CHAPTER IV

AN APPRAISAL OF THE AGRICULTURAL DEVELOPMENT

DURING THE FIRST FIVE YEAR PLAN
THE GENERAL SITUATION OF THE AGRICULTURAL SECTOR AT THE END OF THE FIRST FIVE YEAR PLAN

In fact, the First Plan did not merely set physical development targets in agricultural sector but it also formulated policies designed to bring about a better organisation of agriculture. It emphasized the need of a change in technology and agrarian structure in the following manner:

'The reform of antiquated land system which was inhibiting agricultural production setting upon nation-wide agricultural extension services as part of a comprehensive community development programme revitalisation of the co-operative movement expansion of irrigation and power facilities on a large scale strengthening and improving the administrative structure of the country, and establishing a number of specialized institutions for providing credit of agriculture and industry, for developing small scale industries and for giving special assistance to backward sections of the population were some of the notable features of the First Plan. The Plan focussed the nation's attention on the vital need for planned effort for achieving rapid economic growth as well as social justice. It offered to the people not only the objective for which to work, but also the means with which to realise them through mutual self-help and co-operation and the mobilization of local resources'.

Therefore, as a matter of fact, the main objective of the First Plan was to replace old techniques by new ones and also to change the agrarian structure through the adoption of a massive programme of agrarian reforms. This change in agrarian structure and social-set-up of the agricultural society cannot be measured in terms of measuring standards applied in the determination of pure physical changes. The measures adopted to bring about a change in agrarian structure included the abolition of intermediaries, protection and improvement of tenancy rights, the imposition of ceilings on land holdings and consolidation of holdings. The programme for ameliorating the economic conditions

1 The Third Five Year Plan, Govt. of India, Planning Commission, p.37.
of agricultural labourers included the settlement of labourers on fallow and reclaimed lands and fixation of statutory minimum wages. The formation and implementation of a realistic price policy was also an important participant of this programme. One of the most significant developments in agrarian economy during the First Plan, was the introduction of the extension services as an integral part of the Community Development movement and the development of co-operation.

In order to obtain a clear picture of agricultural sector at the end of the First Plan period i.e. March 1956, we may carefully read some of the most important indicators of economic development. Let us, in the first instance, consider the nature and magnitude of the changes in the national income during this period. The actual trend of national income during the First Plan is in the following table.

<table>
<thead>
<tr>
<th>Year</th>
<th>Agricultural income</th>
<th>Non-agricultural income</th>
<th>Total income</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1951-52</td>
<td>44.4</td>
<td>46.8</td>
<td>91.2</td>
<td>48.7</td>
</tr>
<tr>
<td>1952-53</td>
<td>46.0</td>
<td>48.7</td>
<td>94.7</td>
<td>48.5</td>
</tr>
<tr>
<td>1953-54</td>
<td>49.8</td>
<td>50.5</td>
<td>100.3</td>
<td>49.6</td>
</tr>
<tr>
<td>1954-55</td>
<td>50.3</td>
<td>52.5</td>
<td>102.8</td>
<td>48.9</td>
</tr>
<tr>
<td>1955-56</td>
<td>49.8</td>
<td>54.4</td>
<td>104.2</td>
<td>47.8</td>
</tr>
</tbody>
</table>

*Source: Estimates of National Income.*

It is obvious from the above table that the agricultural output as well as non-agricultural output increased simultaneously. But we mark a greater difference in this trend and the trend prevailing
preceding the First Plan period. The proportion of agricultural income tended to decrease during this period. Over the five years of the Plan, national output increased by about 17.5 per cent. The net output of agriculture and ancillary activities showed an increase of 14.7 per cent. There was an increase of about 20 per cent in the non-agricultural income. The proportions of agricultural income to non-agricultural income might be smaller than they were because the agricultural output increased at higher rate than the projected rate due to natural factors as it was stated:

'During the First Plan, owing largely the progress recorded by agricultural production, the national income increased by 18 per cent as against a target of 12 per cent.'

This shows that the output of the agricultural sector increased in magnitude as it exceeded the target figures and decreased in proportion to non-agricultural output during the First Five Year Plan period.

Any change in population has an implication for economic development. It was estimated that population will increase at an average rate of 1.27 per cent per annum and the total population, thus, will increase by about 6.6 per cent up till the end of the First Plan period. While the total national income increased at an average rate of 2.7 per cent per annum registering about 18 per cent increase in aggregate during these five years.

A perusal of the above table would indicate that the rate of increase in national income was higher than the rate of population growth during these five years. This higher rate brought about an increase in per capita income. As a matter of fact, the total

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1 The Third Five Year Plan, p. 34.
### TABLE 88

**GROWTH OF POPULATION DURING THE FIRST PLAN PERIOD**

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated population</th>
<th>Increased population</th>
<th>Increase in population over each year</th>
<th>percentage increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950-51</td>
<td>35.932</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1951-52</td>
<td>36.335</td>
<td>0.403</td>
<td>0.403</td>
<td>1.12</td>
</tr>
<tr>
<td>1952-53</td>
<td>36.867</td>
<td>0.935</td>
<td>0.532</td>
<td>1.4</td>
</tr>
<tr>
<td>1953-54</td>
<td>37.328</td>
<td>1.396</td>
<td>0.461</td>
<td>1.23</td>
</tr>
<tr>
<td>1954-55</td>
<td>37.808</td>
<td>1.876</td>
<td>0.480</td>
<td>1.28</td>
</tr>
<tr>
<td>1955-56</td>
<td>38.305</td>
<td>2.373</td>
<td>0.497</td>
<td>1.31</td>
</tr>
</tbody>
</table>


Population and total output of the country are inter-dependent. None of them can indicate alone the level of economic development. It is not the total national income that indicates the poverty or prosperity of a country but it is per capita income that is meaningful to indicate the level of welfare. Total income of a country may be higher than the total income of another country but due to higher population in the former country, per capita income is reduced. The number of people supported is greater in the former country than the latter. This appears to be one of the reasons that in developed countries such as U.K. and U.S.A. per capita income is comparatively manifold higher than the income in underdeveloped countries such as India and China. Per capita income in India increased from Rs. 246.3 to Rs. 250 in 1951-52, to Rs. 256.6 in 1952-53, to Rs. 268.7 in 1953-54 to Rs. 271.9 in 1954-55 and to Rs. 272.1 in 1955-56. Per capita income, thus, increased by 10.5 per cent over the Plan period. This increase in per capita income led to an increase in consumption by about 8 per cent by the end of the Plan period. The consumption of cereals per adult per day went up from 12.6 ounces in
1950-51 to 14.4 ounces in 1955-56. The consumption of cloth increased from 9.7 yards to 16.4 and of sugar from 0.37 ounces to 6.57 ounces. There were also significant increases in the consumption of other consumption goods.¹

The method and pattern of land utilization is the basis of the development of the agricultural sector. A balanced utilization of land is the most important measure to maximize its production. During the First Plan period efforts were made to increase land under cultivation through the utilization of fallow land and reclamation. The following table gives actual picture of land utilization during this quinquennium.

**TABLE 89**

**LAND UTILIZATION IN INDIA DURING THE FIRST PLAN**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area according to the village lands</td>
<td>702556</td>
<td>711235</td>
<td>718268</td>
<td>718973</td>
<td>719210</td>
<td>719555</td>
</tr>
<tr>
<td>i) Forests</td>
<td>100033</td>
<td>120808</td>
<td>127306</td>
<td>128024</td>
<td>123774</td>
<td>125554</td>
</tr>
<tr>
<td>ii) Not available for cultivation</td>
<td>117416</td>
<td>123918</td>
<td>121972</td>
<td>1188614</td>
<td>120076</td>
<td>118388</td>
</tr>
<tr>
<td>iii) Other uncultivated land</td>
<td>122183</td>
<td>99835</td>
<td>98963</td>
<td>98084</td>
<td>97989</td>
<td>96979</td>
</tr>
<tr>
<td>iv) Fallow land</td>
<td>69495</td>
<td>71567</td>
<td>65403</td>
<td>61193</td>
<td>61612</td>
<td>60416</td>
</tr>
<tr>
<td>v) Sown area</td>
<td>293429</td>
<td>295044</td>
<td>304669</td>
<td>313058</td>
<td>315757</td>
<td>318220</td>
</tr>
</tbody>
</table>


It was suggested in the First Plan to extend the area under forests. Actual development in this regard shows that land under forests increased from 10 crore acres in 1950-51 to 12.6 crore acres in 1955-56. This increase amounts to about 26 per cent over these five years. ¹

¹ Review of the First Five Year Plan, p. 8.
Area sown showed an increase of about 2.5 crore acres or about 1.3 per cent. Fallow land and uncultivated land other than fallow land decreased by 13.5 per cent and 20.5 per cent respectively. In this way more area was available to expand sowing and thus the area under different crops increased by more than 437 lakh acres as against the target of only 104 lakh acres in the First Plan.\(^1\)

A general view of the growth of agricultural economy over the quinquenium of the First Plan may be obtained from the selected indicators given in the following table.

| TABLE 90 |
| SELECTED INDICATORS OF AGRICULTURAL SECTOR |

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>1950-51</th>
<th>1955-56</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Income at 1948-49 prices</td>
<td>Rs. crores</td>
<td>9120</td>
<td>10,420</td>
</tr>
<tr>
<td>Population</td>
<td>million</td>
<td>359.32</td>
<td>383.05</td>
</tr>
<tr>
<td>Per capita Income</td>
<td>Rupees</td>
<td>246.3</td>
<td>272.1</td>
</tr>
<tr>
<td>Index of agricultural production</td>
<td>1949-50=100</td>
<td>96</td>
<td>117</td>
</tr>
<tr>
<td>Foodgrain production</td>
<td>million tons</td>
<td>52.2</td>
<td>65.8</td>
</tr>
<tr>
<td>Nitrogenous fertilizers</td>
<td>000 tons of</td>
<td>55.0</td>
<td>105.0</td>
</tr>
<tr>
<td>Sown Area (net)</td>
<td>million acres</td>
<td>293</td>
<td>318.0</td>
</tr>
<tr>
<td>Area irrigated (net total)</td>
<td>million acres</td>
<td>51.5</td>
<td>56.2</td>
</tr>
<tr>
<td>Co-operative movement: Advance to farmers.</td>
<td>Rs. crores</td>
<td>22.9</td>
<td>49.6</td>
</tr>
</tbody>
</table>

The figures in the above table indicate a higher platform for agriculture after the completion of the First Plan. The Planning Commission explained this situation in the following words:

\(^1\) Area, production
'On the whole, the economic situation on the eve of the Second plan is distinctly better than it was on the eve of the First Plan, there is more confidence and greater readiness all round for a larger effort'.

There is no doubt that food production exceeded all expectations and it cannot be gainsaid that a general improvement took place in agriculture during the First Plan period. But the general development of agricultural sector has come under strong criticism and opinions have been expressed that several vital problems remained unsolved. For instance, it is pointed out that no realistic effort have been made to provide gainful employment to the rural population. Provisions for better health and living conditions remained less than adequate. It is said that very little direct benefits of agricultural development during the First Plan period reached the agricultural landless workers. The results available in the Second Agricultural Labour Enquiry Report indicate that between 1951 and 1956 there was a fall in self-employment and a rise in the number of persons offering themselves for wage-employment in the rural areas. It is doubtful even today if this situation has improved since 1950-51. Also the administration and planning with regard to supply of manure and fertilizers, improved seeds and agricultural credit has not been quite satisfactory. The big agriculturists got more opportunity to utilize these facilities but the small cultivators did not benefit much from it. Thus the gap between small agriculturists and big agriculturists became wide. It may, therefore, not be too incorrect to say that Indian agriculture at the end of the First Plan period continued to be handicapped by the presence of a vast number of dispersed and unorganised agriculturists.

