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National Food Security: A Policy Perspective for India

OVERVIEW OF PERFORMANCE AND EMERGING ISSUES

Achievement of national food security has been a major goal of development policy in India for half a century, since the country became independent. This was to be achieved by attaining self-sufficiency in the availability of food; by raising the purchasing power of the poor through the endowment of land and non-land assets and by generating employment opportunities so as to enable them to have adequate access to food; and through public intervention for stabilizing consumption, reducing the annual variations in the availability of food and providing subsidized food to the poorer and the vulnerable sections of the community.

The achievements have been substantial in terms of reaching near self-sufficiency in food and overcoming transient food insecurity through public procurement and distribution of foodgrains. However, despite a significant reduction in the incidence of poverty, chronic food insecurity persists, as a large proportion of the population is still below the poverty line. This is basically explained by the slow growth in gross domestic product (GDP) and, consequently, sluggish growth in employment. This has been exacerbated by the failure of land reforms to provide land for the landless poor in rural areas, the ineffective implementation of the poverty alleviation programmes and the universal nature of the public distribution of foodgrains with hardly any selectivity.

In terms of its performance, the food economy of India reveals three distinct phases. The first phase, from the beginning of planning to the mid-1960s, was characterized by severe imbalances between the demand for food and its domestic supply. Over the post-'green revolution' period, from about the mid-1960s to the close of the 1980s, the country achieved near self-sufficiency in the availability of food and experienced an improvement in effective food security insofar as there was a significant reduction in the incidence of poverty, especially in the 1980s. This second phase itself warrants sub-grouping into the 1970s, characterized by the emergence of interregional and inter-crop imbalances in agricultural growth, and the 1980s when crops like rice, oilseeds and pulses registered high growth, especially in the eastern and central regions where poverty is widespread, and which were largely bypassed in the early

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phase of the 'green revolution'. The third phase is represented by the post-economic reform period of the 1990s, when measures for macroeconomic stabilization and structural adjustment were launched. The immediate, or short-run, consequences of these reforms for the food economy seem to have been adverse.

Foodgrain production in the pre-'green revolution' period barely kept pace with population growth, the annual growth rate of per capita output being negative in the 1960s. Output growth was achieved mainly through the extension of the area under cultivation by using traditional technology. Imports of foodgrains increased, reaching a level of 14 per cent of domestic availability in 1966. The droughts of 1965 and 1966, with the rising prices of food, highlighted the imbalance in India's food economy. There was sluggish growth in productivity, with a slow rise in the use of inputs such as high-yielding seeds, irrigation and fertilizers, in the face of growing demand for food on account of rapid growth of population and improving income.

This crisis prompted the government to give an overriding priority to the goal of achieving self-sufficiently in foodgrains by launching the 'green revolution'. Public investment in irrigation and agricultural research was stepped up. As a result of this and the rise in total factor productivity, the per capita growth rate in the output of foodgrains was close to 1 per cent in the first decade of the 'green revolution' and accelerated further, to slightly over 1.5 per cent, during the 1980s. Consequently, the dependence on imports declined in the post-'green revolution' period, when net imports of foodgrains were either negative or less than 1 per cent of domestic availability (Government of India, 1997). The relative prices of foodgrains declined after the mid-1970s (Figure 1) and there was a rise in real wages of farm labour.

In the post-reform period of the 1990s, however, the growth rate in foodgrains output, at 1.7 per cent, has been lagging behind the population growth rate of 1.9 per cent (ibid.). The rate of inflation has been high, at 10 per cent or more, for four consecutive years, with the rise in the prices of foodgrains being even greater, so that the relative price registered a steep rise. As a result there was an increase in poverty and inequality in the immediate post-reform period, with only a slow reduction in poverty thereafter (Gupta, 1995).

Public intervention in the foodgrain market assumed greater significance in the post-'green revolution' period, both for ensuring remunerative prices for farmers and for stabilizing consumption. Procurement of foodgrains by the government increased steadily, from well below 5 per cent of output over much of the pre-'green revolution' period to well above 10 per cent and 15 per cent in the 1980s and 1990s (Government of India, 1997). Correspondingly, the volume of public distribution of foodgrains increased markedly, exceeding 10 per cent of domestic availability in the post-'green revolution' period. As a result, prices were remunerative for producers of wheat and rice in better endowed regions, while price collapses were prevented in periods of bumper harvest (Radhakrishna and Rao, 1995). Thanks also to a series of good monsoons, the annual fluctuations in the per capita availability of foodgrains declined during the 1980s and 1990s when compared with the previous period, and there was a decline in the seasonal as well as regional variation in their prices (Bhalla, 1994).

