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# STRATEGY FOR AGRICULTURAL GROWTH IN THE EARLY STAGES OF DEVELOPMENT

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## PART I

Continuous and rapid agricultural development in most of the over-populated countries is achieved if the following four conditions form the strategy of growth of production and productivity. The underlying conditions also constitute the basic assumptions tested from Indian experience in the second part of this paper :

1. In the annals of agricultural growth 'resource approach' to planning is given wider attention than what may be called the 'target approach.'
2. In the early stages of development the 'terms of trade' is allowed to move in favour of agriculture to enable this sector to stand on its own footing.
3. During the inflationary spirals in the economy over a period of years 'consumption in the agricultural and specially in its subsistence sector' is not to be hampered at any stage till the propensity to consume stabilizes at a point beyond which consumption would not increase further and savings would start generating.
4. When the saving starts generating in the economy, resources in the form of material inputs are to be made available in abundance in order to absorb the increasing levels of investment and to safeguard leakages in the form of diversion of savings into further consumption and other unproductive channels. At this point, the level of investment in agriculture as well as in industry tries to keep pace with each other. It is the last approach that links the first approach and forms an economic model, which we shall discuss using the following notation.

Let

$R_i$  = Resource (inputs) availability,

$Y_a$  = Total Income of agricultural sector,

$C_a$  = Consumption of agricultural sector,

$I_a$  = Investment of agricultural sector or availability of capital for investment or savings.

$$Y_a - c_a = I_a$$

Now if in the resource market,

$$(i) I_a > R_i \quad \therefore C_a.$$

If capital available for investment is more than the availability of resource (inputs), then the result is the diversion of investment into consumption.

$$(ii) I_a < R_i = - C_a.$$

If capital available for investment is less than the market availability of resource (inputs), the farmer is either curtailing his consumption or going for credit in order to invest in inputs for taking advantage of new strategy.

$$(iii) I_a = R_i$$

The best solution is to maintain resource (inputs) supply line so that it may absorb the capital available for investment according to the law of supply and demand. If  $I_a = R_i$  is achieved, growth in the agricultural sector is also achieved. In such a situation leakages in investments stop, productivity rises, income rises and so also the efficiency of this as well as the industrial sector.

Before we proceed ahead, we shall try to explain the meaning, implications and contents of the above four conditions/assumptions in relation to the agricultural sector as well as its counterpart industrial sector.

### 1. Resource Approach

A rapid rise in the production and productivity of agriculture is possible if in the strategy of planning more attention is focussed towards the creation and utilization of new resources in the form of material inputs and other requisites. These are two types, *viz.*, those useful directly in raising crops and those used as supporting in crop production. Under the first category falls power and bullock drawn agricultural machinery and improved implements, irrigation water, high yielding varieties of seeds and hybrids, and chemical fertilizers and plant protection materials. The supporting requisites under the second category include pumping sets and oil engines, power, fuel and lubricants, cement, pipes for irrigation wells, wires for fencing, spare parts and other related material. In the 'resource approach' to agricultural growth industrial and mineral capacity is geared up to produce the above-mentioned inputs and requisites for agriculture which, in turn, supplies the necessary food, raw materials and labour for its counterpart industrial sector. The farmer when learns about these inputs and their great advantage becomes highly responsive to them. He may surpass all expectations and produce high yields than the research/experimental farms. The high yielding varieties of seeds and hybrids supported by other inputs can raise the yields to four or five times the current averages. Farmers cultivating these can make profits of over Rs. 2,000 or \$ 270 per hectare. Even the subsistence farmer (0 — 5 acres)<sup>1</sup> can become rich by earning more, by consuming more, by saving more and by investing more. Aided by this new strategy of agricultural production, the present structural deficiencies and inequities become obsolete sooner than many believe possible.<sup>2</sup>

1. This has already been demonstrated by hundreds of farmers in the Tarai Area of Uttar Pradesh.

2. This condition can be true in those developing countries where economic planning had started during the 'fifties.

## 2. *Terms of Trade*

In order to provide more incentive to increase production and productivity, the terms of trade in the early stages of development are made to move in favour of the agricultural sector by allowing agricultural prices and incomes to keep an upward trend both in absolute and in relative terms. In other words, the wholesale prices of the commodities which farmers sell in the form of food and industrial raw materials are allowed to be moved upward as compared to the wholesale prices of non-agricultural commodities purchased by the farmers for domestic use and for use in agricultural production as well. This is to result in continuous savings and investment thereby keeping the growth rate self-sustained.