1 Second Five Year Plan, op.cit., p. 5.
2 D.K.Gadgil, Sunil Guha, J.S.Patel and Doulas Ensminger, etc.
3 The Second Agricultural Labour Enquiry Report, op.cit.
TECHNICAL REFORMS AS SOURCES OF INCREASED PRODUCTION

Actual increase in agricultural production can be brought about mainly, through technical reforms. In a limited sense, these technical reforms include only mechanisation and modern technique that aim at cutting down labour and increasing its productivity. In every type of operation such as cultivating and harvesting of crops, the labour both human and animal are replaced by the machine. The necessary background for this type of change pre-supposes a fundamental reorganisation within agriculture and rapid expansion of non-agricultural sectors to absorb the labour force which is thrown off the land through the introduction of mechanization on a large scale. It was therefore, that even China avoided the adoption of such type of mechanization though in principle, she was committed to a policy of rapid mechanization of her agriculture. Similar view is also expressed by the Indian Delegation to China in the following words:

'... until their country is sufficiently industrialized so as to syphon away a fairly large number of people from the rural areas to urban areas, or rural industries are developed very considerably, mechanisation of agriculture may accentuate the problem of rural under-employment.'

Besides a widespread mechanized cultivation is also inhibited by its excessive cost. The per acre charges for reclamation through tractor comes to nearly Rs. 45 to Rs. 55 and that for ploughing an acre to Rs. 30. Thus the heavy costs involved in the use of tractor for ordinary ploughing act as a deterrent to the widespread use of tractor by the Indian farmers. The technical reforms do not only include mechanization and the adoption of modern techniques but it also includes the adoption of the intensive methods of cultivation. In the First Plan

1 Report of the Indian Delegation to China on Agricultural Planning and Techniques, Govt. of India, Ministry of Food and Agriculture, 1956, p. 140.
these technical reforms were discussed and considered under programmes of agricultural development. These programmes were adopted to secure increased agricultural production, especially in the production of foodgrains. During the First Plan the production of foodgrains was expected to be increased by about 7.6 million tons. These different programmes were to contribute specific amounts of foodgrains such as 2,088.7 thousand tons through major irrigation works, 1,784.4 thousand tons through minor irrigation schemes and 15,125 thousand tons through land reclamation and development of new land. The rest of the amount of foodgrains was expected to be raised through other programmes. The Evaluation Reports, Progress Reports and even the Review of the First Five Year Plan, do not mention any relationship between the increase in foodgrains and the completion of any specific programme of agricultural development. The progress in separate programmes was mentioned but it was not stated that how did each programme affect the production of foodgrains. For example, progress was made in minor irrigation schemes but how much more foodgrains were produced due to these expanded facilities of water supply was not given. The foodgrains production exceeded the target in 1953-54. But this increase in the production of foodgrains was not due to these programmes as it is said:

'The increase in production realized in 1953-54, and the subsequent increase in the marketed surpluses of foodgrains, were on the whole of a fortuitous character, and were not related to improvements of a significant nature either in techniques of production or in form of organisation in agriculture.'

The break-down of expenditure under different heads of agricultural development programme was considered to be of great importance. It was thought that the increase in agricultural production was the sum of effects of expenditure incurred on separate and specific head of the

1 Economic Survey of Asia and the Far East, 1957, p.79.
agricultural development programme during the Plan period. In this connection, it may be pointed out that:

'The fact that the rise in the output of foodgrains in the First Plan period took place suddenly towards its third year, when less than half of the planned developed expenditure had been incurred, suggests that not even 6 million tons of the increase can in fact be attributed to the expansion of production potential created over the plan period. If taken together with the failure of foodgrains production to rise further in the subsequent years, the developmental outlays in agriculture in the period of the First Plan would appear on the whole to have had a less significant impact on production than was it at one time thought.'

The programmes undertaken during the First Plan were neither adequate nor appropriate. The Planning Commission did not pay sufficient attention to technical reforms due to one reason or the other and it is said that:

'The Planning Commission, when devising First Five Year Plan did not find it incumbent to give much attention to the problem of the techniques and agencies of the implementation of the Plan.'

There is great need to consider seriously the problem of technical reforms in Indian agriculture. They are necessary to achieve a higher level of economic development as J.R. Gadgil has rightly pointed out:

"... in order to achieve any measure of success in planned, rapid economic development, an attempt must be made to plan the effort as much as possible, in the domains of agriculture also."  

During the First Plan period, the Central Tractor Organisation was the main agency to reclaim the waste land. C.T.O. was expanding rapidly by acquiring more tractors and breaking up progressively larger

1 Ibid., p. 76.  
3 Ibid., p. 160.
areas every year. As against the net cultivated area of 318 million acres in the Indian Union and the cultivable wastes of approximately 97 million acres the coverage of 11.86 lakh acres during the five years seems smaller. The rate of reclamation by C.T.O. was only about 2.2 lakh acres per annum. This rate should be increased to about 10 lakh acres per annum and, therefore, the remaining uncultivated area may come under cultivation to the maximum extent in minimum possible time. Through this programme the pressure of population can easily be wiped out. The landless agricultural workers and other cultivators with small land can be settled on this reclaimed land and it may be the best solution of the acute rural problem of under employment and unemployment. In these new settled areas the co-operative farming should be started and practised so that it may gradually be extended over to other lands also.

India's success in agriculture with improved techniques has been limited in the First Plan period (as judged by relatively stable yield per acre figures), even further improvements of techniques (through greater use of fertilizers, farm equipment and improved seeds) depend for their success upon an assured supply of water. The only dependable way of establishing a system of intensive agriculture as well as of extending the margin of extensive cultivation through reclamation seems to be to provide areas with an assured supply of water. The total area under irrigation was increased by only 9 per cent during the First Plan period. The irrigated area was about 18 per cent of the total net cultivated area. This figure should be increased at least by 50 per cent to the net cultivated area. This can be done only by storing

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the precipitation in catchment areas which have an abundant rainfall and diverting this dependable supply of water through canals and distributaries to the areas with inadequate and variable rainfall. In short, what is required as the construction of major dams and reservoirs capable of storing and controlling the flow of important rivers and their tributaries. As a result of major irrigation only about 4 million acres of land could get the benefits of irrigation till the end of the First Plan. Irrigation through these sources should be increased far from this. An assured supply of water will bring a change in the structure of agricultural production i.e., a gradual transition from subsistence farming to the production of cash crops. This will ultimately be the most important economic and social change that can seem to happen in response to the provision of assured supply of water. With a perennial supply of water sowing and planting can start earlier than in areas dependent on rainfall. In fact irrigation will make it possible to plant and grow two or even three crops of rice in the tropical areas. Many other crops can respond to earlier planting. For instance, cotton usually cannot be grown before June; with irrigation planting can start in April. Similarly, a shift to sugarcane can bring far-reaching changes in productive methods in areas which have now no perennial supply of water. The rural population can then be in a position to earn more through this transition. An assured availability of water will make it less risky and more profitable to switch from subsistence farming or from dry food crops to crops which require more water than rainfall makes available. These will be better quality and higher priced crops such as sugarcane, wheat, paddy and fodder as well as garden produce. Whereas the unirrigated farm tends to concentrate overwhelmingly on the production of food crops which in our country is largely consumed locally or within the cultivator's own family, the irrigated farm can
be shown to concentrate on the more valuable food crops for sale (such as rice, wheat and sugarcane) and also may turn to fibre crops and fodder. The following table can help us to a great extent to understand the importance of this change from some figures from Punjab.1

TABLE 91
PERCENTAGE GROUPS GROWN IN IRRIGATED AND UN-IRRIGATED AREAS, PUNJAB, 1954-55.

<table>
<thead>
<tr>
<th>Crops</th>
<th>Irrigated areas</th>
<th>Unirrigated areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food crops</td>
<td>55</td>
<td>94</td>
</tr>
<tr>
<td>Oilseeds</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fibre crops</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Fodder crops</td>
<td>23</td>
<td>5</td>
</tr>
</tbody>
</table>

The data are significant inasmuch as they show a greater diversification of crops in irrigated areas as compared to the almost complete concentration on food crops in unirrigated areas. This pattern will certainly not affect the supply of foodgrains in the country. The productivity per acre will also increase with the change in the pattern of crops. Inadequacy and unevenness of rainfall in unirrigated areas make Indian agriculture a particularly precarious and risky business, the degree of which can be measured by the extent of crop failures. If the average rainfall during the growing period is inadequate or unevenly distributed the entire crop of a high percentage of it may never mature and the area suffers famine. Crop failures of this kind can be measured by the percentage of matured crops to total area of cropping. The lower

the percentage the greater the extent of crop failure. In the Hissar District (Punjab) where until recently irrigation had not made much headway and where the nature of the soil would not permit the land to bear more than one crop even in the years of normal rainfall. The available data covering 15 years (1939 - 1954) indicate that in the years more than two-thirds of crops failed; in 7 years failure ranged between 41.9 per cent and 71 per cent; and only in one year did 88.2 per cent of the crop mature. ¹ In the area in which the 1952-53 study of potential effects of the Bhakra Dam was conducted, a large part of the crop was lost due to inadequate rainfall. As much as 85.25 per cent of the bajra crop did not mature. Conditions of other crops were only slightly better such as 50.58 per cent of jowar, 100 per cent of watermelons, 46.7 per cent of jowar (cyamopsis tetragonloba), and 12.31 per cent of Mint had failed during the year under report. Many other crops had been complete failures and grain (even arietinum) barley and wheat suffered losses of 86.3 per cent and 85.3 per cent.²

The social losses of crop failures can be measured whether in terms of the value of the crop lost or in terms of the waste of seeds, family and hired labour (wages), and bullock power or the loss of public revenues due to the suspension of the collection of land taxes and the remission of instalments of various government loans and substantial expenditure for relief measures to drought areas. By providing an assured supply of water throughout the entire growing season, irrigation will change the nature of agriculture. As compared to extreme variations in the percentage of crops matured that is the

characteristic of unirrigated areas, farm output can tend to be stabilized by irrigation. This extent of the stabilization can be measured directly in terms of the increased output. Irrigation will also make the supply of foodstuffs and farm output less dependent upon the vagaries of the weather and thereby will place the whole planning effort including the long-run industrialization plan upon a sounder foundation.

In order to obtain the fullest possible benefit of irrigation, it is necessary to make more intensive use of human labour, bullock power, fertilizers and manure, improved seeds as well as of farm equipment. More manpower will also be required for such purposes as clearance, levelling, planting, harvesting and supervision. Irrigation crops such as sugarcane and rice will require the use of more fertilizers and manure, and these in turn will produce the best results only if they will be applied in proper proportions with water and improved varieties of seeds. In short, irrigation will call for a more intensive form of agriculture than dry farming under conditions of normal rainfall. Thus the new pattern of agriculture will be reflected in a new pattern of farm inputs and outputs. An enquiry into the monthly distribution of manual and bullock labour in dry area (Hissar District) for 1952-53 shows that the workdays of manual labour for farm cultivation are concentrated largely during the five months from July to November when sowing and harvesting operations are conducted. Hired labour as well as bullock labour follows almost the same course. There is practically a complete idleness of manual and bullock labour during the months of December, January and February. On dry farms the average number of days worked per year is more than 153.9 or expressed in different terms the average number of hours worked per day is 3.37 hours.1 By extending the

1 Ibid., p. 28.
period of cultivation and by making it less dependent upon seasonal rainfall, the irrigation will have the effect of spreading work more evenly over the entire year.

