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AGRICULTURAL POLICY IN INDIA SINCE INDEPENDENCE*

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The paper deals with agricultural policies adopted in India since Independence. A fair appraisal of a policy can be made only when viewed in the context of the nature of conflicts and the choices confronting the policy-maker at the given point of time. For example, during the latter half of 1960s, when the food situation was critical and the High-Yielding Varieties (HYVs) of cereals became available, the policy-makers in India faced a conflict: the adoption of HYVs would augment food production but was likely to aggravate inter-class and inter-regional disparities. Given the situation were they right in the decision they took, if not what were the available alternatives? Such are the issues discussed in this paper.

India's agricultural policy, and perhaps that of most less developed countries (LDCs), has often been criticised for its 'neglect' of agriculture. The criticism acquires legitimacy because of what is generally characterized as the 'failure' of agriculture. The alleged failure may have a reference to either the growth of agricultural production or the promotion of social justice, or both. It is, therefore, necessary to get a more precise idea of the performance of Indian agriculture in both these fields and identify policies related to this performance.

A reference to agriculture's performance in the pre-Independence period (approx. 1901-1950) may not be considered quite relevant, but legacies do matter and the state of agriculture as inherited from the colonial days—whether it be India or Taiwan—is not quite irrelevant for the assessment of the post-Independence performance. George Blyn's study has revealed that between 1891 and 1947, aggregate grain output in British India increased at an average rate of 0.11 per cent per year. In fact, in the latter half of the period, the growth rate was a negligible 0.03 per cent. Rice output, constituting half of the total output, actually declined over the 56-year period at an average annual rate of 0.09 per cent (4). During this period, population increased at a mercifully low rate of 0.67 per cent per annum in British India. Even so, between 1911 and 1941, per capita availability of food-grains—taking into account international trade flows—declined by as much as 26 per cent.

This was from where agriculture in independent India took off. Its subsequent performance though not a shining example of success is not as

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dismal as is sometimes depicted. Between 1951 and 1971, foodgrains production increased from 55.0 million tonnes to 108.4 million or at the annual rate of 2.7 per cent, slightly ahead of the growth rate of population. The growth was however not smooth and there were quite a few years—particularly 1966, 1967, 1973—when the country experienced a severe food crisis. Throughout the period—with the exception of the year 1972—foodgrains had to be imported, the maximum being 10 million tonnes in 1966. After 1971, foodgrains production started declining again, dropped to 97 million tonnes in 1973 and rose to about 104 million tonnes in the next two years. In 1975-76, foodgrains production staged a remarkable recovery and is currently estimated at 118 million tonnes. As the Economic Review for 1974-75 by the Reserve Bank of India has observed: "Notwithstanding the expansion of irrigation since 1951, the degree of vulnerability of the agricultural sector to vagaries of climate does not seem to have diminished significantly"(37).

Equally germane to the assessment of agriculture's production performance is the fact that in these two decades (1951-1971), India's population has increased by 187 million, and by 1976 another 60 million have been added. It is worth noting that in spite of this tremendous increase, this backward agriculture has been able to provide a per capita availability of foodgrains—with marginal imports—at about 450 grams per day.

The above should not be interpreted as reflecting a sense of complacency about India's agricultural production performance. Indeed, in years to come, India will have to do much better than its best performance in the past. According to a 'medium' projection, by the end of the century, India's population will be about 1,000 million. Making a few balanced assumptions regarding the growth of population, growth rate of national income and its (more equitable) distribution, V.M. Rao has estimated that by the year 2001, India's requirements of foodgrains (assuming low population growth) would be 2.5 times its consumption in 1964-65; requirements of "other foods" would be as high as 4.35 times (34). We can ignore at our peril, the warning sounded by David Hopper. Presumably reflecting the world opinion and employing "whom to save, whom to abandon" life boat analogy, he has warned: "India, along with some of its neighbours in South Asia, is *seldom considered a candidate for salvation*" (11) (emphasis added).

Let us revert to the post-Independence period, and briefly review agricultural policies germane to agriculture's performance. We shall confine our review of agricultural policy in India to a few specific issues which have figured prominently in the literature on the subject. These may be listed as below:

(1) Inadequacy of Plan investment for agricultural development,
(2) Price policy and terms of trade,
(3) Urban bias,
(4) 'Green Revolution' and inegalitarian growth,
(5) Land tenure and institutional reforms.

I

PLAN EXPENDITURE ON AGRICULTURE

The 'neglect' of agriculture for which the Indian policy-makers have often been criticised is generally identified with the failure to allocate an adequate share of public expenditure to agriculture. Every one was happy that agriculture was given pride of place in India's First Five Year Plan (1951-1956). The share of agriculture and community development in the Public Sector Outlay[1] in the First Five Year Plan was 15.1 per cent, as against 6.3 per cent for industries and minerals. The Second Five Year Plan reversed the ranking by allocating 14.4 per cent to 'industries' and 11.8 per cent to 'agriculture.' Apart from this, the major sin of the Second Plan was alleged to be its preference for "rapid industrialisation with particular emphasis on basic and heavy industries." We shall not discuss here whether for a country of India's size and geo-political situation it would have been wiser to ignore the establishment of basic industries. Apart from that, the accent on rapid industrialisation does not *ipso facto* prove neglect of agriculture. Modernization of agriculture is incompatible with retarded industrialisation. In any case, the importance attached to a sector should not be judged by its share in the public sector outlay. The absolute quantum of public expenditure on agriculture in the Second Plan was raised to Rs. 568 crores from Rs. 357 crores in the First Plan. Besides, it may as well be argued that the First Plan 'neglected' industrial development, as the planners were not yet ready with a plan of industrial development and allocated to it a meagre share of 6 per cent. Had the First Plan provided for a steel mill or better still a few power generation units and fertilizer factories, the allocation to 'industries' in the First Plan would have been larger and the appearance of reversal of priorities would have been avoided. Besides, industry-agriculture linkages make it inappropriate to talk in terms of 'shares' of sectors in public expenditure. What is relevant is investment *for* agriculture, rather than investment *in* agriculture.