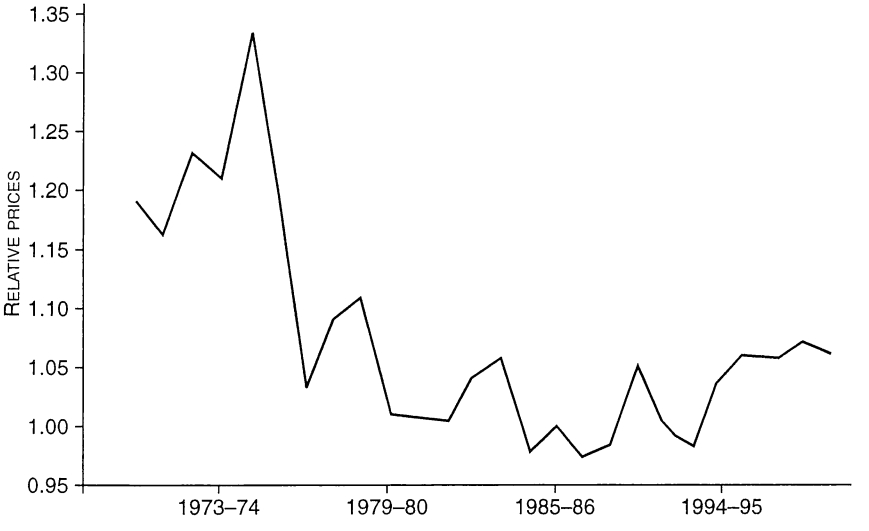

FIGURE 1 *Relative prices of foodgrains*

This overview suggests that the most important problem of food management in India is to overcome chronic food insecurity, by ensuring adequate nutrition for the whole population on a sustainable basis (Radhakrishna, 1996). This would require augmentation of food supplies to meet the expanding food basket which, as mentioned later, is becoming increasingly diversified on account of changing tastes and preferences. However, the real challenge is to ensure that there is adequate purchasing power in the hands of those suffering from chronic food insecurity. As argued in this paper, the current economic reforms, given appropriate content and sequencing, can be expected to generate productive employment necessary to overcome the insecurity problem. Public support for poverty alleviation programmes, as well as subsidized food for the vulnerable sections, will have to continue but, basically, it will be supplementary to the broad-based employment-oriented growth. The focus of such interventions in future should be on better designing and direction of the schemes and on cost-effective delivery systems.

FOOD TRENDS

The National Sample Survey (NSS) consumption data suggest that the per capita consumption of cereals in India is falling. Between 1970–71 and 1991–2,

it declined by 0.52 per cent per annum in rural areas and by 0.23 per cent per annum in urban areas (Radhakrishna, 1996).[1] The decline is very prominent in Punjab and Haryana. What is striking is the low per capita intake of cereals in the most prosperous state of Punjab (12 kg. in rural areas and only 8.85 kg. in urban areas in 1991–2) and high consumption in the backward state of Orissa (17kg. in rural areas and 13.36 kg. in urban areas). Part of the explanation for this paradox lies in the diversification of the food basket in Punjab in favour of non-cereal food, particularly milk and milk products, meat, eggs, fish, vegetables and fruits. The wide coverage of the public distribution system (PDS) in Kerala, and the substantial increase in rice production in West Bengal and Orissa in the 1980s, may explain the rising trend in cereal consumption in these states.

The fall in cereal consumption was offset by an increase in the consumption of non-cereal food. In fact, when compared with 1972–3, the per capita food expenditure was higher in 1987–8, by 15.15 per cent in urban areas and by 14.70 per cent in rural areas (Table 1). However, these increases were not commensurate with the increase in per capita total expenditure. Despite this increase in food expenditure, the nutrient intake expanded at a slower rate; per capita calorie and protein intakes, respectively, grew by 5.15 and 3.51 per cent in rural areas and 8.59 and 5.56 per cent in urban areas. Considering the long timespan of 15 years (1972–3 to 1987–8), these improvements were negligible. Part of the explanation for this slower improvement in nutrient intake lies in the decline in the consumption of cereals, which is the cheapest source of calories. In the case of the lowest 30 per cent of the population, there has been hardly any improvement in the cereal and nutrient intakes in both rural and urban areas (Table 1). It seems that the improvement in economic access to cereal food did not result in higher consumption. The poorer section of the population fails to enjoy a diet which provides the required food energy, with adverse effects on health and nutritional status of both adults and children.

Among the poor, per capita cereal consumption did not alter despite a significant improvement in their real per capita expenditure and a decline in the relative cereal price. This counterintuitive result can be attributed to changes in preferences as a result of the increased availability of a wide variety of food and non-food items (Radhkrishna and Ravi, 1992; Rao and Gulati, 1994). There has also been a substantial diversification of the consumption basket of the poor in favour of non-cereal items, particularly non-food items. The question of topical interest is whether poor households are buying efficient diets from a nutritional perspective. It can be argued that, if the diversification of the consumption basket improves nutritional status, even though it may not add calories, there should be no cause for concern. However, while the implications of changes in dietary preferences on nutritional and health status may be important there is, unfortunately, hardly any work which throws light on the issue.

Given the changing structure of demand, any improvement in the nutritional intake levels of the poor would require a substantial increase in their incomes so that their choice of consumption basket would ensure adequate nutrients. In the absence of such a possibility in the near future, there is a need to increase the supply of subsidized food to the poor through the PDS and through em-

TABLE 1 *Per capita consumption expenditure and nutrient intake in 1972–3 and 1987–8 at 1987–8 prices*

Commodity group	All classes					
	Rural			Urban		
	1972–3	1987–8	Percentage change	1972–3	1987–8	Percentage change
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Per capita expenditure (Rs/month)					
1. Cereal and cereal substitutes	22.23	21.36	3.91	19.41	19.37	0.21
2. Non-cereal food	19.43	26.61	36.95	35.47	43.58	22.86
3. All food	41.66	47.97	15.15	54.88	62.95	14.70
4. Non-food	18.78	26.72	42.28	39.34	56.71	44.15
5. Total expenditure	60.44	74.69	23.58	94.21	119.67	27.02
	Nutrient intake					
Calories (kcal/day)	2 134	2 244	5.15	2 026	2 200	8.59
Protein (g/day)	57.00	59.00	3.51	54.00	57.00	5.56
	Poorest 30 per cent population					
Commodity group	Rural			Urban		
	1972–3	1987–8	Percentage change	1972–3	1987–8	Percentage change
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Per capita expenditure (Rs/month)					
1. Cereal and cereal substitutes	16.41	16.50	0.55	15.59	16.36	4.94
2. Non-cereal food	8.87	12.71	43.29	15.17	21.25	40.08
3. All food	25.28	29.21	15.55	30.76	37.61	22.27
4. Non-food	6.98	11.19	60.32	10.81	16.19	49.80
5. Total expenditure	32.26	40.40	25.23	41.57	53.80	29.42
	Nutrient intake					
Calories (kcal/day)	1 510	1 599	5.89	1 524	1 704	11.81
Protein (g/day)	41.25	42.98	4.19	40.23	46.00	14.34

Source: Radhakrishna (1996).

ployment programmes, as well as strengthening various nutrition programmes to provide supplementation of the diets of vulnerable groups such as children, and pregnant and lactating women.

