. Grain marketing has been further complicated through ban on futures, and also by the inter-state differences in the sales and other taxes. More than all these, the very operations of the FCI with regard to price stabilization are so opaque and fraught with several uncertainties, that they not only crowd out private traders, but are also a major disincentive for private investments in grain marketing. For example, the private sector investments in bulk foodgrains storage infrastructure are not forthcoming despite the acute need for such facilities and also the various investment incentives provided by the Government of India (World Bank 2004).

Unless reforms are holistic covering all these dimensions private sector participation in foodgrains management may not be forthcoming despite the enormous latent potential of the sector. That the government itself recognizes the need for comprehensive reforms is amply clear from the following two passages from the Tenth Five Year Plan document:

“The FCI should gradually hand over its role of MSP-related procurement to private trade. This requires a comprehensive reform of policies, rules and procedures to strengthen the role of the modern private sector in the matter of storage, distribution and processing of foodgrains. Various restrictions that inhibit private initiatives in this regard need to be removed so that the private sector has an incentive to make huge investment in grain handling operations and food processing. There is urgent need to upgrade market infrastructure, cold storage facilities, mandi facilities and roads, areas in which the private sector should be encouraged to make productive investment.” (Tenth Five Year Plan 2002-07, Chapter 3.4, Paragraph 3.4.51).

“However, the success of the proposed public-private partnership will be limited unless the existing control on storage and movement of foodgrains and other essential commodities is suitably relaxed. Many of these controls have outlived their utility since the country has achieved self-sufficiency in food and their continuance hampers the market from performing its productive and commercial role. There is an urgent need to withdraw them, and legislative and administrative measures to ensure this need to be accorded top priority”. (Tenth Five Year Plan 2002-07, Chapter 3.4, Paragraph 3.4.53).

Although the government has already undertaken several reform measures, as seen earlier in the previous Chapter, a lot more remains to be done. For example, most of

the restrictions on storage and movement of foodgrains emanate from the ECA. Although the central government has passed amendments that restrict indiscriminate use of the ECA by the states, there is frequent demand (often from sections within the government) for invoking its draconian features from one quarter or the other. World-wide experience, including that of India, shows that while private enterprise can put up with bad policies, it cannot digest uncertainty in the policy environment. No amount of tax and other incentives can overcome the disincentives generated by an uncertain policy regime.

Another area where reforms are urgently required is with regard to agricultural marketing in general and foodgrains marketing in particular. The Government of India has formulated a model APMC Act allowing contract farming, private investments in wholesale markets, and direct marketing between buyers and sellers. However, most states are still to amend their state APMC Acts to bring them in line with the model Act.

Yet another area that requires attention is with regard to futures markets. Private trade often relies upon futures market for hedging against price risks over time. A well designed public program of price stabilization too can look up to the futures markets for signals on where the supplies and prices are headed. Although futures trading has been permitted in rice and wheat, for this market to function effectively several other complementary reforms need to be pursued. One such is the need for modern warehouse facilities, a system of quality certification and the transferability and negotiability of the warehouse receipts backed by legal provisions. Legally backed negotiable warehouse receipts would enable farmers and traders to buy / sell grains, without the grains having to be physically moved around with every transaction. Not only would this reduce transactions costs and hence the final cost to the consumer, the negotiable warehouse receipts can in principle be used as collateral by farmers to raise credit. Further, this system by unbundling ownership and storage functions, can foster specialisation in storage activity and help reap economies of scale and scope that reduce storage costs and losses. With ownership of grains and management of storage in different hands, this system can also help prevent large traders from getting a stranglehold on the market through uncompetitive trade practices (World Bank 1999). For this system to take off (which is important for futures markets to play its critical role), apart from legal changes that provide a regulatory framework, there is also a need for a system of quality certification. This is a public good, which only the government is best suited to put in place.

While the above reform measures are critical, perhaps the one single measure that is likely to have the largest impact in promoting private sector participation in foodgrains

management is reforming and downsizing the system of public procurement at an MSP. We now turn to this.

