

AGRICULTURAL DEVELOPMENT IN INDIA IN THE 1970'S

by

Dr. Martin E. Abel
Program Advisor in Economics

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PREFACE

This is one of twelve volumes representing the culmination of a major effort begun by the India Field Office of the Ford Foundation several months ago. At that time, a staff decision was taken to have the Foundation's Program Advisors, with the maximum interdisciplinary involvement of the entire Foundation Program staff, engage in a mind-stretching exercise. Our objective was to look at India in the 1970's and to do so without regard for any role or relationship for the Foundation. Ours has been and continues to be a quest for understanding India as a culture and as a nation committed to socio-economic equality and social justice.

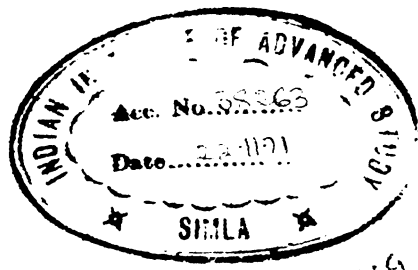
If we are to achieve our objectives of gaining understanding about India's development prospects in 1970, we clearly need help from our Indian friends. One of the volumes, "Poverty in India", was especially prepared for the Foundation by Professor V. M. Dandekar, Director, Indian School of Political Economy, Poona, for inclusion in this series. While all the other papers were prepared by the Foundation staff, they have the benefit of considerable informal interaction with Indians.

In our quest for maximum understanding of India as it moves into the decade of the 1970's, we are now sharing these twelve volumes with a very small circle of Indian colleagues. Through this sharing with our Indian friends, we hope to further true up our own thinking and thus better anticipate India's major problems and priority needs for the future.

In addition to this volume, the other eleven volumes on India in the 1970's are:

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| Volume I. | "India and the 70's" - An Overview, by Dr. Douglas Ensminger. |
| Volume II. | "Poverty in India" by Professor V. M. Dandekar. |
| Volume III. | "Indian Agriculture in the 1970's" by Dr. A. A. Johnson and staff. |

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- Volume V. "Water Use and Development in India in the 1970's" (1) by Donald A. Williams.
- Volume VI. "India's Family Planning Program in the 1970's" by the Family Planning Staff.
- Volume VII. "Some Key Economic Policy Issues in India in the 1970's" by Dr. Martin E. Abel.
- Volume VIII. "Indian Education in the 1970's" by Harold Howe II.
- Volume IX. "Indian Politics, Policy and Public Administration in the 1970's" by Edward A. Kieloch.
- Volume X. "Human Resources Development and Utilization in the 1970's" by George Tobias.
- Volume XI. "Indian Urban and Regional Planning in the 1970's" by C. Preston Andrade.
- Volume XII. "Trends in Indian Culture in the 1970's" by Artur Isenberg.

Douglas Ensminger
 Representative in India
 New Delhi, July 21, 1970

(1) Made available, by request, for publication in the June 1970 issue of Economic and Political Weekly, Vol. V. No. 26 under the title, "Water Management in the Seventies."

Martin E. Abel

Introduction

A decade ago a team of Ford Foundation consultants issued their now famous "Report on India's Food Crisis and Steps to Meet It" in which they predicted a serious food crisis in India in the mid-1960s if significant changes to support rapid agricultural modernisation were not made in agricultural policies and programmes. The predicted crisis did develop in the form of stagnating foodgrain production in the first half of the 1960s and sharply rising food prices starting in late 1963. The crisis was turned to near disaster by two severe droughts in 1966 and 1967. Widespread starvation was avoided only by a combination of high levels of food imports and a good job of managing food supplies within India during these trying years.

The failure to significantly increase foodgrain production during the Third Five-Year Plan period (1961-66) and the resulting sharp increase in food prices ^{1/} resulted in the development and enunciation of a New Agricultural Development Strategy in 1965. This strategy was based on (a) incentive prices to producers, and (b) concentration of new seed varieties, fertiliser, pesticides, and other inputs on approximately 32.5 million acres with assured water supply. This strategy has yielded significant increases in foodgrain production and has stimulated many

people to talk about the "Green Revolution" in India and food self-sufficiency in the early 1970s.^{2/}

There is now sufficient experience with the new Agricultural Strategy to ask how green is the "Green Revolution" and is it a "revolution" or merely a small "palace revolt"? Answers to these questions are a necessary prelude to an examination of the demand and supply situation for agricultural products in India in the 1970s.

Green Revolution Turns Pale

It is useful to look at the nature and causes of increased agricultural production during the period 1951 to 1965 in order to gain a perspective for what has happened in recent years and to ascertain prospects for growth of agricultural output in the 1970s.^{3/}

Between 1951 and 1965, agricultural output grew at 3.1 per cent per annum. This rate of growth consisted of a 1.4 per cent rate of growth in gross cropped area, a 1.33 per cent rate of growth in per acre productivity and a 0.37 per cent rate of growth due to changes in cropping patterns. Thus, nearly one-half of the growth in agricultural output came from expansion of gross area under cultivation. During the 1961-65 period, foodgrain production expanded at 3.21 per cent per annum, with cereals growing at 3.41 per cent and pulses growing at 1.67 per cent per annum.

