CHAPTER I

IMPACT OF NEW TECHNOLOGY ON SMALL FARMERS IN INDIAN AGRICULTURE
INTRODUCTION

Indian agriculture has been experiencing a substantial impact of new technology since mid-sixties and consequently a significant break-through has been achieved in production and productivity, especially in respect of cereal crops like rice and wheat. The new technology which is said to have led to the transformation of Indian agriculture from a 'traditional' to a 'modern' one, has brought in its wake many short and long-run implications for the economy in general and for the farm sector in particular although it is primarily confined to certain agronomic regions.1

The new agricultural strategy involves the use of modern inputs, such as, high yielding varieties of seeds, fertilizers, pesticides, tractors, pumps, threshing and harvest combines. The fundamental departure in the new strategy is its emphasis on science and technology and genetic manipulation and chemicalization.

of agriculture are the twin pillars of the new strategy. Some of the technical characteristics like non-photo period sensitiveness, their response to heavy dose of fertilizers in terms of grain of new varieties seem to hold out a promise of widespread use of these varieties and a substantial increase in the growth rate of aggregate foodgrains production in underdeveloped countries like India. Thus, the new technology is seen as setting off a 'green revolution' or a 'soil-fertilizer revolution'. These developments have led some observers like drawn to predict an end to the foodgrain problems in underdeveloped countries and the beginning of an era of world wide surplus production.

**Strategies of Agricultural Development**

Several strategies of agricultural development have been evolved and executed over the years in India. In the fifties, 'community development' and 'national extension service' schemes were started with the objective of attaining rapid development of rural areas. But due to failure of supply lines and administrative lapses, these programmes could not produce

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desired results. Hence the 'diffusion model' of agricultural development which formed the basis for community development and extension programmes was replaced by the 'High pay-off input model'. On the basis of this, several programmes like Intensive Agricultural District programme (IAD), Intensive...
agricultural area program (IAP), high yielding varieties program (HYV) etc., have been launched during sixteen in order to overcome the food crisis and its adverse effects on the pace of economic development. The realization for a food surplus as a pre-condition of sustained development was manifested in the design and execution of these growth-oriented strategies in agriculture. 5

SPEAD OF HIGH YIELDING VARIETIES

The high yielding varieties are land-substituting and labour-saving innovations. As they are all neutral to scale, they are usable by all farmers regardless of farm size. One school of thinking holds that their rapid spread could break the chain of rural poverty in important parts of the world. 6 It is significant


that the proportion of area under high yielding variation of rice and wheat between 1966-67 and 1979-80 has increased from 3.5 per cent to 41.9 per cent and 1.2 per cent to 71.1 per cent respectively. 7

The data relating to the area under high yielding variation of important crops is provided in Table 1.1.

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From the table above it is quite clear that the proportion of the area under high yielding varieties to the total area under food grains has gone up from 0 per cent to a little over 20 per cent between 1968-69 and 1979-80. During 1980-81 the total area under high yielding varieties was 46 million hectares, which is 30 per cent of the total area under food grains. Crop-wise analysis of the data shows that the spread of high yielding varieties of wheat is more impressive than that of rice. The area under high yielding varieties of rice marks a steady increase from 2.6 million hectares to 16.9 million hectares during 1968-69-1979-79 and the proportion of the area under high yielding variety rice to the total area under rice has risen from 7 per cent in 1968-69 around 35 per cent in 1979-80. The area under wheat during the same period has gone up to 61 per cent of the total wheat area from 30 per cent. It may be noted that the coverage of area under high yielding varieties in respect of rice, wheat and total cropped area there has been a decline in 1979-1980 as compared to the preceding year due to drought conditions. Thus, the comparative analysis of
high yielding varieties of rice and wheat indicates that the spread of high yielding varieties of wheat is more impressive than high yielding varieties of rice.