Moreover, irrigated crops call for a much more continuous and intensive use of manual labour and bullock power. The data from the studies in Economics of Farm Management in Punjab in 1954-55 reveal that while the use of human labour on unirrigated crops per acre was 12 adult man days\(^1\) per year, the employment of human labour on irrigated land was 24 mandays. Similarly, the use of bullock power showed a substantial increase on irrigated cropped areas as compared with dry areas (18.7 against 11.6 days of 8 hours). Whereas about 90 per cent of the total mandays on unirrigated cropped areas are contributed by family and exchanged labour only 82 per cent are provided in this fashion on irrigated land. That is to say, the percentage of hired labour only to the extent of 1.3 mandays per acre, the irrigated areas used 4.1 mandays or more than three times as much hired labour.\(^2\) Thus the effect of intensive farming on rural employment will be significant.

Any assessment of the impact of irrigation on yields and output is complicated by the fact that water is only one factor among many that determine yield and output. Of the other factors only the following may be mentioned: the use of manure and fertilizer, the utilization of improved varieties of seeds, especially seeds that yield crop in a shorter growing period, crop rotation, proper planting and lastely adequate cultivating. Maximum results are obtainable only by a combination and proper proportion of these various factors. Available data on differences of yields on un-irrigated and irrigated tracts show

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1 An adult mandays is equivalent to 8 hours per day.
2 Studies in Economics of Farm Management in Punjab op.cit, pp.73-79.
differentials more than 100 per cent for specific crops. For wheat, the most recent data from the Punjab indicate that whereas unirrigated tracts do not produce more than 4.3 to 7.7 maunds per acre, irrigated areas have yields of from 12.9 to 13.5 maunds per acre.\(^1\) Pre-independence estimates on average yield differentials on dry and irrigated lands vary from area to area. They range from 572 lbs. per dry acres to 967 lbs. per irrigated area in Punjab, and from 510 lbs per dry area to 1250 lbs. per irrigated area in Bombay State.\(^2\) For rice the Punjab shows the greater variation (587 lbs as against 1267 lbs.), whereas the estimates for Madras State show yield differentials per acre of 1138 to 1694 lbs. In the light of the above considerations it must be evident that comparative yield data on irrigated and non-irrigated tracts cannot be accepted for the time being as reliable measures of either the actuals or the potential benefits of irrigation in India. The total potential effects of irrigation on yields and output can be ascertained only under controlled conditions where it is possible to experiment with modern techniques and methods in accordance with the contemporary knowledge of agronomy. So it may be unrealistic to use yield data on experimental farms as the basis for calculations of the potential benefits of irrigation. It is certainly not more realistic to appraise the benefits of irrigation simply in the light of yield data which do not reflect the level of output which modern agricultural knowledge and techniques could open up to the Indian farmer.

It is not necessary to comment in detail on these increases of average yields and output made possible by irrigation. But it can

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1 Studies in Economics of Farm Management, op.cit., p. 85.
2 Burns W: Technological op.cit., p. 56.
3 Studies in Economics of Farm Management, op.cit., p. 95.
unquestionably be said that irrigation is the strategic factor without which these increases in yields and output would have not occurred. This is not to say that the increase in the supply of water is the only factor responsible for the improvements of farm yields and outputs. Certainly there were improvements in techniques of farming such as the use of fertilizers, manures, improved seeds, new methods of planting and cultivation, which contributed to the final outcome; and it is important to realize that these improvements in techniques represent additional farm investments called for by irrigation farming. In this sense, the increased yields and outputs are not the result of investments in irrigation but are the combined result of the joint investments in irrigation and improved techniques of farming.

Reference to the problem of the supply of manure and fertilizers may be made to illustrate the lack of overall thinking and of coordination of the activities of the various ministries. The Agricultural Administration Committee admitted in its report that it was generally felt in the States that sufficient fertilizers are not being allotted to them by the Government of India. In view of the pivotal position held by fertilizers in relation to a programme of increased agricultural production, it is difficult to underestimate the importance of adequate supply. At the same time government has been encouraging the export of groundnut cake. This policy is presumably based on the recommendations of the Export Promotion Committee which have reasoned as follows:

'We are already producing fertilizers on a large scale and importing that part of the requirements which cannot be met from internal production. Further, molasses could, we are told, be used increasingly as cattle feed.'

No agricultural expert is likely to agree with this complacent view.

of the committee regarding the supply of fertilizers, but evidently
government in one ministry accepts it.

In order to the low productivity per acre of land, a wide-spread
application of artificial fertilizers to different crops depends
primarily upon the marginal rate of profit derived from their applica-
tion. According to an important study the average increase in yield
of wheat on account of the application of phosphorus to its crop, is
nearly the same in India as it is in West Germany. Whereas the average
increase through per unit of nitrogen is half of what it is in West
Germany. The reason of this glaring disparity in the average increase
in the yield of wheat, in the two countries as it is that the
differences in other factors (irrigation, quality of seeds, pest
control, method of sowing and harvesting etc.) are important in
influencing the yield though the maximum increase through the applica-
tion of nitrogen in India is equal to the average increase in Germany.
However, the increase in wheat production in India through the applica-
tion of phosphorus is three times greater than in Germany. It is so
because in West Germany agricultural productivity has reached the
maximum; Hence the rates of increase in marginal yield on account of
the per unit application of fertilizers are smaller in Germany than in
India. Therefore, under such favourable conditions as exist in India,
it is quite likely to obtain more average increases in yield, than in
Germany. As regards the cost aspect, super-phosphate and muriate of
potassium are about twice as costly in India as in Germany and the
Indian price for nitrogen (in ammonium sulphate) is about one and
half times greater than the price in Germany. But nitrogen in urea

1 Joppich, W.G: Some Economic Aspects of the Application of Artificial
Fertilizers in Indian Agriculture, Table III, p.70, The Indian Economic
has the same price in India as nitrogen ammonium sulphate in Germany. According to the ratio of the product price to the fertilizers price (the amount that has been calculated in terms of pounds of wheat) the Indian farmer has to pay twice as much as in Germany for buying one pound of nitrogen and for super-phosphate nearly thrice as much. It is therefore, concluded that the prices of fertilizers and their ratio to the prices of products are considerably less favourable in India than in Germany.\(^1\) The price of fertilizer should fall considerably in India so that an average Indian farmer may easily and profitably utilize it. It may also be noted that more efficient results can be obtained through the application of specific fertilizer to specific crop. It will lead to the achievement of maximum returns in Indian agriculture. An augmentation of marginal profits from the use of different fertilizers applied to the different crops, the following measures are considered quite effective:

\[
\begin{align*}
\text{i) Nitrogenous fertilizers are applied with the highest profit to cotton tea; with good profit to rice sugarcane; and with small profit to wheat and oilseeds,} \\
\text{ii) phosphorus fertilizers(superphosphates) are applied with the highest profit to cotton; with good profit to rice; and with loss to maize and tea.} \\
\text{iii) Nitrogenous and phosphorus fertilizers(combined ammonium sulphate and superphosphate) are applied with the highest profit to cotton; good profit to rice and tea; and with moderate profit to oilseeds, wheat and sugarcane; and} \\
\text{iv) Potassium used for rice yields a higher profit than where it is used to maize.}
\end{align*}
\]

The preceding account shows that an agricultural planning in India suffers a great deal due to relatively little connection between research and its application on the field. The Royal Commission had

\(1\) Ibid., Table VII, VIII, IX and X.
noticed that much earlier and had termed it as one of the basic
defects of the Indian agrarian situation. The A.A. Committee also
recorded in 1958 that though the experimental stations in the country
collected scientific information on manurial requirements of crops,
this was not translated into practical application. At the same time,
in framing agricultural policies, government and its experts operate
with the results of experiments which they have never bothered to
translate into practical application. It is necessary to emphasize
that the responsibility of agencies of government to prove the results
of research in the field and to propagate them is as great as the
conduct of research itself. To take action on the results of research
experiments without caring to see whether they have been translated into
practical application and have been generally adopted, is to jeopardize
the success of planning; because this undermines the confidence of
cultivators in research as well as in the government policies.

Another point that needs emphasis is related to the fact that
actual increases in the average yields and output in any particular
region do not necessarily represent the limits of agricultural improve­
ments. On the contrary, the fact is, that in many areas under irrigation
the utilization of water is still far from complete, and the adoption
of improved techniques are still the exception rather than the rule.
Therefore, the first major step required for technical reforms is the
extension of irrigation over maximum possible land. With the extension
of irrigation, other technical reforms are inevitably necessary such as
the use of fertilizers and manure the utilization of improved varieties
of seeds, crop rotations and proper planting etc. These technical
reforms are summarized as follows:

i) Reclamation of waste lands;

ii) provision of irrigation through the construction of new
minor irrigation;
iii) extension of irrigation from the existing irrigation works and by constructing new dams;

iv) increasing the intensity of cropping of land by:

(a) reduction in the area under fallow either by raising *cash* crops or by growing green manures;

(b) increase in double and triple cropping by adjusting rotations, introduction of new crops or early maturing crops or method for speedy participation of the land for sowing and by raising cash crops before or after the main crop.

v) introduction of techniques of crop production:

(a) increase in the area under green manures;

(b) increase in the production of compost;

(c) increase in the consumption of fertilizers;

(d) increase in the area under improved seeds;

(e) increase in the area under better cultivating and harvesting methods;

(f) adoption of plant protection measures.

vi) replacement of low production crop by high production crops. For example, replacement of millets with early paddy, sweet potatoes or maize;

vii) Planting more high yielding crops i.e., Japanese method of paddy and long staple cotton on maximum land area.

viii) Soil improvement i.e., measure for soil erosion etc.

The aforesaid technical reforms were not properly practised during the First Plan. Nor these measures were taken on whole culturable area but they were confined only to the area covered by Community Development Projects and National Extension Services Blocks. Even in these areas the method and manner in which these technical measures were being implemented was not satisfactory. In Community Project areas there were the village level workers who were assigned the task to enthuse the villagers and to act as the channel through which information of improved techniques could be passed on from research workers to
actual tillers of the soil. But at the same time they were also to look after the health sanitation, credit and supplies etc:

"In India, much of the time and energy of the village level workers and even of technical officers at higher levels are taken up by the need for looking after credit, supplies, etc., and by the fact that they have to look after not only agriculture but also a number of other subjects like education, health etc."  

We find that it is officially presumed that the village level workers are fit enough to look after all types of activities social, political as well as economic. But obviously they could not pay attention to their main task of disseminating the knowledge of improved techniques and their eventual adoption by the cultivators for increasing agricultural products. In China the manner and method adopted in this regard is noteworthy. There is a specialized technical organisation for agricultural extension programme in rural areas of China called 'Agricultural Technique Popularization Station', maintained by the provincial Department of Agriculture. This organization educates the farmers in improved techniques and passes on to them the results of specialized research. They also help to maintain and establish contact between the farmer and the research worker and to pass the problem of the former to the latter. They also serve useful purpose of a balancing factor in the whole process of development of co-operative farming. These technical Technique Popularisation Stations thus play an important role in the development of China's agriculture. They are not multi-purpose organisations as in India where the Extension Services expect the village level workers to do different types of work. In case of China, simultaneously the duty of such workers is clearly defined as under:

"Their main work is agricultural extension and they stick to that work only. They have nothing to do with the provision of credit or provision of supplies".

1 Report of Indian Delegation to China on Agricultural Planning and techniques, Govt. of India, 1956, p. 146.
2 Ibid., p. 141.
3 Ibid., pp. 145-146.
Viewed in this context, there is an obvious need in India to reorganize its present Extension Service on the model of Agriculture Technique Popularization Stations in China. The V.L.W. should be assigned exclusively the work of agricultural improvement and they should receive help in this task from the village Panchayats in the implementation of these technical reforms should be expedited in the following fields:

i) Marketing decisions regarding the control of stray cattle which damage the crops;

ii) Arranging the repairs of minor irrigation works ensuring rotational supply of water to the farmers;

iii) Settling the land ownership and boundary disputes in time; and

iv) Prescribing certain minimum standards of cultivation which must be adhered to in the village so that disparities in yields may be reduced.