## 3. *Consumption during Inflation*

When the terms of trade are kept in favour of agriculture, a slight rise in the prices of non-agricultural commodities results in a comparatively greater rise in the prices of agricultural products. With the increase in productivity and side by side in agricultural prices, farmers as a whole get higher net returns, the benefit is more however in the case of those who do not fall within the category of subsistence farmers. During this inflationary period, farmers and particularly subsistence farmers raise their consumption and a part of the increased production is appropriated in this process. This reduces the marketable surplus and in turn savings out of the increased incomes from greater sales to be used for real productive investment in agriculture. As has been indicated under condition 1 above that even the most subsistence farmer would be a better earner in this new strategy on a continuous basis, increased consumption which is a short term phenomenon is likely to be compensated by increased production and by increased incomes. Hence consumption is not to be hampered, till it reaches the bare minimum; thereafter the propensity to consume declines and marketable surplus increases. With this, savings and not too in the long run investment catches up and try to match with the available inputs, and also the levels of investment of the industrial sector where the rise in products prices is comparatively smaller. Though the 'terms of trade' are not so favourable as compared to the agricultural sector, increased income in the industrial sector on account of rise in prices does not affect consumption nor savings and as such the levels of investment move upward.

## 4. *Investment to Match Available Inputs*

If consumption is not hampered during the inflationary period, saving starts generating gradually in the whole agricultural sector, so also the real investment. The farmer as a group finds no dearth of investment during the period of rising prices which even after meeting increased consumption tries to match the investment of the industrial sector which also moves slightly upward during this period of inflation. In the above analysis, the levels of investment in the agricultural sector keep pace with the levels of investment in the industrial sector even after moving upward-downward in order to achieve an equilibrium between both these sectors. The situation is well explained in Figure 1.