6.4. Pricing Policy Reforms

Currently, the cornerstone of the government's foodgrains pricing policy is the system of open-ended procurement at a MSP. This policy effectively ensures that market prices do not go down below a certain level.⁶⁹ The current practice is to set the MSP at the C3 cost level – one that covers the paid out costs on material inputs and also assures a certain return on land and family labor, including managerial input. Thus, the government effectively determines the returns for rice and wheat, and hence the income levels of rice and wheat farmers. This system is not compatible with a liberal market friendly economic policy regime.

The government should move away from providing income support to farmers through procurement at MSP by the FCI. It should not be in the business of determining farm incomes as the current system of MSP does, and should instead let the market determine the returns to various crops so that agricultural diversification can take place more effectively based on market signals on the demand and supply conditions. The government should limit its role to (a) stabilizing prices in order to promote food security of the poor, and (b) protecting farmers from bankruptcy when there is a precipitous fall in prices. Price stabilization in a band bordered by the c.i.f. and f.o.b. prices can be pursued by a combination of variable tariffs, and through procurement and offload operations at market prices and by maintaining buffer stocks by the FCI. Only when there is a precipitous fall in prices, a price support may be provided to farmers at a level that is just adequate to recover the variable input costs. Accordingly, we propose the following set of reforms to the government's foodgrains pricing policy:

Market prices should be stabilised based on transparent rules in an open economy environment (i.e., free of any movement, storage and trade restrictions) somewhere within a band bordered by c.i.f. and f.o.b. prices by using a variable tariff (within the bound rates) policy consistent with World Trade Organization (WTO) rules. When domestic prices tend to reach the upper (c.i.f.) level of the band, tariffs may be lowered enabling greater imports and also buffer stocks may be released, both of which will help lower the prices. When domestic prices tend to reach the lower (f.o.b.) level of the band, tariffs may be increased to curtail imports and additionally the government may also procure grains at market prices to boost demand.

⁶⁹ At least in the few surplus states where FCI operations are widespread.

For effective implementation of such a price stabilization scheme, it is critical to know where the band itself is headed. That is, whether there will be a secular rise or fall in the band. A well functioning foodgrains futures market is a useful institution that can give guidance about the future direction of change of the band itself. It is, therefore, important to integrate tariff setting in line with the movements in the futures prices. Institutional arrangements for monitoring the price movements and carrying out tariff changes would have to be developed. The existing Commission for Agricultural Costs and Prices (CACP) should be transformed into a body that monitors (a) the domestic price, (b) the c.i.f. price, (c) the f.o.b. price, (d) signals from the futures markets on the directions of change in the price band itself and (e) domestic production (A2-level) costs, and recommends tariff changes required to stabilize prices. Appropriate institutional changes have to be made and skill sets have to be developed in the current CACP to enable it to perform these new tasks effectively.⁷⁰

As long as the lower level of this band (including tariffs) remains above a level that is adequate to recover the variable inputs cost, i.e., the A2 (paid-out-cash-cost levels), all public procurement of foodgrains for TPDS and / or for buffer stocks should be at market prices only. And in that situation, returns to land and family labour for rice and wheat farmers is the market price less the A2 costs. The government should refrain from determining returns to land and family labour by fixing a higher procurement price and/or by providing “bonuses” to rice and wheat farmers.

It is of course possible that occasionally the lower (f.o.b.) level of the band, even after raising the tariffs to the maximum permissible bound rates, may go down to such a low level that it is inadequate to recover even the A2 costs. When such a situation occurs farmers should be protected against the risk of bankruptcy due to precipitous fall in prices. For this, we propose that the MSP must be set at A2 cost level, and should be defended through vigorous public procurement. That is the MSP should be just that – *a minimum support price*, one which enables farmers to recover their variable (i.e., A2) costs thereby protecting them from bankruptcy. While defending the MSP it is critical to eliminate arbitrage opportunities that a liberal import regime would give rise to in this situation. To address this the government should invoke “special safeguards mechanisms” to impose temporary quantitative restrictions on imports. Such special safeguards are currently not available to India (and other

⁷⁰ One concern that may be raised here relates to the large diversity in the type, quality and variety of foodgrains produced and consumed in different parts of the country that poses operational difficulties in tracking their prices (domestic and c.i.f.), availability, etc. However, this may not be an insurmountable problem considering that typically markets attach a (more or less) fixed premium / discount to different qualities / varieties of any particular grain. Consequently, one needs to track the prices and availability of only a few varieties, typically those with large production and consumption shares for which relevant world prices are also easily available.

developing countries) under the current WTO regime, but future trade negotiations should be directed to ensure that such options are available to the country.