NUTRITION INTAKE AND NUTRITIONAL STATUS

The National Nutrition Monitoring Bureau (NNMB, 1991) provides data on diet and nutritional status of rural households in seven sample states for the periods 1975–80 and 1988–90. The results do not reveal any increase in nutritional intake. Although the average daily intake of calories and protein was found to have become closer to the standard requirements suggested by the Indian Council of Medical Research, the lower socioeconomic strata can suffer from protein–calorie deficiency as there are inter-state, inter-household and intra-household (gender) inequalities in food intake. NNMB data also reveal severe micronutrient (Vitamin 'A', Thiamine, Riboflavin and Niacin) deficiencies stemming from lack of variety in the diet.

The NNMB classified rural children, aged 1–5 years, into different nutritional grades based on weight for age. The results show that the percentage of children in the standard normal range increased from 5.9 in 1975–9 to 9.9 in 1988–90, while those falling into the severe malnutrition range declined from 15.0 per cent to 8.7 per cent during the same period (Table 2). If those classified in the moderate and severe malnutrition ranges are considered together, the percentage declined from 62.5 per cent in 1975–9 to 52.5 per cent in 1988–90. It is clear, however, that even with some improvement in nutritional status, more than half of the rural children can be considered to be suffering from malnutrition.[2]

In terms of the nutritional status of children, middle-income states such as Kerala, Tamil Nadu and Andhra Pradesh performed better than those with higher income, such as Gujarat and Maharashtra. Not surprisingly, lower-income areas such as Madhya Pradesh and Orissa had the worst performance. It is notable that calorie intake per consumer unit was very low in Kerala and Tamil Nadu, where there was a high ranking in nutritional status. Inter-state comparisons do not reveal any empirical association either between per capita GDP and nutritional status, or between average calorie consumption per consumer unit per day and nutritional status. The state level mismatch between food intake and nutritional status can be attributed to the differences in education, health, availability of safe drinking water and environmental sanitation, which intervene between food and nutritional status. The better nutritional status at a comparatively lower level of nutrient intake per consumer unit per day, as observed in Kerala and Tamil Nadu, could be due to better health care and nutritional intervention.[3]

Does all this imply that calorie intake hardly matters? Empirical evidence tends to suggest a positive association between calorie intake and nutritional status, though the relationship is likely to be affected by the prevalence of disease. The nature of a desirable diet from a nutritional perspective still remains unsettled, as does the extent to which malnutrition is due to an inadequate diet or to the general conditions of life.[4] But, given the fact that a

TABLE 2 *Percentage distribution of children (aged 1–5 years) according to nutritional grades*[1]

State	Period	Normal	Mild	Moderate	Severe
Kerala	1975–79	7.5	35.7	46.5	10.3
	1988–90	17.7	47.4	32.9	2.0
Tamilnadu	1975–79	6.2	34.2	47.0	12.6
	1988–90	8.0	42.0	45.8	4.2
Karnataka	1975–79	4.6	31.1	50.0	14.3
	1988–90	4.8	38.1	48.8	8.3
Andhra-	1975–79	6.1	32.4	46.1	15.4
Pradesh	1988–90	8.7	39.5	44.3	7.5
Maharashtra	1975–79	3.2	25.4	49.5	21.9
	1988–90	6.7	38.0	47.5	7.8
Gujarat	1975–79	3.8	28.1	54.3	13.8
	1988–90	7.3	33.9	45.8	13.0
Madhya-	1975–79	8.4	30.3	45.1	16.2
Pradesh	1988–90	17.7	27.4	38.9	16.0
Orissa	1975–79	7.5	35.9	41.7	14.9
	1988–90	8.1	34.6	46.6	10.7
All states[2]	1975–79	5.9	31.6	47.5	15.0
	1988–90	9.9	37.6	43.8	8.7

Notes: [1]Based on National Centre for Health Statistics (NCHS), USA standards.
[2]Pooled estimates for Kerala, Tamilnadu, Karnataka, Andhra-Pradesh, Maharashtra, Gujarat, Madhya-Pradesh and Orissa.

Source: National Nutritional Monitoring Bureau (1991), *Report of Repeat Surveys (1988–90)*, Hyderabad: National Institute of Nutrition.

sizeable section of the population is exposed to risk, food and nutrition interventions are required to supplement the normal effects of economic growth.[5]

FOOD PRODUCTION TRENDS

During the 1960s and 1970s total food production, including non-cereal food, barely kept pace with population growth. The growth rate per capita declined during the 1960s, but grew at a slow rate during the 1970s (Table 3). It was only during the 1980s that per capita output increased at a satisfactory rate of 1.6 per cent per annum. A similar pattern is discernible in the supply of calories and protein. The improved performance during the 1980s was mainly due to significant acceleration in non-foodgrain production, with oilseeds and livestock products as the principal engines of growth. The diversification of production more or less conforms to the growth patterns of domestic demand.

