

India's Consumer and Producer Price Policies: Implications for Food Security

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Abstract: India has made enormous progress in providing food security for its people. Per capita calorie consumption increased 20 percent between the early 1980s and 2000. However, a sizeable share of the population still lacks access to sufficient quantities of food. Poverty remains a problem in that nearly a third of the country's population lives below the poverty line. In the 1990s, rising prices of staple foods was the principal constraint to improving economic access to food. This increase was in contrast to a declining historical trend and reflects a fundamental contradiction in India's food policy. Policymakers seek to provide low-priced foods to consumers while supporting producer prices. Mounting government expenditures are required to subsidize both farmers and consumers through price policies, implying the need for policy alternatives to address the trade-off between the welfare of the poorer consumer and that of the producer.

Keywords: India, food security, price policies, consumers, producers.

Introduction

India has made great strides toward improving food security. Food grain production began its sharp rise in the mid-1970s and grew 2.7 percent per year during the last two decades. According to FAO data, more than 2,400 calories per capita were available for consumption, on average, in 2000. This marks more than a 20-percent increase from the level of the early 1980s. Per capita incomes grew at an even higher rate of about 3.7 percent per year during 1980-98, leading to the expectation of significant improvements in food purchasing power and food security.

The food security problem in India is currently one of access, as a sizable share of the population lacks economic and physical access to sufficient food. Results from the ERS food security model indicate that roughly 20 percent of the population are estimated to be food insecure in 2002. Consumption for this segment of the population is estimated to fall 10

percent below the nutritional requirement of 2,100 calories per day. Lack of infrastructure and the relative isolation of the poor have limited the physical flow of food to deficit areas. Interstate flows tend to favor urban areas where food grain markets are better integrated, while the poor tend to be landless rural households and small farmers, who are thus net consumers of food. Poverty, which limits economic access to food, continues to be a serious problem, based on recent (1999-2000) national household survey estimates of 30.2 percent for rural areas and 24.7 percent for urban areas (Deaton and Tarozzi, 2000). As India's population is over 1 billion, where 28.4 percent live in urban areas, the poverty estimates imply that approximately 291 million individuals in India are below the poverty line.

In the 1990s, increases in the prices of staple foods emerged as a factor constraining improvements in economic access to food. Prices can have a significant effect on access, as the poor spend roughly 80 percent of their income on food. Although poverty fell, primarily as

a consequence of income growth, improvements in food security could have been greater if prices of staple foods had maintained their historical downward trend.

Overview

Food security is influenced by availability of food and access to food. This article distinguishes two periods in the performance of India's agricultural sector marked by changes in these two areas: 1) the 1980s, when rapid growth in the country's food grain yields and availability led to falling retail and farm prices, and 2) the 1990s, when there was a pronounced slow down in the growth of grain yields and availability, combined with increasing farm and retail prices. Although yield growth declined in the 1990s, the government of India's (GOI) policy of paying higher support prices to farmers tended to keep farming profitable at a greater expense to the poorer consumers.

Increases in food availability in the 1980s were driven by growth in the area under cultivation and growth in agricultural productivity. Lack of access to food, particularly in recent years, was effected by slower growth of farm yields and the GOI's price, procurement, and distribution policies. An examination of food availability and access in India reveals a fundamental contradiction in India's food policy. Indian policymakers, operating through the Food Corporation of India (FCI), are pursuing conflicting objectives of attempting to provide low-priced food for consumers while increasing the support prices paid to farmers. Mounting government expenditures are required to subsidize both farmers and consumers through price policies, implying the need for policy alternatives to address the growing tradeoff between the welfare of the poorer consumers versus that of producers.

Food Availability

The performance of India's domestic agricultural sector has a major influence on domestic food availability. Imports currently play a small role in the domestic food supply, because of the government's orientation toward food self-sufficiency. The most important food crops are rice and wheat, which together account for roughly 80 percent of grain production.

Several factors that drove historical agricultural growth in India may also help determine future performance. The use of inputs, such as fertilizer, high-yielding varieties (HYV), pesticides, surface irrigation, and electricity and diesel-powered tube wells, together

contributed to a 65-percent increase in yields between the mid-1970s and the late 1980s. This period has been referred to as the "Green Revolution." Expansion of irrigation was a cornerstone of this success. Irrigation allowed intensive production and increased opportunities for diversification. Gross irrigated area in India nearly doubled from 1970 to 1997, and this accounts for nearly 40 percent of gross cultivated area in the country.