A similar trend is noticed in the relative spread of high yielding varieties of rice and wheat in other developing countries. It is quite clear that in both absolute and relative terms, the new wheat varieties have spread more rapidly than the new rice varieties. The following table shows the details regarding the area under high yielding variety of rice and wheat in the selected developing world.
## Table 1.2

<table>
<thead>
<tr>
<th>Country</th>
<th>Rice</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>—</td>
<td>7.0</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>3.3</td>
<td>7.7</td>
</tr>
<tr>
<td>China</td>
<td>4.0</td>
<td>—</td>
</tr>
<tr>
<td>Indonesia</td>
<td>11.3</td>
<td>—</td>
</tr>
<tr>
<td>Japan</td>
<td>7.0</td>
<td>—</td>
</tr>
<tr>
<td>Nepal</td>
<td>5.8</td>
<td>49.1</td>
</tr>
<tr>
<td>Pakistan</td>
<td>41.7</td>
<td>48.7</td>
</tr>
<tr>
<td>Philippines</td>
<td>50.3</td>
<td>—</td>
</tr>
<tr>
<td>South Vietnam</td>
<td>39.3</td>
<td>—</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>4.5</td>
<td>—</td>
</tr>
<tr>
<td>Syria</td>
<td>—</td>
<td>10.1</td>
</tr>
<tr>
<td>Thailand</td>
<td>2.1</td>
<td>—</td>
</tr>
<tr>
<td>Tunisia</td>
<td>—</td>
<td>14.0</td>
</tr>
<tr>
<td>Turkey</td>
<td>—</td>
<td>5.8</td>
</tr>
<tr>
<td>West Malaysia</td>
<td>—</td>
<td>24.5</td>
</tr>
</tbody>
</table>

The table above suggests that in many developing countries the percentage of cropped area under high yielding varieties of wheat is more than that of high yielding varieties of rice. In case of Pakistan, the difference is less while in respect of other countries, the proportion of wheat area is much higher than the proportion of rice area under high yielding varieties.

Productivity and Productivity

The fact, however, is that Indian agriculture put up a valiant effort to raise itself from stagnation to which it was reduced for half a century prior to Independence and demonstrated its capacity to take high strides on the path of growth. George Slinn in a meticulous study of agricultural production in British India from 1891 to 1947 finds that over the period of 56 years prior to Independence, aggregate food grains output increased at an average rate of 0.11 per cent per year. In fact, during the later half of the period the

percentage of increase was a mere 0.03 per year. As for rice, which comprised half of food grains output and one third of all crops output, its production over the entire reference period declined at an average rate of 0.07 per cent per year. 

But not only was this poor growth performance getting worse over time but what growth there was came almost entirely from acreage expansion. The average rate of change in yield per acre of food grain fell by -0.18 per cent per year and the trend was getting sharply worse with the period 1931-40 showing a declining by -0.44 per cent per year. 

Looked at from this historical perspective the achievements in food production and productivity in the post-independence period, especially since mid-sixties, are quite significant and substantial. At one time the international community despised of Indian agriculture’s ability to feed its population and a few publicists suggested that since the country “cannot be saved”, it should be written


10. Ibid., p. 113.
off as a candidate for aid, but afterwards there has been a remarkable resurgence and ability to assimilate the new technology in Indian agriculture.

As a result of the introduction of various agricultural programmes such as Intensive Agricultural District Programmes (IADP), Intensive Agricultural Area Programmes (IAAP), and High Yielding Varieties Programmes, food production in India has markedly increased. The achievement in the field of food production is significant, the extent of technological change, as Hanumantha Rao observes, can be assessed by estimating the increase in output attributable to modern inputs themselves. On the basis of this success of the new technology, one can safely assert that is no evidence to show that a change has not occurred in Indian foodgrains production, the evidence does show that increases in output obtained since 1967-68 are not attributable exclusively to favourable rainfall. In fact,


even when the effect of weather is held constant in statistical analysis, the effect of the new technology shows up quite strongly in the form of enhanced output.\textsuperscript{13} Thus the earlier gloomy prediction\textsuperscript{14} has lost its validity in the context of new technology in Indian agriculture.

Foodgrains production was estimated at 130 million tonnes in 1980-81 and at this level it would surpass the earlier peak of 126 million tonnes in 1977-78.\textsuperscript{15} The following table gives data relating to the area, production and yield of the total foodgrains, wheat and rice respectively.

\begin{table}
\centering
\begin{tabular}{|c|c|c|}
\hline
Crop & Area (Hectares) & Production (Tonnes) & Yield (Kg/Hectare) \\
\hline
Wheat & 50,000 & 1,000,000 & 20
\hline
Rice & 60,000 & 1,200,000 & 20
\hline
\end{tabular}
\end{table}


\textsuperscript{14} William and Paul Paddock, \textit{Grits}, p. 20.