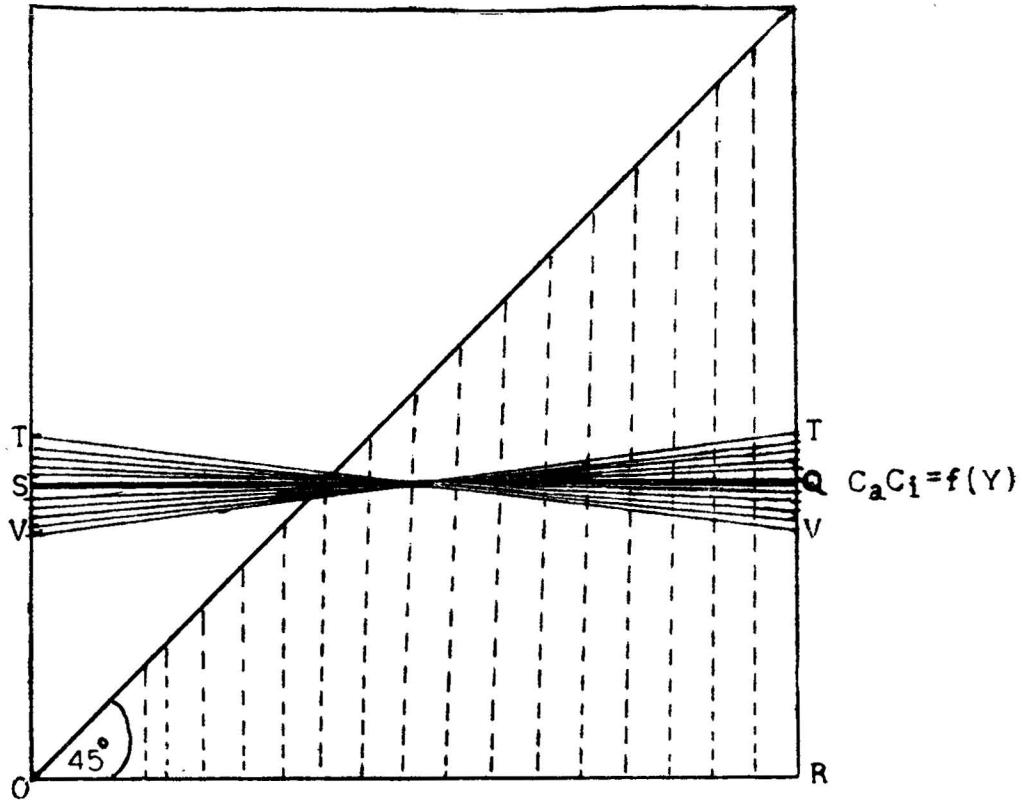


Figure 1

*Explanation :*

- (i) At OP,  $Y = C + I$  (income is equal to consumption plus investment).
- (ii) PQ = Investment in the agricultural and industrial sector.
- (iii) QR = Consumption in the agricultural and industrial sector (where consumption in agriculture— $C_a$  and consumption in industry— $C_i$  is the function of income (Y)).
- (iv) SQ = Line of investment equilibrium between agricultural and industrial sector.
- (v) TV = Lines of investment variations in agriculture, which tries to catch up SQ by moving upward-downward.

This near equality of investment between agricultural and industrial sectors at SQ is only possible when terms of trade are allowed to move in favour of agriculture (because consumption in the agricultural sector is more than that in the industrial sector or in proportion to the rise in agricultural prices as compared to industrial prices), till the time agriculture becomes completely self-generating. Now this level of real investment is to be fully absorbed in the purchase of resources (inputs) and other production requisites. If at any stage, shortage is allowed to be developed a part of this investment is likely to be diverted into non-productive channels on account of short season of *Kharif* and *Rabi* crops. And if this

process is allowed to be continued, it will not only result in moving the terms of trade in favour of the industrial sector, but would also keep the agricultural sector under the shadow of stagnation.

## PART II

What has been done to Indian agriculture while planning for its growth, with whom the terms of trade have moved during the last fifteen years, what it has done to Indian agriculture regarding investment equilibrium with industry, and how consumption behaved in relation to income—these and some other related issues concerning resource use problems have been discussed in this section.

### *I. Resource Approach*

In the strategy of India's agricultural development, the 'target approach' to planning has been given wider attention than, what may be called, the 'resource approach.' This failing neither gives due consideration to resources available at the farm, nor places adequate emphasis on resources planned to be created for the attainment of specific production targets. In other words, the strategy has so far been one of revolving around a certain fixed figure, known as 'target of production' to be achieved during the period of a Five-Year Plan. This approach does not give prime consideration to those resources (conventional) that are available with the cultivator at the farm and their potential in raising a part of the targeted increase in output; instead attempts are made to realize the fixed target of production through the creation of *new resources* (non-conventional inputs), which sometimes too are not created or built fully or partly during a particular period of a Plan and accordingly production targets are not realized in the same proportion or order. Thus we have no planning of existing resources but only the planning of target fixation and their realization through the creation of new resources. While preparing the village agricultural plans for five years on the basis of a prescribed Planning Commission's proforma by the V.L.W.'s, no attention is given to the potentialities of the existing resource of the village; instead targets of production are fixed keeping in view their realization through the help of new resources like irrigation, quality seeds, fertilizers, pesticides, etc., to be created or used by the farmer during the next five years. The information so collected may prove useful for official and other purposes, but it does not carry any meaning for the farmers at all. The farmers are not kept aware of their production targets to be achieved during the Five-Year Plan, though the district, State and national targets are fixed on the basis of their pooled targets. This strategy of production planning and not of resource planning, therefore, seems to be partially faulty. The right approach would have been a planning of resources (inputs) existing as well as new ones and on the basis of these, production targets could have been fixed and realized. This new approach of resource planning would have calculated better as to how much we could have realized in terms of available resources and how much in terms of additional resources. Now the lack of emphasis and foresightedness in planning for the creation of new resource—those directly used in crop production like machinery and implements, fertilizers, irrigation, high yielding seeds and pesticides—and those used as supporting like pumping sets, oil engines, cement, pipes, spare parts, etc., is only resulting in their shortage and, in turn, in the depressed levels of crop productivity.

