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Agricultural Price Policy, Output, and Farm Profitability—Examining Linkages during Post-Reform Period in India

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ABSTRACT

The formulation of agricultural price policy is complicated by the multiplicity of functions that price performs. The objectives, thrust, and instruments of agricultural price policy in India have undergone conspicuous shifts during the past 50 years and so has the role and effectiveness of price policy as a tool to influence the agricultural economy. The country's post-reform period witnessed higher emphasis and dependence on price policy compared with previous decades, where price policy aimed only at maintaining a balance between the interests of consumers and producers. It is in this context that the paper examines the effectiveness of procurement prices in getting sufficient income to the farmers. An in-depth analysis of costs and returns was conducted for wheat and paddy, the crops offered the highest protection by the state, to get idea of the profitability of Indian agriculture and gain insights into the workings of the price policy.

Keywords: structural reform, agricultural prices, agricultural commodity, agriculture policy

JEL classification: Q10, Q11, Q13, Q18

INTRODUCTION

The agricultural price policy in India is basically aimed at intervening in agricultural produce markets to influence the level of fluctuations in prices and price-spread from farm gate to the retail level (Government of India [GOI] 2010). The formulation of agricultural price policy is complicated by the multiplicity of functions that price performs. The objectives, thrust, and instruments of agricultural price policy have undergone noticeable shifts during the past 50 years. Up to the mid-1960s, when the major concern was to ensure that the gap between demand and supply of food did not result in an excessive rise in

consumer prices, the main instruments of policy were controls/restrictions on food grain sales, food imports, and distribution of food grains at pre-specified prices that were normally below the market prices. After the mid-1960s, when new seed and fertilizer technology became available, price policy was assigned a positive role of augmenting the availability of food grains by increasing domestic production. The emphasis of the policy was on achieving the twin objectives of assuring remunerative prices for the farmers and providing food grains to the consumers and raw material to the industry at reasonable prices.

Recognizing the limitation of price policy in achieving these broad objectives, India had adopted a new strategy built on a foundation of three elements: (1) the provision of an improved high-yielding technological package to farmers; (2) the delivery of modern farm inputs and services, including credit; and (3) the assurance of remunerative pricing and marketing environment to farmers. The policy framework was modified in 1980, with the emphasis shifting from maximizing food grain production to ensuring a diversified production pattern consistent with the overall needs of the Indian economy. To achieve the new strategic objective, three support approaches were extended to non-food grain crops: technology, inputs, and marketing. As a result, the production of non-cereal food items such as edible oilseeds, fruits, vegetables, spices, and livestock products increased. The main instruments of agricultural price policy have been: (1) assured prices to producers through the system of minimum support prices implemented through obligatory procurement, (2) inter- and intra-year price stability through open market operations, (3) maintaining buffer stocks, and (4) distributing food grains at reasonable prices through the public distribution system. This policy has been helpful in several ways. From a situation of massive shortages, India has emerged as a net exporter of food; food security has been attained at the national level. Prices of basic food items have remained relatively stable; India did not face the sharp price spikes experienced by many countries during the global food crisis (Chand 2008). The policy has had a positive effect on farm income as well, and has led to economic transformation in well-endowed, mainly irrigated, regions (Chand 2012).

However, the post-reform period in India witnessed a dilution of the supportive mechanisms that were built up in stages in the post-independence period to protect the farmers from the market's uncertainties (Patnaik 2003). The package of reforms in agriculture was based on the diagnosis that while the sector remained unprotected,¹ the distortive nature of India's agricultural policy framework (in particular, subsidies on inputs such as fertilizers, credit, and electricity), arising out of the inappropriate pricing of inputs and outputs, has led to misallocation of resources and production patterns that did not fully correspond to country's comparative advantage, has eroded the government's capacity to finance public investment in the agricultural sector, and has benefited only the producers of a few crops (and only in some regions). The suggested agenda for the agriculture sector's reform revolves around the close integration of Indian agriculture with the world economy by "setting the prices right" via the withdrawal of subsidies on inputs, targeting the public distribution system to only the poor, abolition of the food management system and its attendant costs, and trade liberalization in agricultural commodities (Bhagwati and Srinivasan 1993; Pursell and Gulati 1993; Vyas 1994; Singh 1995). The essence of the reform package was to move agriculture from the prevailing "low input low output price" regime to a "high input high output price" regime, and aligning the intercrop price ratios in the domestic markets with the world market ratios (Acharya 1997). As a result, during the post-reform period, the government not only slashed the subsidies on major inputs, but also absolved itself of the responsibility of producing or procuring and distributing farm

¹ In spite of subsidies on inputs, since the output prices were maintained below world levels, the agriculture sector has been net taxed (Gulati and Sharma 1994).

inputs at farm gates (Raghavan 2008). When prices of farm inputs went up, private operators seized the opportunity and further pushed up prices. The situation worsened when interest rates on institutional credits were raised, while the already narrow window of such credits became narrower, driving the cultivating households into the clutches of private moneylenders (Bagchi 2004). Therefore, during the post-reform period, price policy assumed a significant role of being a means of providing a safety net to farmers exposed to the workings of the market in the form of state intervention in the agricultural product markets as well as a component of the safeguard measures.

In sum, the context of price policy has changed substantially over the years and so has the role and effectiveness of price policy as a tool to influence the agrarian economy. The post-reform period witnessed higher emphasis and reliance on price policy compared with previous decades, where price policy aimed only at maintaining a balance between the interests of consumers and producers. Contrary to expectations and the anticipation of reforms in the economy in general and the agricultural policy framework in particular, however, the agriculture sector in India neither experienced any significant growth subsequent to the initiation of economic reforms in 1991 nor derived the expected benefits from the trade liberalization. As a matter of fact, when compared with the immediate pre-liberalization period (1980–83 to 1990–93), the agricultural growth recorded a visible deceleration during the post-liberalization period (1990–93 to 2003–06) (Bhalla and Singh 2009). Nonetheless, this was succeeded by an unambiguous turnaround in growth performance in the years coinciding with the Eleventh Five-Year Plan (2007–12).

The observed pattern in agricultural growth during the post-reform period invites a fresh look at price policy as an instrument for influencing important parameters of the agrarian economy. Government's intervention in procurement of grains through fixing of procurement prices for various agricultural commodities acts as a means of protecting farmers' income and providing incentives to the farmers. This warrants an examination of the effectiveness of price policy in getting sufficient income to the farmers. The specific questions that arise are: How has the cost of production/cultivation changed during the different policy regimes? What relationship do support prices have with other costs and prices? What impact does price policy have on farm profitability/income?

This paper examines these issues empirically by doing an in-depth analysis of costs and returns in the production of wheat and paddy,² the crops offered the highest protection by the state, to get some idea of the profitability of Indian agriculture and gain insights into the workings of the price policy.