Our contention is not that public investment on agricultural development has been adequate. Our submission is that the charge on inadequacy needs a more substantial proof. There is no sector of Indian economy which has not—perhaps justifiably—complained about inadequacy of public investment, be it power, transport, family planning, education, social services, and even coal, cement and steel. Scarcity of investible resources is chronic to all developing countries and no sector of the economy should put the blame for its poor performance on inadequacy of funds. In fact, it should look inward and examine whether it has used the resources made available to it efficiently. This imposes an unpalatable self-scrutiny and needs more rigorous analysis than a populist demand for more funds.

1. "Public Sector Outlay" should be distinguished from 'Investment.' The latter excludes 'current outlay' but includes (estimated) private sector investment.

II

AGRICULTURAL PRICES

One of the most persistent criticisms of agricultural policy in India and other poor countries is that they have been deliberately "forcing producers' prices down." In 1964, T.W. Schultz (39) asked : "Why are so many poor countries (including India) placing a low economic value on their farm outputs ?" Edward Mason (21) wrote that the prices of foodgrains and some other farm outputs were held down by Government action. Michael Lipton (18) asserted that "farm prices have been systematically kept down since 1960 in India." He reiterates the charge in his most recent article and quoting S.R. Levis avers that in Pakistan, in the early 1960s producers' food prices were forced down by as much as two-thirds of their real value (18). An exactly opposite view is expressed by Walter Falcon (8) : "With the new wheat-fertilizer technology and a government-guaranteed price in West Pakistan almost double the world market price at official exchange rate, wheat was extremely profitable . . . The Government tied up more than $ 75 million in supporting the prices of wheat. These funds delayed, perhaps even precluded, other expenditures that were more productive." Writing about the same time as Lipton, Keith Griffin (10) complains that "in many cases the cost of innovation has been heavily subsidised by the government. The innovating farmers have not only *high* prices for their products but also low prices for their inputs." And more specifically, "at the moment, however, the governments of several countries, *e.g.*, Pakistan and India, are supporting domestic grain prices at levels which exceed world prices by a considerable margin" (10). Whom should one believe ? In any case, it seems that both those who allege high prices and those who allege low prices are agreed that LDCs are following a wrong price policy.

Tables I and II show that in India the terms of trade as judged by (*a*) Relative Prices of Manufactures and Agricultural Commodities and (*b*) Relative Prices of Agricultural and Non-agricultural Commodities have been, by and large, favourable to agriculture. A more sophisticated exercise by R. Thamarajakshi (43) pertaining to inter-sectoral terms of trade (all agricultural products purchased by non-agriculture : non-agricultural products purchased by agriculture) also clearly indicates favourable terms for agriculture. Thamarajakshi has also calculated the index of income terms of trade [by correcting the indices of net barter terms of trade with the value at constant (1960-61) prices of the actual marketed surplus] of the agricultural sector to the domestic non-agricultural sector for all uses. The index of income terms of trade has risen at a rate of 4.53 per cent per annum during 1951-52 to 1973-74 (see Table III).

TABLE I—INDEX NUMBERS OF WHOLESALE PRICES : RELATIVE PRICES OF MANUFACTURES AND AGRICULTURAL COMMODITIES

(*Base : 1961-62 = 100*)

	General index of wholesale prices	Index for manufactures	Index for agricultural commodities	Prices of manufactures as per cent of the prices of agricultural commodities
Weights	100.00	32.26	33.20	
(1)	(2)	(3)	(4)	(5)
Average of months				
1965-66	131.6	117.0	141.7	82.6
1966-67	149.9	125.3	166.6	75.2
1967-68	167.3	129.1	188.2	68.6
1968-69	165.4	132.8	179.4	74.0
1969-70	171 6	139.7	194.8	71.7
1970-71	181.1	149.7	201.4	74.3
1971-72	188.4	160.5	199.6	80.4
1972-73	207.1	168.8	219.7	76.8
1973-74	254.2	189.3	280.6	67.6
1974-75	313·0	240·7	350·8	69.5

Source : See (15, Table 5·4, p. 97).

TABLE II—RELATIVE PRICES OF AGRICULTURAL COMMODITIES AND NON-AGRICULTURAL COMMODITIES

Year (July-June)	General index of wholesale prices		Index for agricultural commodities		Index for non-agricultural commodities		Prices of agricultural commodities as percentage of non-agricultural commodities
Weights	1000		332		668		
	Index	Percentage increase	Index	Percentage increase	Index	Percentage increase	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Annual average							
1961-62 ..	100.6	—	100.4	—	100.7	—	99.7
1962-63 ..	105.2	4.6	102.9	2.5	106.4	5.7	96.7
1963-64 ..	112.3	6.7	112 4	9.2	112.3	5.5	100.1
1964-65 ..	124.6	11.0	134.0	19.2	119.9	6.8	111.8
1965-66 ..	135.9	9.1	147.5	10.1	130.1	8.5	113.4
1966-67 ..	155.2	14.2	174.0	18.0	145.9	12.1	119.3
1967-68 ..	167.0	7.6	185.2	6.4	158.0	8·3	117.2
1968-69 ..	166.6	(—)0.2	183.1	(—)1.1	158.4	0.3	115.6
1969-70 ..	174.3	4.6	198.8	8.6	162.1	2.3	122.6
1970-71 ..	182.1	4.5	198.9	0.1	173.8	7.2	114.4
1971-72 ..	191.2	5.0	200.7	0.9	186.5	7.3	107.6
1972-73 ..	216.2	13.1	234·3	16.7	207.2	11.1	113.1
1973-74 ..	271.0	25.3	299.5	27.8	256.8	23.9	116.6
1974-75 ..	316.8	16.9	352.6	17.7	299.0	16.4	117.9

Source : Derived on the basis of Index Numbers of Wholesale Prices (Base: 1961-62 = 100). See (36, 37).