6.5. Parastatals Reforms

The final element in the reforms of the foodgrains management system in the country pertains to the parastatals themselves. From the above it is evident that the role of the FCI (and other state government agencies involved in procurement) and the nature of its operations in a reformed foodgrains management system would be drastically different from the way it has been doing business so far.

In the reformed system, with a reduction in demand for foodgrains for safety net programs there has to be a matching reduction in the extent of procurement operations. Along with this, there has to be a down-sizing of the FCI itself. Downsizing the FCI should be effected in the current surplus states such as Punjab, Andhra Pradesh, etc., where FCI operations have ceased to bear any benefits as seen earlier. Instead there has to be a re-orientation of FCI operations to the eastern and north-eastern states of Assam, Bihar, Orissa, West Bengal, etc., where there is enormous potential for growth of agriculture particularly rice, and where public support for market development is direly lacking now. What the FCI did during the last three decades in today's surplus states has to be done in the eastern and north-eastern states. Public procurement to meet the requirements of the TPDS as well as for buffer stocks should be from these states. More importantly, since only limited amounts will be procured by the FCI, and, that too at market prices rather than some pre-announced procurement price, changes are also required on the operational side. From a system of open-ended procurement at pre-announced procurement prices, the FCI has to move over to a system of tendering for the desired quantities and quality to be delivered at the desired location. For example, if grains are required in the state of Kerala for the TPDS, then the tender can specify that the grains be delivered in Kerala. Competitive bids have to be sought from private suppliers and procurement will have to be at the lowest price. The market prices will thus not be distorted, and costs can be minimised.

The other important role envisaged for the FCI in the reformed system would be to stabilise prices within a band bordered by the f.o.b. and c.i.f. prices through procurement / offload operations and by maintaining a buffer stock. Several organisational reforms within or outside the FCI are required in order to carry out this mandate. Currently, FCI operates in a system wherein it is told by the government what the procurement and offload prices would be. In the reformed system, the FCI will have to monitor the market prices and decide whether it should procure / offload in order to stabilize prices. It is then critical to equip the FCI with the necessary

expertise to operate on a commercial basis at a (non-MSP) market price, which would vary from time to time, and may also vary from place to place within the country. For this, several organisational changes are required for the purpose of market monitoring and price gathering. For example, a market committee involving prominent persons of repute and knowledge may be formed (within the FCI or, preferably as an independent body), which would meet on a regular basis (say every fortnight) to monitor movements in prices and the action (procure / offload) to be taken.⁷¹ Such a system would ensure that FCI's operations are responsive to market movements. Besides, it would also ensure a certain degree of accountability of its operations.

Continuing on the issue of accountability, several other institutional changes at the governmental level may also be required to enable FCI to carry out its function in the reformed system. With FCI being required to carry out its procurement / offload operations at market prices, it is natural that occasionally financial losses may be incurred by the FCI on some of its transactions due to sudden / unanticipated movements in market prices. The system of public accountability should be suitably reformed so that such normal commercial losses are distinguished from deliberate fraudulent transactions. This institutional change is critical to ensure that FCI officials can function effectively in the reformed regime without fear of being subjected to criminal prosecution for every commercial loss that may occur.⁷²

The above set of comprehensive reforms, in our view, would help in wringing in a more efficient and welfare improving foodgrains management system in India that is rooted in today's conditions, responding to the present and foreseeable needs, by exploiting the current opportunities.

⁷¹ A model here is the market committees of the Federal Reserve of the USA to monitor interest rates.