The paper is organized into five sections. The first section traces the evolution of India's food policy during the past 60 years in the light of agricultural growth patterns. The second section examines the trend in the different components of cost of cultivation/production at various policy regimes. The third section discusses the relationship among costs, prices realized by farmers, and support prices. The fourth section examines the trend in profitability to assess the viability of farming. The fifth section presents some conclusions and identifies the causes of higher support prices in recent years.

The data used in the analysis were taken from reports of cultivation cost³ of the Directorate of Economics and Statistics,

2 In this paper, paddy refers to threshed, unmilled rice.

3 See "Cost of Cultivation of Principal Crops in India" reports (1991, 1996, 2000, 2007).

Ministry of Agriculture. Costs and returns were calculated at the all-India level⁴ to determine emerging trends in profitability. Weights based on area and production of the respective crops were used to aggregate the data from the different states. Area-based weights were used for all the variables, except cost of production.

FOOD POLICY REGIME AND AGRICULTURAL OUTPUT: A REVIEW

A distinct change in food policy in India appears to have taken place over time, evolving along with developments in the country's economy. Two elements may be discerned in the government's food policy: the short-term concern with demand management and the long-term objective of attaining national self-sufficiency in food grains. The short-term concern with demand management attempts to maintain an adequate supply throughout the crop year, thus focuses on inflationary pressure within the economy. In contrast, the long-term objective is concerned with the pattern and rate of growth of production of major food grains in the economy.

The main aim of the food policy until the mid-1960s (since independence) had been to ensure that the gap between food demand and supply did not result in an excessive rise in consumer prices. As with the pre-independence period, the emphasis continued to be on food imports, price controls, and food rationing. During the early 1960s, the government launched the intensive agriculture district program (IADP) and intensive agriculture area program (IAAP) in selected districts; both were aimed at increasing food production. A land reform program was also initiated during this period, abolishing intermediaries and giving

land titles to the actual cultivators. However, these initial efforts did not make much impact on the food shortage problem, and India remained dependent on imports to feed its rising population. By the mid-1960s, India's food grain imports had reached 16 percent of its total food grain needs. Imports of this magnitude were beyond the country's purchasing power. Food grains, mainly wheat, were imported at concessional prices from the USA under Public Law 480.

Furthermore, the country experienced an unprecedented severe drought for two consecutive years, which worsened the situation. Food grain production in 1965–66 declined by over 17 million tons, which was 19 percent less than the previous year's production. Though production improved marginally in 1966–67, it remained 10.90 percent below the average figure for the three years prior to the first year of drought. Food grain prices recorded their highest rate of increase since 1950. This forced the government to step in with a massive public food distribution program that was greatly facilitated by the large-scale imports of food grains under Public Law 480.

This period became a turning point in the evolution of the country's food policy. The government rethought its approach in tackling the food shortage and launched a new agricultural development strategy aimed at maximizing production and achieving self-sufficiency in food grains in the long run. This strategy coincided with the advent of high-yielding varieties (HYVs) of wheat and rice, later called the Green Revolution. The adoption of HYVs involved the use of modern inputs and investments on the part of the farmers. It was thus necessary to create adequate incentives

4 States covered in the analysis of costs and returns for wheat were Haryana, Madhya Pradesh, Punjab, Uttar Pradesh, Bihar, and Rajasthan; included for paddy were the states of Andhra Pradesh, Haryana, Madhya Pradesh, Punjab, West-Bengal, Orissa, and Uttar Pradesh.

for the farmers by providing a favorable price environment for them. To achieve this objective, the strategy was built on three foundations: (1) assurance of a remunerative price and market environment to farmers, (2) provision of an improved package of farming technologies to the farmers, and (3) creating a system for the supply of critical modern inputs, including credit for agriculture.

This led to two major developments in government policy toward food management. First, the Food Corporation of India was set up to enable the government to undertake trading operations through which it can influence market prices, resulting in the continuance of public distribution.⁵ Second, the Agricultural Prices Commission (APC) was created to advise the government on agricultural price policy and price structure vis-à-vis the need to raise agricultural production by guaranteeing reasonable prices to the farmers (Report of the Jha Committee on Food grains Prices for 1964–65, quoted in Chopra 1988). Following the recommendation of the Foodgrains Policy Enquiry Committee of 1966, the government began to build up a sizeable buffer stock with a view to stabilize the price of food grains via appropriate stock adjustment.

Apart from the abovementioned measures, the new agricultural strategy used several other instruments for market intervention to maximize the production and achieve self-sufficiency in food grains such as: (1) arrangements for the production, importation, and distribution of high-yielding farm inputs (e.g., improved seeds, fertilizers, plant protection chemicals, and other services, including credit to farmers); (2) provision of input subsidies; (3) lower user charges for canal water and electricity for irrigation; (4) establishment, strengthening,

and expansion of an agricultural education and training system; and (5) regulation of domestic trade practices (e.g., stocking restrictions).

The adoption of the Green Revolution technologies reversed the trend in agricultural growth. The new seed-fertilizer technology introduced in the mid-1960s made a major impact on raising yield and output levels of some crops and the aggregate crop output of India. Though in the beginning the new technology was confined to wheat in the irrigated north-western region only, over time it covered rice and some other crops as well as other geographical areas (Bhalla and Singh 1997). Policy support, adoption of improved production technologies, and public investment in infrastructure, research, and extension contributed to growth in the crop sector (Bhalla and Singh 1997). The new strategy paid dividends and resulted in the acclaimed Green Revolution. A further increase (2.56%) in growth rates of major crop groups was experienced in the period of wider dissemination of Green Revolution technologies (1975–76 to 1988–89).

During the early 1980s, a balance between demand and supply of food grains was in sight. Thus, the objective of agricultural development was modified from maximizing food grain production to evolving a production pattern consistent with the emerging demand pattern. In this regard, the three support approaches (i.e., technology, inputs, and marketing) were extended to non-food grain crops. As a result, the production base got diversified and production of non-cereal food items increased (e.g., edible oilseeds, fruits, vegetables, and spices). The period of diversification sustained the tempo of growth in the crop sector.

A perceptible slowdown in performance was noticed in the post-reform period (Table 1). The

⁵ The earlier practice of disbandment of public distribution system in years of a good crop and its revival in years of poor harvest was found to be a strain on food administration and not the most natural way to food security.

