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ARTICLES

The Grain Management in Andhra Pradesh: Scope for Reforms

Surajit Deb*

I

INTRODUCTION AND ISSUES

Andhra Pradesh has traditionally been known as a major rice producing state, which contributed to the central pool procurement of rice in India in a big way. The cropping pattern in the state indicated shifts away from jowar, bajra and ragi to rice cultivation during the 1970s, 1980s and 1990s. Although, the paddy cost of cultivation was high, alongside low rice yield level as compared to other rice producing states, the state retained its position as a major rice producer primarily due to its physical production volume (World Bank, 2003). As a result, the government procurement for carrying out the public distribution system (PDS) and buffer stock operations in the country depended much on the rice production volumes in Andhra Pradesh. On several occasions, the minimum support price (MSP) of rice was raised due to the pressures from farmer's association in Andhra Pradesh and it is claimed that every increase in rice MSP undertaken in the previous years have benefited the state's surplus-producing farmers. It may also be noted that an elaborate levy system on rice millers is used to carry out the state procurement operations in the state. As a consequence, the private trading of rice produced in Andhra, both inside and outside the state, is controlled by the strict enforcement of the levy system.¹ Finally, the state also remained famous for its Rs. 2/kg rice scheme in the PDS, which was first introduced in 1982-83 for providing additional subsidy on the central issue price (CIP) to the below-poverty-line (BPL) families. The scheme continued uninterrupted till 1991-92 when the rate was revised to Rs. 3.50 per kg, and the rate was finally raised to Rs. 5.25 per kg in 2000-01 after several changes during the nineties. The government went on with supplying rice at this rate to BPL families through its targeted PDS (TPDS) till recently.

Of late, a number of developments around the food grain sector have taken place in the state along with corresponding changes in the government policies. First, the

*Associate Professor, Ram Lal Anand College, University of Delhi, Delhi.

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cropping pattern analysis reveals that the area under rice production has declined and the estimates of agricultural production bring to light that rice production has suffered a setback in Andhra Pradesh. As a result, the proportion of rice procured from Andhra Pradesh in comparison to the all-India procurement has exhibited a declining trend. Second, the mill levy rate on rice was recently lowered from 100 per cent to 75 per cent, but the government has recently proposed to modify the levy rate ratio so as to impose restrictions on the sale of non-levy rice to buyers in other states. Under the modified formula, rice millers in Andhra will be allowed to sell only half a tonne of rice to buyers outside the state and another half within the state for every tonne surrendered as levy. Third, the state government after a gap of 12 years has also revived its famous Rs. 2 per kg rice scheme for the poor. This time, about 42,000 fair price shops (FPS) are networked and the government plans to provide 4 kg of rice per head, subject to a maximum of 20 kg per family per month. Given these developments and policy changes, one would be interested in assessing their possible effects on the grain economy of Andhra Pradesh. To be specific, it would be useful to examine whether the reinstated subsidised rice scheme at the time of the production slow-down could become a successful food grain policy? In this context, one may raise several questions that are relevant for the grain management in Andhra Pradesh. First, since huge production subsidies on fertiliser and power are generally used for rice production in Andhra Pradesh, one may wonder whether the all-round production as well as procurement support to rice is an effective grain management strategy in the state? Second, whether the use of levy measures in Andhra Pradesh needs to be reformed so as to ensure the competitive efficiency in rice marketing. Third, whether the existing policy of depending on rice as the preferred cereal for PDS is a financially viable approach for attaining food security in the state? Against this backdrop, the paper intends to examine the procurement, storage and distribution aspects of foodgrain in Andhra Pradesh, and subsequently suggest reform measures for a sustainable foodgrain management in the state.

With this objective in mind, the plan for the rest of the paper is as follows. We first examine whether there has been any noticeable change in the cropping pattern and production trends for rice in Section II. The patterns in production, yield level and cost of cultivation of paddy over time is then analysed in comparison to other rice producing states in India. The system of grain procurement as well as the trends in procurement of rice and maize are then explored in Section III. The response of rice procurement volume in Andhra to changes in production level vis-à-vis the prices is also investigated in this section. In Section IV, the extent of grain (rice and wheat) distribution under Andhra PDS is examined. In recent times, reforming the agricultural marketing system and developing the storage and warehousing network has become the major thrust area of the state's grain policies. We look at the grain marketing system in Section V, whereas the aspects of storage and warehousing are taken up in Section VI. Section VII deliberates on the need and areas for reforming

the grain management in Andhra Pradesh. The strategies for making sustainable grain management policies are outlined in the conclusion.

II

TRENDS IN AREA AND PRODUCTION

Apart from producing rice, Andhra Pradesh has also been a large producer of cash crops like tobacco, groundnut, chillies, turmeric, oilseeds, cotton and sugar. The share of agriculture in the net state domestic product remained about 15.5 per cent at constant (=1999-2000) prices during the triennium ending 2006-07. A high degree of landlessness among the farmers is reflected in the high concentration of agricultural labourers in the state, i.e., about 63 per cent of the total workers (including cultivators and agricultural labourers) are engaged in the farm sector. The number of agricultural labourers per cultivator is much above the level of all-India, indicating a highly concentrated land distribution pattern. The cropping pattern reveals that rice occupies a major segment of the cropped area in the state. The districts in the coastal Andhra region, particularly, East Godavari, West Godavari, Nellore, Krishna, Srikakulam, Vizianagaram and Visakhapatnam have remained as traditional rice-growing areas and have high proportions of net sown area under rice. Some districts in the Telengana region, viz., Nalgonda, Nizamabad, Khammam, Karimnagar and Warangal also reveal high area under rice in their cropping pattern. Ramgopal (2003) had earlier observed a decline in the area under food crops along with corresponding rise in the non-food crops in the state as a whole. Our analysis of area under major crops to total area sown over the period 1960-61 to 2006-07 reveals that the cropping pattern in Andhra Pradesh has undergone some noticeable changes.² The area under rice, which expanded steadily since the 1960s and continued to rise in the 1970s and 1980s decade, revealed a slow-down in the late 1990s. In recent years, the rice area as percentage of cropped area declined from 31.3 per cent during the triennium ending 2000-01 to 29.8 per cent in the triennium ending 2006-07 in the state. At the disaggregated level, a declining trend for the area under rice is observed for fourteen out of twenty two districts between the period 2000-01 and 2006-07. As regards the coarse grains, except for maize, all the cereals and millets that are grown in the state registered decline in the cropped area. The percentage of area sown under jowar, bajra and ragi revealed continuous decline in successive decades as well as in recent years. On the other hand, the area under pulses expanded due to increased acreages in green gram, black gram, red gram and bengal gram, although the area under horse gram dropped in the state. The area under groundnut production earlier registered continuous increase in the 1960s, 1970s and 1980s and occupied a sizeable proportion of the cropped area in the state till recently. But area under groundnut started to decline since the late nineties, so the area under total oilseeds recorded decline in recent years. In contrast, the area under cotton and sugarcane – the two important cash crops in the state – exhibited continuous increase in the previous five

decades. Thus, the cropping pattern for Andhra Pradesh in recent years (triennium ending 2006-07), seems to have shifted from food grains (particularly rice, and other cereals and millets like jowar, bajra and ragi) and oilseeds to pulses and commercial crops like cotton and tobacco and in certain cases to fruits and vegetables. It may however be noted that although the area under cereals and total food grains registered a decline, the area under maize indicated a noticeable improvement in the state.