⁷² The parallel here is with the banking system in India in recent times, where managers of several public sector banks have been observed to be extremely risk averse in their lending to commercial enterprises for fear of criminal prosecution should there be a default on the loans.

Reference

- Ahmed, R., S. Haggblade, and T. E. Chowdhury 2000. *Out of The Shadow of Famine: Evolving Food Markets and Food Policy in Bangladesh*. Johns Hopkins University press, Baltimore and London.
- Aksoy, M. A. and J. C. Beghin. 2005. *Global Agricultural Trade and Developing Countries*. Washington, D.C.: The World Bank.
- Ali, A.M.M. and I. Jahan 2003. Public Food Distribution System (PFDS) in Bangladesh: Successful Reforms and Remaining Challenges. Paper prepared for the workshop, "Agribusiness: From *Parastatals* to Private Trade – Why, When, and How?" New Delhi: December 15-16.
- Anderson, K. and W. Martin. 2006. *Agricultural Trade Reform and the Doha Development Agenda*. Washington, D.C.: The World Bank and Basingstoke. Palgrave Macmillan.
- Anderson, K., W. Martin and D. van der Mensbrugge. 2006. Market and Welfare Implications of Doha Reform Scenarios, in K. Anderson and W. Martin [Eds.] *Agricultural Trade Reform and the Doha Development Agenda*, New York: Palgrave Macmillan.
- ASCI (Administrative Staff College of India) 2001. *A Study of the Costs of Acquisition and Distribution of Foodgrains by the Food Corporation of India*, Commissioned by the Ministry of Consumer Affairs, Food and Public Distribution, Government of India.
- Bansil, P.C. 2003. Demand for foodgrains by 2020 AD. In *Towards a food secure India: Issues and policies*, ed. S.M. Dev, K.P. Kannan, and N. Ramachandran. New Delhi: Institute for Human Development.
- Behrman, J. R. 1987. Commodity price instability and economic goal attainment. *World Development* 15(5): 559-573.
- Besley, T., and S. Coate. 1992. Workfare vs. welfare: Incentive arguments for work requirements in poverty alleviation programmes. *American Economic Review* 82: 249-261.
- Besley, T., and R. Kanbur. 1993. Principles of targeting. In *Including the poor*, ed. M. Lipton and J. van der Gaag, 67-90. Washington, D.C.: Johns Hopkins University Press for the World Bank.
- Bhalla, G. S. and P. Hazell. 1997. "Foodgrains Demand in India to 2020: A Preliminary Exercise", *Economic and Political Weekly* 32(52): A150-A154.

- Bhalla, G. S. P. Hazell and J. Kerr. 1999. "Prospects for India's Cereal Supply and Demand to 2020", Washington, D.C., International Food Policy Research Institute, Food, Agriculture and the Environment Discussion Paper 29.
- BICP (Bureau of Industrial Costs and Prices) 1990. *Report on the Operation of Food corporation of India*, Ministry of Industry: New Delhi.
- Bigman, D., D. Newberry, and D. Zilberman. 1988. New approaches in agricultural policy research: Discussion. *American Journal of Agricultural Economics* 70(2) (May): 460-461.
- Braverman, A., R. Kanbur, A. S. P. Brandão, J. Hammer, M. de Rezende Lopes, and A. Tan. 1993. How to analyze the Brazilian price band proposals. In *The Economics of Rural Organization*, ed. K. Hoff, A. Braverman, and J. E. Stiglitz. New York: Oxford University Press for the World Bank.
- Breton, A. 1996. *Competitive Governance: An Economic Theory of Politics and Public Finance*. New York. Cambridge University Press.
- Business Line. 2006 (October 03). *Gujarat Govt plans retail store format for fair price shops*.
- Chand, R. 2002. Government Intervention in Foodgrain Markets in the New Context (Report to the Ministry of Consumers Affairs, Food and Public Distribution, government of India), National Centre for Agricultural Economics and Policy Research.
- Chand, R. 2003. *Government Intervention in Foodgrain Markets in the New Context*, Policy Paper 19, National Centre for Agricultural Economics and policy Research (ICAR), New Delhi: India.
- Chopra. R. N. 1981. *Evolution of Food Policy in India*. New Delhi: Macmillan.
- CIMMYT (Centro International de Mejoramiento de Maiz y Trigo). 2001. 2000-2001 World Wheat Overview and Outlook, Part 3, p. 48.
http://www.cimmyt.org/Research/Economics/map/facts_trends/wheat00-01/pdf/wheat00-01_part3.pdf
- CMIE. 2005. 'Agriculture'. Mumbai. Center for Monitoring Indian Economy.
- Coady, D., M. Grosh, and J. Hoddinott. 2002. Targeting of transfers in developing countries: Review of experience and lessons. Social Safety Net Primer Series. Washington, D.C.: World Bank.
- Cummings Jr., R., A. Gulati, P. K. Joshi and Kavery Ganguly 2006. Withering Punjab Agriculture: Can it Regain its Leadership? Draft Report, Washington, DC: IFPRI.

