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by

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THE ECONOMIC CASE FOR LAND REFORM:

EMPLOYMENT, INCOME DISTRIBUTION, AND PRODUCTIVITY*

Peter Dorner and Don Kanel**

Professional literature contains a wide range of viewpoints on the interrelations between land reform and agricultural development. This divergence of views is evident not only among agricultural production specialists but also among agricultural economists. Of course, some of the basic questions involved in land reform concern political and social consequences which are not always quantifiable. Others, however, are readily subject to empirical verification. This paper deals primarily with empirically demonstrable relations, although evidence on some of the questions involved remains incomplete.

We will not discuss land reform in specific detail nor elaborate on its definition. Neither will we explore the important political and social consequences that usually accompany land reforms. We recognize that such reforms may result in (or are intended to bring about) a major reorganization of society as well as of the agricultural sector. We do view land reform as more than changes in tenure or ownership conditions. Especially in the Latin American case, land reform must be seen to include a redistribution of land, a reorganization of agricultural producing firms, and the development

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and extension of supporting services to the reformed and to the existing small farm sectors.

Our conception of agricultural development includes more than growth in output per capita. Development cannot be measured by changes in any particular statistical series or along a unidimensional scale. We view agricultural development as widening the economic opportunities for the mass of people in the agricultural sector, improving their skills and capacities needed to exploit these opportunities, reducing mass poverty, and elevating the conditions of life among the rural population.[1]

This paper will begin with a brief historical exploration of land tenure systems and the different functions of such systems under varying economic, political and cultural conditions. This is followed by a discussion of the role of agriculture in current economic development, especially as it relates to questions of employment and income distribution. Included in this discussion will be the points of difference between agriculture and industry, and the problems of reasoning by analogy from the experience of the industrialized countries in devising agricultural policies for the poor agrarian countries. The paper will next present an analysis of the relationship between farm size and productivity, and finally, it will outline some implications of previous topics for agricultural development policies.

I

There is nothing inherently good or bad, right or wrong about land tenure systems as such. While ideological arguments on the best ways of organizing agriculture continue, no tenure system can be adjudged best in the abstract. Any judgements concerning a particular system must take note of the institutional and technological conditions in the society and the stage at which that society lies in the transformation from an agrarian to an industrial economy. Our judgements should also consider what specific groups and individuals in that society are attempting to accomplish.

The system of European feudalism of several centuries ago is today, by most any standard, an anachronism. It appears, under modern conditions, to be without redeeming qualities. Although comprising a total system of political, social, and economic institutions, it was at base an agrarian system built around the control of land. The European feudal system came into conflict with the evolving goals of creating strong nation states; proved ill-equiped to respond to the requirements of expanding markets; was too inflexible to accomodate the increased use of capital; and failed to meet the needs of man's evolving conception of himself.

Yet despite its inadequacies, its injustices, and its rigidities by present standards, this feudal system was an adaptation to the times. Growing as it did out of a crumbling and disintegrating world empire, it organized people according to strict and rigid class

structures with mutual obligations between clases, thereby assuring some degree of internal harmony and a measure of security from potential enemies external to the feudal manor.

But these feudal structures were inconsistent with the requirements of making the great change from an agrarian system to an industrial society. The various attempts at reforming these agrarian systems, and their eventual transformation, define major landmarks in the economic history of the European states. Let us then look at several systems of economic organization in the agricultural sector which have resulted in transformation of an agrarian economy into an industrial economy. Two basic models are the Soviet system of collectivization and the U. S. system of private property and family farms.

Russian collectivization may not have provided the individual incentives or the decision making freedom that family farms did; however, the Russian planners' major concern was rapid industrialization. Russian agriculture was producing a substantial export surplus at the time the collectivization policy was implemented. A key need was to free labor from work in agriculture to provide manpower for the new factories. In addition, the state had to "squeeze" some of the surplus production from the agricultural sector in order to provide relatively cheap food for the growing population in the industrial sector. And of course collectivization of agriculture was perhaps necessary to assure party control over the economic system and to prevent decentralized political developments. The

collective system functioned to achieve these ends.[2] In recent years modifications have been introduced, presumably because the system was not achieving present objectives and goals.

The Soviet system was instituted more than forty years ago. The country then had a low man-land ratio and a relatively slow population growth--a sharp contrast with the current situations in South and Southeast Asia, most of Latin America, and much of Africa. Rapid population growth of recent decades (and capital intensive, low labor absorptive industrialization) make it imperative that the agricultural sector hold people rather than being forced to release them.