Table 1. Growth rates in value of production (VOP) of major crop groups during various phases of growth (% per year at 2004–05 prices)

	Early Green Revolution (1968–69/ 1975–76)	Wider Technology Dissemination (1975–76/ 1988–89)	Diversification Phase (1988–89/ 1995–96)	Post-reform (1995–96/ 2004–05)	Recovery Phase (2004–05/ 2010–11)
Cereals	1.75	2.63	2.52	0.51	2.6
Pulses	-1.02	0.75	0.22	0.23	1.31
Oilseeds	2.31	2.95	4.42	-1.07	1.43
Drugs & narcotics	2.51	2.23	2.11	2.89	2.68
Fruits & vegetables	5.33	3.13	4.07	3.85	5.02
Fibers	1.79	1.65	5.31	-1.17	7.97
Spices & condiments	3.1	4.11	3.6	4.95	3.52
All crops	1.9	2.56	2.64	1.88	3.01

Source: Adopted from Chand and Parappurathu (2012)

post-reform period (1995–96 to 2004–05) was a phase of lackluster performance for most crops. Overall growth in the crop sub-sector dipped to 1.88 percent from 2.64 percent in the previous period. As mentioned in the introductory section, the slowdown in growth was attributed to a variety of factors such as technology fatigue, reduction/stagnation of public spending on irrigation and water management and scientific research, collapse of the agricultural extension system in the country, slowdown in use of primary inputs, and biased economic reform (Thamarajakshi 1999; Balakrishnan 2000; Hirashima 2000; Mahendradev 2000; Vyas 2001; Rao 2003; Chand, Raju, and Pandey 2007). The government thus renewed its policy thrust in the mid-2000s to revive agricultural growth through various development programs such as interest subvention on crop loan, national agricultural development program, and National Food Security Mission. These and a special emphasis on certified seed production have helped arrest the slide and bring about a recovery of growth (Table 1).

An analysis of the agricultural growth pattern suggests that the sector had gone through a wide variation in growth performance,

embracing a wide variety of institutional interventions and technology and policy regimes during the past six decades since independence. The Green Revolution technologies introduced in the late 1960s played an active role in lifting the growth trajectory from below 1 percent to 3 percent in a short time. During the period of wider technology dissemination, the spread of these technologies across regions aided in sustaining the tempo of growth realized in the early Green Revolution period. Subsequent years saw the growth becoming broad based, with faster diversification of production toward horticultural and cash crops. However, the growth in most of the major crops decelerated again in the post-reform period. The retardation of growth had continued up to 2004–05, after which a sharp recovery was observed.

COST OF CULTIVATION: THE GENERAL TREND

The previous section clearly highlighted that the lackluster growth performance of most crops during the post-reform period coincided with the dilution of elaborative support mechanism that had been built up in

stages since the independence. With subsidies slashed and the state agencies becoming redundant in distributing inputs, the post-reform period witnessed a slowdown in the use of primary agricultural inputs. On the other hand, the reduction of public investments in irrigation, research, extension, and other related infrastructure resulted in major setbacks in technology development, dissemination, and adoption. Agricultural growth has recovered since 2004–05 as a result of the government's renewed policy thrust through various development programs that were put in place.

Since the government has put in place non-price interventions to make farming profitable enough, the withdrawal of such mechanism may adversely affect farm profitability. Moreover, going by simple economic logic, nobody would invest money in a venture that does not provide reasonable remuneration. In this context, an analysis was done on the trend in paid-out cost of cultivation (i.e., A2 cost of cultivation⁶) and total cost of cultivation and production (i.e., C2 cost of cultivation/production⁷) in real terms,⁸ of wheat and paddy under different policy regimes, covering the period 1981–82 to 2009–10.

The total cost of cultivation (C2) of wheat and paddy were high during the post-reform period compared with that in the 1980s (Table 2). The average real paid-out cost of cultivation (A2) of these crops during the post-reform period increased from INR 444 to INR 527 for wheat and INR 479 to INR 597 for paddy in absolute terms, registering an annual growth of 2 percent and 2.5 percent, respectively, which is much higher than in the previous decade.

With the freeing of controls, the role played by market forces in this unprecedented increase in input costs has become clearly identifiable. The higher growth in paid-out cost (which can be taken as proxy indicator for variable cost of cultivation) compared with total cost of cultivation during the post-reform period also establishes the fact that it is the cost of variable inputs that have pushed the estimated total costs of cultivation. The growth rates in the real cost of production (CoP), which was negative during the pre-reform period despite a robust gain in yields, registered a positive growth during the post-reform period on account of decline in productivity growth that coincided with the reduction of public investments in agriculture.

The deceleration in growth of agricultural productivity during the post-reform period put pressure on the production of wheat and paddy and forced the government to take measures to reverse such trends. Since then conscious efforts have been made to raise investment in agriculture. As a result, the share of public investment returned to its 1980s level by the end of 2008–09. The period since mid-2000s has witnessed also the launch of various agricultural developmental plans to revive agricultural growth. These efforts paid dividends—the production of major crops and livestock products has recovered in recent years. The increase in productivity growth during the recovery phase has drastically decreased the real cost of cultivation. As Table 1 shows, the real paid-out cost of wheat during the recovery phase declined in absolute value; however, in the case of paddy, it was almost stagnant.

6 The A2 (paid out) costs include the value of hired labor (human, animal, machinery), value of seed (farm produced and purchased), value of insecticides and pesticides, value of manure (owned and purchased), value of fertilizer, depreciation of implements and farm buildings, irrigation charges, land revenue, cesses and other taxes, interest on working capital, miscellaneous expenses (artisans, etc.), and rent for leased-in land.

7 The C2 costs include paid out costs plus imputed value of family labor, rental value of owned land, and interest on value of owned fixed capital assets.

8 Nominal values were deflated by consumer price index for agricultural laborers with base 1960–61=100.

Table 2. Trend in different components of cost of cultivation of wheat and paddy at all-India level (in real terms), 1981–82 to 2009–10

	Wheat			Paddy		
	C2 Cost of Cultivation (INR/ha)	A2 Cost of Cultivation (INR/ha)	C2 Cost of Production (INR/quintal)	C2 Cost of Cultivation (INR/ha)	A2 Cost of Cultivation (INR/ha)	C2 Cost of Production (INR/quintal)
Pre-reform phase						
1981–82	737	429	29	631	357	25
1982–83	744	433	28	593	344	26
1983–84	661	383	26	680	383	23
1984–85	717	392	27	692	383	24
1985–86	723	427	24	635	344	21
1986–87	713	422	24	691	395	23
1987–88	775	447	25	737	417	24
1988–89	796	465	25	804	443	24
1989–90	773	450	24	774	427	24
1990–91	856	473	26	805	428	24
1991–92	801	448	23	732	392	22
1992–93	812	445	24	714	376	24
1993–94	NA	NA		NA	NA	
Post-reform phase						
1994–95	891	444	25	912	479	24
1995–96	851	445	24	840	440	24
1996–97	923	464	25	921	461	24
1997–98	856	443	26	910	469	24
1998–99	829	419	24	943	490	25
1999–00	917	449	24	959	480	26
2000–01	959	490	26	1031	535	26
2001–02	957	501	26	1080	575	26
2002–03	1014	539	28	1125	618	28
2003–04	979	527	26	1109	597	25
Recovery phase						
2004–05	1000	553	27	1135	612	27
2005–06	1069	565	30	1099	576	26
2006–07	1078	572	28	1037	544	25
2007–08	1076	551	28	1082	545	24
2008–09	1138	539	29	1212	614	27
2009–10	1066	507	27	1206	613	27
Annual compounded growth rate						
1981–82 to 1992–93	0.89	0.34	–1.76	1.13	0.46	–0.42
1994–95 to 2003–04	1.15	1.91	0.67	2.21	2.48	0.56
2004–05 to 2009–10	1.29	–1.74	–0.44	1.20	0.03	0.24

Source: Computed from CACP data

The cost of production (C2) of wheat and paddy in all the major producing states of India for the years between 1981–82 and 2009–10 is provided in Table 3. The states of Rajasthan, Bihar, and Haryana were observed to be efficient wheat producers in the triennium ending 2009–10; Rajasthan farmers were the most efficient producer (Table 3). On the other hand, Punjab farmers were the most efficient paddy producers, reducing the cost of production relative to the all-India average during the study period. They produced a quintal (about 100 kilograms) of paddy at 15 percent lower than the all-India average. On the other hand, Haryana farmers incurred the highest cost in paddy production, which was 28 percent higher than the others.

