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BACKGROUND PAPERS FOR DISCUSSION

AT

THE INTERNATIONAL SEMINAR

ON

"COMPARATIVE EXPERIENCE OF AGRICULTURAL DEVELOPMENT IN DEVELOPING COUNTRIES SINCE WORLD WAR II"

NEW DELHI

25th, 26th, 27th and 28th OCTOBER. 1971

THE INDIAN SOCIETY OF AGRICULTURAL ECONOMICS
46-48, Esplanade Mansions, Mahatma Gandhi Road, Fort,
BOMBAY-1.

PRODUCTION OPPORTUNITIES IN ASIAN AGRICULTURE : AN ECONOMIST'S AGENDA*

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IV. Key Unsettled Economic Problems Pertaining to Asian Agriculture**

In terms of planning for economic development and the contributions that agriculture can make to it throughout Asia, I listed under topic II, a number of problems that should be placed on the back burner so that we can get on with those awaiting analysis. Among the problems that should be placed aside are the following: Whether or not farmers respond to changes in price; the extent to which the existing agricultural resources are allocated efficiently under conditions of traditional agriculture; closely related, the extent of surplus farm labor under these conditions; the farm price effects in the receiving country of P.L. 480 imports; and whether to start with an agricultural extension service or with organized agricultural research in modernizing agriculture.

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* Presented at Michigan State University, Asian Studies Center, at the Symposium on "Development and Change in Traditional Agriculture: Focus on South Asia," June 20, 1968.

@ Extract. Agricultural Economics Paper No. 68:12 (Revised July 12, 1968), Department of Economics, University of Chicago.

** Sections I to III have been dropped.

Turning now to new analytical business, we observe that Asian agriculture is entering upon a secular production boom, and let us assume that the governments of these countries will not return to a cheap urban food policy, and that there are no sudden widespread outbreaks of plant diseases that will seriously impair new highly productive varieties. This secular agricultural production boom will be dependent primarily during the next 5 to 10 years upon increases in supply of cheap fertilizer, new varieties of food and other grains that are fertilizer responsive, and installations to control and increase the supply of water which can be installed in a short period of time, such as tube wells, other water lifting equipment and improvement of major existing irrigation systems. Thus, back of this agricultural boom, there will be three agricultural input booms, i.e., fertilizer, new varieties, and tube wells, and closely related investments to improve the supply of water which can be done fairly rapidly. On these assumptions, let me turn to the key unsettled economic problems that, in my view, should be on our research agenda. In approaching these problems, I shall also advance a number of hypotheses.

1. Supply of entrepreneurial skills: For traditional agriculture, we have an economic equilibrium model from which we derive the hypothesis that there is no entrepreneurial supply problem. But the economic dynamics in agricultural production upon which Asian agriculture is entering alters this picture. From the disequilibria associated with this process, we derive two sets of hypotheses: (1) for relatively simple changes, such as replacing traditional foodgrain varieties with new superior varieties, applying some fertilizer and even in joining with neighbors to put down a tube well--the entrepreneurial skills of

Asian farmers are not in short supply; and (2) for the more complicated changes that are, also, becoming necessary, for example, the efficient use of pesticides and of chemicals to control weeds, the use of mechanical power, and of other purchased inputs, the use of much more credit in financing the purchase of these inputs, coping with the implied financial risk, with more flexible landlord-tenant arrangements, and acquiring the advantages of owner operatorship in adjusting to these dynamic developments--all of these and more call for improvements in the quality of the supply of entrepreneurial skills. Schooling becomes increasingly important as a consequence. The hypotheses here advanced are testable. If they are supported, we turn to extension activities, on-the-job-farming experience and schooling as the means of increasing the quality of this component.

2. The timing of institutional reforms. The question here is the optimum sequence in undertaking such reforms. In planning for the modernization of Asian agriculture, there has been much controversy with regard to this issue. There is the view that major institutional reforms are a pre-condition and that these reforms are sources of considerable additional agricultural production. The small increases in production and weak dynamics associated with institutional reforms that have been undertaken would appear not to support this view. Nevertheless, the established institutions of traditional agriculture in Asia and elsewhere are not adequate in terms of economic efficiency once modernization is underway. Accordingly, the modernization process gives rise to a demand for institutional changes and the institutional lags can be observed. Therefore, in view of the agricultural dynamics in many parts of Asia brought about by the availability of new varieties,

relatively cheap fertilizer and tube wells, I would advance the following hypotheses: (1) Whereas Asian farmers have shown little interest in credit reforms, they will now demand a larger supply of credit including credit that is timely and on better terms than they have had; and they will demand where these do not already exist, legal authorization and technical assistance to help them organize cooperatives for this purpose. (2) They will demand more flexible tenancy contracts. (3) They will cooperate among themselves to acquire the tube wells and to undertake minor investments to improve the supply of water. (4) They will, also, use whatever political influence they have to induce the government to provide more and better large scale irrigation and drainage facilities. (5) They are likely to be slow in seeing the inadequacies in the markets of agricultural inputs and of the products they sell. These are all testable propositions.[4]

3. Supply of scientific and technical skills: In allocating their resources, Asian countries, except for Japan, have grossly neglected these skills. There has been underinvestment on their part in organized agricultural research and especially so in bringing the advances in modern biology to bear on their agriculture. They have relied quite heavily upon the resources of the Rockefeller and Ford Foundations and upon foreign aid and technical assistance for this purpose. But these resources will no longer suffice. The development process now underway will

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4 I am indebted here to W. David Hopper and his treatment of these issues in "Regional Economic Report on Agriculture," Volume 1, Section III, Asian Agricultural Survey, Asian Development Bank, Manila, March, 1968.

require new regional research enterprises and many additional research programs to stay abreast. Since I have examined this problem with care elsewhere,[5] I shall do no more than call attention to it here.