The coastal region still remained the major rice producing area within the state, and West Godavari, Krishna, East Godavari, Guntur, Prakasam districts in the coastal-Andhra contributed in a major proportion of the state's rice production. Some of the districts in the Telangana region, viz., Nalgonda and Karimnagar also remained important in terms of the rice production. The rice yield-rates are found to be significantly high in West Godavari, Krishna, East Godavari, Guntur, Nellore, Prakasam, East Godavari, Nalgonda and Karimnagar districts. Earlier, Ravi and Indrakant (2003) had argued that the growth rate of rice production in Andhra Pradesh decelerated during the 1980s and 1990s after recording accelerating growth rates in the 1970s. The analysis of recent data on principal crops production reveals that rice production level recorded a decline between the triennium ending in 2000-01 and 2006-07. The production level of all the cereals and millets (except for maize) either declined or stagnated in recent years, whereas the production of maize registered significant growth. It may be observed that the total food grain production in the state could record an improvement owing to the growth in maize and pulses production. While the production of oilseeds declined due to the drop in groundnut production, the production of cotton denoted improvements in recent years. Subsequently, the analysis of crop yield levels reveals that yield improvements have taken place for some of the cereals and pulses, viz., rice, jowar, maize, ragi, red gram, bengal gram and horse gram. On the other hand, stagnant or declining yield levels are observed for bajra, green gram and black gram. Among the major non-food crops produced in the state, groundnut, tobacco and sugarcane recorded a drop in their yield levels whereas the cotton yield level exhibited improvements in the recent triennium. Finally, there are indications of declining production and yield levels of rice cultivation in the state from the district level information. As many as nine districts recorded either declining production or deteriorating yield levels in rice production between the triennium ending in 2002-03 and 2006-07.

2.1 Rice Production and Cost of Cultivation

Subrahmanyam and Sekhar (2003), Rao and Dev (2003) earlier argued that Andhra Pradesh has lost its competitiveness in rice production due to higher cost of rice production in comparison to other rice producing states like Punjab and Uttar Pradesh. The comparative analysis of production levels among major rice producing states of India indicates that the production volumes of rice in West Bengal and Uttar Pradesh are higher than that of Andhra Pradesh (Table 1). The rice yield rates in the

state, although indicated modest increase in recent times, it remained below the level of Punjab. The comparison of cost of cultivation data also indicates a disadvantage for rice cultivation in Andhra Pradesh. If we focus on the narrowest definition (cost A_1), it can be seen that cost of producing paddy remained high in the states of Andhra Pradesh, Haryana and Tamil Nadu, however, the cost of paddy cultivation in Andhra remained substantially higher as compared to other rice producing states, viz., Punjab, Uttar Pradesh, West Bengal, Assam and Haryana. The analysis based on the broader definitions of cost of cultivation that includes costs for leasing land, capital inputs or family labour does not change the assertion. On the contrary, the comparative data on maize cost of cultivation in major producing states reveal that the cost in Andhra Pradesh is lower than the costs in Bihar, Haryana, Tamil Nadu, Uttar Pradesh and West Bengal. It therefore appears that the state's position in terms of rice production has weakened in recent years along with improvements in maize production, where there is a cost of cultivation advantage.

TABLE 1. PRODUCTION AND YIELD OF RICE IN MAJOR PRODUCING STATES

States↓ Triennium ending →	Production (thousand tonnes)			Yield (kg/hectare)		
	1980-81 (1)	1990-91 (2)	2005-06 (3)	1980-81 (4)	1990-91 (5)	2005-06 (6)
Andhra Pradesh	6916.3	10078.0	10085.7	1872.0	2426.0	3020.0
(as per cent of all India production)	13.9	13.9	11.5			
Karnataka	2267.0	2388.3	3167.3	2008.7	2079.7	2474.3
(as per cent of all India production)	4.5	3.29	3.6			
Tamil Nadu	5212.0	5849.3	4976.7	1958.0	3078.7	2528.3
(as per cent of all India production)	10.4	8.0	5.7			
Punjab	3122.0	6051.7	9956.0	2760.0	3169.3	3779.0
(as per cent of all India production)	6.3	8.3	11.4			
Uttar Pradesh	4196.7	9153.0	11063.3	8687.0	1764.0	1988.0
(as per cent of all India production)	8.4	12.6	12.6			
West Bengal	6657.7	10639.3	14931.7	1347.7	1873.0	2570.0
(as per cent of all India production)	13.4	14.7	17.0			
All India	49911.3	72783.7	87816.7	1250.0	1724.7	2050.7

Source: Worked out using data published by Directorate of Economics and Statistics, Government of India, New Delhi.

III

PROCUREMENT FROM ANDHRA PRADESH

A major portion of rice produced in Andhra Pradesh is procured for the central pool and the state is known to be surplus in rice.³ Besides the procurement by Food Corporation of India (FCI) for the central-pool, the Andhra Pradesh State Civil Supplies Corporation (APSCSCL) and AP Markfed also carry out paddy procurement in the state. The FCI undertakes procurement of mill levy rice at MSP, and the APSCSCL procures additional quantities from the rice millers at the procurement price of levy price, which is negotiated with the millers. At present, the state government also procure coarse cereals and hand it over to FCI, which subsequently

disposes off the stock through traders or auction it off in the case of quality deterioration.

3.1 Rice Procurement Under Levy

The government procurement operations in Andhra mainly involve MSP purchase of paddy, custom milling of paddy and procurement of levy rice. The FCI and APSCSCL opens *paddy purchase centre* in each district and commission agents are employed to undertake the procurement. The farmers pay 1.5 per cent of the value of paddy at MSP for unloading, cleaning, auctioning, weighing and stitching the gunny. The lion's share of rice procurement in Andhra is done through a compulsory levy on traders/millers under which the miller shares a specified portion with the government at a fixed price.⁴ Every rice levy-delivering mill in the state operates as purchase points to fulfil the state procurement and also accomplish custom milling for the FCI. The state fixes district-wise targets based on production/milling capacity and the respective administration ensures the fulfilment of targets in each district. On the other hand, paddy purchased by the APSCSCL is handed over to the nearest designated mill for custom milling, and the delivery of rice is monitored by the district administration and APSCSCL staff. An analysis of agency-wise paddy procurement pattern under MSP operations indicate that a major portion is procured through the rice millers (Table 2).

TABLE 2. AGENCY-WISE PADDY PROCUREMENT (MT) UNDER MSP OPERATIONS IN ANDHRA PRADESH

Year (1)	Rice millers (2)	APSCSCL (3)	FCI (4)	Total (5)
2001/02	9449686 (96.9)	229887 (2.4)	73740 (0.8)	9753313
2002/03	5787295 (99.8)	5993 (0.1)	3558 (0.1)	5796846
2003/04	7585537 (97.5)	98667 (1.3)	99091 (1.3)	7783295
2004/05	6576128 (99.7)	11927 (0.2)	9717 (0.1)	6597772
2005/06	9590455 (95.3)	284366 (2.8)	191877 (1.9)	10066698
2006/07	10171249 (93.4)	607395 (5.6)	107749 (1.0)	10886393

Source: APSCSCL Records, Hyderabad.