The major expansion in cultivated area took place in the 1950s. ^{4/} Very little new cultivated land was brought into production during the Third Five-Year Plan period, 1961-66 (Table 1). Thus, one of the major sources of increased agricultural output in the 1950s ceased to be operative. It is no wonder that agricultural production slowed down in the first half of the 1960s. The expansion of gross cropped area over net crop (multiple cropping) was modest and not enough to offset the sharp slowdown in the growth of net cultivated area. The expansion in availability and use of new technologies such as new high-yielding seed varieties and key inputs such as fertilisers was meagre and grossly insufficient to maintain the historical rate of growth in production.

Government of India expects agricultural production to grow at an annual rate of 5 per cent during the Fourth Five-Year Plan period (1969-74), compared with the 3.1 per cent rate for the period 1951-65. Foodgrain production is also expected to grow at 5 per cent per annum which compares with an annual growth rate of 3.21 per cent in the 1951-65 period.

The projected acceleration in the rate of growth of agricultural production is large by any standard - an increase of about 60 per cent. But there is much more to it than that. Since the rate of growth of net cropped area can be neglected for all intents and purposes in the

Fourth Plan period, productivity of each cultivated hectare on the average must increase by five per cent per annum. When we consider that yield per hectare increased only by 1.4 per cent per annum during the 1951-65 period, the Fourth Five-Year Plan (Draft) actually calls for increasing the rate of growth in production per net acre of cultivated land by nearly 260 per cent. The simple arithmetic of what the "Green Revolution" is all about or is not all about is beginning to emerge.

Let us look at this question in some more detail. We focus on the recent record in foodgrains, since this is where the new agricultural strategy applies. It is clear that the recent spurt in foodgrain production has been mainly the result of a sharp jump in wheat production (Table 2). In fact, wheat is the only cereal where the new agricultural strategy has had a visible impact on total production. The same cannot yet be said for rice and coarse grains, although a slight improvement in production is perceptible and there are specific districts within India where progress in the production of cereals other than wheat are pronounced.

The reasons for this pattern of growth in foodgrain production are fairly clear. Briefly, the new varieties of wheat are being produced in areas where water supplies are quite adequate and subject to a fairly high degree of controlled use^{5/} and are less subject to problems of diseases and pest.^{6/} The same favourable conditions

are not yet sufficiently widespread for the other foodgrains to have had a marked impact on their total production. Progress is being made in the development of new high-yielding varieties of rice,^{7/} but India appears several years away from having a set of new rice varieties sufficiently adapted to local conditions to give a significant breakthrough in rice production anything like what has occurred for wheat.

To achieve a rate of growth in foodgrain production of 5 per cent per annum during the Fourth Plan period will require significant increases in foodgrain yields and multiple cropping. To achieve both of these will require a tremendous effort in the development of water and soil management,^{8/} further improvement and adaptation of new grain varieties and more effective provision and use of ancillary production inputs and services such as plant protection materials, selective mechanisation, credit, etc.

The intensive improvement of old and development of new irrigation and drainage facilities, and the development of land resources and cropping patterns to more effectively utilise available rainfall where this is the only type of water available will require tremendous investments. Although irrigation receives high priority in the Fourth Plan, it is doubtful, based on past performance, that the resources being committed are enough or the

efficiency of Plan implementation sufficiently good to make the needed rate of progress. In addition, knowledge of soil-water-plant relationships is at best modest; that is, the technological basis for improving the use of water is seriously lacking.

In addition, we must look also at the institutional structure for support of modernisation. Among others, there are serious questions about the adequacy of rural credit - in terms of volume, terms, and type - and the unfavourable effects of land tenure arrangements for a rapid rate of modernisation.

"In spite of the continuous chatter about the Green Revolution as fait accompli the fact of the matter is that in 1967-68 as well as in 1968-69 the actual foodgrains output has been below the corresponding estimates based on past trends (computed for the 1951-65 period). The trend level estimate of foodgrains output in 1968-69, for instance, works out to about 100.5 million tonnes . . . In spite of our good progress in wheat production and efforts that are being made to improve the yield capabilities of other cereals and in view of the fact that prospects for pulses do not look good as of now, we are not likely to achieve the sharp increase (to 5 per cent per annum) in the trend rate of foodgrain production implied in the Plan."^{9/}

This does not mean a lack of progress in Indian agriculture.

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Far from it. Recall only that maintaining the historical trend in foodgrain production means a sharply increased rate of growth in productivity per hectare to offset the fact that net cropped area has not increased much in the 1960s and that in the 1950s the increase in area accounted for nearly one-half of the increase in output. It

does mean, however, that the job for the future is much more difficult than has been popularly portrayed. Foodgrain self-sufficiency is not around the corner. Yet, the technical knowledge and the economic and social preconditions required for rapid growth are better understood today than at any previous time. This means that a combination of (a) high priority on research to generate new production technologies at an even faster rate, and (b) sufficient commitment to political action needed to support rapid agricultural development and matched by an equal commitment of development resources could make self-sufficiency in foodgrains a realistic target for the 1970s.