- Cummings Jr., R., S. Rashid, and A. Gulati. 2006. "Grain Price Stabilization Experiences in Asia: What Have We Learned?", *Food Policy*, 31 (4): 302-312.
- Dawe, D. 2004. The Changing Structure of the World Rice Market, 1950-2000, *Food Policy*, vol. 27, pp 355-370.
- Deb, S. 2006. Grain Management in Andhra Pradesh: Scope for Reforms and Private Sector Participation. Unpublished Manuscript, Washington, DC: IFPRI.
- Del Ninno, C., P. A. Dorosh, L. C. Smith, and D. K. Roy. 2001. *The 1998 Floods in Bangladesh: Disaster, Impacts, Household Coping Strategies, and Response*. Washington, D.C., International Food Policy Research Institute, Research Report 122.
- Dev S. M. 2003. World Trade Organisation and Food Security in S. Mahendra Dev, K.P. Kannan and Nira Ramachandran (eds.) book 'Towards a Food Secure India: Issues and Policies', Institute for Human Development, New Delhi, 2003.
- Dev S. M. (forthcoming). Food Marketing Parastatals and Social Safety Net Programmes: The case of public distribution system in India, in *From Parastatals to Private Trade: Why, When and How?*, Washington, DC: IFPRI.
- Dev, S. M., C. Ravi, B Viswanathan, A. Gulati, and S. Ramachander. 2004. *Economic Liberalization, Targeted Programmes and Household Food Security: A Case Study of India*. Market Trade and Institution Discussion Paper 68. Washington DC: International Food Policy Research Institute.
- Dreze, J., and A. Sen. 1990. *Hunger and public action*. Oxford: Clarendon Press.
- Dutta, B., and B. Ramaswami. 2001. Targeting and efficiency in the public distribution system: Case of Andhra Pradesh and Maharashtra. *Economic and Political Weekly* (May 5): 1524-1532.
- Fan, S. and A. Gulati. 2004. *Investments and Subsidies in Indian Agriculture: How can India Rationalize its Spending in Agriculture?*. RGICS-World Bank-IFPRI Workshop on "Reenergizing Agriculture in India", Rajiv Gandhi Foundation, New Delhi. December 17.
- FAOSTAT. 2004. Rome: Food and Agriculture Organization of the United Nations.
- Ganesh-Kumar, A., M. Panda and M. E. Burfisher. 2006. *Reforms in Indian Agro-processing and Agriculture Sectors in the context of Unilateral and Multilateral Trade Agreements*. Working Paper No. WP-2006-011. Mumbai: Indira Gandhi Institute of Development Research.
- Ganesh-Kumar, A., M. Panda and S. Mishra. 2004. Employment Guarantee for Rural India. *Economic and Political Weekly*, 39(51): 5359-61.