Note: Figures in parentheses indicate per cent share.

The rice levy rate has been revised in the past keeping in mind the overall food situation, local conditions and FCI storage constraints. During early eighties, FCI was the sole agency for levy procurement, and the levy to levy-free ratio of milled rice used to be 2:1, i.e., half a quintal becomes eligible to be sold in market for the delivery of every quintal. This policy was changed during mid-1980s, the millers now delivered one unit to FCI and half a unit to APSCSCL to obtain a certificate to sell half a unit within the state and one unit outside the state. By the revised procurement policy of 1989-90, the millers delivered one unit to both FCI and APSCSCL till the target of 15 lakh tonnes of rice from each source is met, and the millers are then

allowed to sell 10 lakh tonnes within the state and 20 lakh tonnes outside the state. The mill levy rate was raised to 100 per cent in 2004-05 and then reduced to 75 per cent in 2005-06, during the respective kharif marketing seasons (Table 3). Nevertheless, the Andhra government has recently proposed to modify the levy rate ratio to ensure better availability and stable prices of rice in the domestic market. This time the state government is likely to impose restrictions on the sale of rice by millers to buyers in other states by reworking the ratio of non-levy sale of rice within and outside the state. It may be recalled that under the existing formula, rice millers in Andhra Pradesh are allowed to sell one tonne of rice to buyers from other states after surrendering one tonne to the state government as levy. The proposed policy specifies the levy-sale ratio at 1:1/2:1/2 in contrast to the existing formula of 1:1, thereby allowing the miller to sell only half a tonne of rice to buyers outside the state and another half within Andhra for every tonne surrendered as levy. The new policy is proposed to be implemented once the necessary clearances are obtained from the centre.

TABLE 3. RICE LEVY RATES IN ANDHRA PRADESH ON MILLERS/DEALERS

		<i>(per cent)</i>	
Year (1)	Rice levy rate (2)	Year (3)	Rice levy rate (4)
1982-83	50	2004-05	100*
1986-89	50	2005-06	75
1993-95	50	2006-07	75

Source: Ministry of Food, Consumer Affairs and Public Distribution, New Delhi.

Note: *100 per cent levy rate was operative till February 2005; subject to overall delivery of 75 per cent of levy and deliveries in excess of 75 per cent is parboiled rice, till the total procurement of 6 lakh tonnes of parboiled rice is achieved.

3.2 Determinants of Rice Procurement

Earlier research has provided evidence that the FCI's rice procurement is primarily concentrated in few states, viz., Andhra Pradesh, Haryana, Punjab and Uttar Pradesh (Government of India, 2002). The market-arrival ratio of rice has remained high in Andhra due to the recent hikes in procurement price and also because of the assured supply of PDS rice in the state. It is however observed that there is a decline in the share of Andhra Pradesh to the total central pool rice procurement since 2003/04, along with corresponding rise in contributions from states in the eastern region and Chhattisgarh (Government of India, 2008a,b). When we examine the procurement ratio of rice (procurement as percentage of production in the state), we find that the contribution to government procurement still remains a major destination for the rice produced in Andhra Pradesh (Figure 1). Although there are several inter-year fluctuations, the rice procurement ratio revealed a trend increase over the sample period 1971-2007 and comprised about 40 per cent during the triennium ending 2006-07.

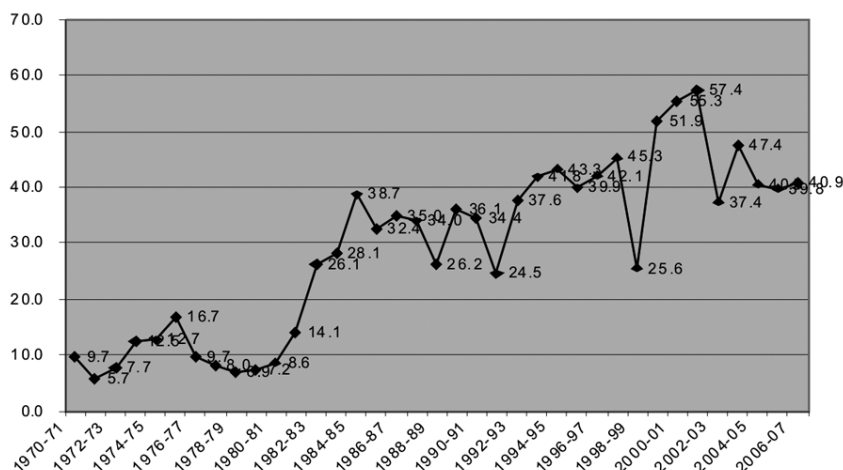


Figure 1: Procurement-Production Ratio of Rice in Andhra Pradesh

We subsequently examine the response of rice procurement in Andhra to changes in production level as well as procurement and open market prices. Radhakrishna and Indrakant (1987) had earlier examined the determinants of rice procurement in Andhra for the period between 1970-71 and 1985-86. Their results revealed that the output level remained highly significant and the price variable (ratio between the procurement and open market price) statistically insignificant in explaining the rice procurement volumes. In this paper, the state's procurement and open market price (viz., wholesale price) of rice have been included separately as well as in the ratio form in the rice procurement function.⁵ The results from alternative specifications of the regression equation are included in Table 4, which suggest that the production volume remained significant in determining the rice procurement level. The prices (procurement and open market) did not turn out to be statistically significant in the procurement function, when included individually. The significance of the production volume is not surprising considering the fact that more than 90 per cent of the rice is procured in the state is undertaken through the compulsory levy route after the harvest. The procurement price, however, turns out to be statistically significant and bearing the correct coefficient sign when it is included as a ratio of the open-market price. The second equation suggests that production volume as well as the price variable (support price as a ratio of open market price) generated a significant positive influence on Andhra's rice procurement. This would imply that while the spurt in rice production volume in the state due to irrigation, power and modern inputs coupled with the secured procurement commitments by public agencies influenced the procurement growth, the spread between support (levy price) and open market price of rice has also played a statistically significant influence on the procurement levels.

TABLE 4. REGRESSION RESULTS ON RICE PROCUREMENT IN ANDHRA (1980-81-2006-07)

Explanatory variables (1)	Dependent Variable: Rice procurement in Andhra (2) (3)	
Constant	-322.49 (-1.56) *	-1148.4 (-2.94) *
Rice production level	4.11 (3.15) *	6.00 (5.36) *
Rice procurement price	0.16 (0.29)	-
WPI of rice	0.23 (0.33)	-
Procurement-WPI ratio	-	7.39 (1.85) *
Summary Statistics		
R ²	0.70	0.63
R-bar ²	0.67	0.60
DW-Statistics	1.64	1.38
F-Statistics	18.26 *	20.85 *

Note: * indicates statistical significance at 10 per cent level.