Growth in total factor productivity (TFP)—the efficiency with which both labor and capital resources are used to produce output—also accelerated during these two decades, spreading across all regions of India, including the lagging agricultural regions of the eastern and southern states. Technological change, in fact, contributed one-third of output growth, depending on the commodity and geographic coverage of the empirical studies (Desai, 1994; Dholakia and Dhokalia, 1993; Kumar et al., 1998). Despite the decline in farm prices up to 1990 (figs. B-1 and B-2), this rapid technological change kept farming profitable, encouraging farmers to invest and use modern inputs.

Several studies, however, find that TFP in agriculture has declined or has become negative in the 1990s (Desai, 1994; Dhokalia, and Dhokalia, 1993; Kumar et al., 1998; Rosegrant and Evenson, 1994; Murgai, 1998; Fan, Hazell and Thorat, 1998), and unless redressed, portends an eventual slowing of agricultural growth in the future. These studies indicate that while output growth in the 1990s can be traced to increased (private) investment and the increased use of inputs and labor, their marginal productivity is now declining because of slower technological change. Indeed, the average annual growth rate of food grain yields slowed from 2.7 percent during 1980-81 to 1989-90 to less than 2 percent during 1990-91 to 1998-99. Despite this decline, the government's policy of increasing support prices paid to farmers tended to keep farming profitable.

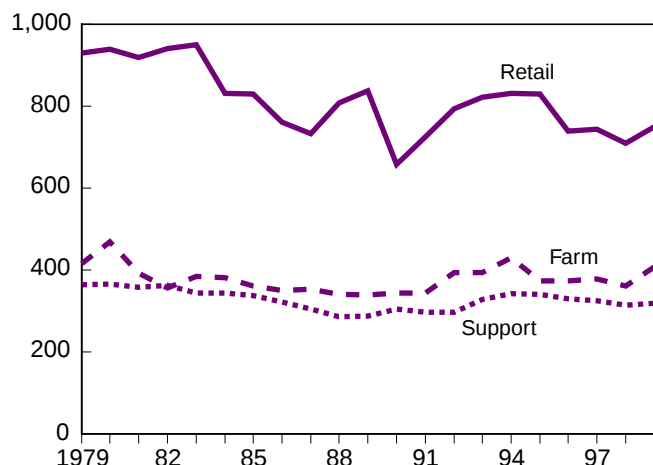
Intensification of agricultural production and growth in crop yields will play a major role in India's future food production growth. As in other Asian countries, population density in India is much higher than in the rest of the world. Population growth alone will put further pressure on agricultural land and reduce the available land for food production.

Given the limited potential for land expansion, the quality of land will be key to increasing yields. Land quality, as defined by soil quality, climate, and rainfall,

Figure B-1

Key rice prices

Rupees per 100 kgs

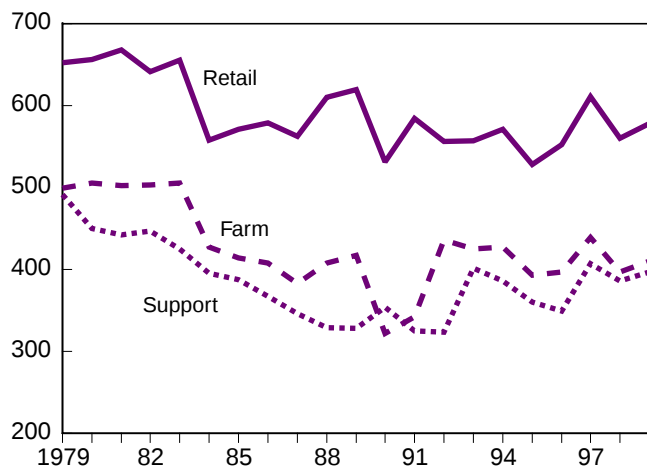


Source: Economic Survey; Farm Harvest Prices of Principal Crops in India; Agricultural Prices in India.