we notice a steady increase in the foodgrains area, production and yield during the early periods of green revolution i.e., from 1967-68 to 1970-71. But the increase in foodgrains, rice and wheat appears to be considerable and rapid in the subsequent years, area under foodgrains has increased from 121 million hectares to 130 million hectares between 1967 and 1982. Foodgrain production has increased from 95 million tonnes in 1964-65 to 102 million tonnes in 1970-71. During the subsequent three or four years there was some deceleration in production. But from 1975-76 onwards foodgrain production recovered and increased steadily to reach 133 million tonnes in 1981-82. Regarding rice, we notice a continuous increase in production with few exceptions in 1972-73, 1974-75 and 1976-77. Rice production has increased from 37.6 million tonnes in 1967-68 to 53 million tonnes in 1981-82 recording an increase of 42 per cent. In case of wheat, the production increased from 16.5 million tonnes to 42.5 million tonnes during the same period, recording an increase of 158.15 per cent. However, during 1979-80, the production has
fallen in respect of rice, wheat and foodgrains. This may be attributed to drought conditions prevailing in many parts of the country. The sustained increase in production is due to the rising yield of rice and wheat, and it is higher in case of wheat than rice.

The increase in the annual foodgrains output in terms of long-term trend rate of growth does not show any substantial increase over the long-run trend rate of growth established in the period 1945-50 to 1954-65, that is the period before the advent of high yielding varieties. The expectation was that the high yielding variety technology would raise the long-run trend rate of growth of foodgrains output considerably over the rate of 3.05 per cent per annum. But the increase was from 3.05 per cent to a more 3.26 per cent per annum. Even the foodgrains yield showed an insignificant increase from 1.63 per cent during 1942-50 to 1954-65 to 1.99 per cent per
annum during 1960-61 to 1970-71. During the subsequent years, however, foodgrains production increased substantially. As a result of the inclusion of subsequent years, the long-run growth rate of foodgrains during the period between 1964-65 and 1978-79 amounts to 0.3 per cent.

In order to know the long-run growth trend of area, production and yield of rice, wheat and food crops during the period between 1967-68 and 1982-83, linear and compound growth rates have been computed and the results are furnished in the table (14) below.

16. See, Banerjee, op. cit., p.20. Ramachandra has observed in his study that the output of foodgrains grew at the rate of 2.5 per cent per annum during 1960-61 to 1970-71 as against 3.3 per cent in previous decade, 1949-50 to 1959-60 and 2.7 per cent over the whole period from 1949-50 to 1970-71. The annual growth rate in the output of agricultural commodities, as a whole, declined from 3.3 per cent to 2.1 per cent between these two decades. See Ramachandra op. cit., p.20, 21.

Table 1.4.

LINEAR AND COMPOUND GROWTH RATES OF AREA, PRODUCTION, AND YIELD OF RICE, WHEAT AND RICE GRAIN IN INDIA DURING 1967-68 TO 1972-73

<table>
<thead>
<tr>
<th>Crop</th>
<th>Linear growth rate</th>
<th></th>
<th></th>
<th></th>
<th>Compound growth rate</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area t-value</td>
<td>Production t-value</td>
<td>Yield t-value</td>
<td>Area t-value</td>
<td>Production t-value</td>
<td>Yield t-value</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>0.58 4.13**</td>
<td>2.36 4.02**</td>
<td>1.59 3.69**</td>
<td>0.55 4.15**</td>
<td>1.96 4.39**</td>
<td>1.39 3.69**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>3.34 11.39**</td>
<td>9.33 10.94**</td>
<td>3.56 5.49**</td>
<td>2.66 10.39**</td>
<td>5.85 11.38**</td>
<td>2.80 3.79**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>9.33 10.94**</td>
<td>3.56 5.49**</td>
<td>2.66 10.39**</td>
<td>5.85 11.38**</td>
<td>2.80 3.79**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>grains</td>
<td>0.39 2.25*</td>
<td>2.66 6.15**</td>
<td>2.19 6.75**</td>
<td>2.29 2.24*</td>
<td>2.25 6.12**</td>
<td>1.91 5.24**</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Significant at 5 per cent level.
** Significant at 1 per cent level.