- Goletti, F. and N. Minot 1997. *Rice Markets, Agricultural Growth, and Policy Options in Vietnam*, Discussion Paper No. 14, Markets and Structural Studies Division, The International Food Policy Research Institute, Washington, D.C.
- Government of India (GOI), 1965. Report of the Jha Committee on Foodgrain Prices for 1964-65, Department of Agriculture.
- _____. 2002. *Report of the High Level Committee on Long-term Grain Policy*, Department of Food and Public Distribution, Ministry of Consumer Affairs, Food and Public Distribution, Government of India.
- _____. 2003. *Buffer Stock Policy for the 10th Five Year Plan*, Government of India.
- _____. 2004. *Central Government Subsidies in India*, Ministry of Finance, Government of India.
- _____. 2005. Reports of the Commission for Agricultural Costs and Prices 2005, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India, New Delhi
- _____. 2006. *Economic Survey, 2004-2005*, Ministry of Finance, Government of India.
- Government of Punjab, various years. Annual Administrative Report of the Department of Food and Supplies, Punjab.
- Gulati A. 1987. *Agricultural Price Policy in India*. Concept, New Delhi.
- Gulati, A. 1989. Food Subsidies: In search of cost-effectiveness. *Economic and Political Weekly* XXIV(28), July 15.
- Gulati, A., J. Hanson, and G. Pursell. 1990. Effective incentives in India's Agriculture. Policy Planning and Research Working Paper No. 332 (Trade Policy), World Bank.
- Gulati, A and K. Mullen. 2003. Responding to Policy Reform: Indian Agriculture in the 1990s and After. Stanford Centre for International Development Working Paper No. 189.
- Gulati, A. and Kahkonen, S. 1996. "The Food Corporation of India: Successes and Failures in Indian Foodgrain Marketing", *NCAER-IRIS Collaborative Project, November, Mimeo*.
- Gulati, A. S. Kahkonen and P. Sharma. 2000. The Food Corporation of India: Successes and Failures in Indian Foodgrain Marketing, in S. Kahkonen and Anthony Lanyi [Edt]: *Institutions, Incentives and Economic Reforms in India*, Sage Publications: New Delhi.

- Gulati, A. and P. Sharma. 1990. Prices, Procurement and Production: An Analysis of Rice and Wheat, *Economic and Political Weekly*, 25 (13).
- _____. 1991. Government Intervention in Agricultural Markets: Nature, Impact and Implications, *Journal of Indian School of Political Economy*, January-March.
- Gulati, A., and T. Kelly. 1999. *Trade liberalization and Indian agriculture*. New Delhi: Oxford University Press.
- Hertel, T. W., and R. Keeney. 2006. What is at Stake: The Relative Importance of Import Barriers, Export Subsidies and Domestic Support, in K. Anderson and W. Martin [Eds.] *Agricultural Trade Reform and the Doha Development Agenda*, New York: Palgrave Macmillan.
- Hertel, T. W., and L. A. Winters. 2006. *Poverty and the WTO: Impacts of the Doha Development Agenda*. Washington, D.C.: The World Bank and Basingstoke. Palgrave Macmillan.
- Ingo, M. D. and J. D. Nash. 2004. *Agriculture and the WTO: Creating a Trading System for Development*. Washington, D.C.: The World Bank.
- Ingo, M. D. and L. A. Winters. 2004. *Agriculture and the New Trade Agenda: Creating a Global Trading Environment for Development*. New York. Cambridge University Press.
- Islam, N. and S. Thomas. 1996. Foodgrain price stabilization in developing countries : issues and experiences in Asia. International Food Policy Research Institute *Policy Review*. Washington, D.C : IFPRI.
- Jha, S., and P.V. Srinivasan. 1999. Grain price stabilization in India: Evaluation of policy alternatives. *Agricultural Economics* 21: 93-108.
- _____. 2004. "Achieving Food Security in a Cost Effective Way: Implications of Domestic Deregulation and Reform Under Liberalized Trade", MTID Discussion Paper No. 67. International Food Policy Research Institute.
- Kaur, R. 2004. Foodgrain management: State and private sector in India, with reference to Punjab. Unpublished Manuscript, Washington, DC: IFPRI.
- Krishna, R., and A. Chhibber. 1983. *Policy modelling of a dual grain market: the case of wheat in India*. Research Report 38. Washington, D.C.: International Food Policy Research Institute Research.
- Krishna, R. and G.S. Raychowdury. 1980. *Some aspects of wheat and rice price policy in India*. World Bank Staff Working Paper No. 381. Washington, D.C.: International Bank for Reconstruction and Development.