This appears to be the best possible way to popularize the use of improved techniques or to bring about technical reforms in agriculture. The following suggestions may also be noted in connection with these technical reforms:

i) With an increase in the area under irrigation, there should be targets in every state, district etc., for land to be put under two or three crops during the year.

ii) The multiplication and distribution of improved seeds should be given the highest priority so that the areas under rice and wheat and as far as possible under millets, maize and other crops are brought under improved strains.

iii) Research work on crops for which improved strains have not yet been evolved should be intensified in each state and for this purpose funds should be made available.

iv) An all-out effort should be made to develop local manurial resources such as farm yard manure, night soil, composting and green manuring as well as the utilization of chemical fertilizers on a much larger scale than at present. With the object of evolving cheap methods for deodorizing and disinfecting night soil so as to make it acceptable to the
cultivators, large scale pilot projects should be undertaken in every state.

v) Manurial schedules should be worked out for each types of soil and crops. Experiments to study the effect of different types of fertilizers on the cultivators fields should be undertaken.

vi) Research on the usefulness of bacterial fertilizers under Indian conditions should be organized and the use of nodule bacteria for inoculating seeds of leguminous crops should be practised.

vii) Advice to cultivators for the use of proper rotation on the basis of soil types and their economic requirements fulfilled.

viii) Much greater attention than hitherto should be given to dry farming methods which have been found successful. These should be popularized and adequate staff assistance should be made available to enable village communities to have their own dry farming and soil and water conservation programmes.

ix) Planting of high yielding crops, such as, maize, potatoes, sweet potatoes and high yielding varieties of paddy should be encouraged. Investigations into the possibilities of developing the Japanese method of cultivation for potatoes should be carried out. Research in the economics of 'Japanese method' should be undertaken with reference to different crops in different areas.

x) Sufficient attention should be made to the design of improved implements which our cultivators can afford to buy. Arrangements for the sale of improved implements and tools and supply of their spare parts and repair services should be improved.

xi) Either the village level workers should be assigned only the work of agricultural development i.e., the popularization of improved techniques or a separate organisation should be established and maintained especially for these purposes. If the village level workers are to continue, they should be provided with high plant protection, soil testing and soil temperature equipment.

xii) Vigorous measures should be adopted in each area for the destruction and eradication of pests and animals which destroy crops.

xiii) State Governments should strengthen their research organisations and increase their research staff to meet the demand for improved agricultural techniques which have arisen and should be developed further in all areas.
xiv) Arrangements for liaison between research and extension workers should be strengthened. Annual or half-yearly meetings should be held in the states between the senior research workers and the senior extension workers to discuss such problems as may require attention. The research staff should be given an opportunity to tour the villages and understand problems of the cultivators at firsthand so as to take up research on problems which have a direct bearing on the needs and demands of the latter. The extension workers should be put in direct touch with research workers in the neighbourhood. Instructions should be given that whenever the extension worker calls upon the research worker for consultation or requests the latter to accompany him to some farm, the latter must invariably come to his help.
AGRARIAN REFORMS AS A PART OF COMPOSITE DEVELOPMENT OF AGRICULTURE

The First Plan's approach to the agricultural planning included two important features. The first was that the programme was conceived of as consisting of a series of independent developmental activities. The Planning Commission in the Review of the First Five Year Plan explained it as follows:

The targets for agricultural production for the First Five Year Plan were worked out on the basis of the results anticipated from the completion of a number of development programmes. These included major irrigation programmes, minor irrigation schemes, supply of manure and fertilizers, production and distribution of improved seeds, land reclamation and improvement, plant protection and other measures for intensive agriculture. For each programme, yardsticks of increase in production potential resulting from its fulfilment over given areas were adopted.¹

The second feature was to gauge the effects of general national economic development upon agriculture. The method that was followed comprised the determination and fixation of the targets on a country-wise or state-wise basis which was finally broken down into targets for smaller areas of units. In this regard the Report of Agricultural Administrative Committee (October 1958) contains the following:

The existing practice is to break district-wise the State targets of schemes of land development or for distribution schemes and then break up the district targets into Block and Tehsil Targets. The village agricultural plans are attempted on this basis.²

In fact, the targets obtained for the country as a whole produced through a putting together of the expected results of a number of programmes of development had little significance. For example, it was expected that the result, of the total effort in the First Plan

¹ Review of the First Five Year Plan, op. cit., p. 88.
² Report of the Agricultural Administrative Committee, Ministry of Food and Agriculture, Govt. of India, New Delhi, October 1958, p.43.
period would be evidenced in a large increase of 4 million tons in rice, a substantial increase of 2 million tons in the production of wheat and moderate increase of 0.6 million tons in small millets and other cereals. But actual results did not conform to the above expectations. Whereas in wheat the general expectation had been more or less fulfilled, the increase in production had fallen considerably short of the expected increase in rice, and on the other hand, it had greatly exceeded expectations in case of millets and other cereals. But no satisfactory explanation of this divergence of the overall result from expectation was available

This approach to agricultural planning through framing national schemes of development suffers from two major defeats. They are as follows:

(1) In the first instance, this approach fails to provide full use of development potentials. The schemes formulated with reference to general or average situations must prove inapplicable and inappropriate, in varying measures, the scheme-approach may itself prove wrong, and something not even provided for in the general schemes may have to be attempted. The report of the Agricultural Administrative Committee gave a number of the wasteful and absurd results of this approach. It started with the following description:

"Agricultural Departments have no effective way in forming policies which contribute to production. In some states, it was felt, that although Blocks were sometimes peculiarly different from each other, the pattern of work and allocation of funds were uniform and rigid." 1 The description ends with the following instance and observation:

"In a state over thirty-five lakhs of acres were said to be water-logged but no scheme had even been included in the state Plan to check effectively this menace and its adverse effects on production. If adequate emphasis was given to programme planning a serious omission of this kind would not have been possible." 2

(2) The second equally important defect of this approach is that it leads to a very low degree of correspondence between expectations and achievements in agricultural planning. The large divergence between anticipations and actuals even at the national level. The degree of this divergence naturally increases with the derived calculations on the basis of smaller and smaller areas.

1 Ibid., p. 40
2 Ibid., p. 41.
Therefore, a Plan which attempts a coordinated and integral development of all sectors of the economy in all regions and locations must attain a high degree of specificity. It must not only attempt a full use of the potentials, but should also ensure a planned development of specific resources in each sector. There is thus a need for a high degree of correspondence between expectations and achievements, both in production resources Plans and area plans, if the developmental process is to move with reasonable smoothness. But this can happen only if the present approach may be reversed and the agricultural plans derived, in the main, through the building up and the putting together of plans originally framed locally rather than through a break-down of programmes and estimates made at the national level. The Planning Commission, while putting forward the Second Five Year Plan, evidently realised the limitations of the First Plan's approach and decided to modify it. The modification in the approach is indicated and marked by the following paragraph:

"Despite the uncertainties to which agriculture is necessarily subject, it is important that a more studied effort to introduce a planned approach to agricultural development should be made. The main elements in agricultural planning are:

i) Planning of land use;

ii) determination of targets, both long-run and short-term;

iii) linking up of development programmes and government assistance to production targets and the land use plan, including allocation of fertilizers, etc. according to plan; and;

iv) an appropriate price policy.

Each district and, in particular, each national extension and community development project area should have a carefully worked out agricultural plan. This should indicate for villages the targets to be aimed at, the broad distribution of land between different uses, and the programme of development. Within the framework of an overall price policy such as has been outlined in an earlier chapter, such local plans will be valuable steps leading to more careful planning for states and regions and for the country as a whole."

1 Second Five Year Plan, Govt. of India, Planning Commission, New Delhi, 1956, p. 216.
The Report of the Agricultural Production Team sponsored by the Ford Foundation, emphasized this aspect of agricultural planning by observing:

'Equally important, improvement programmes should be tailored to fit the condition faced by individual cultivators, village by village, block by block and area by area.'

The Agricultural Administrative Committee puts the matter more clearly:

'The Agricultural Department should evolve plans for increasing agricultural production in every village rather than for executing the targets of distribution of fertilizers and seeds and of executing the various land development schemes in the Second Five Year Plan. If integrated plans for increasing the production in a village are prepared and executed, the targets prescribed for the Second Five Year Plan will be taken care of automatically, and even if these targets are not achieved, it would not matter, so long as agricultural production in every village pushed up.'

Moreover, it is also to be noted that a national plan of economic development is much more than a summation of village plans; and no village plan would itself be possible without the general framework provided by a national plan. Planning is, therefore, called to two-way process. What is meant by this phrase is that whereas the overall objectives and policies, the degree of intensity of effort, and the manner of coordination of various activities would be determined for the country as a whole or for States the extent to which, and the manner in which, an effort in any given direction in a region or location will go, has to be determined for each specific situation. Therefore, while the estimates of what should be attempted in each specific situation has to be made in relation to the overall objective

1 Report on India's Food Crisis and Steps to Meet It, by the Agricultural Production Team, sponsored by the Ford Foundation Ministry of Food and Agriculture, Govt. of India, New Delhi, April, 1959, p. 18.

and directives, the actual targets set for the total effort can be determined only in relation to the totality of the estimates of possibilities assessed for particular situations. It is only by providing for such a mutual influencing process that a national plan that is realistic, meaningful, and detailed can be framed.

The two-way process in planning is important in all sectors; however, its need is particularly great in the Indian agricultural sector. Where government directly controls any activity, planning by government is mainly dependent upon the efficiency of governmental, administrative machinery. But the activities which are not directly controlled by government, their planning is dependent upon non-governmental units. Such units can be acted upon in a variety of ways by the government. They may be directed, they may be included, they may be encouraged or they may be discouraged. To the extent that the units in any area through their activity are well established and known, corresponding provisions and arrangements can be made in government policies and plans, and attainment of targets etc. thus determined may be possible without difficulty. In the sphere of agriculture, however, not only are the production units almost all non-government, but also mostly small and extremely numerous. Moreover, they are inevitably dispersed over the whole area of the country. In Indian agriculture the basic unit of production which is to be regarded an independent unit is by and large the family farm. Each family farmer conducts his business separately, and the ultimate results in terms of total agricultural production are the added results of the activities of million of family farmers all over the country. Therefore, planning for agriculture necessarily means planning to induce or influence this innumerable body of individual small producers to follow the decisions and undertake operations that are expected to yield desired results.
Hence in an important sense the success of a plan for increased agricultural production depends not so much on state action as on the actions of individual cultivators. State action in the main, creates possibilities of wider, more intensive or better use of land and other natural resources; realising these possibilities, in fact, is a matter mostly for action of individual cultivators in the particular areas.

As long as the agricultural producers in India remain as dispersed and unorganized as they are today agricultural planning would continue to suffer from a serious handicap. Therefore, the greatest need in agricultural planning is to organise agricultural producers under a co-ordinated and purposive system. This means that all farming units in the country should be made to operate under a multi-sided federal co-operative system. An early establishment of such a co-operative organisational structure is essential for rapid planned development of Indian agriculture. The change suggested above, is expected to bring about the following:

1) If goals of planning are to be attained without wastes and lags it is highly desirable to eliminate erratic and conflicting patterns of behaviour among producers and to attain some uniformity in their actions;

ii) so far as an area of economic activity is occupied by numerous small, weak and ill equipped units, a co-ordination of efforts of all these is necessary to give them economic and technical strength; and

iii) when activity in an entire economic field sought to be guided, it is highly useful to have this done through a relatively small number of organization of the units in the field.