3.3 Procurement of Maize

Although, the procurement of food grains in Andhra has mostly confined to rice, the state in recent years has begun to procure maize through APSCSCL and AP-MARKFED (Table 5). The coarse grains are presently being procured by the state governments in Andhra Pradesh, Bihar, Chhattisgarh, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra and Rajasthan. As per the existing policy of the Government of India, coarse grains, viz., jowar, bajra, maize and ragi are being procured by the state governments primarily to provide the benefits of MSP to the farmers. In the past, the Andhra government has by and large procured maize only to protect the farmers' interest, whenever their prices fell below the MSP. The APSCSCL started operating as a maize procuring agency in addition to the A.P. Markfed only since the 2003-2004 kharif crop year.

TABLE 5. AGENCY-WISE MAIZE PROCUREMENT (MT) UNDER MSP OPERATION IN ANDHRA

Year (1)	AP-MarkFed (2)	APSCSCL (3)	Total (4)
2001/02	14928 (100)	0	14928
2002/03	4035 (100)	0	4035
2003/04	170725 (64.3)	94760 (35.7)	265485
2004/05	168967 (75.7)	54256 (24.3)	223223
2005/06	563752 (94.9)	30138 (5.1)	593890
2006/07	Nil - Since maize prices are more than MSP rates.		

Source: APSCSCL Records, Hyderabad.

Note: Figures in parentheses indicate percentage share.

IV

GRAIN DISTRIBUTION UNDER PDS

A massive PDS network functions in Andhra Pradesh with better penetration in rural areas and correspondingly high off takes from the FPS.⁶ The state government perceived that supply of cheap rice to poor families is essential for improving food security in the state and therefore, introduced the Rs. 2 per kg rice scheme in the PDS during 1982-83. The state granted additional subsidy on the CIP of rice through this scheme, which however underwent several changes with regard to the issue price, allocated quantity and quality of the rice. At the time of its introduction, the scheme enabled families having income less than Re 6000 per annum to get 5 kg of rice, per month per person (subject to a ceiling of 25 kg per month per family) at a subsidised rate of Rs. 2 per kg. These households were issued green cards and others yellow cards. The yellow card holders were entitled for the same quantity of rice but at Rs. 3.50 per kg. Subsequently, the green cards were converted into white cards and yellow cards into by pink cards in 1991. The FPS issue price was raised to Rs. 3.50 and then to Rs. 5.25, while the ceiling on rice was reduced to 16 kg, then restored back to 25 kg and finally reduced to 20 kg. After the rate was fixed at Rs. 5.25 per kg in 2000-01, the government supplied rice at this rate to the below poverty line (BPL) families through its TPDS till recently.

TABLE 6. PUBLIC DISTRIBUTION OF FOOD GRAINS IN ANDHRA PRADESH

Year (1)	Rice (tonnes)					Wheat (APL) (7)
	Below poverty line (BPL) (2)	Antodaya Anna Yojana (AAY) (3)	Annapurna (4)	Above poverty line (APL) (5)	Total (6)	
1998-99	2113756 (90.05)	-	-	233538 (9.95)	2347294 (100)	N.A
2003-04	1940896	-	-	-	1940896	12637
2005-06	2543334.18 (80.37)	607302.98 (19.19)	13834.37 (0.44)	-	3164471.53 (100)	48770

Source: Derived from Statistical Abstract of Andhra Pradesh.

Figures in parentheses indicate percentage share.

The various rounds of National Sample Survey's (NSS) consumption expenditure data (all income classes) revealed that the per capita rice consumption (kg/person/month) remained substantially higher in Andhra for both rural and urban areas. The recent data indicate that dependence on PDS rice has increased in both rural and urban Andhra between the period 1999-2000 and 2004-05. In 2004-05, about 23 per cent of rural and 15 per cent of urban purchase of rice in Andhra had been from PDS outlets as against 13 per cent and 11 per cent of rural and urban rice purchase for all-states. The higher demand for PDS rice in Andhra is reflected in the state's rice off-take under various PDS schemes from the central pool allocation. The scheme-wise off-take for BPL, APL and Antodaya Anna Yojana (AAY) remained in

the range of 100 per cent, 47 per cent and 98 per cent as against 76 per cent, 17 per cent and 93 per cent for all-states, respectively during the triennium ending 2006-07. Similarly, rice off-take patterns under various welfare schemes, viz., Nutrition Programme, Mid Day Meal, Sampoorana Gramin Rozgar Yojana (SGRY), Special SGRY, Welfare Institutions and Hostels, reveals that the off-take level in Andhra Pradesh has been able to draw its quota of rice to be delivered under several PDS/welfare schemes from the central supplies. The extent of food grain (rice and wheat) distribution under PDS in Andhra Pradesh for recent years is provided in Table 6. It can be seen that while the government distribution of non-subsidised rice has virtually come to an end, the sale of APL wheat has increased in the state.

V

FOODGRAINS MARKETING

A comprehensive Market Act (Andhra Pradesh Agricultural Produce and Livestock Markets Act, 1966) operated in the state with by-laws framed for each market committees.⁷ Section III of this Act necessitates that the notified *market area* is declared and a *market committee* is constituted so as to regulate the sale and purchase of agricultural and livestock products in the state. The marketing staff prescribes the system of sale, which could either be an auction or tender system. Rice remained as a notified commodity and the sale and purchase outside the market yard is prohibited by the act in the state. It is essential that all market functionaries are licensed and there are various charges and taxes on agricultural marketing (Table 7). The system of a single-point market-fee on seller is prevalent in Andhra Pradesh, under which the market fee is collected by APMC on the sale of the produce arriving for the first time in the markets of the state.⁸ The 1 per cent market fee levied on the purchaser and the license fees form the major source of income to the market committee.

TABLE 7. AGRICULTURAL MARKETING CHARGES AND TAXES IN ANDHRA

Market Fee (1)	License fee (Rs./5 years) (2)	Marketing charges (Rs./unit) (3)	Commission charges (4)	Sales tax (5)
All Produce: 1 per cent Fish: 0.5 per cent	Traders: A: 3000 B: 2000 C: 1000	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 and veg: 4 per cent Others: up to 2 per cent	All produce (except Maize, Jowar, Ragi, Bajra, Coarse grain): 4 per cent

Source: Agricultural Marketing Department, Andhra Pradesh, and Government of India.

Note: The classification of A, B and C class traders are based on their yearly turnover, i.e., turnover of Rs. 1 crore and above, between 50 Lakhs and 1 crore and less than 50 Lakhs are categorised under A, B and C class, respectively.

The progress of regulated agricultural markets has remained somewhat better in Andhra Pradesh in comparison to other states, and it is claimed that reductions in the marketing charges and unauthorised deductions have resulted in better farmer's return in the state (Prasad, 1985). The number of agricultural markets in the state has expanded due to the growth in production and rise in marketable surplus. As on 31st March, 2007, the number of total markets in the state remained at 889, out of which 312 are wholesale (principal) markets and the remaining 577 are rural primary (sub-market yards). It is observed that majority of the markets (about 82 per cent) belonged to the Coastal and Telangana region (Table 8).

However, the picture in terms of the market penetration (number of available markets as proportion of geographical area) remained far from satisfactory, since not even a single district in Andhra possessed one agricultural market within a thousand hectares of area. It was claimed earlier that about 70 per cent of the marketed surplus of rice/paddy in Andhra is handled by the village commission agent in coastal districts, while about 35 per cent is handled by the same in the Telangana region (Subbarao, 1987). The predominance of the produce sale at village level arises due to the farmer's reliance on village moneylenders/traders and absence of proper marketing and transport facilities. As a result, 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.