SUPPORT PRICES, COST OF PRODUCTION, AND PRICES REALIZED: A RELATIONSHIP

The minimum support price (MSP) acts basically as an insurance cover to cultivators against the possibility of postharvest crash in market prices. More positively, it serves as

an incentive to farmers and stimulates higher production by encouraging the use of modern inputs and by inducing investment in cost-reducing technology. The MSP system was started in India in the mid-1960s to create a favorable incentive environment for the adoption of HYVs of wheat and rice, which were seen to possess a vast potential for raising grain production. After about one and a half decades of the MSPs system, the policy framework was modified in 1980, when the demand and supply of food grains appeared to be balanced. The emphasis of the Agricultural Price Commission (APC) policy (later renamed the Commission for Agricultural Costs and Prices [CACAP]) shifted from maximizing food grain production to developing a production pattern consistent with the country's overall economic needs. Recognizing the issue of a fair split of the gains accruing from technology and public investment among farmers and consumers, the government mandated CACP to monitor the terms of trade for the agricultural

Table 3. Total cost of production (C2) of wheat and paddy (INR/quintal) in different states (in nominal terms), 1981–82 to 2009–10

Wheat	TE 1983–84	TE 1998–99	TE 2003–04	TE 2009–10
Haryana	133	365	487	741
Madhya Pradesh	135	483	604	799
Punjab	127	391	485	757
Rajasthan	125	400	482	685
Uttar Pradesh	135	371	482	751
Bihar	132	452	588	691
All India	132	397	501	745
Paddy	TE 1984–85	TE 1998–99	TE 2003–04	TE 2009–10
Andhra Pradesh	125	425	524	787
Haryana		480	657	950
Madhya Pradesh	107	450	605	822
Punjab	110	370	445	650
West Bengal	139	433	532	755
Orissa	115		480	703
Uttar Pradesh	120	339	472	715
All India	121	401	506	742

Source: Computed from CACP data

sector. A review of the policy in 1986 resulted in an emphasis on the long-term perspective. This implied that to make the farm sector more vibrant, productive, and cost effective (Acharya 2004), policy should cover major factors that influence agricultural prices in the long term.

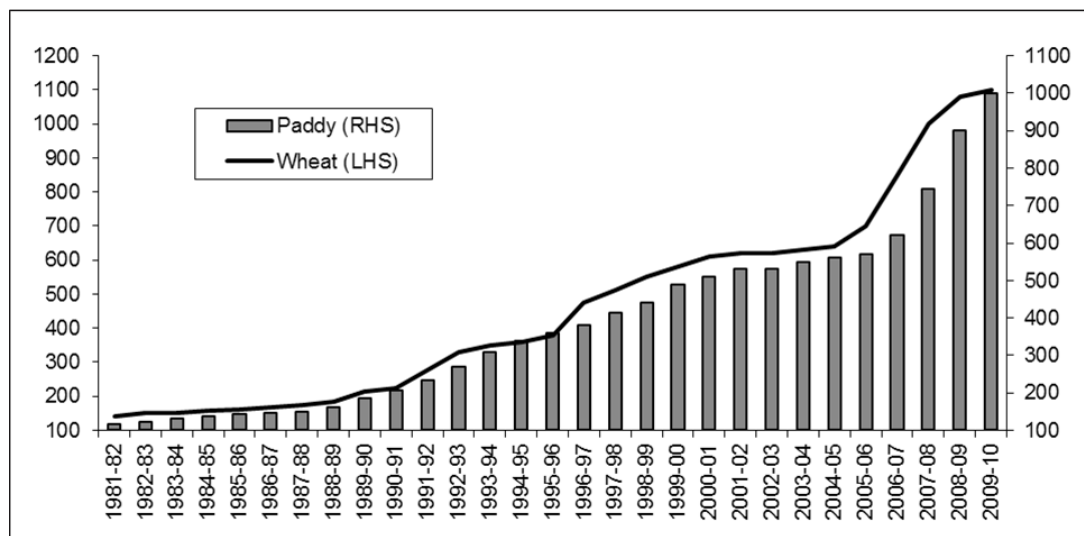
Currently, MSPs with the nature of a price guarantee to farmers are applied by the Indian government to 25 farm products.⁹ If market prices fall below the support level, government agencies buy the quantities offered at support prices. Farmers have the option to sell in the open market. While farmers are under no obligation to sell to government agencies, the latter are bound to buy all quantities offered by farmers at guaranteed prices.

The support levels are determined by the cost of production, changes in input prices, input–output price parity, trends in market prices, the emerging demand and supply situation, and intercrop price parity; the effects

on cost of living, general price level, and industrial cost structure; international price situation; and parity between prices paid and received by farmers (terms of trade [ToT]).

The trends in procurement prices for wheat and paddy show that support prices declined more in the 1980s than in the 1990s (Figure 1). Between 1981–82 and 1988–89, prices witnessed an annual growth of 3.26 percent and 4.62 percent, respectively. The situation started to change since then. Until the launch of economic reforms, procurement prices were based entirely on domestic factors, mainly the cost of crop production. Though CACP was required to consider the international price situation, this aspect was never given any weight when determining the level of MSPs. As a result, MSPs were lower than the international prices. The gap between these two prices further widened with the devaluation of the rupee in June 1991. At the same time,

Figure 1. Trend in support prices for wheat and paddy (INR/quintal), 1981–82 to 2009–10



Source: CACP Reports (various issues), Ministry of Agriculture

⁹ These commodities are rice, wheat, *jowar* (sorghum bicolor), *bajra* (pearl millet), maize, *ragi* (finger millet), barley, gram, *tur* (pigeon pea), *moong* (green gram), *urad* (black gram), groundnut, rapeseed/mustard, *toria* (rapeseed), soybean, sunflowerseed, sesamum, nigerseed, copra, cotton, jute-mesta, VFC tobacco, and sugarcane.

changes in the industrial and trade policy were introduced to expose the industry to competition by reducing the protection hitherto enjoyed by the industrial sector. These policies together with globalization brought the domestic prices of farm inputs in line with world market prices. These factors led the government to implement a substantial hike in MSPs to reduce the gap between domestic and international prices and to compensate the farmers for rising input costs.