If this is so, what does the demand and supply picture for foodgrains look like in the 1970s. The Fourth Five-Year Plan (Draft) projects foodgrain consumption in 1973-74 at 129 million tonnes and 167 million tonnes in 1980-81. Since India is projected to be self-sufficient in foodgrain for both of these dates, these figures also give the projected levels of production. The annual rate of growth in foodgrain production and consumption projected between 1973-74 and 1980-81 is 3.8 per cent per annum. During the Fourth Five-Year Plan period the 5 per cent rate of growth in production exceeds the rate of growth in demand in order that self-sufficiency can be achieved by 1973-74. In the subsequent years,

production has only to grow at the same rate as demand to maintain self-sufficiency, hence the slower rate of growth during the 1973-74 to 1980-81 period.

A few years ago the author ^{11/} published a set of demand and supply projections for cereal grains for all regions of the world, including India as a separate area. These projections are similar in many, but not all, respects to those done by other individuals and organisations and, therefore, the results of other research efforts are not reported here. ^{12/} A few words about the projections are in order so that one has a feeling for their implications.

First, the projections are for cereal grains only; pulses are not included. Data on pulse production from 1950-51 to 1968-69 are given in Table 2. If one adds an estimated 12 to 13 million tonnes of pulses to the 87 million tonnes of cereal grains shown in Table 3 for 1970, the projected foodgrain production of 99 to 100 million tonnes may not be far from the level of production that is likely to obtain, assuming normal weather conditions.

Second, the historical rate of growth in cereal production used in the study is 2.0 per cent per annum calculated for the period 1956-66 on a calendar year basis. This is lower than the rate of growth of 3.2 per cent per annum, cited earlier, which was calculated for the 1951-65 period on a crop year basis. A careful examination of

the data for foodgrain and cereal production in Tables 1 and 2 shows a significantly higher rate of growth (steeper trend) for the 1951-65 period than for the 1956-66 period.

Third, the rate of growth in cereal production in the last half of the decade of the 1960 is assumed to increase significantly as a result of the new agricultural strategy. 13/

Fourth, the three levels of cereal grain production projected for 1980 are based on the following assumptions:

1980 A: The full impact of the new agricultural strategy is felt by 1970, and between 1970 and 1980 cereal grain production grows at the same rate that it did during the 1956-66 period.

1980 B: Cereal grain production in the 1970s grows at the rate of 2.8 per cent per annum, reflecting a moderate improvement in the rate of growth in cereal production over the 1956-66 period.

1980 C: Maximum effort is made to increase agricultural production resulting in an annual rate of growth of 3.8 per cent per year in the 1970s, significantly above that for the 1956-66 period. This is the same rate of growth in cereal production that the Fourth Five-Year Plan (Draft) assumes for foodgrains between 1973-74 and 1980-81.

Finally, the levels of demand projected for 1980 assume that real prices remain at about the 1964-66 average level and the level of demand varies directly with the levels of production reflecting the fact that higher levels of production generate higher levels of income, particularly in rural areas, and, therefore, higher levels of demand for cereal grains. This latter assumption is quite realistic and, yet, it is usually not employed in projection studies. If anything, the magnitude of changes in demand as a result of changes in production are underestimated in Table 3 because the linkages between economic activity in the farm and non-farm sectors are not fully accounted for. More about this point in a later section of the paper where I discuss the income distribution question.

What can one say about these projections? One thing is abundantly clear. India could easily end up being an importer of 10 million tonnes of cereal grains by 1980, or suffer the consequences of sharply rising prices if this level of imports did not obtain, in the absence of a sharply accelerated and sustained rate of growth in foodgrain production. Considering all that is required to get rapid agricultural development, the Fourth Five-Year Plan (Draft) does not seem to accord agriculture the priorities necessary to achieve this high rate of increase in production. Thus, unless these

priorities are changed and changed quickly, another food crisis looms on the horizon for the latter part of the 1970s.

Chapatis and Rice Are Not Enough

So far the discussion has focused on either foodgrains or cereal grains. This is hardly an adequate description of India's total food and fibre picture. What about the other foods and non-food commodities?

It is true that a more rapid increase in both demand and supply of cereal grains would lead to improvement in the nutritional position of the average Indian. Some nutritional experts have estimated that a consumption level of 186 kilograms of cereal grains per person together with other (unspecified) foods would provide a minimum adequate diet for the average Indian. Per capita consumption of cereals per annum averaged 154 kilograms for the 1957-61 period, 168 kilograms for 1964-65 and are projected at 179, 182 and 186 kilograms under the 1980 A, B, and C assumptions, respectively. These projected levels assume, of course, that the projected import levels are realised. Thus, increasing per capita consumption of cereal grains would lead to improvement in average nutritional levels.

But the average Indian does not live only on chapatis and rice. He also consumes some livestock products, particularly milk

and milk products, vegetable oils, pulses, sugar, a variety of fruits and vegetables, and a number of other foods and beverages. And, as population and per capita incomes continue to rise, the demand for these products will also go up. So too will the demands for fibres, especially cotton, and other non-food agricultural commodities. ^{14/}

Two points need to be made about the growth in demand for agricultural products other than foodgrains. First, there is a lack of systematic long-run planning of the needed production, processing, and distribution of many, but certainly not all, of the agricultural commodities other than foodgrains. For some, like cotton and vegetable oils, of which India has been a net importer in recent years, there are research and production augmenting programmes, but one could not argue that they are given anything like the priority assigned to foodgrains. Other categories of items like fruits and vegetables, with the possible exception of potatoes, are receiving only a little attention. Much the same can be said for livestock development. Thus, planning for agricultural development in India continues to be highly subsistence oriented with emphasis on providing for some minimum, albeit rising, level of per capita foodgrain consumption. Qualitative improvement of diet is more implicitly than explicitly planned for.