Source: Computed on the basis of the data given in table 1.4.
The computations presented in table 1.4 clearly show that the growth rate of area, production and yield of wheat is more striking than that of rice and all food crops taken together (via diagrams 1.1 to 1.6). Our results support the conclusion of Griffin that in the Far West, there has been a clear-even dramatic increase in the rate of growth of the production of wheat, there certainly has been a breakthrough in this crop. In the case of rice, the conclusion is inescapable that despite the development of high yielding varieties of rice there has been no increase in the trend of production in the Third World as a whole, i.e., there has been no 'green revolution' in rice.18

Fig. 1.2 Growth (Linear) of production of Rice, Wheat and Foodgrains in India (1967-68 = 100)
Fig. 1.3 Growth (Linear) of yield of Rice, Wheat and Foodgrains in India (1967-68=100)
Fig. 1.4 Growth (Compound) of area under Rice \times Wheat 
and Foodgrains in India (1967-68=100)
Fig. 1.5 Growth (Compound) of production of Rice, Wheat and Foodgrains in India (1967-68 = 100)
Fig. 1.6 Growth (compound) of yield of Rice, Wheat and Foodgrains in India (1967-68 = 100)
In Indian agriculture small farmers constitute a larger proportion, though the total area operated by them is not much. According to 1970-71, world agricultural census, nearly 70 per cent of the agricultural holdings are operated by small farmers but they accounted for only 20 per cent of the total operated area. The size-wise distribution of operational holdings is presented in Table 1.5.
<table>
<thead>
<tr>
<th>Class</th>
<th>size (in hectares)</th>
<th>1970-71</th>
<th>1976-77</th>
<th>Percentage change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Number</td>
<td>Area</td>
<td>Number</td>
</tr>
<tr>
<td>Large</td>
<td>(10 and above)</td>
<td>3,757</td>
<td>53,065</td>
<td>2,437</td>
</tr>
<tr>
<td>Medium</td>
<td>(4 - 10)</td>
<td>3,099</td>
<td>45,231</td>
<td>0.307</td>
</tr>
<tr>
<td>Semi-m</td>
<td>(2 - 4)</td>
<td>18,651</td>
<td>29,290</td>
<td>11,043</td>
</tr>
<tr>
<td>Small</td>
<td>(1 - 2)</td>
<td>13,432</td>
<td>19,233</td>
<td>14,705</td>
</tr>
<tr>
<td>Marginal</td>
<td>(less than 1)</td>
<td>36,300</td>
<td>14,836</td>
<td>44,533</td>
</tr>
<tr>
<td></td>
<td></td>
<td>71,012</td>
<td>162,126</td>
<td>81,524</td>
</tr>
</tbody>
</table>

Source: All India Agricultural Census, 1976-77, Government of India.
Table 1.5 indicates that marginal farmers with less than 1 hectare of land account for 44.5 million or 54.5 per cent of the holdings and 11 per cent of the operated area, while small farmers having land between 1 and 2 hectares form 14.7 million or 18 per cent of the holdings and 13 per cent of the operated area. Thus the proportion of holdings of these two groups was 72.6 per cent with an operated area of 24 per cent in 1976-77. 

Between 1970-71 and 1976-77, semi-medium and small holdings increased by 9 per cent each and marginal holdings by as much as 23 per cent, while the area operated by them increased by 8 per cent each and 20 per cent respectively. Thus numerically strong but economically weaker section of the rural community consists of marginal and small farmers. They also suffer from the vicious circle of low productivity, low income, low capital formation, low levels of technology and economic management and hence in turn low productivity. Thus, it is imperative that they should be enabled to take advantage of new agricultural technology. In this context the Rural Credit Review Committee has rightly observed, 

"It is, therefore, all the more necessary that the low affluent cultivators should be enabled through
state and institutional support, improve their production potential and levels of income by adopting improved agricultural practices. If the fruits of the development continue to be denied to a large section of the rural community, while majority suffers, the economic, social and political stability of the country may not only upset the process of orderly and peaceful change in the rural economy, but even frustrate the national efforts to step up agricultural production. 19

Booth Rama in critical of the new strategy and points out that such an agrarian structure leads to a realistic pattern. In his own words: "It would consist of a prospering, production-oriented, profit-oriented, technology-oriented thin crust of medium and large farms on a great mass of small and minuscule farms that would lag far behind in matters of production, profit, technology, etc. The thin crust of big and medium-sized farms would operate more simply on the lines of expanded production with the generation and reinvestment of surplus, but in respect of the employ-