Figure B-2

Key wheat prices

Rupees per 100 kgs



Source: Economic Survey; Farm Harvest Prices of Principal Crops in India; Agricultural Prices in India.

is crucial to agricultural productivity. Cross-country analysis confirms that low cropland quality is significantly associated with low agricultural productivity. Rosen and Wiebe (2001) find that land quality affects not only yields directly but also crop response to other inputs. The pace at which land for agriculture is lost—due to land degradation or expansion of urban areas—will therefore help determine future production capacity in India.

Broad-based adoption of improved and higher yielding varieties of agricultural crops will be another determinant of long-term productivity growth and food security in India. In this respect, improved research and technology dissemination will play a significant role. India has one of the largest public agricultural research and extension complexes in the world. Despite the large investment in public research and extension, the quality of agricultural research in the public system has weakened, while the agricultural extension system has virtually collapsed in the last two decades (Planning Commission, 2001). As the historical performance of the country indicates, strengthening the agricultural research and extension systems (both public and private) is essential to achieving rapid and sustained growth in agricultural productivity in the future.

While the government plans continued investments to expand surface irrigation, which can clearly help to sustain agricultural productivity growth, several major factors will make this increasingly difficult over the longer term. India has already developed almost 76 percent of the official estimate of ultimate gross irrigated potential. The development of the remaining area will be difficult, as it will increasingly involve dam and canal construction in increasingly harder and environmentally fragile locations. Investment costs could also become prohibitive due to design, resettlement, and environmentally related issues (World Bank, 1999b). In view of the tight fiscal situation, obtaining the required resources to finance these investments, in the context of other competing fiscal demands, will be a major challenge.

Various projections of water demand in India also point to the increasing competition for water resources among users, including agriculture, domestic, industrial, energy, and other consumers. Rosegrant, Ringler, and Gerpacio (1997) projected a 50-percent increase in water withdrawals between 1995 and 2020, including a 34-percent increase for agriculture and a 280-percent increase for domestic consumers and industry. Of critical concern, therefore, is the assessment that total domestic requirement by 2025 will be nearly equal to total available water in the country. To avert such a water crisis in the longer term, improving water use efficiency, especially in the agricultural sector, will be critical.

The GOI's strategy, especially in the 1990s, has increasingly relied on subsidies for inputs, such as power, water, and fertilizer, along with increasing farm support prices. These outlays have crowded out productivity-

enhancing investments in rural infrastructure, irrigation, and research and extension. Similarly, the deterioration of the state government finances has squeezed public investments in irrigation, roads, and technology upgrading. These public expenditure patterns are not only fiscally costly, but, to a large extent, also sacrifice long-term sustainable agricultural and economic growth, thereby jeopardizing India's future food security. The benefits of re-balancing expenditure priorities, therefore, are likely to be considerable.

Food Access

Food access can be related to food availability through the behavior of prices. In examining this relationship, we distinguish between two types of prices: (1) open-market farm and retail prices, which are set by supply and demand and (2) prices determined by the government, which include farm support and consumer prices charged by the Public Distribution System (PDS). The GOI attempts to protect low-income groups from increases in retail food prices by purchasing grain from farmers (at the support price) and selling it to consumers at subsidized prices through the PDS.¹ As discussed earlier, GOI's policy of increasing farm support prices in the 1990s led to rising consumer prices in both private retail markets and the PDS. Greater emphasis on improved agricultural productivity, rather than increases in farm support prices, may be a more effective alternative for maintaining the profitability of farming. Additionally,

¹ The PDS serves consumers below the poverty line (BPL) as well as those above the poverty line (APL). To target assistance to the poor, substantially lower prices were charged to BPL consumers beginning in the late 1990s.

stronger growth in farm yields would allow private retail markets and the PDS to better bridge the gap between access and availability.

India's experience has shown that the mechanism(s) through which policymakers achieve greater food availability also have a bearing on access to food, given India's self-sufficiency policies. Agricultural productivity growth is important for food security both through its impact on food availability as it contributes to output growth and to food access as it affects prices, farm incomes, and the purchasing power of consumers. A major challenge for India will be not only sustaining, but also aiming to achieve higher yield growth to meet rising food demand in the future.