The state has taken several initiatives in implementing the agricultural reforms package and the significant among them is the *pledge loan scheme* called *Rythu Bandhu Pathakam*, which provides credit to farmers and avoid their distress sales.⁹ Similarly, *Rythu Bazars* have been set up to eliminate the middlemen and directly serve the interests of producers and consumers. The reforms process in agricultural marketing has also been initiated in Andhra Pradesh as suggested by the *Model Act* circulated by Department of Agriculture and Co-operation. In fact, Andhra is one of the few states where reforms in the Agricultural Produce and Market Committee (APMC) Act have been introduced fully as suggested by the model Act and has been notified in the state. With the amendments, laws have been adopted to facilitate contract farming or direct marketing, establishment of private or co-operative marketing yards and special markets, setting up of national integrated produce markets for the National Dairy Development Board (NDDB), and change the existing composition of agricultural market committees in the state.

VI

STORAGE AND WAREHOUSING

The grain storage and warehousing activities in Andhra Pradesh is undertaken on behalf of the FCI, Central Warehousing Corporation (CWC) and the Andhra Pradesh State Warehousing Corporation (APSWC). The detailed storage capacity of food grains in Andhra Pradesh and its distribution among public agencies and private

TABLE 8. GROWTH OF AGRICULTURAL MARKETING IN ANDHRA PRADESH

Districts (1)	No. of AMC		Number of markets		Market penetration (markets per thousand hectares in 2002) (6)	No. of markets having sites in 2002 (7)	No. of markets developed (2002)	
	1981 (2)	2002 (3)	1981 (4)	2002 (5)			Functional (8)	Non-Functional (9)
Srikakulam	11	13	30	45	0.08	21	6	5
Vizianagaram	7	9	18	47	0.07	23	6	2
Visakhapatnam	7	8	27	49	0.04	17	11	6
East Godavari	11	14	32	50	0.05	17	7	8
West Godavari	8	16	32	41	0.52	20	3	15
Krishna	10	16	30	37	0.04	28	7	12
Guntur	11	16	32	45	0.04	28	9	14
Prakasam	9	14	36	39	0.02	25	6	17
Nellore	9	11	26	31	0.02	21	1	18
Coastal Andhra	83	117	263	384	0.04	200	56	97
Kurnool	12	12	19	27	0.02	17	7	8
Anantapur	11	12	23	49	0.03	19	11	7
Cuddapah	10	12	21	28	0.02	17	7	9
Chittoor	13	17	31	52	0.03	23	18	3
Rayalaseema	46	53	94	156	0.02	76	43	27
Ranga Reddy	8	9	12	18	0.02	14	9	2
Hyderabad	1	1	3	10	0.03	6	6	-
Nizamabad	7	9	20	26	0.03	18	6	6
Medak	7	10	18	26	0.03	11	8	3
Mahbubnagar	14	16	29	39	0.02	23	17	5
Nalgonda	12	19	40	52	0.04	31	13	16
Warangal	9	13	22	43	0.03	33	12	11
Khammam	9	12	18	33	0.02	20	3	7
Karimnagar	8	19	29	50	0.04	27	16	7
Adilabad	10	16	26	33	0.02	22	12	7
Telangana	85	124	217	330	0.03	205	102	64
Andhra	213	294	574	870	0.03	481	202	179

Source: Directorate of Marketing, Hyderabad.

Note: State figures are derived by summing over districts.

parties are provided in Appendix Table 1. Although, the FCI storage remains the major source of grain storage in the state, it can be observed that the share of FCI in the total (owned plus hired) storage capacity has declined in recent years, and this decline has resulted due to the fall in FCI's owned storage capacity. Foodgrains are also stored in warehouses that are owned by the private or public agencies. 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 the government and are meant for storage of goods owned by the government and private. Besides providing scientific storage facilities, the APSWC assisted in orderly marketing and also provided an *instrument* by way of warehouse receipt to secure credit from the banks.¹⁰ Presently, the APSWC offers storage services for food grains, fertilisers, food products, pulses, food stuffs, oilseeds, oils, fibre, seeds, feed and fodder, tea, coffee and miscellaneous items, the charges are however considered high by the users (Table 9).

TABLE 9. CONSOLIDATED GRAIN STORAGE TARIFFS (RE) IN APSWC (W.E.F. 1/4/2002)

Commodity (1)	Type (2)	Weight (Kg) (3)	Standard Rate (4)	High Rated- II (5)	High Rated-I (6)
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).

Note: Warehouses covered under High Rated-I category: Twin cities of Hyderabad and Secunderabad, Visakhapatnam, Vijayawada, Guntur and Kakinada. Warehouses covered under High Rated-II category: Mandapeta, Mangalagiri, Eluru, Proddatur, Tadepalli, Nellore, Tenali, Pedatadepalli, Narasaraopet – I, Karimnagar, Narasaraopet – II, Kamareddy, Warangal, Khammam, Miryalaguda, Venkatadripalem, Mubaraknagar. Warehouses covered under Standard Rate category: all other warehouses.

While a major part of public storage in Andhra is carried under the mode of *covered, covered and plinth (CAP)*, *plinth and silos*, grains are also stored in the open. The proportion of open grain storage has however declined in Andhra Pradesh and remains at a much lower level in comparison to other states. However, the post-harvest loss of paddy remained substantial in the state, and according to Government of India (2005), the post-harvest losses of paddy in Andhra remained at 3.22 per cent of the total paddy production (amounting to 533.65 thousand tonnes) during the triennium ending 1998-99. This rate of post-harvest loss as percentage of production is high as compared to other rice producing states, viz., Haryana (2.67 per cent), Karnataka (2.33 per cent), Kerala (0.83 per cent), Madhya Pradesh (1.39 per cent), Punjab (1.89 per cent), Tamil Nadu (3.17 per cent), Uttar Pradesh (1.94 per cent), West Bengal (2.07 per cent) and all-India (2.71 per cent).

Thus, there is a need for developing the bulk-handling and storage infrastructures to ensure lesser quantity loss of food grains in the state. The demand for storage and

warehouse services is expected to grow further in the country once the *Negotiable Warehouse Receipt System* comes into operation. The information on capacity utilisation of CWC vis-à-vis APSWC reveals that while there is a scope for improving the storage capacity of CWC, the APSWC in recent years has worked almost with the full capacity (Table 10).

TABLE 10. CAPACITY UTILISATION OF CWC AND APSWC

Year →	1997-98	1999-2000	2001-02	2003-04	2004-05 *
(1)	(2)	(3)	(4)	(5)	(6)
Per cent occupancy in CWC	72	77	83	60	64
Per cent occupancy in APSWC	72	80	93	NA	NA

Source: Andhra Pradesh State Warehousing Corporation and Annual Report, and Ministry of Food, Consumer Affairs and Public Distribution, * Till September 2004.