TABLE III—COMPOSITE PRICE INDICES AND INTER-SECTORAL TERMS OF TRADE : 1951-52—1974-75

Years	Agricultural products purchased by non-agriculture for intermediate consumption	Agricultural products purchased by non-agriculture for final consumption	All agricultural products purchased by non-agriculture	Non-agricultural products purchased by agriculture for intermediate consumption	Non-agricultural products purchased by agriculture for final consumption	All non-agricultural products purchased by agriculture	Net barter terms of trade of all products Col. (4) over col. (7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1951-52 ..	99.13	93.23	95.44	81.65	96.50	94.76	100.72
1955-56 ..	70.92	75.57	73.83	82.86	77.24	77.90	94.78
1960-61 ..	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1965-66 ..	132.42	141.64	138.18	125.42	120.08	120.71	114.47
1970-71 ..	195.34	200.53	198.58	159.89	155.45	155.97	127.32
1971-72 ..	189.40	202.92	197.85	165.85	164.63	164.77	120.08
1972-73 ..	200.72	222.96	214.61	179.99	180.57	180.50	118.90
1973-74 ..	289.61	275.25	280.64	209.21	204.30	204.87	136.98
1974-75 ..	324.86	355.16	343.79	268.25	255.17	256.71	133.92
Compound rate of growth ..	5.89	5.96	5.94	4.53	4.43	4.45	1.43

Notes :—(1) These composite price indices have been prepared by combining the relevant indices of wholesale prices (Government of India Economic Adviser's Index Numbers) of the individual items identified as being purchased from or sold to the non-agricultural sector by the agricultural sector for different uses, and using as weights the estimated value in 1960-61 of the actual purchases or sales as the case may be.

(2) Composite indices using the estimated value of the actual purchases or sales in 1968-69 as weights are being separately prepared by the author.

Source : See Thamarajakshi (43 and 45).

Information regarding the farmers' terms of trade, *i.e.*, the ratio of prices paid and prices received is fragmentary. However, we find that while the weighted index of paddy input prices increased by 18.2 per cent between 1971-72 and 1973-74, the increase in the wholesale price index of rice was as much as 60 per cent between July, 1972, and July, 1974. The increase in the price of diesel oil in March, 1974 and in the prices of fertilizers in June, 1974 would lead to a further rise of 9.5 in the input index (12). However, in 1975, the prices of fertilizers were reduced in two successive instalments. A further substantial reduction has been made in March, 1976.[2]

The impression that the Government of India has been deliberately keeping the prices of agricultural commodities low is perhaps due to the fact that

2. "It has been estimated that farmers would benefit to the extent of Rs. 1,050 million as a result of the cut in the prices of fertilizers"(46). Since then there have been further reductions in fertilizer prices.

in some years foodgrains procurement prices fixed by the Government were below the prevailing market prices, though in quite a few years of good harvest, the Government has also prevented foodgrain prices from falling below the same procurement price as was fixed in deficit years. (For all practical purposes, the distinction between procurement price and the minimum support price has been obliterated.) Thus when both good and bad years are reckoned together, the accruals to the farmers from levy and non-levy sales would not be generally less than under free market conditions. Further, it should be noted that the Government does not procure the entire marketable surplus of foodgrains. Even in the best of years, foodgrains procurement has not exceeded 8.8 million tonnes or 10 per cent of the net foodgrains production.[3] Till 1964, it did not exceed 2 per cent and varied between 5 to 8 per cent between 1965 and 1970. For particular crops and regions, the incidence would however be higher.

It is our contention that the rise in the post-levy free market price, consequent upon the withdrawal of a part of stocks from the market through procurement, more than compensates the farmer for the 'loss' suffered by him from selling the levy portion of the marketed surplus to the Government at below the market price. In other words, the weighted average price of levy and non-levy sales is likely to be higher and certainly not less than the price the farmer would have received in the absence of levy. The magnitude of the difference between the two would depend on (*a*) the price flexibility coefficient, (*b*) the proportion of the marketable surplus procured by the government and (*c*) relative level of the open market prices before the procurement operations commence and the levy price.[4]

It is however contended that because of the zonal restrictions on the inter-State movement of foodgrains on private trade account (wheat and rice), even the non-levy prices in *surplus* States would be lower than the prices which would have prevailed in the absence of such restrictions. The position would be exactly the reverse in *deficit* States. The economic balance sheet of such disincentive in surplus States and incentives in deficit States is anybody's guess. To the best of our knowledge there are no empirical studies on the subject. In any case, given the imperative need to maintain a system of public distribution to protect the consumers, half of whom live below the poverty line, from excessive price rise, there is no escape from procurement of a portion (say 50 per cent) of marketable surplus at reasonable prices; and for such procurement to succeed, zonal restrictions are unavoidable.

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3. Procurement during the 1975-76 season is estimated at 13 million tonnes.
4. Thamarajakshi has estimated the coefficient of flexibility of the price of rice with reference to changes in availability of the grain at — 1.10, given other things equal (45). Mellor and Dhar estimate price flexibility coefficient for all cereals at—2.0 (24).

Imports of foodgrains under concessional terms have also been criticised as constituting a disincentive to food production. Referring to PL-480 Agreements, David Hopper (11) in his recent Coromandel Lecture has stated: "This mutual desire to move grain halfway round the world had calamitous long-term consequences: it held farm prices down for the Indian cultivator to a level that sapped incentives to produce... The price effect of the imports was notable in wheat." Prices of wheat relative to all foodgrains did decline slightly—by 3 to 8 per cent—in different years from 1961-62 to 1967-68. But this was probably due to the higher growth rate of wheat production. Foodgrain imports were at their peak between 1965-1967—averaging about 9 million tonnes—on the eve of the Green Revolution. Yet, wheat production increased steadily from 12.3 million tonnes in 1964-65 to 26.4 million tonnes in 1971-72. Judging by the stupendous private investment in wheat cultivation, it is not at all clear that imports of wheat have sapped the wheat growers' incentive.

While considering the question of price policy it is necessary to carefully examine the price effect on (*a*) production and (*b*) income distribution. While it is true that a change in the relative prices of two substitutable crops is likely to have a favourable effect on the production of the crop in whose favour the price is changed, it will simultaneously have an adverse effect on the production of the competing crop. In other words, the aggregate supply elasticity for the agricultural sector as a whole is considerably lower than that for individual commodities. Thus in a situation prevailing in India where almost all agricultural commodities are in short supply—and so are the the critical inputs including land—price is not an appropriate instrument for augmenting agricultural output. Mahar Mangahas and his colleagues (20) also confirm that "there is little evidence to indicate that price changes are an effective device for influencing *aggregate* agricultural output." This is particularly so in the context of traditional technology.[5] As John Mellor (22) points out, "even if increase in production takes place (as a result of higher prices), it would be a movement along the production function, hence at increasing real cost in resources."