The second point of considerable importance is that the food commodities other than foodgrains and fibres must compete against foodgrains for a relatively fixed net cultivated area.^{15/} As we have already seen, there is not much new land that can be brought into cultivation. The emphasis must be on sharply increasing productivity per acre for all crops. Continued concentration of efforts to increase productivity per hectare of foodgrains at the expense of other food and fibre items will mean a relatively lower level of production and relatively higher level of prices for the latter category of commodities. In addition to the overall impact on prices and consumption, it also works in the direction of denying the poorer segments of society an opportunity to improve the quality of their diet. This has already happened to some extent in recent years as the new wheat varieties have yielded higher returns relative to pulses and production of the latter has fallen off somewhat with a corresponding rise in pulse prices.

As productivity per hectare of cultivated land is increased through obtaining higher yields per crop and achieving a higher degree of multiple cropping, research and production programmes must concentrate more effort on agricultural commodities other than foodgrains. Otherwise, future increases in foodgrain production could come mainly at the expense of production of other agricultural commodities, which may not move the total agricultural development of India forward that much.

Distribution of Benefits of Development .

Changes in the distribution of the benefits of development are difficult to assess because of the lack of adequate data. It is especially difficult to document changes in the distribution of income over time when one does not know with any high degree of confidence what the distribution of income is at any point of time.

Studies ^{16/} of the distribution of income in agriculture for the period 1950-60 indicate the following:

- (1) The distribution of income in rural areas was less uneven than in urban areas, but nonetheless was still very uneven.
- (2) Within rural areas the degree of inequality in income distribution was greater in the non-farm sector than in the farm sector.
- (3) The distribution of income and wealth in agriculture was highly uneven, but did not change significantly during the 1950s. However, the share of agricultural labourers, as a group, in the total income of agriculture declined during the 1950s.
- (4) There was no reduction in the unequal distribution of income and land-holdings in agriculture in the 1950s despite the fact that a good deal of land reform measures had been enacted during the period.

The record of the 1960s on changes in income distribution has not yet been written. But one thing is clear. The technological change that has been taking place in recent years in Indian agriculture has worked strongly to accentuate inequalities in the distribution of income in Indian agriculture. Studies show that to date the medium and larger sized farms have, in the main, reaped most of the benefits of the new seed-fertiliser revolution; the small cultivators and landless labourers have not shared fully in the benefits of the new technology. And, where the new technology is so vastly superior to the old, the benefits from it stand visibly in the farmers' fields for all to see.

In the Punjab, the premier State in India as far as the "Green Revolution" is concerned, wage rates for agricultural labour have gone up only slightly more than the rise in the cost of living.^{17/} In Bihar, it is doubtful that wage rates for agricultural labourers have even kept pace with the rise in the cost of living.^{18/} It is the agricultural labourers who, in significant measure, harvest the fruits of the Green Revolution and feel it slip between their fingers into the godowns of the larger, more prosperous farmers. One would not expect them to be overjoyed with such a situation.

The concentration of the benefits of the "Green Revolution" in the hands of relatively few cultivators has already lead to appreciable discontent in parts of rural India. For example, the agricultural labourers

of Tanjore are not happy with the modest increase in their real wages, when they see owner-cultivators increasing their incomes several-fold. Rural discontent, particularly among labourers and unsecured tenants, is being exploited by some political groups in West Bengal and Kerala, as well as in other parts of the country. And, this phenomenon is likely to spread.

But these facts should not lead us to a hasty condemnation of the technological progress in Indian agriculture. It is not the new technology that is the primary source of rising discontent. After all, improved seeds and fertiliser can produce improved yields on small and large farms alike. What the new technology has done is to bring to the forefront the inherent inequities in the rural institutional structure. 19/

" It is not . . . the new technology which is the primary cause of the accentuated imbalance in the countryside. It is not the fault of the new technology that the credit service does not serve those for whom it was originally intended; that the extension services are not living up to expectations; that the panchayats are political rather than developmental bodies; that security of tenure is a luxury of the few; that rents are exorbitant; that ceilings on agricultural land are notional; that for the greater part tenurial legislation is deliberately mis-carried; or that wage scales are hardly sufficient to keep soul and body together.