We may also illustrate the possibilities latent in the said re-organization with reference to the details of its operations. In this connection, we might consider the case of sugarcane production and its utilization wherein considerable success has been achieved due to better co-ordination and organization between sugarcane growers and its users. This co-operative organization is vitally interested in
securing an adequate supply of sugarcane of good quality from its members. The organisation attempts to do all it can to ensure a rational spread of sugarcane cultivation and its efficient operation. It becomes profitable for the organisation to maintain a staff of agricultural officers, fieldmen, etc., to look after the farming of sugarcane by its members. The organisation is interested in insuring that cane is planted in time, insists upon the adoption of efficient plantation methods, helps members obtain ample credit and administer adequate dosages of manure and fertilizer, secures an adequate water-supply and its maintenance provides knowledge and equipment for protection against pests and diseases etc.

The problem of the organisation of undertaking agricultural planning from the bottom has two aspects. The first is that of organising cultivators so as to enable them to participate in planning enthusiastically. It is not generally realized that what has been attempted during the First Plan was the creation of condition in which the large mass of small and dispersed agricultural producers were able to participate actively in the development of agricultural sector as a whole. These conditions can only be created through the development of co-operation in agricultural sector.

By far the most important aspect of agricultural co-operatives and indeed of the entire scheme of rural development should, therefore, be the emphasis on increasing agricultural production. Energetic efforts must be made to extend the scope of production, develop a diversified economy by combining agriculture with other related pursuits, and practice strict economy to reduce costs of production. Co-operation should be promoted along the following lines in accordance with economic resources and local natural conditions to raise the level of agricultural production:
i) Building-up of irrigation works; conservation of water and soil;

ii) using improved farm tools to gradually bring about the mechanisation of agriculture;

iii) increasing the supply of manure and other fertilizers by all possible means and make better use of them;

iv) use of improved strains of crops;

v) suitable and systematic enlargement of the area under high-yield crops;

vi) improving the soil; level and terrace of arable land;

vii) rational use of all land and increase in area on which several crops a year are grown;

viii) improvement of farming methods; practice of deep ploughing and intensive cultivation;

ix) elimination and prevention of insects and pests, plant diseases and other natural calamities;

x) protection and breeding of more and better live-stock;

xi) reclamation of waste land and enlargement of the area under cultivation according to plan.

The second is the initiation of planning process itself at the lowest levels. There are two important aspects of this problem:¹

a) the size of the lowest planning unit,

b) the structure of planning authority.

The plans should be worked out by local areas in groups that may be passed on to the planning authority at the centre after their due screening and co-ordination by the regional authorities. The size of the lowest planning unit should be determined not on the basis of villages consisting of certain population but ordinarily, in the formation of these lower units, agricultural, economic and social homogeneity should be the governing principle. Planning should take an overall view of requirements in the light of the needs and resources of that particular area covered by this lowest planning unit. The

¹ Gadgil, D.R.: op. cit., p. 175.
development project of that area should take into account various needs of the area and assess carefully available resources. An objective that may be borne in mind while working out and implementing plans for these lowest units should be that the process of economic development should be embodied in mopping out financial investment of a given order, together with a programme of organized collective efforts in a particular direction. The planning officer should not merely be an agent for distributing or disbursing a certain amount of money allocated to that unit, but he should act as an agent responsible for ensuring smooth functioning of the programme. The objective of investment in the area of the unit should be to initiate certain processes of growth which may become cumulative and self-sustaining in the future.

Another objective that needs to be emphasised in these lowest planning units should be that the development of programme must place maximum stress on utilizing the available labour to the maximum. The programme to be taken in hand must, therefore, be labour-intensive. A great deal of under-employment and unemployment in the rural areas should be reduced progressively by better organisation of the production resources of the area concerned. The emphasis to be placed on different constitutes of this programme will differ and should be determined by the results of the surveys and details.

A change in the occupational pattern of the area is normally the ultimate objective of development planning. Therefore, vigorous efforts are needed to lighten the pressure of population on land as it is likely to improve the standard of living of the rural population.
Another important problem is the structure of planning authority. This structure should be such as to discourage the continuance of elements which are not functionally related to the activities that are being planned. It is because when this is prevented the door is closed to the entry of such political and social hostile elements who exercise for too unhealthy influence in rural population. If the persons who are not interested from a specific point of view discuss and take some decisions about certain activities connected with the plan, the extraneous element is introduced that usually an element of influence operates against purely economic objectives of the area plan.

The planning authority at the lowest level should, therefore, be composed of three elements. Firstly, an element representing the local self-government organisation of the area. This is necessary because it is the organisation that may provide, in the main, local socio-economic overheads which are essential for all planning-efforts. They will be responsible for the schools, the road system and, in due time, for the administration of town and country planning legislation, including rural housing. The second element should consist of representatives of the expert official technical personnel. The third element should be the representation of all types of co-operation and at all levels directly connected with the economic life of the particular area.

The planning authority of the lowest area should be concerned chiefly with the development of resources within the unit area and promote the efficiency of all economic units within that area. The main task should therefore, be to adjust in meaningful plan for the area the operations of the various economic agencies and units as well the activities of official and the local self-government
authorities. The operation and plan for each village, or for each
dependent unit, or agent will be derived from this total plan.

The organisation of agricultural sector in order to bring
about agrarian reforms appears most important and the following
suggestions may also be worthwhile.

i) The Land Reform programme should be carried out speedily
so as to create conditions necessary for a rapid develop-
ment of the agriculture.

ii) The dispersed and unorganised agricultural producers
should be organised in such a way that they and their
organisation may get vitally interested in the achieve-
ment of the planning objectives and the reorganized
system may induce them to act enthusiastically and
purposively.

iii) An early implementation of proposals relating to co-
operation is imperative. The building-up of strong
multi-purpose, co-operatives should be an important
condition for the successful implementation of the
agricultural production programme. In the National
Extension Services and Community Development Blocks,
co-operation should be given the central place. A
major test of progress in the N.E.S. and C.D.Blocks,
should be the achievement in the development of genuine
co-operatives through voluntary participation of
agricultural producers.

iv) Every co-operative must promote the learning and use of
the most efficient farming methods that will lead to
increase output.

v) The co-operative must strive in accordance with the state
plan and local conditions to increase the output of the
principal crops such as foodgrains and cotton, and at the
same time promote the cultivation of such other industrial
crops as sugarcane, tea, tobacco and fruit etc.

vi) Wherever necessary and possible, the co-operative should
actively develop forestry, animal husbandry, fishing
handicrafts, transport, poultry farming and other
subsidiary occupations.

vii) The co-operative should draw up a general production plan
in order to organize production on systematic lines such as
drawing up a long-term plan covering a period of three or
more years and giving full consideration to various productive
and constructive tasks that it will propose to undertake
during this period.
viii) Before the beginning of the farming year, the co-operative should draw up its annual production plan under the following main heads:

a) Sowing plans, output targets, and necessary technical measures needed for ensuring fulfilment of these plans;

b) plans for forestry, animal husbandry fishing and other subsidiary occupations;

c) capital construction plans; and

d) plans for employing all available man-power and draught animals.

ix) To ensure fulfilment of the annual production plan, the co-operative shall draw up schemes for the progress of work in various farming seasons and stages of work, set-up definite production tasks and definite dates for their completion.

To conclude finally, we might say that land reforms undertaken in India did, no doubt, broadened the ownership of land but they did not increase the efficiency of agricultural production because alternative arrangements proved to be inadequate and unsatisfactory. This sort of land reform policy may have had some social and political advantages but economically it neither proved to be cost-reducing nor output-increasing. There is no indication that the aggregate farm product supply schedule moved to the right as a result of the implementation of the zamindari abolition schemes in various states. However, land reforms were useful in providing a new social order but they failed to provide a forward-looking framework of co-operative or collective endeavour in Indian agriculture. In fact, the abolition of zamindari should have been followed up by some kind of co-operative organisation so that agriculturists could have seen for themselves the
advantages inherent in any organised co-operative effort. The absence of such organisation was perhaps due to Government's inability to undertake the responsibility of 'taming' the independent and often recalcitrant cultivator. It is also likely that Indian planners might have formed an unfavourable opinion about the efforts made in other countries to introduce co-operation or collectivization on compulsory basis and consequently refrained from any such recommendation in case of India. However, the upshot of the present discussion is that land reform policy adopted during the First Plan did not lead directly any basic improvement in agricultural productivity or output.
ECONOMIC AND FINANCIAL INCENTIVES FOR THE ADOPTION OF IMPROVED TECHNIQUES

It is customarily beyond a large number of farmers to adopt better techniques unless suitable economic and financial incentives are provided to them. Adequate incentives and disincentives are needed to induce the farmers to utilize improved techniques of production in the desired manner and also for the production of the desired crops. The broad test is, therefore, the extent to which they promote economic development in conformity with the considerations by increasing the amount of capital available and utilization of labour and promoting qualitative improvements by changing attitudes, encouraging the use of better techniques and promoting better organisation and more effective leadership in rural areas.

An important incentive in this regard would be to bring about an improvement in the marketing of agricultural products. In spite of some efforts, various mal-practices have persisted during the First Plan period to vitiate the organisation of an efficient marketing system. The effect of these mal-practices is particularly aggravated by the fact that the majority of cultivators in the country are indebted to the village traders who are generally the money lenders. The adoption of Co-operative Marketing remained a comparatively neglected subject and made little headway during the First Plan period. The case of co-operative marketing does not rest merely upon the negative ground that it will assist in the removal of various mal-practices. In fact it is a positive bid which, if efficiently carried out, will help to reduce the price spread between the producers and the consumers and thereby ensure a better return to the agricultural producers. The various marketing functions such as assembly, storage, financing, insuring, standardising, sale and transportation should be
performed by co-operative marketing societies instead of by a large number of middlemen. Therefore, the agricultural producers will benefit directly through the economies of the operation. The First Plan did emphasise the need to develop co-operative marketing on a country-wide basis. But surprisingly no specific targets in this regard were laid down and no planned effort to strengthen or expand co-operative marketing was undertaken.

It is curiously obvious that no detailed reference was made in the First Plan to the marketed surplus in agriculture or to measures of obtaining control over it. While, in relation to the cultivators, plan should be concerned with increasing agricultural production as a whole, but in relation to the non-agricultural sector, the plan emphasises the importance of the volume of the marketed surplus of food articles and of industrial raw materials. Although any planning of exports of agricultural produce, or the production of industrial goods through transformation of raw materials produced in the country, or planning of supply of foodgrains to feed the urban population and keep down inflationary potential, depends on the ability to estimate correctly the marketable surplus and to obtain control over its flow. From this point of view a necessary requirement of our planning would be that the marketing and processing of agricultural produce should be suitably organised on co-operative basis. The situation pertaining to the stock and flow of agricultural produce in the country can be viewed better from the vantage point provided by a national agency for the co-operative marketing of agricultural produce.

It is perhaps not necessary to argue in favour of the creation of a co-operative marketing because there appears to have been a general agreement about this matter in recent times. The Ford Foundation Team emphasized the need for seed supply and distribution of fertilizers to be placed with co-operatives, and for general transfer of responsibility
of supply-lines to the co-operative department from the agricultural department; the last recommendation was also made independently by the Agricultural Administrative Committee. In relation to processing, the Ford Foundation Team states:

'The greatest need today is for more co-operatively owned paddy-hulling and rice mills in major rice producing areas.'

The team also suggested that strength could be given to marketing and supply co-operatives by using them as agencies for price stabilization. The marketing arrangements and service, preferably co-operative, will thus enable cultivators to obtain the full market price for their marketed surplus. The organisation and operation of co-operative processing should therefore, be rapidly expanded in order to strengthen the infra structure of Indian agriculture as a whole.