It would, however, be wrong to dismiss the achievements of the past few years. New high yielding strains like S-227 wheat, IR-8 paddy and hybrids and composite maize, sorghum and bajra come to play a vital role. Supplies of fertilizers and pesticides have also increased. Far more irrigation exists now than ever before. The Indian farmer has become highly responsive to improved practices and it is because of this there never seems to be enough inputs to go round. It is now possible to raise the yields of foodgrains to four or five times the current averages. Farmers cultivating hybrid maize can make net returns of over Rs. 1,000 per acre and these net returns on wheat and rice are even higher. But the realization of this potential is being impeded by the inputs supply position which is not commensurate with the existing demand and it is in this respect that the Indian agricultural planning does not meet fully the first assumption of the strategy of agricultural growth.

## 2. *Terms of Trade*

The fact that agricultural prices have kept an upward trend both in absolute and in relative terms since the close of the Second Plan needs no particular emphasis here. During the period 1955-56 to 1966-67, the index numbers of wholesale prices (base 1952-53 = 100) of the commodities sold by farmers have risen by 153.04 per cent in case of food articles and 142.64 per cent in case of industrial raw materials produced by agriculturists. As against this, the index number of manufactures (non-agricultural commodities purchased by farmers) has risen by only 60.20 per cent. Thus the terms of trade have moved in favour of agriculture during this period. Among its sub-sectors, it has moved more in favour of well-to-do and rich farmers and less in favour of subsistence farmers. It is because most of the small farmers do not have access to the inputs like high yielding varieties of seeds, fertilizers, irrigation from State sources, pumping sets, pesticides, etc. These resources are a must in increasing crop production, provided they are used in a combined form. On account of their short availability and high prices, farm production does not increase as also the incomes of small farmers, despite high farm product prices. Big farmers do face these problems but try to overcome them to the extent their financial resources permit them in purchasing these and other supporting items at prices higher than the statutory or prevailing market prices. Prices of some of these inputs have also risen but the rise is not to the same extent as the rise in prices registered by almost all the agricultural products. For example, in regard to chemical fertilizers, prices of ammonium sulphate and urea in absolute terms have risen by 56.2 and 47.4 per cent in 1967 over 1955. Likewise, prices of calcium ammonium nitrate and ammonium sulphate nitrate in absolute terms have risen by 21.4 and 28.2 per cent in 1967 over 1957. In addition, prices of superphosphate and murate of potash have risen by about 76.3 and 0.6 per cent in 1967 over 1960. Prices of agricultural machinery, implements and pumping sets have registered a rise varying from 20 to 60 per cent in absolute terms during the decade 1957-67. Prices of important pesticidal products have also shown a rise varying from 30 to 60 per cent between 1967 and 1956. Irrigation water charges which used to be levied between 0.9 to 11.29 per cent of the gross income per acre are now being raised to 25 to 40 per cent of the additional benefit derived on per acre of crop irrigated by a farmer.<sup>3</sup> Prices of certified seed

3. Report of the Committee to Suggest Ways and Means of Improving Financial Returns from Irrigation Projects, 1964, pp. 28-29 and 33.



that exceed the price of grain by two to three times for crops like rice and wheat and five to ten times the price of grain of hybrid crops are being recognized as a legitimate part of a seed industry that assumes the proper responsibilities to its customers—the cultivators.<sup>4</sup>

As compared to the increase in prices of the above inputs, the procurement prices of rice and wheat in absolute terms have registered an increase of nearly 80 to 120 per cent in different rice and wheat producing States during the period 1958-59 and 1966-67. Similarly, prices of sugarcane, cotton and oil seeds have also registered an increase of about 100 to 150 per cent during this period. Despite this, of the total share of rising prices that have been appropriated by the industrial sector, proportionately more has been in favour of industries producing inputs of agriculture and other agricultural production requirements. From the above, it may again be reaffirmed that the terms of trade or in other words, the income distribution have been more in favour of agriculture than any other industry and hence our second assumption is fully met here judging, of course, the performance of the Indian economy during the last decade.