Throughout the nineteenth century the United States was also characterized by a low man-land ratio; despite massive immigration, population growth was low relative to the experience of many of today's less developed countries. Furthermore, industrialization in the nineteenth century was generally more labor absorptive than it is today. U. S. development, like Russian development, required production of an agricultural surplus and the release of labor from agriculture to meet the labor demands of the growing industrial sector, but the means employed were wholly different from those used by the Soviet Union a century later. United States policy placed primary emphasis on new technology to increase the productivity of land and especially the productivity of labor, and relied on the competition among small producers for allocation of production factors among alternative uses.[3]

Still, in the past three decades U. S. agriculture has been substantially reorganized. The number of farms at present is less than half what it was thirty years ago. Farms have been combined and their average size continues to grow. The 80 acre and even the 160 acre farm is an inefficient unit for most types of farming in the U. S. today. While farms in this size range were viable going concerns until about thirty years ago, present technology and factor costs and availabilities make such units inefficient in terms of labor productivity. And since labor is relatively scarce compared with land and capital, labor productivity is a reasonably good measure for judging efficiency under U. S. conditions.*

When the design of a U. S. system of land tenure and economic organization of agriculture was being debated, the major alternative to family farms appeared to be a system of large estates and plantations with some features of European feudalism. The latter had been challenged on both political and economic grounds and was in various stages of disintegration. Furthermore, the large land mass to the West had to be secured from threats by other nations. The family farm system was perhaps the only reasonable alternative by which a

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* Labor productivity as a measure of efficiency in the agricultural sector ignores the social costs of people becoming stranded in rural communities and of large numbers of unskilled workers migrating to cities but failing to find employment within the occupational structure, which is largely determined by the technological developments in industry. These are serious problems in the United States, and they are likely to become all but insoluble in the less developed countries if means cannot be found to hold more people in agricultural employment.[4]

relatively weak government, lacking major communication and transportation networks, could assure that this large land mass would be rapidly settled and incorporated into the nation.

But there are very few places in the world today where such circumstances exist. For the most part, the problems then faced by the U. S. are not now central issues in agricultural development in most of the less developed countries. For both the Soviet Union and the United States, then, the land tenure systems reflect specific historical, geographic, and political conditions; both systems continue to be modified as development occurs. One must be careful not to prescribe transplantation of a system on the basis of its achievements elsewhere or in an earlier time or under conditions which no longer exist or cannot be duplicated.

In most of Latin America, the land tenure system is dominated by the large estate or hacienda. There are of course some family farms, communal holdings, plantations, and large numbers of very small holdings--minifundios--in most countries, but the prevalent form of land tenure, in terms of the area of land controlled, is the large estate.

The land grants under the Spanish system of several centuries ago gave control to a relatively small group over both large areas of land and the people living on this land. The tenure system resulting from Spanish conquest reflected the purposes of the conquistadores and the Spanish Crown: to gain control over and to settle this part of the new world, much of which had a larger indigenous population than then existed in North America.

Although the old Spanish-derived system has been modified, in some countries more than in others, there have been few thorough agricultural reorganizations and reforms such as occured throughout Europe. Most of the agricultural land in Latin America continues to be held and operated in very large units with various hired labor arrangements.

However useful this land tenure system was for the Spanish Crown, or is for national elites that now hold power, it has become obsolete and stands in direct conflict with the achievement of development goals. It needs to be changed to meet changing conditions, just as the land tenure systems of the industrialized nations have been modified and reformed in the process of development. Specifically, our view is that the basic land tenure institutions in Latin America must be reformed in order to create more employment, to achieve a more equal distribution of income, and to provide necessary increases in productivity.

The above sketches relating tenure systems to concurrent social problems and policy needs are not intended to imply a neat, logical relationship between land tenure and other circumstances in social systems. The above noted tenure systems emerged out of conflict and debate among contending groups--witness the Soviet debate on the rapidity and method of industrialization and the many U. S. experiments with land settlement policies in the nineteenth century. What this section does try to indicate is that tenure systems, as hammered out by experience and conflict, are adaptations to prevailing circumstances and that great caution is necessary in attempting

to transplant them to other situations.

II

Even in the industrialized countries, agriculture continues to make substantial contributions to overall economic development. However, its contribution to the supply of non-agricultural manpower, to capital formation, and to demand generation for industrial goods certainly becomes less critical in a highly industrialized country where the labor force in agriculture may be less than 10 percent of the total. In the developing countries, by contrast, especially in countries with 50 percent or more of their labor force engaged in farming, agriculture's contribution is critical in all these areas.[5] Although labor must move from agriculture to industry in the process of development, the problem under conditions of rapid population growth is not how to release laborers, but how to keep from releasing too many too quickly.[6] This has become increasingly clear over the past decade. Under present circumstances rapid population growth seems to accompany and even to precede development rather than to follow the 19th century pattern where population growth seemed to be a response to development.