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of

rent labor, they would retain feudal features; labor
would remain a non-free commodity as a result of the
vast surplus labor that would abound in the coun-
tryside. The vast mass of small farms could crawl along
on pre-capitalist lines of simple production. 20

Equity problems that arise in the wake of green
revolution were characterized as "second generation
problems" by Wharton. 21 Falcon holds that equity,
defining and redefining at aspects relate to third gene-
ration problems. 22

Whether the new technology is really biased in
favor of the big and large farmers can be ascertained
by examining two issues vis-i-vis, the distribution of irri-
tated farms and availability of resources among farmers

Commodity or 'Landlord's Line", Foreign Affairs,
April 1969, p.20.
22. Falcon, Walter, D., "The Green Revolution and Gene-
ation of Problems", Agrarian Journal of Agricultural
of different size groups. Realization of yield potential of the high yielding varieties depends critically on controlled application of water and on the availability of drainage facilities. Irrigation is crucial for optimum yield and optimum returns, so the complementarity of the new seeds with water effectively limits the domain of the Green Revolution.

The adoption pattern would be determined by the distribution of the irrigated farms in different size classes, since irrigation is the key prerequisite for the applicability of high yielding varieties. The distribution of irrigated land by farm size is shown 1.6.
In table 1, columns 5 and 6 show the number and percentage of irrigated farms and they reveal the potential pattern of distribution of farms adopting high yielding varieties. Out of the total 22.7 million irrigated farms, 62 per cent are small farms while 34 per cent are medium and the remaining 4 per cent are large farms. Hence irrigation is not a constraint for the small farmers to adopt high yielding varieties. Bandhudesa (1979) points out that the increased participation and adoption of high yielding varieties by small farmers is due to two factors. Firstly, the inherited pattern of distribution of irrigated land is not biased in favour of large farms, it is the small and medium sized farms together operate the bulk of the irrigated land. Secondly, the average small farmer is equally progressive towards innovation, risk-bearing and application of recommended package of inputs. It is clear from column 9 of the table that as the farm size increases, the proportion of irrigated area decreases.

23 Sen, Bandhudesa, Quaterly, p.69.
Considering the sharing of benefits from green revolution, it is not the distribution of operated land but the distribution of irrigated land that is relevant. Column 8 makes it clear that about 25 per cent of the irrigated land is operated by small farms while the large farms operate only about 17 per cent and about 54 per cent of land operated by medium sized farms is irrigated. This evidently shows the statement that the benefits of the new technology would be reaped only by the affluent operators of large farms is wrong. In fact, the above evidence shows that it is the small farmers who can benefit more from the new technology. As such, the small and medium sized farms have potentialities to benefit more from green revolution than the large farms.

ACTUAL GAIN

While irrigation determined the potential gain from the 'green revolution' the realised gain is likely to be influenced by resources like working capital, credit, and the availability of critical inputs like improved seeds, fertilisers, pesticides, and extension services. It is argued that the large and big farmers with greater command over capital
resources, better access to semi-public and Governmental agencies and greater capacity to face risks and uncertainties of innovation will be in a better position to reap the benefits of green revolution vis-à-vis the medium and small cultivators.

As a consequence, in the agro-economic environment of the Indian countryside, high rates of economic development may actually exacerbate social tension and ultimately undermine the foundation of the rural political stability.24 Lipton expresses a similar view when he observes, "it is too soon to be confident that the "New Strategy" has assured a lasting solution to India's food problems. The improved seeds pay only if the water supply is assured in both quantity and timing that cut out at least fourth-fifth's of India's farm land. For the lucky farmers on the remaining land (not one-fifth but up to one-third of India's farmers - on average irrigated holdings are smaller than others), the improved seeds pay only those who also use large inputs of fertilisers, if a man must finance these with money lender credit at 35 per cent or pay half of his

away to the land lord, he will not use the new seeds. So only the 20 - 25 per cent of farmers big enough to do wi
ness: the credit will benefit. The new strategy with
its emphasis on big farmers, seems to be inequitable as well
in inefficient way to use the enormous benefits of the
new high yielding seeds. Thus both Breman and Lipton
have stressed the 'resource class' in favour of the big farmers
as one of the main factors leading to the widening of in-
equalities. The new technology ensures that the surplus
of the big farmers be invested in labour-saving technology.
Thus the new technology tilts the balance more in favour
of the big farmer. In the absence of deliberate policy
of strengthening the position of the small farmer in
input and product markets, the benefits of modern tech-
nology in agriculture have mostly gone to an affluent
minority and this has added further to the disparities
among farmers. It has been argued by Griffith that the
sector market for both capital and labour are
important in poor countries, both factors being avail-