Relatively rapid gains in rice and wheat yields in India in the 1980s (table B-1) contributed to improved economic access, as real retail prices for food grains followed a declining trend through 1990 (figs. B-1 and B-2). Additionally, increases in real rural wages contributed to significant reductions in poverty rates as on-farm productivity rose and demand for rural labor on- and off-farm increased. From 1974-75 to 1990-91, India's share of population in poverty, as measured by the national household survey, decreased from 55.7 to 34.3 percent in rural areas, and from 48.0 to 33.4 percent in urban areas (fig. B-3).

The 1990s witnessed increases in real procurement/support prices for food grains, which were passed through as rising retail prices (figs. B-1 and B-2). For rice, 1999 price levels exceeded 1990 levels by 5 percent (real procurement), 18 percent (farm), and 14 percent (retail). The increase in wheat procurement prices was more pronounced. For wheat, 1999 price

Table B-1: Area, yield, production, and farm revenue growth in India

Period	Area	Yield	Production	Farm price ¹	Farm revenue ¹	Retail price ¹
<i>Rice (percent growth)</i>						
1980-89	1.0	5	6.0	-4.0	2.0	-1.0
1990-99	1.0	1	2.0	2.0	4.0	1.0
2000-29 ²	-0.1	1	0.9	-0.8	0.1	-0.8
<i>Wheat (percent growth)</i>						
1980-89	1.0	5	6.0	-2.0	4.0	-1.0
1990-99	2.0	2	4.0	3.0	7.0	1.0
2000-29 ²	-0.2	2	1.8	-0.8	1.0	-0.8

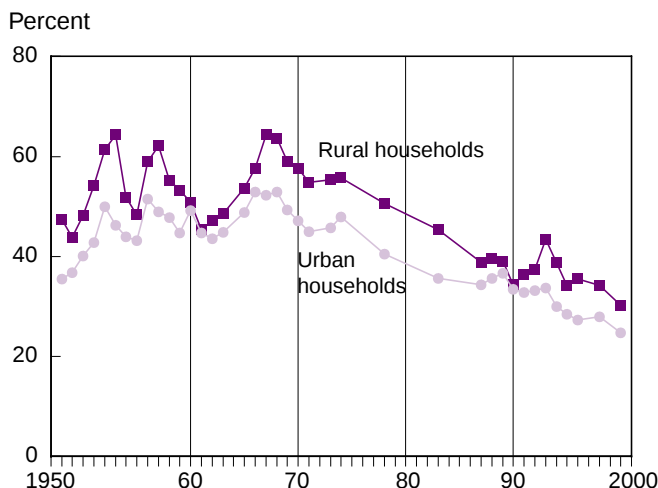
¹ Adjusted for inflation.

² Hypothetical case.

Source: Computed from Farm Harvest Prices of Principal Crops in India; Agricultural Prices in India; Area and Production of Principal Crops in India.

Figure B-3

Rural and urban poverty



Source: National Sample Survey (GOI) data compiled by the World Bank: <http://www.worldbank.org/poverty/data/indiadata.htm>

levels exceeded 1990 levels by 12 percent (real procurement), 27 percent (farm), and 9 percent (retail).

The 1990s represented a break with the past, as increased food grain production did not result in falling consumer prices due to slower growth in farm yields and rising support prices. Despite the observed increases in food prices, poverty fell during the 1990s as economic growth accelerated. Nevertheless, the reduction in poverty would likely have been greater if food grain prices had continued to fall through the 1990s, as they had in previous years.

The GOI attempts to protect low-income groups from increases in retail prices of food through re-distributive measures. In particular, the PDS is now viewed as the main safety net to protect the poor from food price inflation (Srinivasan, 2000). The PDS component of India's food policy is intended to distribute food grains procured from farmers in surplus areas to the "vulnerable sections" of society at subsidized prices, thereby improving economic and physical access to food for the poor.

The FCI, a government-controlled marketing agency, implements these policies by purchasing wheat and rice from farmers at the MSP, as well as storing, transporting, and distributing food grains to supply the requirements of the PDS. Given the large numbers of poor in India as well as the resource constraints, the performance of the FCI is critical to evaluate the effectiveness of India's food policies. At issue is the extent

to which the poor benefit from FCI interventions and at what cost.