The procurement price of wheat was raised by more than 20 percent for three consecutive years—1989/90, 1991/92, and 1992/93. The increase was almost double the highest recorded rise in procurement price during the 1980s (Appendix Table 1). As has been the case with wheat, the procurement price of paddy was also raised by about 11–16 percent from 1989–90 to 1993–94. As a result, paddy procurement price increased by more than 65 percent, from INR 185/quintal in 1989/90 to INR 310/quintal in 1993/94. These changes, coupled with various other factors, caused a small acceleration in the growth rate of agriculture during the period 1988–89 and 1995–96, as discussed earlier in the paper.

The international prices of wheat during 1995 and 1996 boomed and were much higher than the domestic prices. In response, the government raised the wheat MSP by 25 percent in 1996–97, from INR 380 to INR 475/quintal, though the increase in the MSP recommended by CACP was only INR 25. In the next two years (1998 and 1999), CACP raised its recommendation by 21 percent, and the government further raised the effective MSP by more than 12 percent of the CACP recommendation (Appendix Table 1). Some studies have shown that these increases in

MSPs completely ignored domestic demand-side factors and were much higher than was justified by the cost of production (GOI 2002).

After 1996, the international prices started to decline so that by 1999 they were much lower than the MSPs for wheat and paddy.¹⁰ It is noted that CACP recommended an increase in wheat MSP to INR 490 for 1999 and INR 580 for 2001; paddy MSP was increased to INR 440 and INR 510 for the same years. The country had already started accumulating larger than required stock of wheat and paddy in 1999; the stock level further increased to more than double the minimum norm by October 2000. In the light of the buildup of surplus stock and the domestic and international price situation, CACP indicated in its report for crop year 2000–01 that “since the present MSP was already too high the commission did not make any recommendation for wheat” (CACP 2001, 445). Consequently, support prices of wheat and paddy during the period between 2001–02 and 2004–05 almost stagnated, varying only between INR 620 and INR 640/quintal for wheat and INR 530 and INR 560/quintal for paddy.

As the international prices of wheat and paddy started to dramatically increase in 2005/06, there was again a strong pressure on the government from several quarters to maintain parity between domestic and international prices. There was also an urgency to replenish the low level of the buffer stock. Thus, government raised the MSPs for wheat and paddy for 2007 by 21 percent and 9 percent, respectively (Appendix Table 1). As prices in the international market soared in December 2007, the CACP raised the wheat and paddy MSPs from INR 750 to INR 1000 and INR 580

10 When world prices started falling in 1997–98, there was pressure by farmers' groups to protect them from low world prices by increasing MSPs. Consequently, the government continued increasing the MSP for wheat and paddy even when international prices have become low.

to INR 645, respectively, between 2007 and 2008. Other than the high level of international prices, CACP had no justification to recommend such a big hike in MSPs.

In sum, increase in support prices was highest between 2005–06 and 2009–10 (recovery phase). The price for the common paddy variety increased by more than 75 percent (from INR 70/quintal to INR 1000/quintal) during the period 2005–06 to 2009–10, whereas, that of wheat increased by more than 55 percent. The increase was mainly on account of the high level of international prices; the global food price index increased by 83 percent between 2003–04 and 2008–09.

In fixing the procurement price of a particular commodity, CACP claims to rely on various criteria, ranging from production cost to the international price situation. However, the weight given to each of these criteria is not explicitly stated (Gulati 1987). With regard to production costs, CACP takes into account the actual paid-out cost of purchased inputs, including purchased labor and some imputed value for land and family labor (C2 cost) and some value (10% of the C2 cost) for the farmer's managerial input. The C2 cost and the value for managerial input constitute the C3 cost, which forms the basis for the CACP support-price recommendation. Figure 2 and Figure 3 show how cost of production of wheat and paddy and their MSPs moved over time.

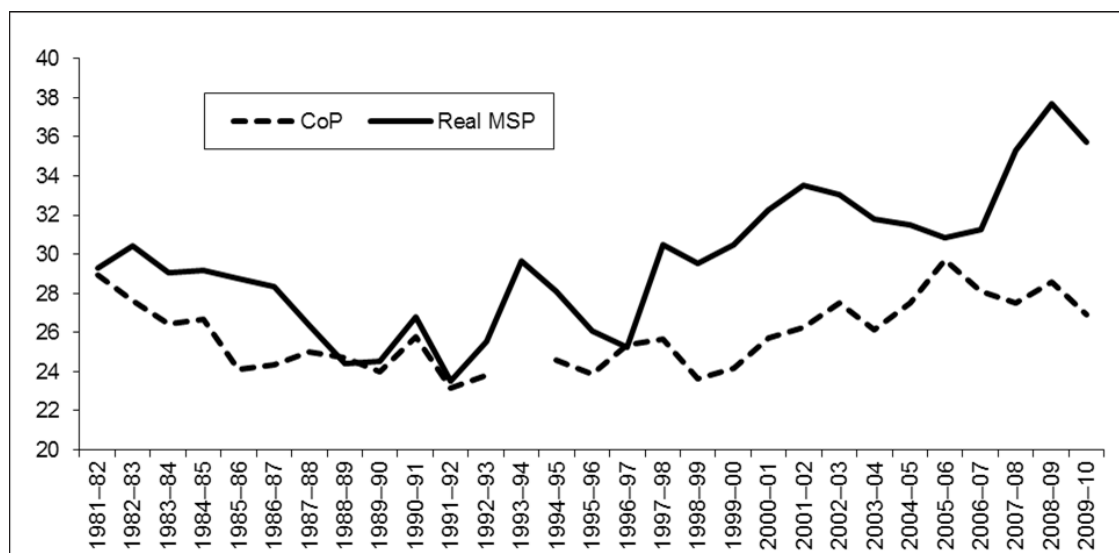
In the case of wheat, until 1997, the level of MSP remained close to its cost of production, though slightly higher. After 1997, it started to become higher from the cost of production and a large gap developed between the two (Figure 2). This clearly indicates that the successive

increases in MSPs from 1997 onwards have permanently shifted the MSP upward on a new trend. The MSP levels almost stagnated between 2001–02 and 2004–05, lessening the gap between the two prices. The situation for paddy, on the other hand, turned out to be totally different. Its level of MSP remained very close to its cost of production throughout, except recently. It mostly stayed slightly higher than the production cost, slightly dipping only occasionally.¹¹ The analysis also showed that the support price mechanism was more favorable to wheat producers than paddy growers in the 1990s. During that period, the rate of increase in paddy MSP was lower than that of wheat, distorting the intercrop price parity.