### 3. Consumption during Inflation

The inflationary phenomenon in the Indian economy started gathering momentum since the beginning of the Third Five-Year Plan and this has raised the profits of the farm business and, in turn, the income levels of the majority of farmers. The important outcome of this spiral has been the rise in the magnitude of consumption by the farmers of cereals and pulses out of the increased production. This can be seen from the data of food supplies by farmers to the markets between 1960-61 to 1965-66 (Table I).

TABLE I—TRENDS IN PRODUCTION AND MARKET ARRIVALS IN SELECTED MARKETS OF MAJOR PRODUCING STATES

		<i>(in million tons)</i>			
Crop		1960-61	1964-65	1965-66	1966-67*
Rice					
Production	.. .. .	34.6	38.7	30.6	—
Arrivals	.. .. .	12.2	10.5	12.9	7.2
Wheat					
Production	.. .. .	11.0	12.1	10.7	—
Arrivals	.. .. .	4.0	3.1	9.4	7.7
Gram					
Production	.. .. .	6.2	5.8	4.5	—
Arrivals	.. .. .	2.0	1.6	5.0	3.1
Jowar					
Production	.. .. .	9.8	9.8	7.5	—
Arrivals	.. .. .	2.1	1.0	0.87	0.36

\* October to fourth week of February, 1967.

Source : *Agricultural Situation in India*, various issues.

4. This statement is based on the actual seed prices charged by the National Seeds Corporation and by the certified and registered seed growers.

Table I shows that although production of wheat and rice has risen during the period between 1960-61 and 1964-65, market arrivals have declined. In the case of gram, market arrivals have declined more in proportion to the decline in production, in the case of jowar arrivals steeply declined while production remained constant. The most important phenomenon that has been observed during this four-year period is that despite increase in production, marketed surplus has declined, and despite high prices market arrivals have dwindled. The only conclusion that can be drawn from the above is that the consumption level of the farmers has increased and it appears to have stabilized since 1965-66. During the year 1965-66, production of rice was much below that in the preceding year, market arrivals were slightly higher than those in earlier years. Similarly, in the case of wheat, production was lower than the 1960-61 level, but market arrivals were a record ever achieved. This may be due to the carry over of the last year's stock during the year under study. In the case of gram, market arrivals surpassed production which was lower than the estimates in earlier years; in the case of jowar, arrivals were more in proportion to its production which was less as compared to preceding years. It is thus clear that consumption is stabilizing and giving way to more arrivals in the markets out of the increased production.

On account of the lack of availability of data on market arrivals after 1965-66, it is not possible to prove the above observation in its entirety. It can, however, be predicted that a trend of increased market arrivals out of increased output, due to the larger availability of high yielding varieties of seeds and hybrids, irrigation water, fertilizers, pesticides and improved implements, has set in and would likely to continue with more vigour with a further increase in production and productivity. The new strategy that is being widely followed is converting subsistence holding into economic holding and economic holding into profitable industry. There is no fear of falling down from the already reached peak level of prices and hence of incomes and with it high levels of savings and investment. If added to this the already increased volume of co-operative loans, the fear of any dearth of capital investment would prove a myth. Our third assumption is, therefore, fulfilled.

#### *4. Potential Investment to Match Available Inputs*

The price spiral which started since 1962-63 has moved the terms of trade more in favour of agriculture, resulting in higher money incomes, saving and hence investment. As such, agriculture as a sector has no dearth of potential investment for being utilized in one or more of the items like permanent land improvement, *i.e.*, digging and construction of new wells and field channels, repairs of old wells, bunding, etc.; and in procuring current inputs like high yielding varieties of seeds, fertilizers, irrigation, pesticides, improved agricultural implements, etc. The agricultural revolution is on the way. The farmer is gradually becoming highly responsive to improved practices and new inputs. The cropping pattern is undergoing a rapid change. Demand for inputs is increasing, while supply line is not keeping pace. There is black marketing in fertilizer, there is not enough improved seed to go round, and scarcity prices are charged for pesticidal products. All these are sufficient evidence from the demand side of those inputs which are directly used in raising crops. Supporting materials like cement, pipes for irriga-