More important is the income distribution effect of the increase in foodgrains prices. Mellor has shown that an increase in foodgrains prices actually reduces the income of small farmers belonging to the lowest three deciles of expenditure classes, as they are net purchasers of foodgrains. (Many Western writers probably do not know that the majority of rural households are net purchasers of food, otherwise they would not have confused consumer bias with urban bias.) Income transfers resulting from increased prices of foodgrains cause the largest declines in the income of low income consumers and the largest increase in the income of high producers. "A ten per cent increase in foodgrains prices compels the bottom two deciles to reduce their

5. In spite of the persistently steeper increase in the prices of pulses relative to wheat since 1960-61, production of pulses has declined over the years.

real expenditure on foodgrain by 5.9 per cent and consumption of milk products by 18 per cent."[6] Mellor concludes : "an increase in foodgrains prices has a substantial income effect in reducing consumption of high nutritive value."

To sum up, the facts are that far from "forcing down producers' food prices," the policy-makers in India have kept food prices high and displayed a big farmer and anti-urban and anti-poor bias. Those vicariously concerned with the LDC's "wretched on earth" would do well to advise policy-makers against the folly of high prices of food. The (big) farmers in India have enough incentives from the negligible agricultural taxation and heavily subsidised critical inputs like irrigation water and electricity for the pumpsets. To the extent that any bias can be deduced from price policy, one can as well discern an anti-industry bias on the part of Indian policy-maker. For several years, the controlled prices of cement and steel were kept so low that the manufacturers were unable to plough back adequate funds for replacement and modernization of their units.

III

URBAN BIAS

Before commenting on urban bias in India's (and all LDC's) agricultural policy, let us admit that such a bias does exist in several fields of Indian policy, particularly in health, education, and organized labour. In regard to agricultural policy, however, the allegation of urban bias seems to be based on misinformation. As regards the alleged deliberate under-pricing of foodgrains we have adduced enough evidence to dispel the impression of urban bias. We shall here deal with only one more misleading example of urban bias, namely, "encouraging farmers to devote more resources—especially land—to rich men's food." Specific instances mentioned are shift from millets to rice (sic), maize to wheat and to milk production. Apart from the facts, which we shall presently cite, it may be mentioned that the most potent factor influencing changes in the cropping pattern in recent years has been the availability of cost reducing technology. In India, the highest increases in agricultural productivity have taken place in wheat and bajra (bulrush millet)—the latter being the most important millet. The rate of increase in the production of bajra has been markedly and consistently higher than that in rice. So much for the shift from "millets to rice." As for maize, the rate of increase in its acreage has been next only to wheat. True, hybrid jowar (Sorghum) has not been a success, and in pulses there is complete stagnation. The failures in these crops are mainly attributable to the non-availability of suitable high-yielding varieties. According to our information, however, neither funds nor scientific efforts have been lacking for evolving suitable varieties.

6. See Mellor (22, pp. 28-35).

Milk no doubt is rich man's food at present, but in areas where milk production has increased, consumption of milk by poor households has increased among both rural and urban households. In cities like Bombay, perhaps for the first time in recent history cheaper milk has become available to the low income households, though not yet to the very poor. More importantly, many scholars and policy-makers consider production of milk, poultry and vegetables as the most promising source of additional income for the smaller farmers and the landless (14). Several field investigations indicate that about 70 to 75 per cent of households owning cattle belong to the category of small farmers and agricultural labourers (40,14). A study by V.S. Vyas and his colleagues (48) reveals that in Nadiad taluka (Kaira district, Gujarat), the share of income from dairying in total farm income was as high as 78 per cent in farms below 5 acres. In dry land agriculture, animal husbandry provides substantial additional employment to agricultural labour households, particularly to women, in the form of self-employment (28). In a recent study of milk production and marketing, it was found that in the 'dairy' villages, the landless labourers and small farmers accounted for 57 per cent of milk producers, 48 per cent of total milk production, and more than 50 per cent of the marketed surplus of milk and milk products. This however did not deprive them of the requisite home consumption of milk of more than 200 millilitres per capita per day (29).

Milk consumption is not a mere urban luxury; it is an important source of income and employment to the poor households in rural India and a valuable source of animal protein in near future, if the discernible trend in lowering the cost of production and distribution of milk is maintained. There would be little hope for the small farmers if they are restricted to growing poor man's food. With State-sponsored irrigation, extension and marketing facilities, they should be encouraged to grow what is most profitable for labour intensive small-scale farming. In India cattle are fed with fodder and oilcakes (and seldom with inferior cereals) and the encouragement of milk production does not involve any significant diversion of land capable of yielding more calories (or nutrition) per acre of land.

It may also be pertinent to mention that in Kerala whereas the per capita availability of rice from internal production has remained almost stationary, the production of tapioca (poor man's potato) has increased from 1.6 million tonnes in 1961-62 to 5.4 million tonnes in 1971-72. An authentic report from Kerala states (6) : "The drop in the availability of cereals (mainly rice) would have produced under-nourishment among the low income families, say, even the middle class families, who could not afford to buy sufficient quantities of rice at the going price. The sharp increase in the output of tapioca has not only averted a deterioration of the situation, but even improved the average level of calorie intake in the State." It adds : "It may be presumed that, by and large, the increase in the production of tapioca, has made a greater impact on the diet of the lower income households."

While Lipton criticises the policy which encourages shifts towards 'inappropriate foods' such as meat and dairy products, Carl Gotsch (9) is unhappy over the fact that "relative prices skewed in the direction of cereals through Government support mechanisms have discouraged diversification and further expansion of acreage under vegetables, fodder for dairying, pulses, etc." (9) Since cereals require a relatively low labour input, such policies reduce the aggregate demand for labour significantly. As pointed out earlier, a shift towards dairying, within reasonable limits, is likely to promote both nutrition and employment.