TABLE 3 *Annual compound growth rates for food and agricultural production (per cent per annum)*

Period	Food production		Agr. production	
	Aggregate	Per cap.	Aggregate	Per cap.
1961–63 to 1971–73	2.11	–0.21	2.03	–0.18
1971–73 to 1981–83	3.00	0.84	3.20	0.90
1981–83 to 1991–93	3.77	1.62	3.82	1.76
1961–63 to 1991–93	2.96	0.75	3.01	0.82
1971–73 to 1991–93	3.39	1.23	3.51	1.33

Period	Food supply (Per cent per annum)		
	K/cal p. cap./day	Protein gr. p. cap./day	Fat gr. p. cap./day
1961–63 to 1971–73	–0.14	–0.44	–0.52
1971–73 to 1981–83	0.51	0.44	1.45
1981–83 to 1990–92	1.05	0.81	2.08
1961–63 to 1990–92	0.45	0.25	0.96
1971–73 to 1990–92	0.76	0.62	1.75

Source: *The State of Food and Agriculture*, Rome: Food and Agriculture Organization.

The annual growth rate of foodgrain production improved from 2.3 per cent during the 1970s to 2.8 per cent during the 1980s. It is particularly noteworthy that real foodgrain prices were declining, as a result both of better production performance and of the long-term downward trend in per capita foodgrain consumption. Another positive feature of growth during the 1980s was its spread to hitherto lagging regions exposed to high risk of food insecurity: both the eastern region, where production had been stagnating,[6] and the slow growing central region showed a better performance.[7]

Agricultural growth has slowed down during the 1990s. It is disturbing that grain production has barely kept pace with population growth and the real price of foodgrains has moved into an upward trend.[8] Ironically, even with slow output growth, supply outstripped the effective market demand and the first half of the 1990s has seen a rapid increase in the stock of foodgrains held by the government. This coincided with a failure to continue the downward trend in poverty.

THE PUBLIC DISTRIBUTION SYSTEM

The PDS, in its present form of a producer price support mechanism allied to a consumer subsidy programme, has evolved in the wake of foodgrain shortages of the 1960s. The main emphasis until the late 1970s was on price stabilization, hence the PDS was mainly confined to urban areas and food deficit states. The welfare dimension has gained importance since the early 1980s, with coverage being extended to rural areas in some states, as well as to areas with a high incidence of poverty. The food subsidy cost accounted for 0.7 per cent of GDP in 1993–4. In the wake of economic reform, the PDS is perceived to be the main safety net to protect the poor from potential short-run, price-induced adverse effects.

PDS supplies

PDS supplies have increased rapidly since the mid-1960s, changing from 6.5 million tonnes per year during 1961–5 to 18.4 million tonnes during 1990–92. A noteworthy feature is the response of the government supply to fluctuations in production: it is higher in drought years than in normal ones. For instance, in 1979–80 and 1987–8, when grain production was low, government supplies were substantially higher than in normal years, even though procurement levels were lower. By means of the PDS and employment-generation programmes, famine deaths have been kept at a very low level during the past decade. This has been achieved despite PDS operations not being very sensitive to inflationary situations, with price stabilization measures being ineffective in combating the foodgrain price increases engineered, in part, by speculative trade practices. On the other side, however, price collapse in periods of bumper harvest has been prevented.

Pricing and subsidies

The recent large increases in procurement prices do not seem to be based on any economic rationale, hence the consequent upward revisions in the Central issue prices have had an adverse impact on the efficacy of the system. The minimum support price was raised by 69 per cent for wheat and 44 per cent for rice between 1990–91 and 1995–6. On the one hand, the price advantage to farmers has resulted in the Food Corporation of India (FCI) buying up more wheat and rice than it can manage. The reason is simply that the FCI is a parastatal which, ever since it was established in 1965, has had no choice but to buy whatever it is offered at the minimum support price. On the other hand, owing to large increases in the issue prices, the off-take of rice from the Corporation has declined from 9.9 million tonnes in 1991–2 to 8.0 million tonnes in 1994–5, with figures for wheat of 8.8 million tonnes declining to less than 5 million tonnes. Consequently, buffer stocks have reached uneconomic levels, far exceeding the norms suggesting by the technical group constituted by the government. This is unfortunate since withholding foodgrains from the

market has adverse effects.[9] Withholding increases the open market price, which hurts the poor and has severe consequences for the very poor, not least because not all of those at risk are covered by the PDS. Even those who are covered depend on the open market for a major portion of their foodgrain requirements.

The sharp increases in the minimum support and issue prices explain the abnormal increase in the carrying cost of buffer stocks in 1993–4 and 1994–5. In the latter period the share amounted to 36 per cent of the food subsidy budget of Rs 51 000 million. The excess stock over the minimum norm is estimated to have involved an additional Central Government expenditure amounting to 19 per cent.

Despite the increasing trend of the central food subsidy budget, the consumer cereal subsidy (measured as the FCI cost minus its sales) has declined since 1992–3. What is more disquieting is the decline in the subsidy which has gone towards poverty alleviation programmes. Their share in 1994–5 was about 30 per cent of the government food subsidy, though even that is probably dispersed among people who do not need it.

PDS food access by the poor

It is important to ask whether the poor have benefited from the increased tempo of PDS operations and to question the efficiency of the scheme in distributing food to them. Many empirical studies have shown severe bias in the interregional distribution of the PDS supplies: states with a high incidence of poverty, such as Bihar, Orissa and Madhya Pradesh, receive a lower share. Further, with few exceptions, the PDS has remained a non-selective programme (Jha, 1991; Dev and Suryanarayana, 1991; Radhakrishna, 1996).

Contrary to the repeated assertion that the PDS is urban-biased, empirical evidence does not seem to support this as a major issue (Radhakrishna *et al.*, 1996). Out of the eight states (Andhra Pradesh, Gujarat, Jammu and Kashmir, Karnataka, Kerala, Maharashtra, Tamil Nadu and West Bengal) in which the PDS network has spread, only in Jammu and Kashmir, Karnataka, Maharashtra and West Bengal were the per capita purchases from the PDS higher in the urban areas. Bias only appears to have been extreme in Jammu and Kashmir and in West Bengal. The major issue, apart from the universal character of entitlement, is regional misallocation.