tion wells, oil engines and pumping sets, spare parts and fuel, etc., are in short supply and scarcity prices are charged to the farmers. The above evidence is sufficient to prove that the demand for inputs and other related materials is far more than their availability. Now where should this potential investment go? It is a question to be carefully studied and answered by our planners. A situation has reached where investment potential is more than the availability of physical resources ( $I_a > R_i$ ). The farmer is not able to procure sufficient inputs and other needed production requisites with his improved cash resources and simultaneously he is diverting a part of his cash into unproductive channels like social ceremonies, litigations, purchase of ornaments, etc. In other words, even with the terms of trade in favour of the agricultural sector, consumption has tended to increase and savings are moving away from the line of investment equilibrium between agriculture and industry. On the other hand, even with unfavourable terms of trade, consumption in the industrial sector has not risen and savings in this sector have tended to catch up with the line of investment equilibrium between industry and agriculture. Thus a case of leakage in the savings of agriculture into unproductive uses is established and with this a case of the non-fulfilment of our fourth assumption of the agricultural growth. The situation is well explained in Figure 2.

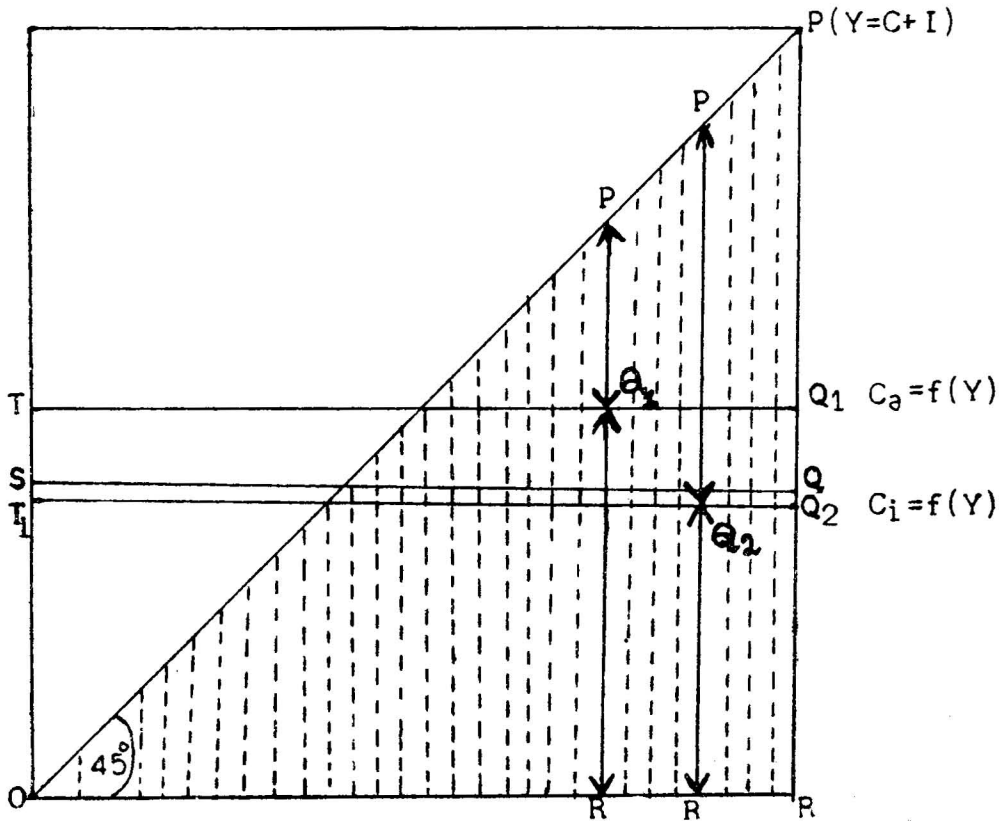


Figure 2

*Explanation :*

- (i) At OP,  $Y = C + I$  (Income is equal to consumption plus investment).  
 SQ = Line of investment equilibrium between the agricultural and the industrial sector.  
 PQ<sub>1</sub> = Investment (savings) in the agricultural sector.  
 PQ<sub>2</sub> = Investment (savings) in the industrial sector.  
 Q<sub>1</sub> R = Consumption in the agricultural sector or TQ<sub>1</sub> = consumption function of agricultural sector or  $C_a = f(Y)$ .  
 Q<sub>2</sub> R = Consumption in industrial sector or T<sub>1</sub>Q<sub>2</sub> = consumption function of industrial sector or  $C_i = f(Y)$ .