Measures designed to attain a rise in agricultural productivity and output will not fructify unless the producer is assured with a remunerative minimum prices for his products. The First Plan stressed the need for the maintenance of a structure of prices to bring about allocation of resources in conformity with the targets in the agricultural sector. A price policy that aimed at the maintenance of integrated structure of relative prices between food crops and other crops, was considered to be a pre-eminent factor. As regards foodgrains prices, the Plan emphasized that:

'.. The problem is to define a level which may be considered reasonable under given circumstances, and to ensure through direct controls or through fiscal and other devices that the producer of foodgrains is not placed at an undue disadvantage. A policy of price stabilization must have in view certain maxima as well as certain minima. At a time when the economy

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1 Report on India' Food Crisis and Steps to Meet It, op.cit., p. 39.
is subject to inflationary pressures, the emphasis is inevitably on the maintenance of the maxima. But if the trend of the prices is persistently downward, a system of the controls with defined procurement prices can be used and indeed should be used - to safeguard the interests of producers by preventing prices from falling unduly. Judicious purchases by Government at defined prices are thus in excellent device for stabilizing prices and for evening out to some extent inter-state disparities.'

But the actual experience during the First Plan was that the prices were neither stable nor in the desired directions. During this period, the prices touched peak on the one hand and they reached the bottom on the other. The indices of all the groups constituting Economic Adviser’s Index Number of Whole Sale Prices, thus showed variations in either directions. The fluctuations in the 'Food Articles' and 'Industrial Raw Materials' groups were larger than those in the 'Manufacturing' groups and S.R. Sen rightly concluded that:

'.. ther- was almost a complete swing of the pendulum from one extreme to the other and then back in the case of most of agricultural commodities.'

The inability to maintain close correspondence between the prices of foodgrains on the one hand and the prices of industrial raw material on the other was due basically to the ad hoc nature of measures adopted during the First Plan period. In fact these measures consisted of more or less administrative improvisations intended to meet particular problems regarding individual commodities as they developed from time to time. Instead of the adoption of a comprehensive and clear-cut price policy as recommended in the First Plan, it was thought possible to weave these ad hoc measures into a concerted programme of action covering all important commodities. This led to serious complications and ultimate result was disastrous. Moreover, the price policy during the First Plan period was of a limited range in the sense that

1 The First Five Year Plan, op.cit., p. 180.
no detailed measures were framed, it was limited only to certain foodgrains and commercial crops, certain areas and certain operations. There was no designated and whole-time authority charged with the specific responsibility of keeping a constant and close watch on the price situation in all its inter-related aspects, to study continuously the behaviour of the economic indicators. In all their technical and administrative significance and to suggest appropriate corrective action as and when necessary. There was also no proper and effective action for the purchase and sale of agricultural commodities whenever the situation demanded so. The measures recommended in the First Plan were thus not implemented in any comprehensive or effective way.

1 The First requisite is obviously to have a machinery for a correct prognosis of the trend of prices and a timely diagnosis of the disturbing factors in the economy. For this purpose, it is necessary to keep a continuous watch over the behaviour of a member of key indicators affecting the price situation. In this connection, the following indicators recommended by the FAO — ECAFE centre on Policies to support and stabilize Agriculture Prices in Asia and Far East deserve consideration:
(a) retail, wholesale and farm price of important commodities;
(b) moving averages of wholesale prices on about a 5 year basis;
(c) cost of living and general indices of retail, wholesale and farm prices,
(d) ratio of indices of prices of important raw material and their manufacture;
(e) ratio of indices of prices of important competing crops;
(f) prices of main imported or exported commodities in international market;
(g) indices of cost of production, or of important input/output items and relationships between them;
(h) indices of prices received and paid by farmers, and their ratios;
(i) estimates of the frequency distribution of production costs;
(j) indices of rural and urban wages and wage rates; and
(k) information regarding changes in the food weight in family expenditure and regarding the elasticities of demand and supply for important crops.

One of the most important objectives of a sound price policy should be the need of avoidance or control of the tendency to steep rise in prices which are associated with acceleration of the pace of investment and significantly, with only a slow rise in national income. A great rise in prices of agricultural commodities than in the non-agricultural prices is always disadvantageous to the development of an economy. The latter feature of price increase that has its basis in sectoral price behaviour may be summed-up in a few generalizations and they are described as follows:

'The first is that as the imbalance between supply and demand, namely price inflation, emerges, the imbalance in the agricultural sector turns out to be larger than that in the non-agricultural sector, so that agricultural prices, generally, rise faster than non-agricultural prices. In inflationary times, therefore, the terms of trade are generally in the favour of the agricultural sector and in deflationary times generally against it.

A second generalization is that the distribution of national income has tendency to become favourable to that sector in whose favour the terms of trade have moved for the time being. It flows that in times of inflation, either agricultural incomes or the normally expected increase in the production of non-agricultural incomes which accompanies industrialization falls to materialize.

A third generalization is that every increase in agricultural income relative to non-agricultural income reduce the average propensity to save and hence serves as a break on saving.

And finally, there is the generalization that when terms of trade turn in favour of agriculture, marketed surplus of agricultural produce, among some categories of farmers, if not among all, declines, thus sharpening the movement of terms of trade and giving a further fillip to inflation. 1

A sharp uptrend in prices is liable to interfere seriously with the successful implementation of the programme of planned development. It directly inflates the money costs of the Plan projects and involves a setting up of the Plan in financial terms with defeating consequences for its real targets which get eroded in the very process. It distorts,

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1 Khursro, A.M: Inter-Sectoral Terms of Trade and Price Policy, the Economic Weekly, Annual Number, February 1961, p. 289.
besides, the investment pattern as income and price relationship alter. It sweeps away exports and gives a fillip to home consumption. In some ways, the most serious consequence of this phenomenon is the direct acceleration of economic inequility, as a rise in prices inflates profits and impairs the real value of wages and other small fixed incomes. Thus this rise tends to affect the economy in two ways. In the first place, it creates partial imbalance in the various sectors of the economy through investment activities in the initial stages and secondly it develops shortage of essential consumer's goods and of requisite basic materials. This evidently affects the process of economic development. The planning of agricultural sector in our First Plan has not been an exception to it and has suffered inadequacies due to the neglect of these vital factors that operate on an inter-sectoral basis.

This urgently points to the need to encourage a specific and definite price policy to cope with the developing pressures caused by the shortage and rising prices of consumer goods. It must remain the prime objective of policy, therefore, to maintain reasonable stability, in the general level of prices as economic development proceeds. While this is then the most general objective of price policy, it is also a most difficult one for any policy directly concerned with regulation of prices as such. By the very fact it being an general and comprehensive objective, the investments required to achieve it encompass the whole range of techniques of policy including fiscal policy, monetary policy, policies for control of expenditure on consumption investment in the public and private sectors alike, policies bearing on control of foreign trade over and above direct physical control and allocations of products and materials for regulation of prices. It is, however, not required to deal with the whole range of these various policies which are directed to the achievement and maintenance of price stability in general during
the process of economic development. Viewed in this context, the First Plan failed to yield an integrated price policy with the result that agricultural sector continued to operate under conditions not very stable.

The problem of prices of agricultural commodities differ in several respects from those of manufactured articles. The most important difference derives from the fluctuations in their output as a result of swings of agricultural fortune and the frowns of nature. This places the problem of agricultural commodities in a class by themselves. The problem varies for different commodities, however, according to the extent to which:

(a) a commodity is primarily home produced and consumed, or exported and imported e.g., rice, oilseeds, wheat;

(b) it is commodity to final consumption or a raw material of industry, e.g., foodgrains or fibres;

(c) its output is peculiarly variable with the state of agricultural seasons or rainfall, e.g. millets;

(d) its production is a principal or subsidiary crop over significant areas of its production e.g., pulses;

(e) it is substitutable in cultivation against other crops with changes in prices (e.g., wheat and oilseeds, rice and jute, groundnuts and cotton etc.) Finally, the importance of a commodity in the budgets of the average household and, therefore, in the general economy is relevant for determining the order of priorities in including commodities with the scope of price policy, if this scope is to be progressively extended over a wider area. Taking all the considerations into account, unquestionably the most important field for exercise of price policy, under our conditions, is that relating to foodgrains.1

The objective of price policy in relation to foodgrains may be described as the maintenance of reasonably stable prices consistently with the trend of the general price level which ensure a fair return

1 Madan, B.K., Some aspects of the Problem of Price Policy For Economic Development, Changing India, Essays in Honour of Professor Dr. Gadgil Edited by N.V. Sovani and V.M. Dandekar, Asia Publishing House, Bombay, pp. 171-72.
to the agricultural producer and safeguard his incentive to increase output. The return to the producer and the charge to the consumer are alike liable to be affected to their disadvantage owing to inflation in the middleman's margin with large and undue fluctuations in prices

i) from one year to another, with changes in marketed surpluses;

ii) from one season to another, owing to inadequate power to the producer or inefficient marketing and processing or ineffective organisation of the consumer; and

iii) from one region to another, owing to poor transport facilities as well as zonal arrangements and restriction on transport.

The Foodgrains Enquiry Committee (1957) which went into the question of instability of foodgrains prices in considerable detail had recommended the setting up of (i) a Price Stabilization Board with a price Intelligence Division attached to it, and (ii) a Foodgrains Stabilization Organisation and emphasized the need for (iii) progressive socialization of the wholesale trade in foodgrains. The Board's function was to maintain a reasonably stable price structure by ensuring better coordination of the various measures bearing on the prices of foodgrains and other related commodities. The Committee recommended as follows:

"... The Price Stabilization Board may keep a careful watch over the price situation and recommended necessary action from time to time for maintaining not only the general price level reasonably stable but also for purchasing undue disparities between the price trends of various commodities."

The Committee had also recommended that the Price Stabilization Board should have at its disposal not only relevant statistics but also related intelligence. For this purpose, they recommended the setting up of a Price Intelligence Division. This division was required to prepare a number of economic indicators, keep a close watch over them

1 Report Foodgrains Enquiry Committee, 1957, p. 84.
so that it was possible to know from the way that pressure points
developed in the economy, as to what was the real source of trouble,
what was the real impact of it and its likely significance in the future.
The Food Stabilization Organisation was intended to be a separate
organisation under the Ministry of Food and Agriculture of the specific
function of foodgrains and maintenance of stocks. The most important
work which this organisation was required to take up was the operation
of buffer stocks which was one of the most important counterwailing
measures recommended in the Second Plan. The Plan reiterates the
importance of a stable price structure and lays special emphasis on
the need for maintaining parity between the prices of food and non-food
crops and it explains as follows:

'... there must be a reasonable relationship between the prices
obtained by the grower for alternative crops, and the price
incentives should work in the direction of encouraging a pattern
of crop production which accords with the requirements of the
Plan.'

It may however, be noted that such vital suggestions were being
made so late almost after one year of the expiry of the First Plan.
The criticism of the agricultural policy by the Committee indicates
that though agriculture received priority in the matter of the allocation
of Funds in the First Plan but failed to obtain detailed expert opinion
and advice regarding its basic reorganisation in the wake of general
national Economic Development.

To mitigate sharp fluctuations in prices, the Plan recommended
measures such as maintenance of buffer stock of foodgrains, timely
announcement of export or import quotas, regulation of forward market
operation and other financial and credit control measures. Strictly
speaking, these were counterwailing measures which were quite important
in their own way, but were far from being automatic corrections in a
situation where distortions and imbalances were more than likely to
occur.

1 The Second Five Year Plan, p. 40.
In a planned economy, state trading has a vital role to play. This is important in international trade as well as in domestic trade. The Committee also emphasized the social control over the wholesale trade and recommended as follows:

'... until there is social control over the wholesale trade we shall not be in a position to bring about stabilization of foodgrains prices. Our policy should, therefore, be that of progressive and planned socialization of the wholesale trade in the Foodgrains.'