Before concluding this section, it should be mentioned that there is a legitimate criticism that public distribution of foodgrains through rationing and fair price shops is predominantly in urban areas and there is a clear case for extending it to rural areas, particularly to those which are vulnerable to droughts and where poverty is most acute. But this would necessitate a substantial increase in internal procurement—variously estimated at 12 to 25 million tonnes. Statutory rationing of foodgrains in big cities is however essential for preventing the pre-emption of marketed surplus by metropolitan areas with their higher purchasing power and the consequent shortages and high prices in rural areas.

IV

THE GREEN REVOLUTION : A BIMODAL DEVELOPMENT

The two successive severe droughts in 1965-66 and 1966-67, gave rise to international apprehensions about India's capacity to feed her huge and growing population. The harshest critics (30) recommended the application of the "triage" formula to countries like India which were considered beyond redemption. Fortunately for the country, at this very time the HYVs of cereals became commercially available. India's policy-makers plumped for it with alacrity. Dr. Norman Borlaug complimented the then Minister for Agriculture as "the first high officer to recognise the significance of the new wheat strains and willing to take the risk involved in importing 18,000 tonnes of dwarf Mexican varieties." The Pearson Report (31) characterized the speedy adoption of HYV as "one of the authentic marvels of our time." Others described the process of agricultural transformation as "one of the most amazing stories of our time." While this was the general observation, the economists, who had neither anticipated the Green Revolution nor played any part in its adoption by way of even policy advice, did not take kindly to it. Their reaction varied from skepticism ("Cornucopia or Pandora's Box") to downright condemnation on the ground that it was leading towards the emergence of dualism. Let us accept that technological changes ushered through the application of HYVs

"as such have contributed to the widening of the income disparities between (1) different regions, (2) small and large farms and (3) landowners on the one hand and tenants and agricultural labourers on the other." But the question is : situated as the country was in the mid-'sixties, when its capacity to feed its people was seriously being questioned, and some critics were advocating the application of 'triage' and 'life boats' formula to food aid, what was the choice before the policy-maker ? Highest priority had to be assigned to augmenting food production and the HYVs offered an excellent means of doing so. The possibility of its inegalitarian effects—assuming that these could be clearly perceived at that time—had to be weighed against the obvious inegalitarian effects of food shortages and high prices, under which the poor suffer the most.

Did the adoption of HYV technology increase food production ? It is contended that "the so-called Green Revolution has failed to raise the overall rate of growth of agricultural output in the country above the level achieved in the 15 years prior to 1965" (32). It is also asserted that "despite technological changes, the growth of agricultural output in India slowed down in the 1960's compared to 1950's." Such statements are, at best, half truths based on selective time spans. Let us accept the suggestion that "the comparison of output between successive peaks (in production) would give an idea of output growth adjusted for weather." According to the data provided by the critic himself, the annual percentage difference between the three pairs of pre-Green Revolution peaks (1953-54 to 1958-59, 1958-59 to 1961-62 and 1961-62 to 1964-65) was 1.8, 1.7 and 2.7 respectively. As against this, the two post-Green Revolution pairs (1964-65 to 1967-68 and 1967-68 to 1970-71) gave the annual percentage change of 2.1 and 4.5 or an average of 3.4 (32, Table 1.2).

Let us look at the statistics differently. Before the Green Revolution, the year 1964-65 was the best year for food production. Even so, the annual (linear) rate of growth of foodgrains production during the five-years ending 1964-65 was just 1.8 per cent. The next two years, 1965-66 and 1966-67 were years of disastrous crop failures. Foodgrains production declined from 89 million tonnes in 1964-65 to 72 million in 1965-66. It was only in 1970-71 that foodgrains production revealed the impact of the Green Revolution. Between 1964-65 and 1970-71, foodgrains production registered a growth rate of 3.4 per cent per year (25). Mellor commenting on the same phenomenon observes : "The most realistic analysis of the trend (in foodgrain production) is made by comparing years of similar weather, such as 1964-65 and 1970-71. In the six intervening years (after the Green Revolution) foodgrain production increased by 19.1 million tonnes, a compound annual growth rate of 3.3 per cent. This rate was 18 per cent higher than the growth rate shown by the same measures between the similar crop years 1949-50 to 1960-61. The weather in 1964-65 was slightly better than in 1970-71, lending a slightly downward bias to estimates of growth rates for the intervening years (23)." As mentioned earlier, foodgrains production declined once again in

subsequent years, but the lowest of this period (1972-73) at 97 million tonnes was substantially higher than the lowest of 1966 (72 million). The increase in wheat production was more spectacular. Between 1964-65 and 1970-71, wheat production increased by 90 per cent and the yield per hectare by 43 per cent.

Whether such an achievement can be characterized as Green Revolution is a matter of semantics. In an atmosphere of gloom, a solitary hyperbole may be excused if it helps to prop up a sagging morale, unmindful of the economist's raised eyebrow. The one claim which can however be made with some confidence is that the technology associated with HYVs opened up a process of modernization of Indian agriculture and significantly raised its production capacity. This is all the more important since Indian agriculture had nearly exhausted its capacity to achieve increases in production through additional conventional inputs. Even irrigation, the most beneficent input, was constrained because of the absence of fertilizer-responsive high-yielding varieties of seeds.

Hanumantha Rao maintains "there are reasons to believe that even without the Green Revolution the growth rate would have been maintained at 2-2.5 per cent per annum." The reasons he adduces are : "The growth of population at about 2.2 per cent per annum has been exerting an upward pressure on prices of agricultural commodities. This would have provided incentives to the farmers for expanding output and would have induced the Government to invest in irrigation, fertilizers, etc." Apart from the fact that under static technology, high prices have little impact on aggregate production, it is surprising that one so deeply concerned with poverty of the Indian masses should wish to rely on high food price path of growth of production instead of welcoming the cost reducing technology for achieving increased production! Besides, his argument that "some of these inputs including fertilizers which were known before the onset of the Green Revolution would have been used at a certain rate even in its absence" is equally questionable. As is well-known, application of higher doses of fertilizers to the traditional seeds was unremunerative, since it resulted mainly in vegetative growth and subsequent lodging and did not increase output. Thirdly, there is clear evidence to indicate that the growth in cropped area was slowing down, from 2.1 per cent per annum during 1949-50—1960-61 to 0.6 per cent during 1960-61—1970-71. Under the circumstances, adoption of the HYVs was the only solution to the food problem of the country.