- _____. 1981. Some Aspects of Rice Price Policy in India. *Indian Economic Journal*, January-March issue.
- Kumar, P. 1998. *Food Demand and Supply Projections for India*. Agricultural Economics Policy Paper 98-01. New Delhi. Indian Agricultural Research Institute.
- Kumar, P., and S. Mittal. 2003. Productivity and supply of foodgrains. In *Towards a food secure India: Issues and policies*, ed. S.M. Dev, K.P. Kannan, and N. Ramachandran. New Delhi: Institute for Human Development.
- Kumar, P. and M. W. Rosegrant. 1997. Dynamic Supply Response of Rice and Other Major Foodcrops in India. *Agricultural Economic Research Review* 10: 1-27.
- Measham, A. and M. Chatterjee. 1999. *Wasting Away: The Crisis of Malnutrition in India*. Directions in Development Series. Washington, D.C.: The World Bank.
- MCA (Ministry of Consumer Affairs, India). 2001. *Report of the Tenth Plan Working Group on Public Distribution System and Food Security*. New Delhi: Ministry of Consumer Affairs Development Policy Division, Planning Commission.
- _____. 2002a. Tata Study in *Annual Report 2001/02*. New Delhi: Ministry of Consumer Affairs, Department of Food & Public Distribution System.
- _____. 2002b. *Report of the High Level Committee on Long-term Grain Policy*. New Delhi: Ministry of Consumer Affairs, Department of Food & Public Distribution System.
- MOA (Ministry of Agriculture, India). 2001. *Agricultural Statistics at a glance*. New Delhi: Ministry of Agriculture, Department of Agriculture and Cooperation, Directorate of Economics and Statistics.
- _____. 2004. *Agricultural Statistics at a glance*. New Delhi: Ministry of Agriculture, Department of Agriculture and Cooperation, Directorate of Economics and Statistics.
- _____. 2005. *Agricultural Statistics at a glance*. New Delhi: Ministry of Agriculture, Department of Agriculture and Cooperation, Directorate of Economics and Statistics.
- _____. 1996. *Cost of Cultivation of Principal Crops in India*. New Delhi: Ministry of Agriculture, Department of Agriculture and Cooperation, Directorate of Economics and Statistics.
- MOF (Ministry of Finance, India). 2003. *Economic Survey 2002-03*. New Delhi: Ministry of Finance, Economic Division.
- _____. 2004. *Budget 2003-04*. New Delhi: Ministry of Finance, Economic Division.

- Minot, N. and F. Goletti. 1998. "Export Liberalization and Household Welfare: The Case of Rice in Vietnam", *American Journal of Agricultural Economics*, 80(4): 738-418.
- Mooij, J. 2003. "Smart Governance?: Politics in the Policy Process in Andhra Pradesh, India", Working Paper 228, London: Overseas Development Institute.
- Mythili, G.. 2006. "Supply Response of Indian Farmers: An Analysis of Pre- and Post-Reform Periods", Working Paper WP-2006-009. Mumbai: Indira Gandhi Institute of Development Research.
- NCAER (National Council of Applied Economic Research). 2007. *India: Rural Infrastructure Report*, Sage Publications, New Delhi.
- Newberry, D. and J. Stiglitz. 1981. *The Theory Of Commodity Price Stabilisation - A Study In The Economics Of Risk*, Oxford : Oxford University Press.
- Radhakrishna, R and S. Indrakant. 1987. Effects of Rice Market Intervention Policies in India: The Case of Andhra Pradesh in J. K. Johnson [Edt]: *Evaluation of Rice Market Intervention Policies: Some Asian Examples*, Asian Development Bank, Manila.
- Radhakrishna, R., K. Subbarao, S. Indrakant, and C. Ravi. 1997. India's public distribution system: A national and international perspective. Discussion Paper No. 380. Washington, D.C.: World Bank.
- Rashid, S., Mahendra Dev, S., Thomas, M., and Gulati, A. (2005). Reforming Food Price Policies in India: Rationales and Distributional Effects. Unpublished manuscript, Washington DC: IFPRI.
- Ravallion, M. 1991. Reaching the rural poor through public employment, arguments, evidence, and lessons from South Asia. *The World Bank Research Observer* 6 (2): 153-175.
- Rediff on the net. 1996. *The Rediff Interview / N Chandrababu Naidu..* May 9, 1996. <http://www.rediff.com/news/1996/0509naid.htm> Accessed 07/20/2005.
- Rediff.com. 2004. *Look where rice meant for the poor goes.* August 18, 2004 . <http://in.rediff.com/news/2004/aug/18rice.htm> .
- Right to Food Campaign. 2005. *Legal Actions: Interim orders.* <http://www.righttofoodindia.org/orders/interimorders.html> Last updated April 2005, Accessed 2005.
- Rosegrant, M. R., M. Agcaoili and N. Perez. 1995. *Global food projections to 2020: Implications for investment.* Food, Agriculture and the Environment Discussion Paper 5. Washington, D.C.:International Food Policy Research Institute.