However, it is important to mention that the MSP announcement does not guarantee that the market price would not fall below the MSP. According to various reports of the CACP, there had been instances of market prices ruling below MSPs for certain crops in areas where government procurement agencies were absent. The experience shows that institutional intervention in ensuring the guaranteed price is effective only in regions and crops where government or public sector agencies procure the produce in a big way. For instance, it does not matter for producers of paddy and wheat in Chhattisgarh, Orissa, Assam, Bihar, and a majority of the other states whether the CACP recommends INR 500 or INR 5000/quintal for their crops as there is no enforcement of the MSP in these areas. The purpose of this illustration is to bring home the point that the MSP, without an effective procurement mechanism, does not guarantee that prices would not fall below the floor set by the government.

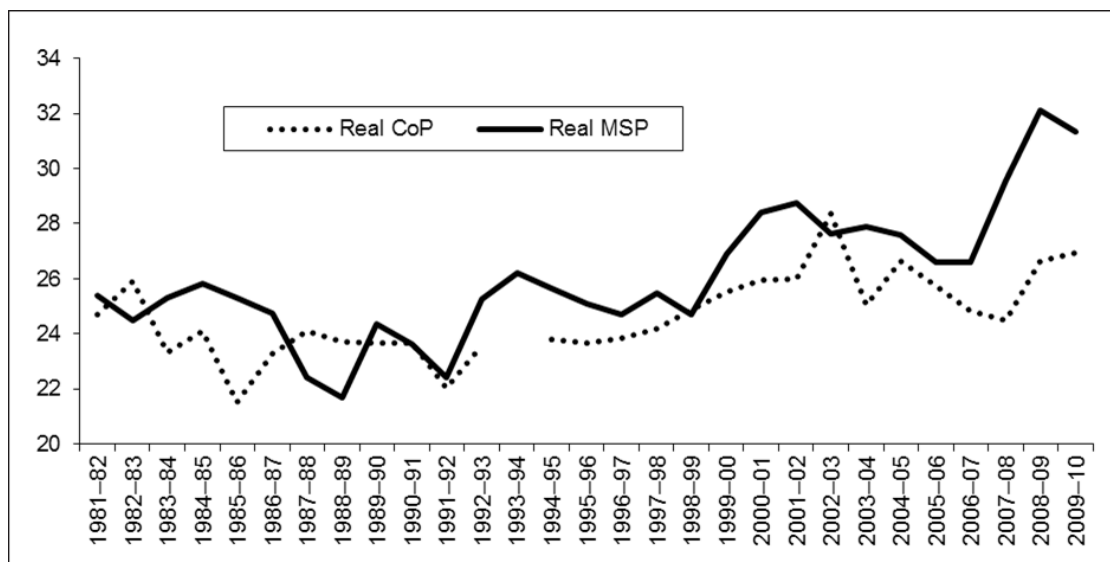
11 CoP is not known at the time of MSP announcement. CACP uses projected cost based on input price trend to estimate the CoP for the year for which the MSP applies. Variation in yield is a major factor for changes in per unit cost compared with projected CoP. Thus, the MSP cannot be exactly anchored on CoP; some deviation between MSP and CoP is obvious if MSP is fixed based on CoP.

Figure 2. Trend in minimum support prices (MSPs) and cost of production (CoP) of wheat (INR/quintal, in real terms), 1981/82–2009/10



Source: Computed from CACP data

Figure 3. Trend in minimum support prices (MSPs) and cost of production (CoP) of paddy (INR/quintal, in real terms), 1981/82–2009/10



Source: Computed from CACP data

In this context, it is more important to see the prices received by the farmers than the MSP per se. For each commodity, the prices realized by the farmers are best represented by the implicit price received by the farmers, which is the ratio of the value of the main product to the average yield. The trend in MSP and prices realized by wheat and paddy farmers is presented in Figure 4 and Figure 5. Until 1998–99, the real prices received by the farmers followed the MSP pattern in the case of both wheat and paddy, though the gap between these two narrowed in the case of paddy. The prices received by farmers remained higher than the MSP during this period (i.e., up to 1998–99). After this, the paddy price received by farmers had remained lower than the MSP in all years, except recently. The story of wheat is better. Though the margin between the MSP and price received by wheat farmers almost evaporated, the price they received remained higher than the MSP, except for 2001–02. The situation improved further after 2005–06.

Significant regional disparities were observed when the ratio of price realized to MSP was considered. The ratio declined in the triennium ending 2004–05 at the all-India level in both crops. The ratio for paddy was much lower in states like West Bengal, Orissa, and Uttar Pradesh (Table 4). In the case of Haryana, it was higher by 32 percent, which means that the realized price was 32 percent higher than the support price. The ratio for paddy was higher than wheat in the triennium ending 2009–10; the realized price for paddy was 3 percent higher than the MSP at all-India level in TE 2009–10.

FARM PROFITABILITY: THE GENERAL TREND

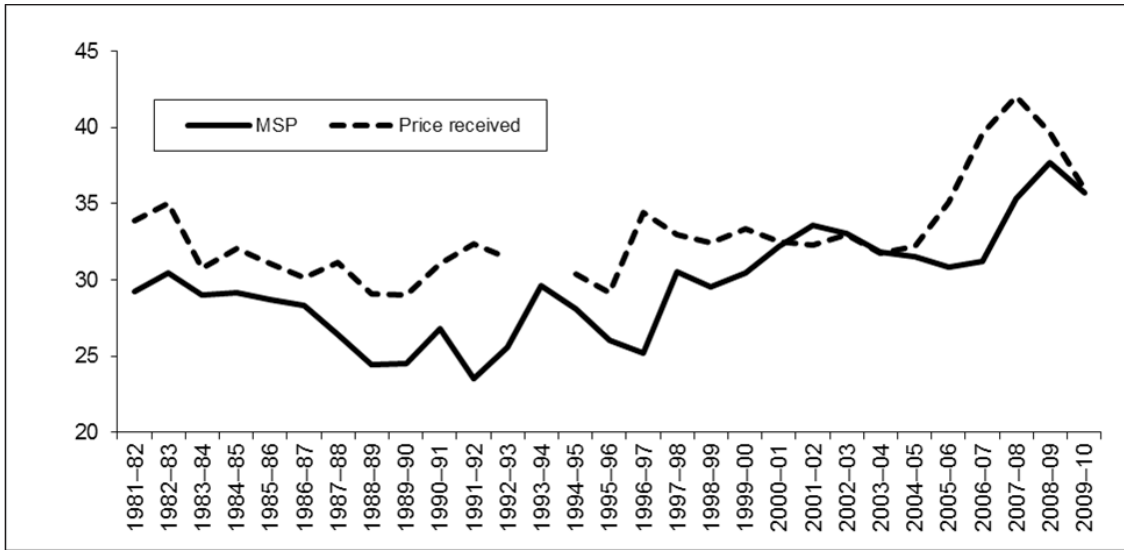
Farmers are interested more in the net income from the cultivation of a crop than in the price of the product they receive. CACP has the data on gross value of output (i.e., value of main product plus value of by-product) and cost

of cultivation per hectare. Though it uses eight different concepts of costs, this study preferred to use the C2 cost concept to calculate net farm income. The difference between gross value of output and C2 cost provides a measure for net farm income. Similarly, to calculate farm business income, the study used the A2 cost concept.