Many studies of the distribution of gains of technological change are vitiated by the fallacy of single factor analysis. There are at least two components which determine the additional gains of different classes of producers over time : (1) change in production and (2) change in prices. There could be a third, namely, changes in the shares of different classes of growers in the total area cultivated. The second and the third have nothing to do with

the technological change *per se*. They reflect the effects of (imperfect) market structure or market behaviour of different classes of growers and the land market.

There is substantial evidence indicating that the big farmers obtain much higher prices than the small farmers for their produce either because of their better bargaining power or the capacity to withhold stocks in a situation of rising prices. But even if the same price is obtained by all classes of producers, the gain from the price rise—which was substantial in the post-Green Revolution period and had nothing to do with it—would be much larger for the big farmers because of the higher percentage of their marketable surplus.

Geoffrey Swenson (42) has analysed the production and price effects in the distribution of benefits in a situation of technological change. Analysing the sources of change in the total value of paddy production between 1965-66 and 1970-71 for a sample of farm operators in survey villages, by farm size, Swenson found that the small farmers (2.5 to 5.0 acres) and the very large farmers (20 acres+) had gained almost equally (21.7 and 22.3 per cent)from changes in production. The main difference in the gains emanated from price changes. While the value of the production of small farmers increased by only 17.9 per cent due to the price effect, very large farmers gained by as much as 47.6 per cent. Swenson sums up the position by observing : "Looking at the Gini ratios, it is evident that the change in the distribution of paddy income would have been in the direction of greater equality *with equal paddy price for all operators* in 1970-71" (emphasis added). The fact that there are "considerable inter-personal variations in the price received" is also corroborated by K. Subbarao (41). Subbarao found that "the average price per quintal, rises generally with the increase in the quantity offered for sale." His investigation showed that the price per quintal of paddy, net of marketing expenses (incurred by the farmer), varied from Rs. 50.72 to Rs. 58.57 for those selling less than 30 quintals and those selling more than 180 quintals.

The contribution of HYV technology should not be judged exclusively in terms of the increase in output which is often distorted by the vagaries of weather. Its impact on the behavioural response of farmers judged by a sharp step-up in investments in irrigation and increased purchases of modern inputs is an equally relevant criterion for judging its contribution. The number of private tubewells increased from 1 million in 1965 to 4.70 million in 1971 and the number of pumpsets—diesel and electric—from 0.8 million to 3.24 million during the same period. The net area irrigated by wells (mostly private) which had increased prior to the advent of HYV technology from 6.5 million hectares in 1951-52 to 8.6 million hectares in 1965-66, sharply increased in the next four years to 11.1 million hectares, and its share in the total net irrigated area increased from 32.8 per cent to 36.7 per cent. Similarly, consumption of chemical fertilizers per cropped acre increased from

4 kg. to 16 kg. or by 400 per cent. It is estimated that expenditure by agriculture on modern inputs in real terms (1960-61 prices) increased from Rs. 207 million to Rs. 734 million during the first decade ending 1960-61. In the second decade ending 1970-71, it went up to Rs. 4,355 million and has further gone up to Rs. 6,181 million in 1972-73. The percentage of expenditure on modern inputs to the total spent on all inputs for agriculture (45) has increased sharply from 6.19 to 21, at constant (1960-61) prices.

Reverting to the issue of the inegalitarian effects of the Green Revolution, let us accept that there has been some aggravation of (*a*) inter-class and (*b*) inter-regional disparities. In regard to the former, it can be said that such aggravation could have been arrested by appropriate policy measures, especially in view of the fact that the application of high-yielding varieties is technologically neutral to scale and has lowered the technical threshold of non-viability. In a later section, we shall discuss the policy measures adopted to equalise the inter-class gains of the new technology and their impact, if any.

As for the widening of inter-regional disparities, it is obvious that whatever may be the strategy of agricultural development, regions poorly endowed with soil-climate conditions cannot gain in the same proportion as the better endowed regions, and it would be irrational to blame a particular innovation or the policy which promoted it for such a consequence. Regions with poor soil-climate conditions would need a different type of innovation and research to improve their productivity and incomes. It would be a legitimate criticism if it can be shown that efforts in this direction have been inadequate or that sufficient research funds have not been allocated for this purpose—for example for dry farming. The establishment of International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) should correct the imbalance, if any. For the growth of such regions emphasis should however shift from crop cultivation to development of grass lands, animal husbandry and more importantly, provision of non-farm employment opportunities.

A recent study by Sudhin Mukhopadhyay (26) suggests that a very large proportion of variation in output in 72 wheat growing districts in India is explained by what he calls "the region effect."[7] The implication of this finding is that a mere reallocation of known inputs—land, irrigation, fertilizer, tractors, education, and labour—will not be very effective in reducing regional disparities in productivity. Mukhopadhyay contends that "the bulk of the disparity" is due to the region effects and it seems to originate from "sources not yet identified and measured—the peculiarities of the specific regions that are stable over time."

7. "In a normal year, with the same quantity of measured inputs, the most productive districts of Punjab produce about five times the average output for the entire sample, while the least productive districts produce, with the same level of measured inputs, only about one-third of the sample output" (26, p. 61).

Public investment in irrigation, including the exploitation of ground water potential, is suggested as having the largest prospect for equalising opportunities of growth. Hanumantha Rao has pointed out that "the inter-State disparities in the ultimate irrigation potential" are significantly lower than the actual position in 1969-70 (32). The prospect of equalisation will however depend upon the cost and benefit of different irrigation projects.