VII

NEED FOR REFORMS

A system of subsidies has been prevalent encompassing aspects of production, marketing and consumption of rice in Andhra Pradesh. The subsidies include input subsidy in terms of low power tariff and irrigation water charges, the producer subsidy in terms of high procurement price, and finally the consumer subsidy owing to the Rs. 2 per kg scheme in the state. It was indicated earlier that these subsidies have impacted adversely on the cropping pattern in favour of the single crop paddy and minimised the farmer's incentives to diversify towards the high value crops. Recently, Dev and Rao (2004) argued that although some of the rice varieties grown in the state had high export potential, the levy based assured procurement mechanism has distorted the incentives to sell better-sized rice and rice bran oil for the export market. It therefore appears that reform measures for maintaining the production incentives and ensuring market liberalisation policies are required for the foodgrain sector. It may be noted in this context that the process of removing the marketing-storage-movement restrictions in the country has been initiated by the central government, so as to reform the public dominated grain management practices and inject efficiency into the grain parastatals. The impacts of these reform measures can turn out to be particularly crucial for Andhra Pradesh due to the size of its grain sector. Similarly, the state's commitment towards the subsidised rice scheme and the mounting rice subsidy bill would remain questionable in view of the Andhra Pradesh Fiscal Responsibility and Budget Management (FRBM) Act 2005,¹¹ which imposes limits on state budget deficits. It therefore seems essential that reform measures are initiated to streamline the subsidy regime and restore the market incentives in the grain economy of Andhra Pradesh. We suggest reform measures in the following directions.

7.1 State Control: Levies and Duties

The control on stock and movement of food grains was operative in Andhra Pradesh and the free movement of paddy and rice within and outside the state was restricted. Subsequently, by keeping the earlier Andhra Pradesh Paddy (Restrictions on Movement) Order, 1987 in abeyance, the Andhra government relaxed the restrictions on movement of paddy and rice within and outside the state in July 2000. However, the rice levy system persists in the state as a requirement under the Essential Commodities Act (ECA) for mills to deliver part of their output at a price determined on the basis of the procurement price of levy rice, irrespective of the market price. The levy price of rice has generally displayed a tendency to increase faster than the MSP for paddy in many states including Andhra Pradesh. The rice millers in Andhra Pradesh have time and again negotiated hikes in the levy price as well as milling charges. It is therefore argued that the levy system actually provided the price support to the millers, whereas farmers continued to get less for their paddy in comparison to what they could have received by selling at the declared MSP. Further, an elaborate control mechanism is required for the levy enforcement when prices are high in the open market, and offers no real price support to farmers when market prices are low. There is another form of inefficiency in the levy delivery system, viz., the millers can apparently sell the poor quality rice to public agencies to cover the loss from the levy sale and sell the good quality rice in the open market at higher prices (Jha, 2002; Jha and Srinivasan, 2002). The long term grain policy charted out in Government of India (2002) and the Commission for Agricultural Costs and Prices (CACP) report (Government of India 2007a) had earlier indicated that the levy system did not help the farmers. It is also argued that the levy system has killed the incentives to modernise the rice mills in Andhra, and Government of India (2007a) has observed that rice mills remained relatively modern in states where the rice levy rates are low or not obligatory, e.g., Tamil Nadu. Although, the quantum of statutory levy in Andhra Pradesh was lowered from 100 per cent to 75 per cent, it is still high as compared to other states, viz., 60 per cent in Punjab or Uttar Pradesh and 50 per cent in Assam or Tamil Nadu or West Bengal. The Andhra government can therefore go in for a gradual reduction in the levy rates used for the official procurement of rice. Further, the Andhra government has recently proposed to modify the ratio of non-levy sale of rice outside the state to ensure better rice availability in the domestic markets. It may be noted that there are several assembling markets for paddy and rice in Andhra Pradesh and the state usually sells out its rice to other states, viz., Karnataka, Kerala, Tamil Nadu, Gujarat, Maharashtra and West Bengal. Thus, the supply of rice from Andhra to these states could be restricted in case the levy modification is implemented.

7.2 Procurement of Coarse Grains

Although, jowar and bajra happen to be the preferred commodities in the consumption basket of the poor, it is difficult to procure these cereals from different locations because of their small and dispersed marketable surpluses (Meenakshisundaram, 2001). The FCI has found selling coarse cereals through PDS impractical since the demands for bajra, jowar and ragi remains localised. The Andhra government has been supporting the MSP for paddy and rice through its procurement operations, whereas the price supports for coarse cereals has remained insignificant. The market price of coarse cereals moved below the MSP even during the peak marketing seasons on many occasions. The APSCSCL normally intervened in such situations, but the procurement was not large enough to lift up the prices. The market price of maize and ragi fell substantially below the MSP; likewise the prices of tur (arhar) remained below the MSP despite the commercial purchase by NAFED in Andhra Pradesh. The CACP has recently recommended that coarse cereals should be inducted in the PDS as an adjunct for enhancing food security in the country. Thus, instead of handing over the coarse cereals to the FCI after the procurement, the Andhra government can distribute the stock through their own PDS network or sell to the neighbouring states. It is argued that the responsibility of FCI as a provider of grain supply to states gets reduced once the proposed decentralised procurement operation becomes binding on the states. On the other hand, the states can have greater freedom under the decentralised operations for designing their own procurement policies catering to the local needs. The APSCSCL can therefore act with more flexibility in the state and is likely to better serve the cause of food security for the poor.

7.3 Rationalisation of Rice Subsidy

Although the Andhra rice scheme was originally meant for the BPL families, it was found earlier that its coverage became almost universal (Radhakrishna *et al.*, 1997, World Bank, 1997, Dutta and Ramaswami, 2001, Indrakant and Harikishan 2003, Sridevi 2004). An analysis of the data on scheme-wise rice subsidy reveals that almost half of the total PDS rice is being purchased from the central supplies at APL rates and being distributed in the state at BPL rates. The difference between the CIP and the retail price at state FPS outlets as well as the improper targeting mainly contributed to the rising food subsidy bill in recent years. We have worked out the subsidy rate on rice distribution in Andhra on the basis of total subsidy bill and the quantum of rice distributed in the state (Table 11). The subsidy rate, both in nominal and real terms, registered a secular rise till 1999/2000 and showed some decline during the triennium ending 2003-04. This decline is due to the upward revision of issue price brought into effect in 2000-01 and also because of the reduction in

quantity of distribution. The rice subsidy rate is however found to be rising since 2003-04 and stayed at a much higher level for the triennium ending 2006-07.

Earlier, several studies have pointed out that a substantial number of non-poor had the access to subsidy benefits due to high errors of inclusion in the Andhra PDS. However, after a gap of nearly 12 years, the Andhra Pradesh government has revived the cheap rice scheme from the 2008-09 fiscal. This time the government plans to target about 18.5 million BPL (white) card holders under the proposed scheme, thereby sell subsidised rice to 65.1 million persons out of the total state population of 82.2 million, at an estimated government cost of Rs. 19.80 billion. Thus with 79 per cent of population under the scheme coverage, it looks obvious that the rice subsidy rate is slated for a phenomenal rise in the coming years. The question therefore arises whether it is justified to take on such a substantial burden of public expenditure on rice subsidies, since it is evident that the high income class groups would also enjoy the welfare gains. On the contrary, there is a possibility that the untargeted subsidy can turn out to be counter-productive by putting pressure on the expenditure budget. In fact, it is learnt that the state-cabinet has recently approved amendments to the FRBM Act so as to borrow and fund the populist Rs. 2 per kg rice scheme. If the proposal to borrow Rs. 16, 000 crore materialises then the state could lose the benefit of a debt waiver on past loans in the current fiscal year.