The system is not functioning at all in the states with a high concentration of the poor, owing to lack of initiative on the part of the state governments (ibid.). The prospect of these states providing safety nets to the poor on the basis of spending from their own resources would seem to be bleak, since they are facing severe fiscal austerity. The proposed new scheme of providing 10 kg per month to a poor household at half the issue price, if earnestly implemented, may help the poor to get access to food, provided the delivery systems in the poorer states are made to function properly, without leakages.

PDS reform

The PDS has remained an expensive and largely non-selective programme and its poverty-reducing effects are weak. Structural reforms need to be introduced against the background of the changing agricultural and institutional scene. Given these changes, and the weakness and constraints under which the FCI currently operates, it may be better to phase out government controls over grain markets and abolish all procurement operations. The FCI should then be allowed to compete in the market without budgetary support, but free from controls, with the added advantage of economies of scale. The new role of the FCI may be to stabilize prices within a range, provide a minimum support price and maintain strategic buffer stocks.[10]

The food subsidy cost saved could be distributed to the state governments and the Panchayat Raj institutions on the basis of the incidence of poverty.[11] The institutions should be entrusted with the responsibility of identifying the poor on the basis of household-specific characteristics. They, as well as state governments, should be free to buy grain, from the FCI or the open market, to meet their PDS requirements and distribute to the poor at a price lower than the purchase price, utilising the Central subsidy. In very poor states, where administrative structures and local institutions are weak, schemes which tie food distribution to wage employment programmes, nutrition programmes and welfare programmes for old and disabled persons should receive high priority.

THE FUTURE: POVERTY AND FOOD DEMAND

Poverty

Until the mid-1970s, the proportion of people below the poverty line remained above 50 per cent, with no declining trend being evident. Higher growth, supplemented by policies to enable the poor to achieve higher incomes, has subsequently contributed to the decline in poverty. The extent of that, however, has differed sharply among regions, with rural poverty being concentrated in the eastern and central regions, which have lagged behind in agricultural development. Urban poverty has been more general.

The declining trend in poverty incidence which ran on into the 1980s seems to have slowed down in the initial years of reform.[12] Whether the reforms have contributed to the slowdown, or what would have happened in the absence of reforms, is difficult to know.[13] The higher incidence of poverty in 1992 (the second year of the reform period) could be attributed to the rise in food prices as well as the decline in public expenditure on the social sector. In 1993–4, official estimates placed the proportion of poor at 36 per cent (37 per cent in rural areas and 32 per cent in urban areas). The incidence of poverty is high, despite the fact that India has long experimented with a number of poverty alleviation programmes (PAPs). In 1993–4, the amount spent by Central and State governments on the programmes, including the PDS, was 1.36 per cent of GDP (Radhakrishna *et al.*, 1996). Many of the schemes suffer from loose

allocation, leakages and high income transfer costs, though this is less evident with employment programmes (particularly the Maharashtra Employment Guarantee Scheme[14]) and with nutrition programmes, both of which seem to be better directed because of self-selection.

Projections of poverty incidence

A growth rate of 6–7 per cent during the Ninth Plan Period is considered to be within reach, and there is a possibility of sustaining this growth rate into the future. Some of the main features are shown in Table 4. The projections are

TABLE 4 *Projected expenditure distribution*

Expenditure groups	Rural				Urban			
	Estimated distribution		Projected distribution		Estimated distribution		Projected distribution	
	1994	2000	2010	2020	1994	2000	2010	2020
Very poor	20	14	6	2	19	11	2	0
Moderately poor	18	15	9	5	14	10	4	1
Poor	38	29	15	7	33	21	6	1
Non-poor lower	29	28	23	16	25	22	12	4
Non-poor higher	33	43	62	77	42	57	82	95
Non-poor	62	71	85	93	67	79	94	99
All	100	100	100	100	100	100	100	100

Note: Persons below 75 per cent of the poverty line (Z) are defined as very poor; persons between 75 per cent of Z and Z as moderately poor; persons between Z and 150 per cent of Z as non-poor lower and above 150 per cent of Z non-poor high. Poverty lines are those of the Planning Commission given for the 1993–4 period. Using the log-normal distribution fitted to the 1993–4 NSS data, projections of expenditure distribution in the year 2000, 2010 and 2020 are made on the following assumptions: (1) aggregate private expenditure will grow at 5 per cent during 1994–2000 and at 6 per cent during 2000–2020; (2) the ratio of urban to rural per capita expenditure will increase at the historical rate; (3) the inequality in expenditure within rural and urban areas will remain the same as in 1993–4; (4) population figures are based on recent estimates released by the Registrar General of India.

Source: CESS Project on Food Demand.

made on the assumption that private consumption will grow at 5 per cent from 1994 to 2000, and at 6 per cent up to 2020,[15] that the rural–urban distribution of population and rural–urban differences in per capita expenditure will follow past trends, and that the inequality of expenditure distribution will remain constant at the 1993–4 levels in rural and urban areas. For rural areas, the projections suggest that 29 per cent will remain poor in 2000, though the figure will then drop to 15 per cent in 2010 and 7 per cent in 2020. In urban areas, 21 per cent will be poor in 2000, with a drop to 4 per cent in 2010 and 1 per cent in 2020. In absolute terms, the number of poor in India will decline from 377 million in 1994 to 266 million in 2000, 115 million in 2010 and, further, to 35 million in 2020. This decline will occur despite a projected increase in population from 909 million in 1994 to 1344 million in 2020. Of the projected 266 million poor in 2000, some 130 million, or about half, will be 'very poor'. The need to focus food security on that group will remain in the coming years. Provided that food transfers can be made without leakages, simple calculations show that it would require about 3 million tonnes of cereals to meet their chronic cereal deficiency in the year 2000, and 1 million tonnes in 2010. This suggests that the problem of chronic insecurity can be overcome in the next decade, though it has to be remembered that malnutrition may persist owing to other deprivations, even if broadly defined food security is achieved.