V

LAND TENURE AND INSTITUTIONAL REFORMS

Reviewing the changes in the agrarian structure over the past two decades, the discussants at the recent Conference of Agricultural Economists have concluded (33) : "the inequality in the distribution of land owned as well as operated in rural India as a whole has shown some decline, particularly during the 'fifties... However, the decline in equality in the distribution of area operated is less marked than in the case of owned land... Several factors are responsible for the observed changes in the structural distribution of land. Sub-division of land as a result of population growth, increase in the benami holdings with a view to evade ceiling legislation, market sale and purchase of land, land reforms and sheer reporting biases are important in explaining the observed changes... As a result of these changes, the proportion of small and marginal farmers as well as the proportion of area held by them has increased significantly in the recent period," whereas the importance of large farms has declined both in terms of their number as well as area held.

The failure of the reform measures *per se* to make the agrarian structure more equitable, and thereby more productive, cannot be condoned. The only relieving feature of the agrarian scene is the abolition of the intermediary (Zamindari) tenures from 170 million acres of land in the early 'fifties. The landed interests have probably already queered the pitch for further reform measures; yet, since land reforms continue to hold the interest of agricultural economists, it may be worthwhile to state a few facts about land ownership and tenancy which might help to indicate the scope for further action.

According to the 26th Round of the National Sample Survey (17), out of 100 million households in the country, an estimated 19.6 million do not own any land and 17.2 million neither own nor operate any land. Another 35.6 million households own less than one acre, and about 15 million own more than one acre but less than 2.5 acres (1 ha). If all these were to be provided with a minimum holding of one hectare each, an additional 58 million hectares of land would be required. At the other end of the spec-

trum, 1.76 million households own more than 25 acres each (10.13 ha.) with a total ownership of 29 million hectares, a large portion of which is situated in regions characterized by semi-arid climatic conditions.[8] If a ceiling on ownership is placed at 25 acres—irrespective of soil and climatic conditions—, about 11 million hectares of surplus land will become available for redistribution. Under the revised and scaled-down ceiling laws to-date about 3.5 lakh hectares have been declared surplus, of which about 1.6 lakh hectares have been acquired and only 43 thousand hectares distributed (16).[9]

This was the position in 1971-72. Since then there has been an addition of approximately 12 to 13 million households, and by 1981, another 13 million will be added. The efflux of time and division of land holdings due to inheritance and perhaps more importantly, large-scale fictitious partitions have blunted the edge of reform measures. Short of wholesale collectivisation of land with all its attendant problems—which the countries that have experimented with it have not been able to sort out—redistribution of land can reduce the inequity in land ownership, but cannot eliminate it. Under the circumstances, the best which land redistribution can, and should, do is to provide a house site with some spare land for a cattle shed, poultry or vegetable growing to the weaker section of the rural population. We are not here discussing other measures like progressive land tax, or graded levy on produce, particularly on foodgrains.

Next to land, irrigation is probably the most crucial factor determining production and income from land ownership. The proportion of irrigated land is larger on smaller holdings. But the recent boom in the tapping of underground water is likely to sharply alter the situation. The number of pumpsets and tubewells energised has increased from 21,000 in 1951 to 2,441,000 in 1974. About 46.7 per cent of area irrigated by tubewells is in holdings of 4 hectares and above. Irrigation through tubewells and pumpsets is a costly business, and unless urgent steps are taken to regulate the use of ground water, most of the available resources are likely to be pre-empted by large farmers. For example, in the Kosi region of Bihar, the number of tubewells (masonry and bamboo) increased from a mere 300 in 1965-66 to 23,000 in 1972-73, but more than half the investment in this expansion was made by farmers with holdings of 20 acres and above; the share of farmers holding less than 5 acres was negligible (5). Several years back, the Central Government had circulated to the States a Model Bill for the regulation of utilization of ground water, but as yet no firm action has been taken. Will it be unreasonable to suggest that hereafter underground water should be allowed to be tapped and utilized exclusively for the benefit of small farmers?

8. According to the Agricultural Census, 1970-71, there were 2.7 million operational holdings with 10 hectares and above; out of these 1.6 million were wholly unirrigated. The operated area under such large holdings was 50 million hectares, out of which 11.62 million were in Rajasthan, 8.7 million in Madhya Pradesh and 8.5 million in Maharashtra, States known for the preponderance of dry regions (27).

9. A recent report in *The Times of India* gives a figure of 3.5 million acres as the expected surplus (47).

As for tenancy, out of 130 million hectares under operational holdings, 89.4 per cent is owner operated and 10.6 per cent is leased in. The magnitude of tenancy thus does not appear to be alarming, but once again there is perhaps under-reporting of tenancy and reduction in tenancy is largely attributed to unlawful evictions of erstwhile tenants.[10] As against this, it also needs to be noted that many large farmers lease in land and many small farmers lease it out. It is therefore difficult to be certain as to who is the exploited and who is the exploiter. Even so, in many States share-cropping and other forms of exploitative tenancy are widely prevalent. Here is an area of land reforms which does not suffer from any physical constraints such as hinder land redistribution; it is only the lack of political will which can explain the persistence of exploitative tenancy relationships.

Apart from the economic and social benefits of land reforms, one of their major objectives is to loosen the land based power structure in rural India. If accomplished, it would remove a major obstacle in the implementation of several programmes undertaken specifically for the benefit of the weaker sections. While it is true that the big landowners provide the base of political leadership, by now the latter has so entrenched itself by dispersing its stakes in diverse areas of influence and patronage that a slight erosion of its land base is not likely to impair its dominance. Besides, a new class of political leadership is emerging which uses it political influence, acquired through the show of appropriate allegiances, to acquire wealth rather than vice versa. Even so, measures to eliminate excessive land ownership, with the excess judged on the basis of the potential income from its land holdings, will certainly have a wholesome effect.

The dominant interests in the rural economy also utilize other agrarian institutions, such as credit, marketing and input supply to strengthen and perpetuate their dominance. Policy instruments have perhaps greater manoeuverability in this area. Policy measures could be adopted through which these institutions will act as a countervailing force against the growth of inequality.