TABLE 11. STATE SUBSIDY ON RICE DISTRIBUTION SCHEME IN ANDHRA PRADESH

Triennium ending (1)	Subsidy Bill (lakh Rs.) (2)	Subsidy Bill (lakh Rs.) (Deflated by GDP deflator, Base: 1993/94) (3)	Distribution (lakh qtl) (4)	Subsidy Rate (Rs. per qtl) (5)	Subsidy Rate (Rs. per qtl) (Deflated by GDP deflator, Base: 1993/94) (6)	Subsidy rate (Rs. per qtl) (Deflated by all-India WPI of rice, Base: 1993/94) (7)
1984-85	6641.0	15150.4	128.2	41.6	96.1	89.9
1989-90	22903.7	36698.6	202.5	113.2	181.5	188.3
1994-95	46711.3	45336.0	207.5	218.6	213.3	210.5
1999-2000	83586.0	56230.0	225.8	366.9	249.7	240.8
2003-04	34471.7	20327.3	212.9	162.8	96.1	97.3
2006-07	58656.0	-	312.3	186.9	-	107.2

Source: Derived from APSCSCL Records, Hyderabad and Government of Andhra Pradesh (2006).

7.4 Private Participation in Marketing and Infrastructure Development

The nature of agricultural marketing in Andhra Pradesh can be expected to undergo changes in the near future since the notification of the new APMC Act has been made recently. It is learnt that the private corporate have shown interests in running large wholesale markets for agricultural produce because they have so far been barred from entering the agri-business. According to Government of India (2007 b), terminal market complexes under the public-private-partnership (PPP) mode is

coming up at Vijayawada, Tirupati and Hyderabad. The Multi Commodity Exchange of India Limited (MCX) proposes to open electronic market for spot trading in Hyderabad and has sought a waiver on the stipulated Rs. 10 crore minimum investment necessary for setting up auction yards and other infrastructures. Although, contract farming, direct marketing, private and co-operative marketing yards have been allowed in the state, there is however no provision for exemption of market fees and tax on direct marketing, contract farming, processing or exports from the state. Further, there is no mention of the rationalisation or simplification of the market fees after the amendment. The licensing requirement for the market functionaries has also been kept necessary and there is no stipulation of grading and standardisation of product under the new act.

It may be noted that the central government mooted private sector participation on the basis of PPP model for building up modern grain supply chains with the objective of attaining lesser quality and quantity loss in the country (Government of India, 2000). The bulk-storage with temperature-moisture-quality control also remains a requirement under the proposed Warehouse Development and Regulation Bill. The *Andhra Infrastructure Policy* (2000) earlier laid out the PPP framework and outlined specific projects to develop rural road, rural water supply, water harvesting and ground water recharging in the state. The build-operate-transfer (BOT) scheme has earlier been used for the development of port services and construction of long express highways in Andhra Pradesh. The government must attempt in achieving partnership for joint ventures in the field of storage modernisation, bulk handling and transport of agricultural produce.

VIII

CONCLUSION

The grain management in Andhra Pradesh has earlier received attention from the policy-makers due to the specific concern on the impact of government's rice procurement and the functioning of the subsidised rice scheme. One can observe that some significant developments and policy changes around the state's grain economy have recently been taken place. The Rs. 2 per kg rice scheme has been re-launched at a time when the area and production of rice has started to decline in the state. The state government has further proposed to modify the levy rate ratio mainly to control the non-levy sale of rice both within and outside the state. The production shortfall and levy rate modification of rice along with the re-introduction of subsidised rice scheme have some important implications for the state's management of food grains in the short run. This paper examines the three crucial aspects of grain management, viz., procurement-storage-distribution operations, alongside developments in marketing infrastructure, and subsequently suggests possible reform measures. The findings of this paper indicate that shifts in cropping pattern have taken place in Andhra Pradesh from food grains (rice, jowar, bajra and ragi) and oilseeds

(groundnut) to pulses and commercial crops like cotton and tobacco. The decline in rice area and production caused the state's share in the all-India production to fall in relation to other rice producing states. Although, the government procurement ratio of rice remained high in the state, the share of Andhra Pradesh in the total central pool procurement recorded decline in recent years. The estimation of rice procurement revealed that although the production volume remained important, the rising support prices have played an important role in determining the rice procurement level in Andhra Pradesh. On the distribution side, the use of rice in PDS schemes has raised the PDS-dependence in the state, thereby causing the rice subsidy rate to rise consistently since 2003/04. While the proposal for levy rate modification can be seen as a measure to enhance the state's procurement and sustain the massive demand for rice, the state had to take the drastic step of amending the FRBM Act so as to borrow and finance the subsidized rice scheme. All these facts indicate the need for reforming the grain management in Andhra Pradesh before it turns out to be unsustainable, both financially and operationally.

The prevailing grain management policy in Andhra typically provided an all-round support to sustain the production and procurement of rice. While the inputs for rice production were made available at subsidised rates, the government regularly lifted the marketed produce at high procurement prices. As a matter of fact, the support prices for paddy and rice were defended quite well, whereas the procurement operations for coarse cereals remained insignificant in the state. It was earlier claimed that the guaranteed public procurement has influenced the cropping pattern in favour of paddy in the state. The excessive cultivation of paddy has in turn led to many adverse effects, viz., declining productivity of the soil, and also minimised the farmer's incentives to diversify into high value crops. We doubt whether the dominance of rice in terms of the crop produced as well as grain distributed in the state PDS is an effective grain management policy for the state. We further found that the penetration of agricultural markets remained insufficient in Andhra Pradesh and are concentrated in the coastal and Telangana regions. The post-harvest loss of grain continues to be worrying and there is also decline in the FCI-owned grain storage capacity in the state. We therefore suggest reform measures in the following directions.

First, the present policy, which considers rice as the preferred grain for providing food security to the whole state, may not be the appropriate choice and needs to be altered. It was argued earlier that the state PDS policy - by distributing only rice- has created rice dependence in Andhra Pradesh. In fact it is claimed that at least in some regions (Telangana), the millet-eating culture has changed to rice-eating culture due to the rice subsidy scheme. In this paper, we found evidence that while the government distribution of APL rice has virtually come to an end, the demand for APL wheat sale has increased in the state. It therefore becomes essential that the grain management in Andhra becomes consistent with the changing consumer demand taking place in the state and at the same time fulfill the needs of low-income

population. It is then crucial that other grains and millets are introduced in the PDS system of Andhra. This is particularly important considering the fact that jowar, and other millets are grown in large parts of the Telangana region. Therefore, the scope of procurement and distribution of coarse grains as options for augmenting the food security requires to be explored in the Andhra PDS. It appears that the state government would be able to serve the local food requirements in a more effective manner with the adoption of a decentralised procurement scheme. It may be mentioned in this context that the experience from farmer's self-help groups (SHG) carrying out procurement and distribution of commodities has been found to be encouraging in the state.¹²

Second, a populist food subsidy scheme like the Rs. 2 per kg rice scheme can be sustained only in the short run but bears the risk of turning out to be fiscally taxing in the long-run. As the rice subsidy rate in the state has been found to be consistently increasing since 2003-04, the subsidy bill on rice can only be expected to grow after the reintroduction of rice scheme. Further, since, the scheme has been implemented at a time when the open market price of rice is prevailing at Rs. 13 per kg, such a huge difference between the subsidised price and the market rate causes scope for open market diversions. It therefore becomes essential that the rice scheme in Andhra Pradesh is redesigned in terms of identification, targeting and the delivery mechanism. These adjustments could potentially reduce the excessive fiscal burden of the cheap rice scheme of the state through the self-selecting out of the non-poor from the scheme. In a recent study, Jha *et al.*, (2007) have argued that the decentralised food grain procurement system would reduce the food subsidy and also encourage the efficient private trading of rice in the country.