" These are man-made institutional inequities. Correcting all of these within the foreseeable future is out of the question. On the other hand, even if only some of them

are dealt with -- security of tenure, reasonable rent and credit to sustain production needs -- a measure of economic and social justice could be fused with economic necessity, thereby adding another essential dimension to the green revolution. " 20/

That such a minimum package of technological and institutional change can be brought to small and big cultivators alike is not out of the question, provided the will to do it is there. Working with six villages in Raipur, an Intensive Agricultural Development Programme (IADP) District from 1964-65 to 1968-69, the following results were achieved: 21/

- 1) The rate of participation in the use of improved technology and inputs increased from 41 per cent to 84 per cent for all farmers, from 15 per cent to 43 per cent for farmers with less than one acre, from 33 per cent to 87 per cent for farmers with one to five acres, and from 33 per cent to 96 per cent for farmers with over five acres.
- 2) Of the total area in paddy in these six villages, the proportion covered by some form of improved package of practices went from 34 per cent to 86 per cent.
- 3) Consumption of nitrogenous fertiliser rose by 230 per cent; phosphatic fertiliser by 267 per cent. By comparison, use of nitrogenous fertilisers increased

by 90 per cent and phosphatic fertilisers by 160 per cent in the whole district.

- 4) The proportion of cultivators who are members of cooperatives went from 58 per cent to 89 per cent.
- 5) Per acre yield of paddy increased by 59.8 per cent on the small farms and by 66.7 per cent on the bigger ones.
- 6) The amount of labour employed went up three times in terms of labour days. This is in addition to the increased time the small cultivators are devoting to their own land. The labour wage rates during the periods of peak demand in the crop season went up by 150 per cent and by about 100 per cent during the rest of the season.

These are impressive results for six villages in India. The challenge is to spread this type of programme to a good part of the other 500,000 Indian villages.

Two of the major development challenges facing India in the years ahead are (a) how to bring the benefits of the new technology to the operation of small farms, and indirectly, to the rural labourer, and (b) how to generate additional, productive employment for the many millions of wretched poor in rural India who may never find remunerative employment in agriculture.

Many things are required. The need to remedy the institutional bias against small farmers and tenants has already been discussed and more need not be said about this area. Along with these changes is the need to enable more farmers, small and large alike, to make more effective use of India's water resources. This is a complex area that includes bringing the benefits of irrigation whether from private tube-wells or canals to millions of small farms; improving the efficiency of water use through reduction of losses in storage and distribution systems and in farmers' fields; improving water distribution and drainage systems to allow controlled water application which is so important in the case of new cereal varieties; and soil conservation and crop management practices which enable more effective utilisation of water in rainfed areas without irrigation.^{22/} Detailed calculations of the required investment levels for water resource development have not been done. However, total investments would have to be large by almost any standard. But so too could be the returns.

The importance of more effective utilisation of water resources to the future growth of agricultural production and productivity should not be underestimated.^{23/} Studies for India and other countries have shown that investments in the development of water resources can be profitable even in the absence of improved seed-fertiliser technologies.^{24/} These investments become even more profitable when new production technologies are employed.

In addition to the development of water resources, a large amount of rural infrastructure will have to be created to extend the geographic impact of agricultural modernisation. Among other things this will include an adequate system of rural roads, extension of electric power into rural areas, development of improved marketing and storage facilities for both inputs and agricultural products.

Providing the institutional and technological base for widespread agricultural development supported by effective use of water resources and a necessary degree of infrastructure will provide the demand for growing small-scale manufacture and service industries that can yield significant new employment opportunities,^{25/} both in rural areas and elsewhere in the economy. These new employment opportunities are essential to absorb the growing labour force that will not be able to find remunerative employment in farming under the best of circumstances.

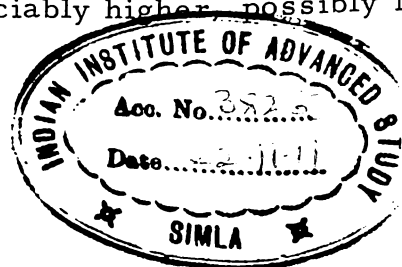
It seems only logical to think about how a significant segment of the rural underemployed and unemployed could be brought into the mainstream of agricultural development by labour-intensive programmes to provide the rural infrastructure required to support wide-spread technological change in rural India and create the preconditions for future sustained growth of the agricultural, manufacturing, and service trade sectors.^{26/} The Government of India has been adverse to consider a long-term, systematic programme of rural works using labour-intensive techniques to generate overhead capital.^{27/} Several writers have urged

this approach without success. John P. Lewis has been a strong proponent of a large-scale rural works programme. ^{28/} D.R. Gadgil has also written on the subject, ^{29/} as has K.N. Raj. ^{30/}

^{31/} V. M. Dandekar has probably given more thought to this subject than anyone else in India. As far back as 1962 he outlined the basic elements of a large-scale rural public works programme that would withdraw labour from agriculture on either a temporary or permanent basis to create agricultural and social capital required for sustaining economic development in rural areas. A large-scale programme of rural public works roughly along the lines outlined by Dandekar deserves serious and urgent attention.

The ruling Congress party is giving attention to this matter as well as to land reform. ^{32/} It remains to be seen whether or not anything is actually done.

The discussion so far on ways to bring about a more equal distribution of income in rural India and create a wider base for technological change points in the direction of increasing incomes of the poorest segments of society -- the poorest of the poor. This means, among other things, providing a boost to food consumption. The average income elasticity of demand for foodgrains is in the neighbourhood of 0.4 to 0.5. The marginal income elasticity for the poorest groups would undoubtedly be appreciably higher, possibly in



the neighbourhood of 0.7 to 0.8, Thus, one could reasonably expect that a very high proportion of the additional income generated among the rural poor would go for increased food consumption, principally foodgrains. But, the expanded employment and income associated with a rural works programme directed toward increasing agricultural and social overhead capital, together with other measures already discussed, will work toward increasing food production by enabling small farms to more readily exploit the new seed-fertiliser technology. Thus, one can visualise the expanded demand for food putting transitional pressure on food supplies until the rural works programmes result in further increases in food production.