Thus, on the one hand, it was necessary to ensure that the level of prices should provide adequate incentive to the producer to expand agricultural production and should not only minimize the risk of loss for the producer but also provide him with adequate incentives to expand production. On the other hand, it was necessary to protect the interest of the consumer and also to maintain a reasonable cost-structure in the economy so as to facilitate the realization of the planned pattern of development. Concrete action was, therefore, needed to ensure the stabilization of agricultural prices at appropriate levels. It is evident that price policy needed to be formulated on the basis of the following lines:

1) to prevent sharp fluctuations in the general level of prices through a balanced and suitably phased pattern of investment and appropriate monetary and financial policies.

ii) To ensure that the prices of agricultural commodities do not fluctuate beyond certain reasonable limits and inter-alia;

(a) to maintain reasonable relationship between the prices of agricultural commodities and those of manufactured goods with a view to ensuring that the terms of trade between these two important sectors of the economy do not change too sharply.

(b) to maintain appropriate relationship between the prices of competing crops in the agricultural sector necessary for filling the targets of the Plan.

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1 Report Foodgrains Enquiry Committee, op. cit., p. 86.
(c) to reduce to the minimum fluctuations in prices from reason to reason and from year to year, And also

iii) to ensure that there is a constant urge for improving the efficiency and reducing the costs and prices of industrial enterprises.

In an economy which is aiming at rapid economic development, it will be neither possible nor desirable to keep prices pegged at a pre-determined level. Gradually rising prices are in fact conducive within certain limits to investment and may be, to some extent, acceptable in a developing economy. So long as the rise in prices is very gradual and remains well in step with changes in wages and costs. But great care should be constantly exercised so that the rise in prices in any particular year should not become unduly large or should not get out of control throwing away the whole economy completely out of circle.

In the light of the above, it cannot be gainsaid that the agricultural price policy during the First Plan formulated neither on the basis of full knowledge of the facts of the situation nor had a clear view of the developments in future. The inadequacy of the price policy during the First Plan is not fully realized because an element of good luck in the shape of good harvests that in some cases resulted in the over-fulfilment of plan targets impressed both the planners and the public. In fact, during the plan period prices of some important agricultural commodities tended to fluctuate in a very wide range. Such price fluctuations ordinarily induce not very wholesome change either in the expectations of the cultivators or in the size of the product.

An efficient system of agricultural credit is necessary if agriculture is to make its contribution to economic development. Agricultural credit must lead to a cumulative increase in agricultural productive power. Therefore, the conversion of static credit into
dynamic credit should be the primary objective of the agricultural credit policy in India. The static credit means that after paying interest and repaying debt, the assets of the farmer and his capacity to produce do not allow him to increase the level of consumption and the family, thus, remains economically bogged down to its previous level. Whereas the dynamic credit means the utilization of agricultural credit in such a way as to promote a cumulative increase in the agricultural output. In other words:

Credit will only be dynamic when it may be confined to those farmers who have actual or potential capacity to produce beyond the amount needed to sustain the marginal levels of consumption required for health, efficiency, meet changes and repay the loans.

Therefore,

'Our general problem is to convert static into dynamic credit, by which is meant that at the end of the credit period there is an improvement in output and income, or in assets.'

The quantitative change is not only sufficient to achieve the said objective though it is usually a necessary, but not, a condition. Therefore, we should place considerable stress on the qualitative aspects and qualitative effects of agricultural credit. For this purpose, credit must be so designed as to give a strong positive inducement to improvements in farm techniques, institutions and organisations, and to change the attitudes of the agricultural producers. Its significance in relation to farm operations is clear enough in so far as it provides the necessary finance for improved cultural practices. It should also provide the finance for institutional changes such as land reform and

2 Ibid., p. 47.
3 Ibid., p. 230.
consolidation and improvements in organisation; for example, in marketing and processing. The Second Plan states:

'In the nature of the things, as a result of land reform the number of small cultivators increases, those with large holdings or considerable surpluses disappear and the new owners need a great deal of credit.'

The failure of agricultural credit arises from the characteristics of supply as well as of demand. The conversion of static into dynamic credit requires an increase in the amount available, reduction in the cost of credit and adjustment of credit terms to suit the conveniences and repayment capacity of farmer; and, in addition, assistance in applying new techniques and improving farm management.

Within the framework determined by many considerations and overall development programmes, there are certain desiderata which the Indian agricultural credit system should aim to satisfy. These may briefly be stated as follows:

1 - Credit should be equally available on comparable terms in different areas and for different classes of borrowers.

2 - The cost of credit should be as cheap as practicable. This involves the promotion of an efficient organisation which avoids unnecessary costs and reduces unavoidable costs by the organisation of the supply of finance and the management of credit institutions.

3 - Risk should be reduced, as far as practicable, to the borrower, to the institution and the lender, while aiming at types of security which safeguard the institution and the lender, but which are suited to the conditions of peasants enterprises.

4 - The timing of loans, amount, conditions of repayment and other terms should be suited to the convenience of

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1 The Second Five Year Plan, p. 233.
the borrower and not lead to social embarrassment.

These demand a certain flexibility in conditions and a sympathetic attitude.

5 - The equity of the farmer must be conserved in so far as this is consistent with the security of the lending institution and of the investor. This implies that in the event of foreclosure or assuming possession of assets held as security, the borrower should be entitled to the proceeds in excess of the amount secured, and the lending institution should exercise due care in the disposal of the assets, not being content merely with covering the amount due.

Credit will run to waste, or its contribution will be limited unless it is supported within the rural sector by other measures as well as by the growth of other sectors of the economy. Agricultural credit, should, thus, not be considered in isolation but as a part of an integrated process of economic development and social betterment in India.

In some advanced countries, an important feature of this kind of structural transformation of agricultural credit has been the change in kind and quantity of capital used in farming. Two important and inter-related aspects of structural change have had a dominant influence on changes in aggregate kinds and quantities of capital used. These are as follows:

i) the substitution of non-farm inputs for both farm labour and farm land; and

ii) the marked decrease in number and increase in size of farms.

These two major economic forces are also basic to an understanding of the changes that have occurred in aggregate kinds and quantities of capital used in agriculture. The rising price of labour relative together
input, together with the general availability of non-farm employment opportunities, has influenced greatly the composition of agricultural and the use of capital in farming. The farmers also had strong economic incentives to adopt improved production practices and lower unit costs of production throughout most of the years between 1940 and 1959. The incentives were effective primarily because of a continuing reserve of unused technology and favourable price relationships.¹

For instance, in U.S.A., the value of productive assets used in farming has increased substantially since 1940. Farm real estate dominated the capital picture, accounting 65 per cent or more of the value of all assets during each of the periods. But the value of machines and motor vehicles rose more percentage wise than did the value of real estate during the two decades. Investment in machines and motor vehicles accounted for 10 per cent of the value of all productive assets in 1959, compared with less than 7 per cent in 1940-42.² Changes in the volume and composition of the stocks of productive assets on farms have been closely inter-related with the marked change in the input-structure of agriculture. Farm real estate dominated the assets structure of agriculture from 1940 to 1959, accounting for about two-thirds of the stocks of all production assets. However, when real estate inputs are considered in relation to all inputs, real estate becomes a relatively minor factor. Real estate input - chiefly the constant - dollar value of interest on investment in real estate and depreciation and repairs of service buildings - accounted for approximately 15 per cent of total inputs throughout the period since 1940.³

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² Ibid., p. 104 and see table 6.1 on p. 105.
³ Ibid., p. 108.
Whereas farm real estate dominated the stocks of productive assets, farm labour dominated the input structure of agriculture. In contrast of real estate, however, the relative importance of farm labour decreased substantially during these two decades. In 1940 farm labour made up more than half (56 per cent) of total inputs. By 1958 the proportion had declined to 30 per cent.

The data in the following table indicate a major feature of structural change in agriculture—the substitution of non-farm inputs for both farm labour and farm land. Inputs of farm labour decreased by almost half since 1940. The absolute volume of real estate inputs showed a moderate increase in contrast to a near doubling in volume in inputs other than labour and real estate.

**TABLE 92.**

INPUTS USED IN AGRICULTURE, UNITED STATES, SPECIFIED PERIOD 1940-59.

<table>
<thead>
<tr>
<th>Period</th>
<th>Farm Real estate</th>
<th>Power and machinery</th>
<th>Food, seed</th>
<th>Fertiliser</th>
<th>Miscellaneous</th>
<th>Total farm and state</th>
<th>Total real estate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1940-42</td>
<td>100</td>
<td>99</td>
<td>106</td>
<td>110</td>
<td>101</td>
<td>105</td>
<td>101</td>
</tr>
<tr>
<td>1944-46</td>
<td>93</td>
<td>96</td>
<td>129</td>
<td>152</td>
<td>170</td>
<td>101</td>
<td>124</td>
</tr>
<tr>
<td>1947-49</td>
<td>82</td>
<td>102</td>
<td>172</td>
<td>159</td>
<td>208</td>
<td>107</td>
<td>143</td>
</tr>
<tr>
<td>1950-52</td>
<td>73</td>
<td>106</td>
<td>217</td>
<td>172</td>
<td>266</td>
<td>119</td>
<td>169</td>
</tr>
<tr>
<td>1953-55</td>
<td>65</td>
<td>108</td>
<td>233</td>
<td>184</td>
<td>313</td>
<td>126</td>
<td>180</td>
</tr>
<tr>
<td>1956-58</td>
<td>56</td>
<td>107</td>
<td>237</td>
<td>211</td>
<td>338</td>
<td>134</td>
<td>192</td>
</tr>
<tr>
<td>1959</td>
<td>54</td>
<td>d</td>
<td>d</td>
<td>d</td>
<td>d</td>
<td>d</td>
<td>d</td>
</tr>
</tbody>
</table>

a. 1947-49 price weights were used in combining inputs. The concept of flow of resource services is used in calculating the inputs measures; this contrasts with the 'Stock' concept used in measuring value and volume of productive assets.

b. The index of inputs of real estate differs from the index of capital stock of real. The two measures differ in concept and also in other respects.

c. Excludes value of inter-farm transactions.

d. Not available.
Changes in stocks of productive assets and in inputs used in agriculture can be contrasted in another important respect. Stocks of all productive assets increased 25 per cent from 1940 to 1959, but the decline in labour inputs largely offset the increase in non-real estate capital and other non-farm inputs, thus resulting in little change in total input over the period.

The above reference to the experience of U.S.A. with regard to the increase in the agricultural efficiency of that country is deliberate because the future reorganisation of Indian agriculture will face similar problems. If the new pattern of industrial development in our country is being shaped on the lines of industrially developed countries, then there is no reason why our agriculture should not aim at the attainment of efficiency levels obtaining in the advanced countries. Introduction of new techniques in our agriculture and the provision of effective incentives for our cultivators is an urgent necessity. Agricultural planning in India must per force involve an expeditious resource readjustment concomitant with improved technology to bring about significant changes in the productivity of assets and inputs used in agriculture. It appears that in India the volume of productive assets used in agriculture are unlikely to increase by a larger proportion and similarly the possibility of a substantial increase in the total quantity of inputs is limited. Therefore, it is incumbent on our planners to devise ways and means that would lead to an increase in the average productivity of total assets and inputs used at present in agriculture in the shortest possible period. It is however, regrettable that this aspect of the developmental problem of Indian agriculture was completely neglected during the First Plan period.