A number of steps have been taken in this direction. As for their impact, opinions would differ. It can be said that, at best, they have arrested to some extent the deterioration in the condition of the weaker sections. The Reserve Bank has stipulated that a minimum of 20 per cent of the total short-term loans advanced by the primary co-operative societies should be issued to the small/marginally weak farmers. In 1974-75, 28 per cent of the small and medium-term loans were advanced to farmers with holdings upto 2 hectares. (The area operated by farmers cultivating upto 2 hectares

10. There are however a few exceptions. For example, in the coastal region of Western Maharashtra "tenants became owners of nearly 70 per cent of leased land and on another 10 per cent tenants continued because the landowners were widows, minors or disabled persons"(19).

constitutes 24 per cent of the total operated area). Including loans to tenants and agricultural labourers, the percentage of loans to the weaker sections goes up to 32. The percentage of long-term agricultural credit provided by the land development banks to this category of farmers was 32 (35).

A recent study on financing of small and marginal farmers by co-operative societies in Maharashtra reports : "There is little evidence to suggest that very small and small farmers do not receive their due share in the total short-term credit dispensed through the co-operative credit structure. In fact, they seem to receive more than their due share in comparison with medium and large farmers."[11] Their handicap is that the extent of their membership of the co-operative socieites is much smaller than that of the medium and large owners. Co-operative laws are now being amended to provide automatic universal membership of co-operative societies. Multipurpose Farmers Service Societies (FSS) have been established to cater mainly to the weaker sections. Two-thirds of the membership of the board of management of the FSS will be reserved for the weaker section. Similarly Regional Rural Banks are being established to cater exclusively to the needs of small and marginal farmers, landless labour and small artisans in rural areas. State Governments have passed legislation for moratorium, discharge or scaling down of debts incurred by small and marginal farmers, agricultural labourers and rural artisans from private moneylenders. The resulting non-availability of non-institutional credit is sought to be made up by the provision of consumption credit by the (well managed) co-operative societies and the FSS for purposes like medical expenses, education, marriage ceremonies, funerals, etc. Such loans will be issued against personal security with at least two sureties to borrowers who are not able to offer any tangible assets as collateral. It is estimated that Rs. 170 crores would be needed to meet the requirements of consumption loans.

Other measures to help the weaker sections and backward regions include formation of Small Farmers Development Agency (SFDA), agency for Marginal Farmers and Agricultural Labourers (MFAL), Drought Prone Area Programme (DPAP), Integrated Tribal Development Projects (ITDA) and Employment Guarantee Schemes (EGS). It is beyond the scope of this paper even to attempt to evaluate the achievements of these programmes. Official sources give an impressive array of statistics on the number of beneficiaries under the schemes, and the number of dugwell/tubewells, pumpsets, other minor irrigation works, dairy units, poultry units, etc., provided to the beneficiaries. It may, however, be mentioned that there is a widely shared view that most of the benefits under the scheme have been diverted and appropriated by better-off farmers with political influence. From this a

11. Maharashtra State Co-operative Bank : Report of the Committee (Chairman : Prof. V. M. Dandekar) on Financing Small and Marginal Farmers through Co-operative Credit Structure, Bombay, 1976.

general conclusion is drawn that in the absence of a radical change in property relations and socio-political power structure, such reformist measures as outlined above will make little impact on the conditions of the rural poor and in fact "tend to be unproductive and as such add to the inflationary pressure in the economy." The choice is wide open. Change the machine or the mechanic or the proprietor or any combination out of the three.

VI

SUMMING UP

In the preceding sections we have argued that some of the charges against India's agricultural policy such as neglect of agriculture, deliberate under-investment, under-pricing of agricultural commodities and urban bias need a more dispassionate appraisal. We have also contended that the Green Revolution, or more modestly the widespread adoption of HYVs, has helped to step-up cereal production, stimulated investment and substantially increased the use of modern inputs. While it is accepted that the technological change has led to a widening of the inter-regional and inter-class disparities, the price restraining effect of higher foodgrains production—more than negatived by monetary inflation—has relieved to some extent the burden of poverty. As against these positive aspects, agricultural policy has not contributed significantly to the removal of rural poverty and unemployment or to making the agrarian structure more egalitarian. Thus, while Indian agriculture since Independence has been able to maintain, by and large, the level of per capita consumption of foodgrains, in spite of the addition of 251 million people over the 25 years since 1951, it has failed to provide land or employment to a large segment of the additional labour force. Only one question may be asked : Was it the sole responsibility of Indian agriculture to provide employment to all and as many people born in rural India, or atone for the failures of population policy or for that matter industrial and monetary policy ? Our dissent is mainly with this fragmented view which looks at agricultural policy, isolated from the totality of economic policy.

As pointed out earlier, efforts have been made to help the weaker sections of the rural population through programmes like SFDA, MFAL, DPAP, Employment Guarantee Schemes, and the earmarking of a percentage of co-operative advances to small farmers. Apart from a few exceptions, their overall impact has not been very perceptible. The recent 20-Point Programme enunciated by the Prime Minister gives pride of place to agriculture and especially to the problems of the rural poor. The programme includes items like bringing under irrigation at least 5 million more hectares of land, provision of drinking water especially in drought-prone areas, implementation of (land) ceiling laws and redistribution of surplus land among the landless

with redoubled zeal, vastly expanded programme of providing house sites to the landless in rural areas, abolishing the practice of bonded labour, liquidation of rural indebtedness by stages, enhancement of minimum wages of agricultural labourers wherever necessary. It is too early to judge the performance of the programme.

The failure of agricultural strategy—and its economic policy content—to make any impact on rural poverty and unemployment or equitably distribute the gains from technological change has been variously attributed to socio-political factors such as the lack of political will, the elitist composition of political leadership and bureaucracy—no less than that of its critics—, structural inequalities in the ownership of land and other assets, a bias in favour of big farmers, etc. There is a strong element of truth in each of these criticisms. Yet perhaps this is not the whole explanation. It is not as if only the projects meant for the benefit of the weaker sections have been frustrated. Even projects which would have benefited the affluent farmers have performed poorly. Poor planning and poorer implementation appear almost endemic in developing countries. Are the answers outside the domain of the economists ? Is this a sociological phenomenon, or is it associated with some sort of cultural traits or work ethics ? We have yet to find an answer. While the economists know enough about stimulating growth, perhaps their knowledge and understanding are not adequate enough to suggest solutions to the probems of poverty and unemployment.

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