As we have already seen, India will likely require food imports for several years to come and at an increasing level unless the rate of growth in foodgrain production is increased very significantly. It would, therefore, make a great deal of sense for India to use future foodgrain (and other food commodities as well) imports as a wage fund (but not necessarily a payment-in-kind scheme) to pay for a large part of the expenditures connected with a large-scale works programme. Why let imported food go directly into unproductive consumption when it could be used to create valuable capital for future development? And this is true regardless of the financial terms under which the imported food was obtained. Additional budgetary support

will undoubtedly also be required.

Supplies of foodgrains in the world available for food aid on concessional terms are likely to be large in the 1970s.^{33/} This being the likely case, it would make good sense for India to begin planning a large-scale rural works programme whose financial requirements are built into future foreign aid requirements, particularly food aid. This approach is consistent with Minhas' view that less foreign aid at the expense of growth is no virtue and more aid could significantly raise the rate of economic growth and the ability to repay foreign aid.^{34/}

Summary and Conclusions

We have reviewed the nature and sources of increased foodgrain production in India since 1950. We have also looked at the impact in recent years of the new seed-fertiliser technology on production of foodgrains. Much more remains to be done to adapt the new seed technology to India, particularly in rice where a significant increase in production has yet to take place. But possibly more important, because it will not be easy to come by, is the tremendous investment that India must make in the development of water resources and the elimination of the institutional biases against the small cultivator. It is only when these things are done in adequate measure that the base will be laid for further and sustained diffusion and expanded use

of the new technology. In addition, there are more than ample opportunities to employ the underemployed and unemployed in rural India on well conceived and well managed projects of labour intensive forms of capital creation to sustain a rapid pace of rural development that has a tolerable degree of equity in the distribution of the benefits of progress. Unless this is achieved, the social and political tensions that have been building up in rural India for some time and made even more acute by the stark visibility of the new seed-fertiliser technology could raise havoc with the whole development process.

A failure to accelerate the rate of growth of agricultural production will make India increasingly dependent on food imports and increasingly vulnerable to sharp increases in food prices when the rains fail and full import requirements are not met. Experience has already shown that there is no better way to fan the flames of discontent of the poor than by allowing food prices to rise sharply.

In 1969 it is estimated that about 250 million Indians have a level of living below the bare minimum considered necessary to keep body and soul together.^{35/} According to the Fourth Five-Year Plan (Draft) there will still be 225 to 235 million people below a bare minimum level of living by 1974.^{36/} Modest progress in relative terms does not count for much in reducing the absolute level of poverty.

I can do no better than reflect the views of a handful of thought-

ful Indians who are concerned with the problems and implications of India's grinding rural poverty. It is hoped that Indian leadership at all levels recognises soon the seriousness of the problem and acts soon in a significant way.

In commenting on the problems of the rural poor, Dandekar has said:

"It is thus that this weakest section of the population has remained neglected over the years. Presently, the policy-maker is unwilling to consider its problems any further because the answers seem to lead into directions inimical to the emerging structures of political power in the country. Therefore, no immediate action seems possible which will relieve the hunger of these people and prevent the waste involved in their unemployment. Admittedly they are hungry. But they must wait for the promised bread that will come at the end of the n-th five-year plan of overall economic development - where n is an eternal unknown. The only difference the five-year plans of economic development has made to these people is that while earlier they used to count in single years, now they are asked to count in five-year periods. "37/

But increasingly the rural poor are refusing to wait.

"... flash points have been noticed among the green revolution. The eyes of small farmers, share-croppers and landless labourers are turning red with rage rather than green with jealousy when they see the big farmers in their villages reaping the entire benefit of the green revolution.

"A recent survey by the Home Ministry has struck a serious note of warning: Rural India will be in flames in a year of scarcity. In a year of bumper crop when the going is good, the 'forgotten majority' can be consoled with crumbs. But when there is a setback in production, they will have no crumbs to fall back upon. "38/

And Minhas concludes his excellent and critical evaluation of the Fourth Five-Year Plan (Draft) by saying:

"A natural question to ask, therefore is: Will the large masses of the poor have the patience to wait until we develop the necessary will to break out of these vicious circles? The air is so tense with anxiety and the political situation in certain parts of the country so grim that an answer in the affirmative can hardly be ventured. The impatience of the poor with their lot is already evident. If we fail to accelerate the improvement of their opportunities and living standards, their discontent will turn out to be a potent political force capable of destroying the very foundations of the system that we have been trying to build. To believe that they can be contained by vague promises is a dangerous illusion. The political stability of the republic is in peril and the need of the hour is to speed up the rate of growth of the economy and also to modify the income generation process in favour of the poor through imaginative programmes and policies, so that they can benefit and develop a stake in the continuance of our democratic system. It is only with clarity of purpose, imagination and, above all, political courage that difficulties inherent in our situation can be overcome." ^{39/}

And so it is. Unless the leadership of India at all levels deals quickly and humanely with the plight of the poor, the poor may deal quickly, but not necessarily humanely, with the leadership.