28. Lipton, Michael, "India's Agricultural Performance:
Distortions and Ideologies", In Asia and African Studies,
Vol. 6, reproduced in Agricultural Development in Develo-
ping Countries, Bombay, Indian Society of Agricultural
Economics 1971, p113.
ble to rich farmers at more favourable prices.\textsuperscript{26} As the relative price ratio facing the large and small farmers are different, it is possible to have a new technology which could be profitable to adopt at one set of prices but not at other.

In the mid-fifties and early-sixties the dominant view among Indian economists was that small farmers were more productive on per hectare basis than big farmers. But after the emergence of new technology the situation was reversed. Because of inadequate access to resources the small farmers are losing their land and swelling the ranks of the agricultural workers. If all the necessary resources (inputs) are supplied to the small peasants, it is likely that their performance will be better than those of rich farmers. The small farmers can only obtain credit from the private money-lenders who charge exorbitant rates of interest. Peasants are forced to borrow even at interest rates of 50 to 200 per cent. Most of the small farmers cannot repay these loans. They are compelled to sell their land and become either tenants or agricultural labourers with large debts. It contributes to the rise of

\textsuperscript{26} Griffin, Keith. \textit{Op. Cit.}, p. 17.
large landowners, the demise of small peasants
propriators and increase of landless.

The rural masses of which the small farmer is a
part are bypassed by the plans of development in the
Third World. These masses are mostly passive aesthe-
tic and inarticulate. The small farmers are no
exception. There have been sporadic peasant revolts
against the landowners from time to time in many
parts of the developing countries, but rather regu-
larly they have been as in consequential as many
slave revolts in the United States in the centuries
before the Civil War. They lacked organisation and
a clear plan and have been easily suppressed. 27

The urgency for institutional reform, especially
land and credit reform is increasingly felt in the
countries with high densities of rural population and
greater incidence of rural poverty. The need for full
diffusion of the new technology and to counteract its
disqualifying and deleterious effects, usually recog-
nised, but effective instruments for attaining these
objectives do not exist. The usual instrument adopted

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is some form of administrative intervention designed to counteract the exclusion of the poor due to highly imperfect markets. This intervention has taken the form of some specially designed schemes for the target groups of the rural society like the Small Farmers Development Agency. The funds allocated for these schemes, although show a rising trend, hardly meet the needs of the target groups partly because of the inadequacy and leakages. Therefore, the trickle down is very much minimized.20

CONCLUSION

Indian agriculture has been undergoing technological break through since mid-sixties with the introduction of high yielding varieties. Consequently both production and productivity have gone up substantially in respect of cereal crops, especially wheat and rice. However, the growth performance is not even. Our results show that growth rates - linear and compound - are higher and striking in the case of wheat vis-a-vis rice. This corroborates the view that in the Far East there has been a breakthrough in wheat and there is no green revolution in rice.

Marginal and small farmers who own 73 per cent of the operational holdings and 26 per cent of the operated area, constitute a significant proportion in Indian agriculture. The skewed distribution of operated area and the resource constraint prevent the small farmers from taking advantage of the opportunities offered by the new agricultural technology, though the potential gain in terms of irrigated area is in their favour. Thus, the new technology has exacerbated the inequalities between the small and large farmers.

The logic of a growth maximization strategy dictates that resources should be concentrated on progressive farmers and regions. There is consequently relatively little in the way of development of resources that will be left over to deal with the mass poverty that remains unabated by growth. It is little wonder, therefore, that resources devoted to small farmer programmes and to infrastructure schemes have been puny in relation to estimated requirements. Besides, there are leakages in the flow of funds to the target groups due to administrative laxity and inefficiency. Thus, a partial justification for a growth strategy is patently unconvincing; those who
locally absolutely are not compensated, both because benefits do not trickle down and because the demands of growth leave little for the implementation of compensatory, poverty-oriented schemes. This experience of growth-oriented strategies of agricultural planning is slowly paving the way for strategies of growth with redistribution.