In a situation where savings and hence the potential investment in agriculture try to match the available inputs, TQ<sub>1</sub> would come nearer and try to catch up SQ by reducing the disguised consumption. Where however potential investment is more than the resource inputs ( $I_a > R_i$ ), TQ<sub>1</sub> would try to move away from SQ (as in the present case) and would thus give way to the so-called disguised consumption.

From the above discussion it becomes clear that Indian agriculture has reached at the cross-road, from where the cream of the potential investment which is to be diverted into productive purposes is being diverted into non-productive uses. The only explanation that can be offered for such a situation is the non-availability or shortage of inputs and other production requisites in the required quantity. With the shift of approach from 'target planning' to 'resource planing', the train of Indian agriculture can be steamed off. A slight delay might result in moving the terms of trade in favour of the industrial sector, thereby keeping Indian agriculture in the midst of a vicious circle of stagnation.

## PART III

*The Solution*

The above survey of the performance of Indian agriculture reveals that it does not meet the first and the fourth assumption of the strategy of agricultural growth and hence lacks in its objective of achieving a self-generating growth. The solution, therefore, lies in the 'planning of resources' and in the fixation of production norms. Accordingly, the right approach is the planning of resources—existing as well as new ones and on the basis of these, production targets should be fixed and realized. Such a strategy calls for a complete survey of the existing resource potential in the villages and fixation of plot-wise production norms on the above mentioned basis, as well as on the basis of a systematic application of new resources. This necessitates the undertaking of a survey, firstly, of existing resource potential in each village by an agricultural graduate appointed for this purpose. In other words, information on the existing resources relating to land, soils, irrigation, manures, labour—human and bullock, machinery, tools and implements, etc., and their present use according to their capability should be made available and on this basis future planning of resources should be tried. And secondly, the existing availability of new resources and their capability in raising additional crop yields should also be taken into consideration for this purpose. The requirements of new inputs in each village as assessed by the agricultural graduate when pooled

together will facilitate better planning of material inputs production in the country. And this will be the real planning of resources. The production norms fixed during the previous year may be utilized as a guide-line for obtaining same or more production in the next year and so on. Along with this a scheme of proficiency bonus would also be introduced which may be given on the comparative performance of present production over the previous year's yield. The norms would be partially revised each year in accordance with the changes in land development programme, cropping pattern, and the changes in technology affecting the production potential. One of the advantages of fixation of production norms is that these norms will be a guiding factor for the cultivators in raising the productivity as compared to the earlier year's norms. To realize this, fullest utilization of existing resources as well as the available new resources, with the intention of competing in proficiency bonus scheme for better performance in farm production is essential. The scarcity of new resources can be avoided or in other words, their additional demand can be met only if their production is increased several fold by raising the capacity of the existing industrial units,<sup>5</sup> by establishing more such units and even by liberalizing imports in their favour. This will necessitate a shift in official policy.

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## THE PROBLEM OF LAND TENURE AND ECONOMIC GROWTH IN OVER-POPULATED COUNTRIES\*

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### THE PROBLEM

The common economic characteristics observed in over-populated economies are that land resources are limited in relation to agricultural population and the magnitude of unemployment is quite high in disguised form. Due to critical land-man ratio the marginal productivity of land is very low—in certain cases it is zero. The non-agricultural sector is not developed to such an extent as to absorb the surplus labour force depending on agriculture. The economic approach to the problem centres round the key point of achieving full employment, maximizing agricultural production and creating necessary conditions for the long range economic growth. To ensure continuous growth of the economy it is desirable that "output should increase more than in proportion to employment or in other words, output per worker should increase faster than the wage rate with the result of continuous increase in the surplus per worker."<sup>1</sup>

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5. In case of high yielding varieties of seeds and hybrids, by bringing more area under foundation and hybrid seeds cultivation.

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1. G. C. Mandal : *Studies in the Problem of Growth of a Rural Economy*, World Press, Calcutta, 1961.