TABLE 1GROSS AND NET CROPPED AREA AND AGRICULTURAL PRODUCTION
IN INDIA, 1951-65

Crop Year ending June 30	Gross Cropped Area	Net Cropped Area	Gross Area in food- grains	Index of Agricultural Production	Foodgrain Production
		(Million hectares)		(1949-50 = 100)	(Million metric tons)
1951	131.9	118.7	97.3	95.6	54.9
1952	133.2	119.4	97.6	97.5	52.0
1953	137.6	123.4	102.1	102.0	58.1
1954	142.4	126.8	109.5	114.3	67.1
1955	144.0	127.8	97.9	117.0	67.8
1956	146.7	128.8	110.6	116.8	69.3
1957	149.1	130.5	111.1	124.3	69.9
1958	145.8	129.1	108.7	115.9	63.5
1959	151.6	131.8	112.7	133.5	74.3
1960	152.8	132.9	115.8	130.3	77.7
1961	152.7	133.1	115.6	142.2	82.0
1962	156.0	135.3	117.2	144.8	82.7
1963	156.8	136.3	117.8	139.6	80.2
1964	156.8	136.4	117.4	143.1	80.6
1965	158.1	137.9	117.5	158.5	89.0
1966	155.3	136.1	113.2	132.7	72.0
1967	156.6	137.0	115.3	132.4	74.2
1968			121.4	161.0	95.6
1969			120.4	158.7	94.0

Source: Economic Survey of India, 1968-69; Statistical Abstract, 1958-65; and Economic Survey of Indian Agriculture, 1966-67; Directorate of Economics and Statistics, Ministry of Food, Agriculture and Community Development.

TABLE 2

PRODUCTION OF FOODGRAINS, INDIA, 1951-1969

(million metric tonnes)

Crop Year ending June 30	Total Food- grains	Rice	Wheat	Jowar	Bajra	Other Cereals	Pulses
1951	54.9	22.1	6.8	6.2	2.7	7.9	9.2
1952	52.0	21.3	6.2	6.1	2.4	7.7	8.3
1953	58.1	22.9	7.5	7.4	3.2	9.1	8.0
1954	67.1	28.2	8.0	8.1	4.6	8.7	9.5
1955	67.8	25.2	9.0	9.2	3.5	10.1	10.8
1956	69.3	28.7	8.9	6.7	3.5	9.8	11.7
1957	69.9	29.0	9.4	7.3	2.9	9.7	11.6
1958	63.5	25.3	7.9	8.4	3.6	8.6	9.6
1959	74.3	30.2	9.9	8.8	3.6	9.6	12.2
1960	77.7	31.7	10.3	8.6	3.5	10.8	12.8
1961	82.0	34.6	11.0	9.8	3.3	10.6	12.7
1962	82.7	35.7	12.1	8.0	3.6	11.5	11.8
1963	80.2	33.2	10.8	9.8	4.0	10.9	11.5
1964	80.6	37.0	9.9	9.2	3.8	10.6	10.1
1965	89.0	39.0	12.3	9.8	4.4	11.0	12.4
1966	72.0	30.7	10.4	7.5	3.7	10.0	9.8
1967	74.2	30.4	11.4	9.2	4.5	10.4	8.4
1968	95.6	37.9	16.6	10.1	5.1	13.7	12.2
1969	94.0	39.8	18.7	9.8	3.8	11.6	10.4

TABLE 3

PROJECTED CEREAL GRAIN PRODUCTION AND CONSUMPTION IN INDIA
1970 AND 1980

(Million metric tons)

Item	Production	Imports	Consumption*
1959-61 ave	67.6	4.0	71.6
1964-65	73.6	6.6	80.2
1970	87.0	6.0	93.0
1980 (A)**	106.1	16.5	122.6
1980 (B)+	114.7	10.3	125.0
1980 (C)++	126.3	1.1	127.4

Source: Martin E. Abel and Anthony S. Rojko, "World Food Situation: Prospects for World Grain Production, Consumption, and Trade", Foreign Agricultural Economic Report, No. 35, US Department of Agriculture, Washington, DC, September 1967.

- * An attempt was made to adjust consumption upward in relation to the increased income generated by a faster rate of growth in cereal grain production. Population is projected to be 685.8 million in 1980.
- ** Assumes the historical rate of growth in cereal grain production that prevailed in the 1956-66 period of 2.0 per cent per annum prevails between 1970 and 1980.
- + Assumes that between 1970 and 1980 there is a sustained rate of growth in cereal grain production of 2.8 per cent per year.
- ++ Assumes that between 1970 and 1980 there is a sustained rate of growth in cereal production of 3.8 per cent per annum.