The profitability of wheat cultivation in real terms had improved during the period 1981–82 and 2009–10 (Table 5). However, while net farm income increased from INR 148/ha to INR 326/ha, it fluctuated heavily. For instance, the pre-reform period (1981–82 to 1992–93), witnessed a robust growth in income, which increased from INR 148/ha to INR 261/ha, registering an annual growth rate of 5.29 percent. Elaborated supportive mechanism along with substantial increases in MSPs by the government contributed positively to agricultural growth during the period. During the post-reform period, though the initial years witnessed a wide fluctuation in net income, the trend was positive. In 1999–2000 to 2004–05, however, net income sharply declined from INR 347/ha to INR 164/ha. An almost stagnant growth in support price coupled with rising input costs contributed significantly to squeezing the profit margin between 2001–02 and 2004–05, but from 2004–05 onwards, net farm income recovered. After reaching the level of INR 164/ha, the net farm income increased sharply and by 2009–10 it had reached INR 326/ha. The significant improvement in net farm income during the period can be attributed to the government's renewed policy thrust starting in the mid-2000s to revive agricultural growth through various development programs. These interventions resulted in a clear turnaround in agriculture growth performance.

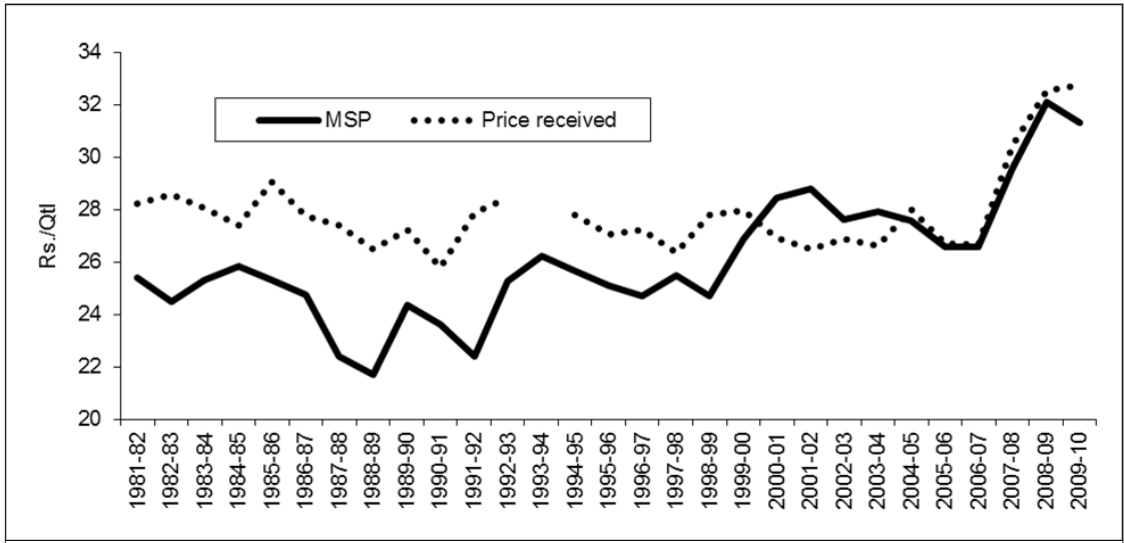
In sharp contrast to wheat cultivation, the net profitability of rice cultivation declined consistently during the post-reform period, reaching an insignificant level by 2002–03

Figure 4. Trend in price realized and minimum support price (MSP) by wheat farmers (INR/quintal, in real terms), 1981–82 to 2009–10



Source: Computed from CACP data

Figure 5. Trend in price realized and minimum support price (MSP) by paddy farmers (INR/quintal, in real terms), 1981–82 to 2009–10



Source: Computed from CACP data

Table 4. Price realized relative to the minimum support price (MSP) in wheat and paddy in different states (%)

Wheat	TE 1983–84	TE 1989–90	TE 1998–99	TE 2004–05	TE 2009–10
Haryana	103	111	113	101	100
Madhya Pradesh	128	147	125	107	111
Punjab	105	109	113	100	101
Rajasthan	120	142	124	111	104
Uttar Pradesh	108	115	115	94	95
Bihar	138	-	119	97	90
All India	112	118	117	100	99
Paddy	TE 1983–84	TE 1988–89	TE 1998–99	TE 2004–05	TE 2009–10
Andhra	110	118	109	107	108
Haryana	-	144	129	139	163
Madhya Pradesh	111	123	110	104	113
Punjab	106	118	107	108	110
West-Bengal	128	-	117	88	88
Orissa	117	-	-	82	88
Uttar Pradesh	107	117	98	94	100
All India	113	119	109	98	103

Source: Computed from CACP data

Table 5. Cost and returns in wheat, all-India, 1981–82 to 2009–10 (in real terms, INR/ha)

Year	CoC–C2	CoC–A2	Gross Value of Output	Net Income	Farm Business Income
Pre-reform phase					
1981–82	737	429	885	148	456
1982–83	744	433	953	209	520
1983–84	661	383	771	110	388
1984–85	717	392	867	150	475
1985–86	723	427	931	208	504
1986–87	713	422	897	184	476
1987–88	775	447	966	191	519
1988–89	796	465	927	131	462
1989–90	773	450	922	149	471
1990–91	856	473	1029	173	555
1991–92	801	448	1118	317	670
1992–93	812	445	1073	261	628
1993–94	NA	NA	NA	NA	NA
Post-reform phase					
1994–95	891	444	1116	225	672
1995–96	851	445	1044	192	598
1996–97	923	464	1257	334	792
1997–98	856	443	1108	252	665
1998–99	829	419	1145	315	726
1999–00	917	449	1265	347	815
2000–01	959	490	1205	245	715

Table 5. (Continued)

Year	CoC–C2	CoC–A2	Gross Value of Output	Net Income	Farm Business Income
2001–02	957	501	1173	216	672
2002–03	1014	539	1213	199	674
2003–04	979	527	1188	209	661
Recovery phase					
2004–05	1000	553	1163	164	610
2005–06	1069	565	1269	201	704
2006–07	1078	572	1523	445	952
2007–08	1076	551	1626	550	1075
2008–09	1138	539	1557	419	1018
2009–10	1066	507	1392	326	885
Annual compound growth rate					
1981–82 to 1992–93	0.89	0.34	1.77	5.29	2.96
1994–95 to 2003–04	1.05	1.91	0.70	–0.83	–0.18
2004–05 to 2009–10	1.29	–1.74	3.66	14.80	7.74

Source: Computed from CACP data

(Table 6). The analysis shows that net farm profitability in real terms declined by 10 percent per annum during the period. However, a significant improvement in net profitability was observed during the recovery phase, where it increased from INR 54/ha in 2004–05 to INR 249/ha in 2009–10, registering an annual growth rate of 36 percent. Despite such unambiguous turnaround in net profitability, paddy farmers got only two 14 percent returns over their total cost of production between 2004–05 and 2009–10, whereas their counterparts in wheat cultivation got 33 percent net returns over costs during the same period. A comparison of the ratios of returns over total costs and variable costs of wheat and paddy shows that the ratios for wheat were higher than those for paddy. This indicates a higher level of profitability for the former, which could be partly due to better realization of prices for wheat than paddy.