Impacts of FCI on Farmers and Consumers

Farmers retain 60-70 percent of their rice and wheat production for seed, animal feed, and their own consumption. The FCI procures wheat and, to a lesser extent, paddy from farmers at minimum support prices. FCI guarantees to buy all food grains from farmers at the support price, which is normally less than the open-market farm price. Thus, the farm-support price becomes the floor price, while the upper limit is determined by demand and supply. The FCI procurement policies are intended as an insurance mechanism for farmers, providing price and income stability. Additionally, procurement meets the requirements of the public food distribution program as well as the buffer stock program. However, farmers are required to sell a share of their output to the FCI, where the share is based on the farmer's holding size, the state, and the region (Gulati, Sharma, and Kahkon, 1996). Slightly less than half of the marketed food grain surplus (22 million tons in 1997-98) is handled by the public sector, while the residual is handled by private trade. Specifically, private markets handle 30-50 percent of domestically traded wheat and 50-60 percent of rice (World Bank, 1999c).

The FCI procures food grains from farmers for the central pool, which is then sold to state governments (at a central issue price), based on interstate allocation rules established by the central government. In addition to wheat and rice, the central government supplies sugar, kerosene oil, cooking coal, edible oil, and cloth. The PDS distributes these goods (at subsidized prices) through Fair Price Shops, employment programs, the Integrated Tribal Development Program (ITDP), and the Revamped PDS (RPDS). State governments have the option of further subsidizing (at their cost) these items, as well as providing additional items.

The PDS supplies only a small proportion—roughly 15 percent—of total food grain consumption, underscoring the importance of the open retail market as the primary supplier of grain. Because PDS supplies of subsidized food grains have been relatively modest, the role of PDS in restraining food price inflation is limited (Gulati, Sharma, and Kahkon, 1996). Radhakrishna and Subbarao (1997) estimate that without the PDS, national poverty would have

increased 2 percentage points, while in rural areas, where most of the poor live, poverty would have increased only 0.3 percentage points. In other words, PDS outlays explain few of the changes in poverty shown in figure B-3, partly because of ineffective targeting and substantial leakages to the nonpoor; only 25 percent of PDS food grain distributions actually reach the poor (Ahluwalia, 1993).

Even with perfect targeting of food grain to the poor, it may be necessary to expand the size of the PDS, depending on the proportion of the food grain needs that policymakers elect to supply. Based on estimates from Deaton and Tarozzi (2000), we calculate that India's population below the poverty line is 291 million. To supply half the daily requirement of 370 grams of cereals (based on recommendation of Indian Council of Medical Research), the PDS would have to distribute 19.5 million tons of food grains. This figure is substantially higher than the 11.7 million tons of PDS off-take in 2000 (GOI, 2001). However, if past performance is indicative, PDS costs would increase disproportionately as the scale of its operations grows (World Bank, 1999c).

Although the actual PDS outlays are relatively small, they are costly. Radhakrishna and Subbarao (1997) estimate that the cost of transferring 1 rupee of income to the poor is approximately 4.27 rupees, which excludes costs incurred by state governments. The economic cost per unit of food grains handled through the FCI is the sum of the *procurement price paid to the farmer* plus the unit cost of physically procuring and distributing the grain. Clearly, an increase in the MSP tends to raise the FCI's economic costs, which sooner or later is reflected in higher PDS prices.

From 1999-2000 to 2000-01, the PDS prices of food grains charged to the poor rose 54 percent (wheat) and 50 percent (rice). These sharp price increases were a delayed impact of the rising farm support prices, as the GOI attempted to reduce its food subsidy bill. It is important to note that this has been the historical pattern as well, that is, increases in farm support prices have been passed through as higher PDS prices (Radhakrishna and Subbarao, 1997).

Prices in private retail markets also rise as the GOI increasingly diverts food grains from the open market to the public sector. Thus, an increase in the MSP creates an imbalance by depressing the consumption of food grains from both retail and PDS outlets, while

increasing the farm production of grain. This discussion begs the question as to where the grain goes. By far, the most favored destination has been storage. Prior to 1999, food grain stocks were in line with the recommended quantity of 24 million tons. By July 1, 1999, they increased to 34 million tons and then increased further to 43 million tons in 2000. Indeed, a sizable cost of India's food grain price policy arises from mounting stocks of grain, which were approximately 62 million tons in July 2001 (GOI, 2001). The most recent available cost information indicates that food subsidies in 1998-99 amounted to \$2.2 billion (World Bank, 1999c).