4. Supply of fertilizer for Asian farmers : In the United States, agricultural economists have, literally, made hundreds of studies to determine the agricultural production possibilities of using more fertilizer with profit. But they have not analyzed the production and distribution of fertilizers to explain the decline in fertilizer prices to farmers. They have taken all this for granted. The study of Sahota* is the exception. But when we turn to Asia, the key problem that governments must solve is that of importing, or producing, and of distributing to farmers fertilizers at prices that are consistent with the prices that now prevail in world trade. The analytical problem awaiting solution in this area is of many parts. It would require a major paper to clarify and formulate the technical development in producing nitrogen, which has occurred since 1964-65, and has radically reduced the cost of producing it; the optimum scale of the plant, i.e., 1,000 tons per day, and its implications; the developments bringing down the price of potash; the gains from scale in producing phosphates offset presently by the world shortage of sulphur, soon to be reduced by the large increases in the sulphur from gas that is entering the market; what is a country like India to do in terms of economic efficiency in view of her many outdated fertilizer plants; and, not least, the possibilities

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5 "Efficient Allocation of Brains in Modernizing World Agriculture," Journal of Farm Economics, Vol. 49, No.5, December, 1967, 1071-1082.

* Gian S. Sahota, "An Analysis of the Causes of the Secular Decline in the Relative Price of Fertilizer," Ph.D. research at the University of Chicago, February, 1965; and his book, Fertilizer in Economic Development, Frederick A. Praeger, Inc., New York, 1968.

of more efficient facilities within Asian countries to transport and distribute fertilizer to farmers including the handling of it on farms and applying it to field crops.

5. Supply of water for Asian farmers: In terms of climate, much of Asian agriculture has a marked comparative advantage over agriculture in the temperate parts of the world because it permits the growing of two and more crops per year. Then, too, if there is water, the dry season crops produce substantially higher yield than the crops grown during the wet season. But the economics of water for Asian agriculture is still in its infancy despite the long history of investment in irrigation and drainage in populous parts of Asia. The economic record, in terms of agricultural production of the large, very expensive irrigation systems installed since World War II, has, in general, been very poor. There are strong reasons for using a different approach to an economic solution of a large part of this water problem. The price of additional capital is high and it is hard to come upon new large irrigation installation opportunities that will earn upward of ten per cent returns. Meanwhile, the technical advance in tube wells and related equipment to lift water has reduced their cost; moreover, the time required to install them, is much less than that of the large irrigation systems; thus, the pay-off is not so long delayed. It is, undoubtedly, true that the physical water supply conditions in the better parts of India and Pakistan are especially favorable at this juncture for additional water by means of tube wells and associated equipment. It, also, is true that some additional investment to "complete" some of the large irrigation systems recently

installed to bring this water to farms and to make it available when it is required and enough of it to make the crop successful, would pay off handsomely.

6. Increasing the market for food grains within Asia: On the assumption that the production of foodgrains in much of Asia will increase as a consequence of the modernization of agriculture now underway at a higher rate than the rate of increase in population, will the market demand increase accordingly? The solution of this problem on the demand side is not in any large increases in exports, although countries that have been dependent upon some foodgrain imports may shift to home produced foodgrains in replacing such imports. Better transportation facilities can play a part. In general, the critical problem is that of enlarging the extent of the domestic market. In solving it, the question is: How best to strengthen the economic tendency of the additional agricultural production creating its own demand? The success of Mexico on this score, should be highly instructive in analyzing this problem.

7. Lastly, the query: What happens if the modernization of agriculture succeeds? Assume, also, that birth rates decline and population level off. There are three economic consequences of the modernization of agriculture that can be anticipated : (1) a consumer surplus, (2) a decline in the Ricardian rent in agriculture, and (3) a shift in the comparative advantage of the agricultural areas within the country. The consumer surplus concept is old hat in economic theory, but the personal distribution of income effects of this surplus has major welfare implications. In the train of the decline in rent, there are important social and political adjustments related to the income from landownership. But the gradual shift in the comparative advantage of agricultural areas within the country will set the

stage for very serious problems unless they are averted by appropriate policy as modernization occurs. But this raises the question: Is there a policy approach that would spare Asian countries from depressed areas within agriculture? Western countries have not been spared; on this score they have done badly except for a few small countries, e.g., Denmark. But parts of agriculture in Italy and France are seriously depressed. The U.S.S.R. is not spared and the depressed Appalachia is testimony of the very uneven agricultural development in the United States. Japan, however, has a better record in averting this problem than that of major western countries. Consider India, the comparative advantage is shifting as a consequence of agricultural modernization to the northern parts (Ganges plains) and to the major "rice bowls" of the southern parts. A very large triangle in dentral India is losing out competitively. Scores of millions of people who are dependent upon agriculture reside in this large area that will be left behind. It would be hard to overstate the analytical challenge of discovering policy approaches to cope with this problem that would stand the test of economic efficiency and that would be manageable in planning for the economic development of India.

But these gains in Asian agriculture will be in vain--like reaching for the pot of gold at the end of the rainbow--unless the opportunities for family planning are, also, much improved.