The growing importance of non-farm inputs in agricultural production and their impact on the capital structure and productivity of agriculture is also important. In case of India, a rapid substitution of capital and
non-farm inputs or purely farm services; though a distant possibility should, however, be constantly kept in mind. It is not too much to expect that farmers are likely to respond to some powerful economic incentives in substituting capital and non-farm inputs for farm labour. The economic pull, plus the existence of non-farm employment opportunities due to planned development in the country will result in a migration of workers from farm to non-farm jobs. An important corollary development would be a sharp rise in farm wage rates to a higher level which will augment the general efficiency of Indian agriculture.

Again in advanced countries, the technological revolution in agriculture is rapidly transforming it into one of the higher capital rising industries. Changes in production per man-hour serve as an index of this change in technology and the substitution of capital for labour. In some cases production per man-hour has increased 90 per cent in the last ten years or 6 per cent per annum. This increase in production per worker has had and will continue to have a tremendous effect on farm size and capital requirements. Ordinarily, past changes in scale and efficiency in farming have occurred without any increase in the use of hired labour.

For example, farms operated by family labourer have maintained their dominant position in U.S. agriculture. The tendency for the size of farm to continue to rely primarily on the labour of the farm family is explained partly by the willingness of the farm families to accept lower earnings on labour and capital than the earnings received in other sectors of the economy where larger business prevail. Adjustments in the levels of farm and non-farm earnings obviously represent a long-term rather than a short-term prospect. However, in case of India such a rise in the rates of return in farming to levels comparable to those in either sectors might
in turn provide a more direct test of the prevalent and comforting hypothesis that almost regardless of type of farming, there are no significant economies of scale in agriculture beyond a certain size limit.

The increased capital requirements and the associated technological developments place a premium on sound management decisions in agriculture. As a result, Land Mortgage banks, Block Development authorities and other credit agencies in India must turn to more direct participation in the farm planning and in the major management decisions of farming. So far they have given more attention to security and less attention to the purposes of the loans and to economic prospects for repayment. These conditions represent a shift away from improved management by the farmer who obtains credit.

The persistence of labour returns in agriculture at lower level than elsewhere provides several prepositions of relevance in explaining the differences. This under-employment of labour in agriculture, a chief cause of downward drag in average incomes would not exist in full-employment economy where capital and knowledge supply served effectively to transfer and reallocate labour of farms to other sectors. It is, therefore, more than likely that demand for labour from the non-farm sector and supply from the farm sector would balance to give employment of agricultural labour which lifts returns in farming to the non-farm level.

Three conditions of inter-industry allocative patterns under economic growth can be postulated: In the first, wants for any product

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are far under the satiation level, and income elasticities of demand are equal for all commodities. With equal growth in supplies and productivity of resources, the relative allocation of resources would remain unchanged among industries. Resources employment in each sector would grow by the same proportion. Each sector would tend to retain in the short period the historic proportion in national product and resource shares. Each sector could, in fact, absorb exactly the capital accumulation and population growth within it, supposing comparable inter-sector rates of saving and birth. If labour resources were like those of capital, without personal preference or utility attaching to different occupations, inter-sector exchange would be needed only in commodities and not in factors. Economic growth could be just as rapid under edicts preventing capital or labour arising in one sector from transferring to another, as where freedom of markets and resource flows are allowed and occur. The biological and psychological nature of consumers prevents this constancy of sector shares over time and under economic growth.

In India, we find that wants for agricultural and non-agricultural commodities are far from the level of satiety. Any increase in income does not lead to proportionate change in the demand for all these commodities. During the period of the First Five Year Plan the experience is that greater proportion of increased income was spent on foodgrains. There was not even equal growth in supplies and productivity of resources employed in agricultural and non-agricultural sectors nor the relative allocation of resources was the same in both sectors. The bulk of the resources in India is employed in agriculture and its supply is obtained from the agricultural sector itself. This may be contrasted with the
relatively small percentage of resources employed in agricultural sector in advanced countries. In the United States, national wealth based on property data is 1922 was 321 billion dollars of which agricultural land excluding improvements represented 41.5 billion dollars, or about one-eighth of total. Gross investment in agriculture which was about 9 per cent of total investment in 1919-23, declined to nearly 5 per cent in 1924-28 and 1929-33, and increased to roughly 7 per cent in 1934-38. The share of income produced by agriculture amounted to 17.3 per cent of total income in 1920 and 12.9 per cent in 1938. Income from agriculture as percentage of income from all industries stood at 17.4 per cent in 1919, 8.8 in 1939 and 8.4 in 1949. In India the share of agricultural net product amounted is roughly 50 per cent of total net product. It is not possible to infer the percentage of resources employed in agriculture and other sectors of the economy from the output data directly since the capital-output ratio tend to vary in the two major sectors of the Indian economy.

Therefore, a major task of Indian planners should be to break the relatively rigid historic proportion of the contribution of the agricultural sector to the total national product and resource shares. A balance rate of growth does not necessarily imply the maintenance of the given proportions sometimes termed as the desired proportion of fixation of physical targets of each sectors contribution to the total national product. It is true that the Indian planning envisages continual increase in agricultural output but fails to provide detailed information.

regarding separate net sectors namely agricultural and industrial at different levels of employment.

Under the second condition, one encompassing most nations over the world, growth takes place in all major sectors, but at unequal rates. Preferences of consumers approach a satiation limit and marginal utility declines for particular goods. New consumer goods are developed and income elasticities of demand take on varying magnitudes. With income elasticities greater than zero but having differential magnitudes for all sectors, a relative change in resource allocation necessarily takes place even all sectors grow in magnitude of product and total resources employed. Resources are drawn from sectors with lowest income elasticities to those with highest elasticities, although some additions to capital and labour remain in the former. Relative shares of particular sectors then change, in respect to both income and resources employed. If the transfers came from the additions to capital stock and labour force within sectors where demand for product grows less rapidly than supply of resources, the costs and difficulties of transfer could be small under certain conditions. With transfer coming from growth generated additions to resource supplies, resources previously specialized to the particular sector could remain so, and with some growth rate, realize returns comparable to those of sectors, expanding at greater relative rate even while the sector is absorbing more resources. Comparable factor returns could still prevail even if the sector of declining relative share has rates of capital accumulation, birth and technological improvement greater than those of sectors increasing in relative share because of changing consumer expenditure patterns and high income elasticities under income growth; providing, of course, that markets are sufficiently alert in sectoral reflection of demand and prices for
factors and major shifts come from resources added to total supplies.

In India the economic growth is taking place at different rates in the principal sectors of the economy. During the First Plan, production in agricultural sector increased by about 22 per cent while the increase in the industrial sector was in the neighbourhood of 39 per cent.\(^1\) The primary idea was to initiate efforts to push the demand for agricultural and non-agricultural commodities to want satiation level and to cause diminution of the marginal utility of certain goods. Income elasticities for all commodities were greater than zero but not equal i.e., the demand for all commodities were different. The following table gives the derived income elasticities of demand for different consumption goods.

**TABLE 93**

**DERIVED INCOME ELASTICITIES OF DEMAND FOR FOODGRAINS, EDIBLE OILS, COTTON CLOTH AND TOBACCO FROM NATIONAL SAMPLE SURVEY**

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foodgrains</td>
<td>0.52</td>
<td>0.28</td>
</tr>
<tr>
<td>Major cereals</td>
<td>0.55</td>
<td>0.12</td>
</tr>
<tr>
<td>Minor cereals</td>
<td>(-)0.83</td>
<td>(-)1.32</td>
</tr>
<tr>
<td>Pulses</td>
<td>0.62</td>
<td>0.45</td>
</tr>
<tr>
<td>Edible oils</td>
<td>0.89</td>
<td>0.78</td>
</tr>
<tr>
<td>Cotton clothing</td>
<td>0.65</td>
<td>0.70</td>
</tr>
<tr>
<td>Mill-made cloth</td>
<td>0.66</td>
<td>0.70</td>
</tr>
<tr>
<td>Handloom cloth</td>
<td>(-)0.12</td>
<td>0.21</td>
</tr>
<tr>
<td>Tobacco</td>
<td>0.70</td>
<td>0.44</td>
</tr>
<tr>
<td>Cigarette Tobacco</td>
<td>1.51</td>
<td>1.17</td>
</tr>
<tr>
<td>Bidi Tobacco</td>
<td>0.64</td>
<td>(-)0.19</td>
</tr>
<tr>
<td>Hookah Tobacco</td>
<td>0.58</td>
<td>0.54</td>
</tr>
</tbody>
</table>

*Source: NCAER: Long Term Demand for the Supply of Selected Agricultural Commodities 1960-61 to 1975-76, p. 64.*

1 Third Five Year Plan, p. 35.
It is evident from the above table that income elasticity for major cereals is very high in rural areas (0.55) as compared to urban areas (0.12). Another important feature is that minor cereals have a very high negative income elasticity relative to the corresponding figure observed for major cereals. This is expected for reasons already mentioned, i.e., as incomes increase households tend to substitute major cereals for minor cereals. Edible oils as a group have an income elasticity to 0.89 and 0.78 in rural and urban areas respectively. In the case of all cotton clothing though the income elasticity work out of 0.65 for rural sector, it is instructive to note that handloom cloth has a negative income elasticity of 0.12. In urban areas the estimated income elasticity for all type of textiles is substantially higher than that of handloom cloth. This phenomenon implies that for the country as a whole consumer preference tends to shift from handloom to mill-made cloth as incomes increase. Among the different kinds of tobacco, cigarette tobacco seems to be highly sensitive to income both in rural and urban areas. However, the income elasticity for all kinds of tobacco, on the average, appears to be lower at 0.70 and 0.44 respectively for rural and urban areas.

During the First Plan period efforts were made to increase the production of those agricultural commodities for which income elasticities were greater. This was the main reason why agriculture was given top priority in the development planning of Indian economy. An expenditureous transfer of surplus labour from agricultural sector to other sectors was, therefore, regarded as a major objective of this developmental planning. However, progress in this respect was not according to expectations. More vigorous efforts are needed to bring about this transfer of surplus labour if substantial results are to be obtained in the shape of higher agricultural productivity or increasing
the capital-labour ratio.

Under the third condition of development, rates of growth vary greatly among sectors, because of either near-complete satiation of certain consumer wants or because substitute commodities are developed. Some sectors have rates of capital accumulation, technical progress and birth which exceed growth in demand for their product. These sectors then must decline in shares of income and resources. In these sectors, it is also necessary for some resources already employed, as well as those added to the supply, to transfer.

Under this condition it is necessary that capital should not be allowed to decrease in agriculture but at the same time a part of the total savings and capital accumulation should be transferred to other sector as an integral contribution to aggregate economic growth. Capital use increases but not in proportion to net family savings of agriculture over time. Therefore both out of labour and capital surplus should be consistent with national economic growth and changing consumer preferences, together with maintenance of incomes and resources returns in agriculture at more favourable levels. In Indian agriculture, we find that capital use has increased but not in proportion to net family savings of agriculture. Nor savings and capital accumulation have been transferred to other sectors as an integral contribution to balanced economic growth due to lack of savings and capital accumulation in the agricultural sector. There is a problem of surplus labour on the one hand and lack of capital on the other in Indian agriculture. Indian agriculture has re-employed all of its additions to the labour with insufficient capital input with the result that the agricultural sector comprises a vast number of small holdings. This aspect of the
problem is clearly stated as follows:

'In a country where there is no surplus labour, industrialization waits upon agricultural improvements ... The reverse is the case in a country where population is so large in relation to cultivable land, that the land is carrying more people than can be employed in agriculture. In such a situation, technical changes which reduce the number of people required per acre are of no value ... substantial technical progress in agriculture is not possible without reducing the numbers engaged in agriculture'.

The later point of the above quotation applies to the Indian agriculture and requires careful consideration by the planners. It appears that the situation referred to is likely to operate with undiminished vigour unless a powerful instrument such as a massive co-operative agricultural organization is established on country-wide basis at an early date.

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