Food demand

Based on the above assumption, food demand is projected to increase at 4.41 per cent between the years 2000 and 2010, which is closer to the target agricultural growth rate in the Ninth Plan (Table 5). The projected annual rate of increase in household demand varies among the food items: it is more than 5 per cent for milk and milk products, 4–5 per cent for meat, eggs, fish, sugar, gur and edible oils, and less than 3 per cent for cereals items. These differential growth rates imply substantial diversification of the food basket in favour of non-cereal food. The contribution of population growth to rising cereal demand is very significant, as it accounts for more than three-quarters of the increase. Clearly, the shifts in tastes observed in the historical data have dampened the growth of cereal demand. Household demand for cereals in future will slow down, eventually levelling off at about the rate of the growth in population, which itself is likely to decline.

The other sources of demand for cereals are for seed, feed and for processing by industry; these together accounted for about 12.5 per cent of cereal production in 1993. Feed demand, which constituted about 6 per cent of production, is likely to be influenced by the growth rate of consumption of milk and milk products as well as meat, eggs and fish (that is, 4–5 per cent per annum). Since cereals may replace other types of feed, demand may grow at a higher rate than that of total feed demand. Taking all aspects into consideration, a maximum growth rate of 4.5 per cent can be assumed for non-household cereals demand, while the growth rate of national demand (household and non-household) can be assumed at 2.8 per cent during 2000–2010 and 2.5 per cent during 2010–2020. It is pertinent to note that the household cereal demand has

TABLE 5 *Projected annual growth rate in total household demand, by commodity groups, 1994–2020*

	1994–2000	2000–2010	2010–2020
Rice	2.66	2.58	2.23
Wheat	2.98	3.06	2.69
Other cereals	0.93	0.76	1.01
All cereals	2.49	2.49	2.24
Milk and milk products	5.34	5.80	5.21
Edible oil	3.96	4.40	4.26
Meat, egg and fish	4.61	5.05	4.74
Sugar and gur	4.11	4.55	4.15
Other food	4.58	5.26	5.21
All food	4.41	4.41	4.32
Non-food	6.55	7.81	7.37
Total	5.00	6.00	6.00

Note: Projections are based on an integrated demand model and on NSS rounds from 1977–8 to 1993–4, which includes the latest round. The projections are made at the relative prices of 1993–4 and the assumptions about the variables are those given in Table 4.

Source: CESS Project on Food Demand.

been projected on the assumption that the historical downward trend in per capita consumption of cereals due to change in taste will be reversed and food demand will depend only on population, per capita income, level of urbanization and income inequalities. Hence the estimated growth rate of 2.8 per cent is likely to be on the high side.

To match growing food demand, there is need for production to grow at a rate of 4.41 per cent, which implies a significant increase on the rate of 3.4 per cent achieved during the 1970s and 1980s. The objective of national food security requires that the deceleration in the growth rate experienced during the first half of the 1990s, as well as the weaknesses of the PDS, should be overcome. There is a long-term problem of sustaining a growth rate of about 2.8 per cent in cereal production during 2000–2010 and 2.5 per cent during 2010–2020, though these are lower than the rates achieved during the 1980s. As will be argued in the next section, the targets are within reach.

EMERGING PERSPECTIVES AND POLICY IMPERATIVES

Achievement of food security is integral to the process of alleviating poverty through employment generation. The experience across countries in Asia shows that the overall growth rate of the economy is the most important factor

accounting for the alleviation of poverty (Quibria and Srinivasan, 1994). The Asian experience shows further that there are strong linkages between agriculture and the rest of the economy, with there being a significant correlation between agricultural growth and overall growth (ESACP, 1996).

The 'negative protection' of agriculture under the pre-liberalization strategy, with the implied subsidy to the consumers of food which it entailed, failed to reduce poverty to any marked extent. Clearly, the potential loss to the poor from the failure to generate productive employment through higher agricultural and overall growth was far greater than the 'gain' from cheaper food. However, it is equally clear from the Asian experience that the impact of post-liberalization growth on poverty reduction is greatest in situations where land reforms have been implemented effectively, and a high priority has been accorded to enlarging physical infrastructure and fostering agriculture and human resource development.

In several countries of East and Southeast Asia, in the 1970s and 1980s, the growth in GDP originating from agriculture was well over 1 per cent, or close to 2 per cent, per head. In India, on the other hand, the per head GDP growth originating from agriculture was negative in the 1970s and only around 1 per cent in the next decade. In countries like China, Indonesia and Thailand, the post-reform growth was spearheaded by agriculture, resulting in the speedy alleviation of poverty (ibid.). The experience of East and Southeast Asia suggests that India needs to aim at 4–4.5 per cent agricultural growth, or 2–2.5 per cent per head, together with an overall GDP growth rate of 7 per cent, if chronic food insecurity is to be overcome through the speedy alleviation of poverty.

At this level of development, agriculture would become diversified and its growth would increasingly consist of dairying and animal husbandry, fishing and horticulture. With this composition of output, agroprocessing industries in rural areas could receive special impetus, meeting domestic as well as export demand. Such activities would be labour-intensive and have strong linkages with manufacturing and service sectors. Thus, despite a significant decline in the share of agriculture in GDP in several of the East and Southeast Asian countries, the proportion of labour force engaged in the rural sector including agriculture is still quite high, exceeding, for example, 60 per cent of the total labour force in China and Thailand (ibid.). It is this broad-based labour-intensive, rural development, together with high levels of social development such as primary education and primary health services, which has triggered off a speedy demographic transition in many countries. Apart from leading to high rates of savings and investment, this process has activated 'trickle-down' mechanisms which have aided poverty reduction.