CONCLUSION

India's emphasis and reliance on price policy during its post-reform period and the relative exclusion of non-price interventions in the form of public investment shifted the earlier policy regime of "low input low output price" to a regime of "high input high output prices." The analysis shows that as part of the reform strategy, the government not only slashed the subsidies on major inputs to discourage environmentally unsustainable practices but also absolved itself of the responsibility to produce or procure and distribute these inputs at farm gates. Subsequently, yield levels went down, resulting in rising costs of cultivation. With the freeing of controls, the role played by market forces has become clearly identifiable in the unprecedented increase in variable costs. Taken together, these changes perceptibly slowed down the performance of the agriculture sector in the post-reform period.

Table 6. Cost and returns in paddy; All India 1981–82 to 2009–10 (In real terms INR/ha)

Year	CoC–C2	CoC–A2	Gross Value of Output	Net Income	Farm Business Income
Pre-reform phase					
1981–82	631	357	716	85	359
1982–83	593	344	653	60	309
1983–84	680	383	820	140	437
1984–85	692	383	792	100	410
1985–86	635	344	862	228	518
1986–87	691	395	816	125	421
1987–88	737	417	834	97	417
1988–89	804	443	889	85	445
1989–90	774	427	891	117	464
1990–91	805	428	871	66	443
1991–92	732	392	900	168	508
1992–93	714	376	858	143	482
1993–94	NA	NA	NA	NA	NA
Post-reform phase					
1994–95	912	479	1071	159	592
1995–96	840	440	961	120	520
1996–97	921	461	1047	127	586
1997–98	910	469	983	72	513
1998–99	943	490	1046	103	556
1999–00	959	480	1041	82	561
2000–01	1031	535	1058	27	523
2001–02	1080	575	1093	13	518
2002–03	1125	618	1052	–73	434
2003–04	1109	597	1171	62	575
Recovery phase					
2004–05	1135	612	1189	54	577
2005–06	1099	576	1132	33	556
2006–07	1037	544	1108	71	564
2007–08	1082	545	1340	257	795
2008–09	1212	614	1477	265	863
2009–10	1206	613	1455	249	842
Annual compound growth rate					
1981–82 to 1992–93	1.13	0.46	1.65	4.81	2.71
1994–95 to 2003–04	2.21	2.48	1.05	–10.30	–0.27
2004–05 to 2009–10	1.20	0.03	4.12	36.02	7.86

Source: Computed from CACP data

Increases in production cost, along with the desire to link domestic prices with international prices in order to integrate the domestic economy with the global economy, necessitated higher support prices. The trend analysis of MSPs clearly shows this phenomenon. However, the MSP announcement alone does not guarantee that market prices would not fall below it. An effective procurement mechanism is needed to help ensure that prices would not fall below the floor set by the government. This is clearly evident in the comparison of MSPs and prices received by farmers. Moreover, experience shows that institutional intervention in ensuring the guaranteed price is effective only in regions and crops where government or public sector agencies procure the produce in a big way.

The trend analysis of MSPs also suggests that, under a liberalized market regime, there should be flexibility in the intervention price and prices should be allowed to move up and down in response to changes in the market conditions. The way MSPs had been used over a period of time suggests that the change would be unacceptable to farmers' lobbies.

Agricultural price policy has been largely successful in playing a major role in providing reasonable margin levels over production costs to farmers of both wheat and paddy. Nonetheless, the margin over total cost and variable cost had declined in the post-reform period in both crops. The net income in real terms had declined also, leading to distress among farmers. The decline in profitability has discouraged farmers from increasing their spending on yield-augmenting technology, resulting in poor yield growth rates and in a decline in production growth rates.

The deceleration in growth of agricultural productivity during the post-reform period had put pressure on the production of wheat and paddy; it also forced the government to take measures to reverse such trends. Since then, conscious efforts have been made to raise investments in agriculture. As a result the share

of public investment by the end of 2008–09 had returned to the 1980s level. Moreover, various agricultural developmental plans to revive agricultural growth had been launched since the mid-2000s, such as interest subvention on crop loan, the national agricultural development program, the National Food Security Mission, and a special emphasis on certified seed production. These efforts have paid dividends; the agricultural sector has experienced a recovery in the production of major crops in recent years. The increase in productivity growth during the recovery phase had drastically reduced the real cost of cultivation and significantly improved net farm income during the period.

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Appendix Table 1. Minimum support/procurement price for wheat and paddy (INR/ quintal); 1981–82 to 2009–10

Crop Year	Minimum Support Price INR /quintal		Excess of Procurement Price over Recommended Price (%)		Percent Change over Previous Year's MSP	
	Wheat	Paddy	Wheat	Paddy	Wheat	Paddy
1981–82	142	115				
1982–83	151	122	0.00	0.00	6.34	6.09
1983–84	152	132	-1.94	0.00	0.66	8.20
1984–85	157	137	0.00	0.00	3.29	3.79
1985–86	162	142	0.00	1.43	3.18	3.65
1986–87	166	146	0.61	0.00	2.47	2.82
1987–88	173	150	0.00	0.00	4.22	2.74
1988–89	183	160	0.00	0.00	5.78	6.67
1989–90	215	185	7.50	7.56	17.49	15.63
1990–91	225	205	0.00	0.00	4.65	10.81
1991–92	275	235	12.24	0.00	22.22	14.63
1992–93	330	270	8.20	3.85	20.00	14.89
1993–94	350	310	0.00	0.00	6.06	14.81
1994–95	360	340	0.00	0.00	2.86	9.68
1995–96	380	360	0.00	1.41	5.56	5.88
1996–97	475	380	17.28	2.70	25.00	5.56
1997–98	510	415	12.09	0.00	7.37	9.21
1998–99	550	440	12.24	0.00	7.84	6.02
1999–00	580	490	5.45	5.38	5.45	11.36
2000–01	610	510	5.17	0.00	5.17	4.08
2001–02	620	530	1.64	1.92	1.64	3.92
2002–03	620	530	0.00	0.00	0.00	0.00
2003–04	630	550	0.00	0.00	1.61	3.77
2004–05	640	560	0.00	0.00	1.59	1.82
2005–06	700	570	7.69	1.79	9.38	1.79
2006–07	850	620	13.33	6.90	21.43	8.77
2007–08	1000	745	0.00	15.50	17.65	20.16
2008–09	1080	900	0.00	5.88	8.00	20.81
2009–10	1100	1000	0.00	5.26	1.85	11.11

Source: CACP Reports (various issues), Ministry of Agriculture