- Roumasset, J. 2003. "Agricultural Parastatals and Pro-Poor Economic Growth", in *Agribusiness: From Parastatals to Private Trade – Why, How, and When?*, ttp.
- Sen, A. 1995. The political economy of targeting. In *Public spending and the poor: Theory and evidence*, D. van de Walle, and K. Nead ed. Baltimore: Johns Hopkins University Press and World Bank.
- Sharma P. 1994. Government Intervention in Foodgrain Economy: Case of Rice and Wheat. Ph.D. Thesis, Jawaharlal Nehru University.
- Son, D. K. and T. C. Thang.2003. "The Role of State Enterprises in Rice Marketing Channel in Vietnam", paper prepared for the workshop, *Agribusiness: From Parastatals to Private Trade – Why, When, and How?*
- Srinivasan and Jha, 2001 Liberalized trade and domestic price stability.: The case of rice and wheat in India. *Journal of Development Economics* 65(2): 417-441.
- Stiglitz, J. E. 1986. Economics of information and the theory of economic development," NBER Working Papers 1566, National Bureau of Economic Research, Inc.
- Swaminathan, M. 2003. The dangers of narrow targeting: An assessment of the Targeted Public Distribution System. In *Towards a food secure India: Issues and policies*, ed. S.M. Dev, K.P. Kannan, and N. Ramachandran. New Delhi: Institute for Human Development.
- Timmer, C. P. 1989. Food Price Policy: The Rationale for Government Intervention. *Food Policy*, 14(1):17-42.
- _____. 1996. Does BULOG Stabilize Rice Prices in Indonesia? Should it Try? *Bulletin of Indonesian Economic Studies*, 32(2): 45-74.
- Tyagi, D. S. 1990. *Managing India's Food Economy*, Sage Publications: New Delhi.
- Umali-Deininger, Dina and Klaus Deininger 2001. Toward Greater Food Security for India's Poor: Balancing Government Intervention and Private Competition. *Agricultural Economics* 25: 321-335.
- UNDP (United Nations Development Program). 1993. *Human development report*. New York: Oxford University Press.
- U.S. Department of Agriculture, Foreign Agricultural Service (USDA-FAS). India: Grain and Products Annual (various years).
- World Bank. 1990. *World development report 1990*. New York: Oxford University Press.

_____. 1999. *India Foodgrain Marketing Policies: Reforming to Meet Food Security Needs, Vols. I and II*. Report No. 18329. Washington, D.C.: The World Bank.

_____. 2003. *India: Revitalizing Punjab's Agriculture*. Unpublished Report, Rural Development Unit, South Asia Region.

_____. 2004. *India: Re-energizing the Agricultural Sector to Sustain Growth and Reduce Poverty*. Report No. 27889-IN, Rural Development Unit, South Asia Region.

WDI 2003. *World Development Indicators*. Washington D.C.: The World Bank