NOTES

1. The rise in food prices was also stimulated by the sharp expansion in money supply that resulted from increased military expenditures during the Chinese War and Pakistan War periods.
2. Fourth Five-Year Plan, 1969-74 (Draft), Planning Commission, Government of India, 1969. These are notable achievements. As significant as the spurt in foodgrain production and the changes in rural areas that have flowed from it is the recognition that, in the main, peasant cultivators will respond to new technologies and economic incentives if the risks are not too high and the means with which to respond are readily available is also of great importance.
3. This part of the discussion draws heavily upon B. S. Minhas, "Fourth Plan: Objectives and Policy Frame", Commerce Pamphlet 20-21, Vora and Co, Publishers Private Ltd, Bombay, India, September 1969.
4. For an analysis of sources of growth in foodgrain production in India in the 1950s see Uma J. Lele and John W. Mellor, "Estimates of Change and Causes of Change in Foodgrains Production; India, 1949-50 to 1960-61", Cornell International Agricultural Development Bulletin, No. 2, Cornell University, Ithaca, New York, August 1964.
5. This has been achieved in significant measure by the rapid expansion of private tubewell irrigation.
6. Evidence indicates that the new rice varieties grown in the rabi season are less subject to disease and pest problems than during the kharif (monsoon) season when environmental conditions are more conducive to the prevalence of these problems.
7. W. David Hopper and Wayne H. Freeman, "From Unsteady Infancy to Vigorous Adolescence: Rice Development", Economic and Political Weekly, Vol. IV, No. 13, March 29, 1969.

8. J. S. Kanwar "From Protective to Productive Irrigation", Economic and Political Weekly, Vol. IV, No. 13, March 29, 1969.
9. Minhas, op cit.
10. Ralph W. Cummings Jr. and S.K. Ray, "1968-69 Foodgrain Production: Relative Contribution of Weather and Technology", Economic and Political Weekly, Vol. IV, No. 39, September 27, 1969.
11. Martin E. Abel and Anthony S. Rojko, "World Food Situation: Prospects for World Grain Production, Consumption, and Trade", Foreign Agricultural Economic Report, No. 35, US Department of Agriculture, Washington, D. C, September 1967.
12. See for example, "Agricultural Commodities - Projections for 1975 and 1985", Vols I and II, Food and Agricultural Organisation, Rome, 1967; S. S. Madalgi, "Foodgrains Demand Projections: 1964-65 to 1975-76" Reserve Bank of India Bulletin, January 1967; Willem Holst, "Planning for Self-Sufficiency in Foodgrains", Economic and Political Weekly, Vol II, No. 26, July 1, 1967; and Nathan M. Koffsky, "The Food Potential of Developing Countries", Journal of Farm Economics, December 1967.
13. See Elbert E. Hendrix, James L. Naive, and Warren E. Adams, "Accelerating India's Food Grain Production; 1967-68 to 1970-71", Foreign Agricultural Economic Report, No. 40, Economic Research Service, US Department of Agriculture, Washington, D. C, March 1968.
14. See "Agricultural Commodities - Projection for 1975 and 1985", Vols I and II, Food and Agricultural Organisation, Rome, 1967.
15. See, for example, John W. Mellor and Bruno De Ponteves, "Estimates and Projections of Milk Production and Use of Concentrate Feeds: India, 1951-1976", Cornell International Agricultural Development Bulletin, No. 6, Cornell University, Ithaca, New York, December 1964.

16. Report of the Committee on Distribution of Income and Levels of Living; Distribution of Income and Wealth and Concentration of Economic Power, Part I, Planning Commission, Government of India, February 1969.
17. Wolf Ladejinsky, "The Green Revolution in Punjab: A Field Trip", Economic and Political Weekly, Vol IV, No. 26, June 28, 1969.
18. Wolf Ladejinsky, "Green Revolution in Bihar - The Kosi Area; A Field Trip", Economic and Political Weekly, Vol IV, No. 39, September 27, 1969.
19. This has been well documented in a number of carefully done studies. See for example V. S. Vyas, D. S. Tyagi and V. N. Misra, "Significance of the New Agricultural Strategy of Agricultural Development for Small Farmers - A Cross-Sectional Study of Two Areas in Gujarat", Agro-Economic Research Centre, Sardar Patel University, Vallabh Vidyanagar, 1969 and "Seminar on Problems of Small Farmers", Indian Society of Agricultural Economics, Bombay, June 1968.
20. Wolf Ladejinsky, "Green Revolution in Bihar - The Kosi Area; A Field Trip", Economic and Political Weekly, Vol IV, No. 39, September 27, 1969.
21. B. D. Shastri, "Quickening the Pace in Village Improvement", Intensive Agricultural District Programme, Ministry of Food, Agriculture, Community Development and Co-operation, Government of India, New Delhi, July 1969.
22. For an excellent discussion of this subject see Donald A. Williams, "Water Utilisation in India: Situation, Developments and Recommendations", the Ford Foundation, New Delhi, India, December 1968, and Donald A. Williams, "Interim Comments and Suggestions on Selected Policy Items for Irrigation Commission", the Ford Foundation, New Delhi, India, November 1969.
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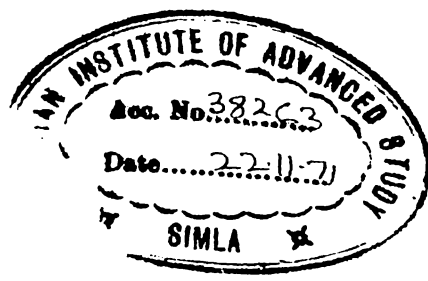
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