Decreasing prices of staple foods combined with economic growth can sharply reduce the number of undernourished, as shown by Senauer and Sur (2001). Specifically, under certain conditions, the number of undernourished in South Asia could fall to 103 million by 2025, from the base year (1996) level of 379 million. Assuming that India's share of the undernourished population in South Asia remains constant at 84 percent, the number of undernourished in India would be approximately 87 million by 2025. This scenario would result from 3-percent growth in per capita income combined with a 20-percent decrease in the price of food staples over a 29-year period. In contrast, with per capita income growth alone, the number of undernourished in India would be 131 million by year 2025, much greater than the 87-million figure under the GDP-price scenario.

Policy Alternatives

A relatively obvious policy measure for achieving lower consumer prices, greater food consumption, and reduced grain stocks would involve downwardly adjusting the MSP for grains over time. For example, a 20-percent price reduction over a 29-year period amounts to a 0.8-percent annual decrease. Price reductions of this magnitude are unlikely to markedly reduce food grain production and availability, as shown in table B-1 (for the period 2000-29). Based on longrun crop area elasticities of 0.12 (rice) and 0.23 (wheat) (Kumar, 1998), the area under rice and wheat cultivation is projected to fall by modest amounts of 0.1 and 0.2 percent per year over the period considered (2000-2029). However, if rice and wheat yields continue growing at annual rates of 1 and 2 percent, as they have since 1990, farm production would expand by 0.9 and 1.8 percent per year, since yield growth would overwhelm the projected-area reductions.

Accordingly, farm revenues expand at annual rates of 0.1 percent (rice) and 1 percent (wheat), for the period 2000-2029.

Farm price changes tend to be passed through to the retail level. Assuming for simplicity proportionate pass-through effects for the projection period (2000-2029), farm and retail prices would both fall 0.8 percent, in response to a policy of lowering the farm support prices. Although the suggested decreases (0.8 percent per annum) in the farm prices appear quite small, the reversal of India's producer-oriented price policies would require considerable political will, given the strongly entrenched interests. To achieve growth in farm revenues in excess of the amounts shown in table B-1, policymakers could undertake a renewed emphasis on agricultural extension to promote the broad-based adoption of high-yielding crop varieties and higher growth in farm yields.

Policy measures aimed at reducing post-harvest losses would also result in lower retail prices, as more grain becomes available for consumers. Post-harvest losses of food grain amounted to roughly 20 million tons in 2001—about 7-10 percent of production at the farm-to-market level, and another 4-5 percent at the marketing and distribution level. Clearly, it is not possible to completely eliminate wastage. However, relatively modest improvements in marketing efficiency could significantly reduce retail prices, as the demand for food grain is price inelastic (Kumar, 1998), implying that price flexibilities exceed one (Tomek and Robinson, 1990). Thus, a 1-percent increase in the availability of grain, made possible through reductions in waste, tends to lower consumer prices by more than 1 percent. Under this policy option of encouraging the growth and modernization of grain markets, infrastructure, and processors, consumer prices could fall without adverse effects on farm prices.

Conclusions

A significant imbalance arises as Indian policymakers, operating through the FCI, pursue conflicting objectives of providing low-priced food for consumers while increasing support prices paid to farmers. Farm price increases tend to be passed through to consumers, whether they seek access to food through the PDS, India's main safety net mechanism, or through private retail markets.

Policy alternatives to address the growing tradeoff between the welfare of the poor (who are net consumers) and that of producers can deliver strong improvements in food security. Under a fairly realistic assumption of 3-percent growth in per capita income, augmented by small, sustained reductions in the prices of food staples, the number of undernourished in India could fall 70 percent by 2025. Returning to a path of decreasing food grain prices is not impossible for India. However, this objective would require a combination of the following policies: reductions in farm support prices, the broad-based adoption of high-yielding crop varieties leading to higher growth in farm yields, and public investments to improve the performance of the marketing chain.

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