The experience with structural adjustment in several countries has demonstrated substantial benefits flowing to agriculture. Exchange rate liberalization and reduction in the rate of protection to industry are translated into improved terms of trade for agriculture. Quantitatively, these indirect benefits are far more significant than the direct benefits from reforms specific to agriculture. Thus the incentive framework for agriculture in India can be expected to improve vastly as a consequence of the current structural adjustment measures and new opportunities may be opened up as the existing restrictions on trade in

agricultural commodities are phased out. Already private investment in agriculture has picked up considerably, not only recovering from the downward trend of the 1980s but recording in 1996 the highest level of real investment ever achieved (Government of India, 1997). However, the economic reforms so far have failed to ensure the necessary physical and institutional infrastructure to evoke a sufficient supply response from agriculture.

The target for reducing the fiscal deficit has been pursued, not so much by raising revenues or by reducing inessential expenditure, as by reducing capital expenditures. The tax ratio (net tax revenues as a proportion of GDP) is still lower by about 1 percentage point than the pre-reform level. The amount of hidden subsidies at the state level, represented by the non-recovery of irrigation charges and the favourable power tariff, is as high as in the pre-reform period and exceeds public investment in agriculture. The combined outlay of the centre and states on rural development and social services, at 6.7 per cent of GDP in 1994–5, was lower than even the immediate pre-reform level of 7.3 per cent (Guhan, 1995). There could have been a justification for a gradual rise in the farm gate prices of fertilizers in line with the rise in the procurement prices of crops but a sudden and steep fertilizer price rise, stemming from a reduction in subsidy, led to a significant decline in the demand for fertilizers (the growth rate in their use was less than half that of the 1980s). On account of the resulting decline in output and income, a large number of small and marginal farmers were pushed below the poverty line in the immediate post-reform period (Gupta, 1995). The decontrol of phosphatic and potassic fertilizers, with a doubling of prices, has accentuated the imbalance in the application of different nutrients, resulting in a decline in the productivity of fertilizers as a whole (Government of India, 1997).

As mentioned above, there are clear signs of a slowdown in agricultural growth in the post-reform period. Real public investment in agriculture continues to be lower than that realized in the early 1980s (Figure 2). As a result, there has been a significant shortfall in the achievement of the Eighth Plan's irrigation target, especially in the major and medium irrigation projects, where the achievement is less than half the target. There has also been a steep fall in the share of credit from the commercial banks allocated to farmers, despite an improvement in the recovery of loans advanced to them (Government of India, 1997). Thus the country has not been able to exploit fully the potential offered by a recent series of good monsoons. To achieve food security by taking advantage of the benefits of economic liberalization, a series of reforms in technology, infrastructure, dryland farming, farm credit and input delivery systems are needed to activate supply response from agriculture. A rise in agricultural productivity could hold the key to deriving full benefits from the opportunities for trade opened up by the Uruguay Round (ESCAP, 1996).

Stepping up investment in infrastructure through cost recovery is inextricably linked with the quality of services provided, and with the way in which infrastructure and other services are managed. Experience in India has shown that, in a democratic polity, farmers cannot be expected to pay heavier charges regardless of the quality and cost of the services provided, especially when the political parties have been practising competitive populism. Decentralized management of infrastructure, with less bureaucracy and political interference,

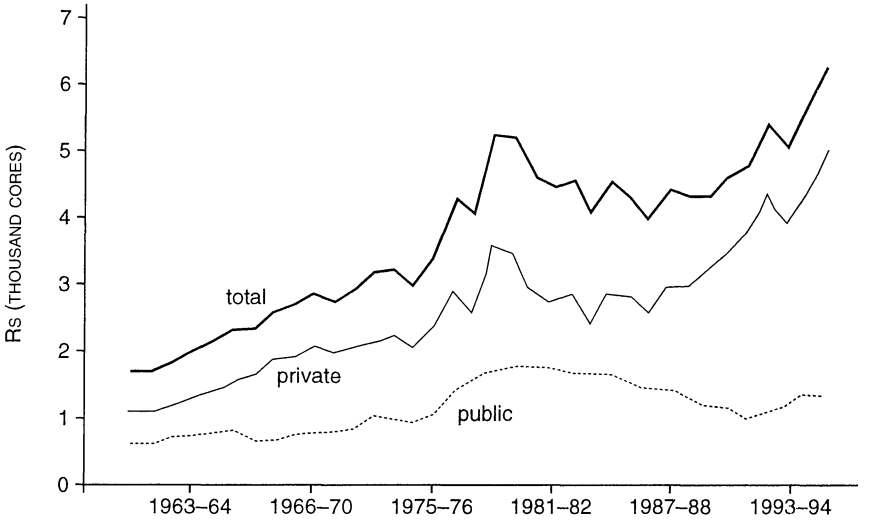

FIGURE 2 *Gross capital formation in agriculture (private, public and total)*

should, therefore, be at the top of the agenda of reform. In many cases, associations of farmers and non-government organizations could be entrusted with the responsibility for repairing and managing small irrigation works, especially if they were given the power to collect water rates and retain a share for maintenance and development. Further, the local elected institutions could be entrusted with similar functions, including the transmission and distribution of power. Investment in infrastructure by the private sector, including subscription to shares by farmers on a wide scale, could contribute a great deal towards augmentation and efficient management.