Finally, it may be noted that the *Approach Paper to Agriculture* in Andhra Pradesh had earlier recommended that jowar cultivation should be made more remunerative by turning it into cattle feed. We have found evidence in this paper that among the coarse cereals, maize production exhibited impressive growth rates in recent years and also possess the cost of cultivation advantage in the state. Thus, maize and jowar cultivation can be made more remunerative by linking them with processing industry and adding value to them which could promote agro-industries in the areas of animal and poultry feeds, starch, industrial alcohols, syrups etc. Suitable arrangements for marketing and storage would become necessary for the developments in processing. Thus, in addition to setting up storage units at the market yards and constructing link roads from villages to market yards, the government should also encourage investments in the field of agro and food processing industries in the state.

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NOTES

1. The levy system is a compulsory procurement mechanism through which a part of the produce is bought from the farmers, traders or millers at a price lower than the market and the government subsequently permits the trader/miller to sell the remaining balance in the free market.

2. These tables were excluded to save space and can be procured from the author on request.

3. The balance sheet of rice (worked out by matching production minus procurement plus PDS supply) however corroborated that Andhra is deficit in rice (Government of India, 2002). Ravi and Indrakant (2003) argued that the underestimation of production or overestimation of consumption data could be the reason.

4. The Andhra government introduced the *millers/trader levy system* in 1965-66, by which all traditional sheller mills, huller-cum-sheller mills and modern rice mills operating in the private and co-operative sectors were covered under the system, whereas the huller mills and some of the non-trading huller-cum-sheller mills were exempted. By 1983-84, all the non-trading rice mills in the state having a milling capacity of more than half tonne of paddy per hour were brought under the levy system (see Subbarao, 1978 for details).

5. The procurement price of levy rice from 1980-81 to 2006-07 has been gathered from APSCSCL, whereas the wholesale price of rice in the state is calculated as the weighted average of wholesale rice (common variety) prices in important rice markets. The markets (with varieties in the parentheses) are: Kakinada (Akkulu), Vijayawada (Coarse), Nijamabad (Coarse), Bhimavaram (Akkulu) and Tadapaligudem (Akkulu). The source for the basic wholesale price data are "Agricultural Prices in India" (DES, Ministry of Agriculture).

6. According to Government of Andhra Pradesh (2006), there is one shop for every 1,965 persons in Andhra as against the Government of India norm of one FPS for 2,000 persons, and out of 41,296 FPS functioning in Andhra Pradesh about 83 per cent belonged to rural areas.

7. The agricultural marketing act operates with the following objectives: 1) create market areas and ensure fair transaction, 2) appoint market committee represented by growers, traders, local authorities, government staff, 3) rationalise market charges, 4) regulate market practices, 5) issue licenses to market functionaries, 6) provide dispute settlement mechanism on quality, weighing, deductions, 7) arrange for sale by tender/open auction, 8) arrange for dissemination and display of market information.

8. 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.

9. Under this scheme, the market committee provides finance to the farmers against the pledge of their produce to the extent of Rs. 50,000/- to a farmer or up to 75 per cent of the value of the produce (whichever is less). This scheme enables the farmers to prevent any distress sale of their produce at low price levels.

10. 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. Food grains 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.

11. Andhra Pradesh Fiscal Responsibility and Budget Management Act 2005 (Act 34 of 2005) with amendment in 2006 and notified as well as in force since 2006.

12. It is learnt that a SHG called Society for Elimination of Rural Poverty (SERP) has created a large rural food security network without subsidies in Andhra Pradesh. Under this model, rice, red gram, tamarind, edible oil and chilly are procured from the producers and sold to the villagers on a credit basis. The SHG makes a profit from the sale and the cost to the villagers is much less than buying it from the open-market since the produce is bought in wholesale.

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APPENDIX TABLE A-1. STORAGE CAPACITY FOR FOODGRAINS IN ANDHRA PRADESH

(1)	(thousand tonnes)										
	Owned	Covered Capacity					Open Capacity				
		FCI (2)	Hired				Owned and Hired (8)	Owned (9)	Hired (10)	Total (11)	G. Total (12)
			State Govt. (3)	CWC (4)	SWC (5)	Pvt. Party (6)					
1981	495.00 (25.28)	6.00 (0.31)	261.00 (13.33)	443.00 (22.63)	12.00 (0.61)	722.00 (36.87)	1217.00 (62.16)	68.00 (3.47)	673.00 (34.37)	741.00 (37.84)	1958.0 (100.00)
1986	761.00 (37.94)	5.00 (0.25)	544.00 (27.12)	396.00 (19.74)	20.00 (1.00)	965.00 (48.11)	1726.00 (86.04)	43.00 (2.14)	237.00 (11.81)	280.00 (13.96)	2006.0 (100.00)
1991	985.92 (41.93)	-	788.93 (33.55)	448.64 (19.08)	127.93 (5.44)	1365.50 (58.07)	2351.42 (100.00)	-	-	-	2351.4 (100.00)
1996	1140.92 (52.63)	-	380.14 (17.54)	279.39 (12.89)	67.17 (3.10)	726.70 (33.53)	1867.62 (86.16)	-	300.00 (13.84)	300.0 (13.84)	2167.6 (100.00)
2001	1181.65 (35.11)	151.80 (4.51)	734.49 (21.83)	846.03 (25.14)	87.87 (2.61)	1820.19 (54.09)	3001.84 (89.20)	224.27 (6.66)	139.00 (4.13)	363.27 (10.80)	3365.1 (100.00)
2002	1201.65 (41.26)	36.10 (1.24)	657.20 (22.57)	520.00 (17.86)	87.40 (3.00)	1300.70 (44.66)	2502.35 (85.92)	287.10 (9.86)	122.80 (4.22)	409.9 (14.08)	2912.3 (100.00)
2007	1273.00 (37.72)	0.00 (0.00)	137.00 (4.06)	1760.00 (52.15)	8.00 (0.24)	1905.00 (56.44)	3178.00 (94.16)	197.00 (5.84)	0.00 (0.00)	197.0 (5.84)	3375.0 (100.00)

Source: Derived from various issues of FCI Annual Reports.

Notes: 1) Figures in parentheses indicate percentage position.

2) Figures as on 1st April except 2007, which refers to 1st June.