The experience with decentralization of services in Southeast Asia has shown that irrigated yields can be increased by at least 50 per cent and that farmers would be willing to pay service charges to the extent of at least one-quarter of the increment in the value of output, as the benefits from better management appear. Such payments by farmers in India would represent almost a tenfold increase over the existing levels. Some state governments in Gujarat, Karnataka and Andhra Pradesh have already taken steps towards decentralization.

The yields under seed-fertilizer technology have been hovering round their peak for some time. The tools of biotechnology offer significant possibilities for breaking these barriers, even in drought-prone areas. Biotechnology may contribute to the protection and regeneration of the environment by reducing

the dependence on chemical inputs and by facilitating afforestation through tissue culture techniques. However, India is currently investing only about 0.3 per cent of its agricultural GDP in agricultural research, as against 0.7 per cent in the developing countries as a whole. Therefore, so far as India is concerned, there is considerable scope for diverting incremental outlays to the priority areas in research.

A large part of the unirrigated area is highly degraded and is characterized by low and uncertain rainfall, low wages and high poverty. The poor suffer intermittently from acute scarcity of food due to weather shocks. The current programmes for soil and moisture conservation in such areas need considerable strengthening through better planning of work on a watershed basis, by involving people and improving coordination between various departments. The integration of wage employment schemes with those for soil and moisture conservation is now being attempted with some success as new guidelines are adopted.

Institutional credit for agriculture has to expand at a faster rate than before because of the need to raise the growth rate and because the changing product mix will necessitate larger investments. It would be useful to phase out the concessionary rates of interest in order to improve the viability of credit institutions, especially as their normal rates are much lower than those charged in the informal market. There is also a need to ensure the timely availability of institutional credit to small farmers through appropriate rationing. Otherwise, the tendency of the commercial banks to reduce unit costs by serving a small number of big borrowers, rather than a large number of small ones, could result in limiting credit to the needy. Subject to such broad guidelines, the management of credit institutions should be accorded greater autonomy by abolishing administrative and political interference in their functioning.

The existing poverty alleviation programmes, including the public distribution of foodgrains, are essentially 'top-down' ventures heavily dependent on the bureaucracy. Whereas even small and marginal farmers, being decision makers in control of their resources, successfully participated in the 'green revolution', the management of poverty alleviation programmes has resulted in inefficiencies and large leakages. The beneficiaries need to be involved in the design and implementation of programmes through the local-level (Panchayati Raj) institutions, for which periodic elections have now become constitutionally mandatory. The recent agricultural breakthrough achieved in West Bengal points to the efficacy of decentralized management (Sen, 1993; Mukerji and Mukhopadhyay, 1995). It strongly suggests that the state governments have to muster the necessary political will to delegate vital decisions bearing on economic development and social justice to a lower level, to devolve adequate resources and confer greater power over administration.

NOTES

[1]More recent NSS material shows that, in 1993–4, the per capita monthly consumption of cereals was 13.4 kg. in rural areas and 10.6 kg. in urban areas, as against the corresponding figures of 15.4 kg. and 11.4 kg. in 1970–71.

[2]Children suffering from malnutrition do not achieve full genetic growth potential and are exposed to a greater risk of child mortality. Pelletier *et al.* (1995) show that malnutrition, by virtue of its synergistic relationship with infectious disease, has a powerful impact in India.

[3]Kerala and Tamil Nadu have better health care and educational facilities and coverage of PDS.

[4]Sekler (1982) observes that 'severe' malnutrition is caused by nutrient intake deficiency, while 'moderate' and 'mild' forms are due to environmental factors. He argues that the former problem calls for nutritional intervention and the latter for environmental intervention. There is, as yet, not much empirical basis for his proposition.

[5]Overcoming the problem of hunger is not the same as elimination of malnutrition. The former can be achieved through the intake of cereals, while the latter will demand non-cereal food as well as a better environment.

[6]It is pertinent to note the contribution of panchayats (local institutions) to the improvement in factor productivity in West Bengal (Mukerji and Mukhopadhyay, 1995). It is argued that the active role of panchayats in input delivery and in land and water management has a positive impact on agricultural productivity.

[7]In the rainfed region, Rajasthan and Madhya Pradesh, the yield increases more than compensated for the substantial decline in cropped area under foodgrains due to a shift in areas under coarse cereals to oilseeds (Sawant and Achuthan, 1995; Bhalla and Singh, 1996). The shift in area from low-yield and low-value coarse cereals to high-value oilseeds would improve the incomes of the poor.

[8]The upward trend in foodgrain prices can be partly attributed to the large increases in the minimum support prices and consequent upward revision in the ration prices.

[9]While foodgrain stocks reached uneconomic levels during 1993–6, they have fallen below the required stocks in 1997. The decline could be partly attributed to the shortcomings of food management. As the result of a failure to notice a decline in production, foodgrains were exported when international prices were low and domestic prices were on an upward trend.

[10]For arguments in favour of these reforms and other details, see Radhakrishna *et al.* (1996).

[11]For details, see Radhakrishna *et al.* (1996).

[12]Official estimates show that, while the proportion of poor in all of India declined from 51 to 39 per cent between 1978 and 1998, it remained at 36 per cent in 1993–4.

[13]The available data are inadequate to permit analysis of the complexities in the underlying relations. Empirical evidence, however, suggests a definite association between the poverty level and the inflation rate. Agricultural wages as well as wages in the unorganized sector do not adjust to inflation without a lag.

[14]Female participation is reported to be high in the Maharashtra Guarantee Scheme.

[15]The assumed growth rate in private expenditure is closer to the one assumed in the Ninth Five Year Plan, which has assumed a growth rate of 5.9 per cent during 1997–2002 under its accelerated growth scenario.

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