There is need for a labor-intensive, capital-saving approach with heavy reliance on yield-increasing technical innovations in earlier phases of agricultural development, followed by a capital-intensive, labor-saving approach only in the later phases. These phases are determined by changing conditions in the areas of 1) demand for food and 2) employment opportunities.

Changes in the demand for food are determined largely by population growth and by the income elasticity of demand for food (which declines as average incomes rise). These changes can be readily seen in the following formulation: $D = p + \eta g$, where D, p and g are annual rates of growth of demand for food, population, and per capita income, and η is income elasticity of demand for food. As an illustration, assume that in a less developed country $p = 2$, and $\eta = .8$, while in an industrialized country $p = 1$ and $\eta = .2$, and that $g = 2$ in both cases. Then the demand for food will grow at a rate of 3.6 percent in the less developed country and at 1.4 percent in the industrialized country. The difference would be even wider if the population growth rate in the less developed country was more than 2 percent, while a higher growth rate of income in the industrialized country would make little difference because of the low income elasticity. Thus the less developed countries need considerably larger increases in food output than more developed countries do.* The need to earn foreign exchange increases even more the importance of increasing agricultural production.

On the employment side the crucial considerations are the high rates of population growth and the difficulty of absorbing a large share of this growth in the small urban sector. Thus rural populations

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* This discussion also assumes that the rate of growth in per capita income is widely shared. If increases in incomes are highly skewed in their distribution, the full impact of the income elasticity of demand for food would not be realized. For similar reasons, there may not be a one-to-one relationship in population growth and increased demand for food.

continue to grow, though at a slower rate than total population. Urban population grows rapidly and much of it is absorbed in precarious, low productivity urban jobs. Absolute numbers of rural people decline only in later stages of development, and only then is it necessary to reorganize agricultural production in a way that would decrease labor requirements.[7]

The combination of the above two sets of circumstances yields the Johnston and Mellor policy prescription: a labor-intensive approach with reliance on yield-increasing technical innovations in the earlier phases of agricultural development.[8] This policy approach both produces the required increases in agricultural production and avoids displacing labor prematurely from agriculture. It is a prescription for agricultural research, for large increases in the use of yield-increasing inputs such as fertilizer, improved seeds, insecticides and pesticides, for increases in irrigation facilities and for building of service institutions in extension, marketing, and credit. It is also a prescription to minimize mechanization, especially when it serves to displace labor.

Under the large farm system in Latin America, however, it has been difficult to gain acceptance of such policies. Labor-saving machine technology is available from the industrialized countries. So long as investment decisions are made on the basis of private profit, large farm entrepreneurs may find it in their best economic interest to import labor-saving machinery. In fact it may be easier to transplant

this type of technology than the biological type, which often requires specific research before it can be adapted to the specific conditions in new areas. The wide range of available production techniques now affecting employment contrasts with the more restricted options open to agricultural entrepreneurs in the nineteenth century. In this earlier period, labor-saving technology was largely a response to labor supply conditions, and the major innovations emerged from within the industrializing countries of the time--especially the United States and Western Europe. And, as already noted, these countries did not face the 3 percent population growth rates so common in our time.

The severity of the employment problem is magnified by the capital intensive-labor extensive patterns of development in manufacturing industries. In Latin America, manufacturing output is estimated to have increased by 140 percent from 1950 to 1965. During this same period, manufacturing employment grew by only 45 percent.[9]

Widespread population growth rates of 3 percent and higher are a relatively recent phenomenon. But the relatively low capacity of the manufacturing sector to absorb labor in early phases of economic development has been a feature of development in earlier times. Though manufacturing has become increasingly capital intensive over the past century, the early phases in the development of manufacturing have always had both a positive and a negative effect on employment. The shift from handicraft and cottage type industries to assembly-line manufacturing has resulted in less employment for a given amount of output.[10]

If agriculture were strictly comparable to industry, this employment dilemma would seem all but insoluble. In certain industries at least, capital intensive developments are frequently inevitable because the pattern of machine technology is set by that used in and available from industrialized countries. This technology may place limits on the substitution of factors (e.g., labor for capital) in production processes. If agricultural production were similarly restricted, then there would be few alternatives to capital intensive developments in this sector since agriculture in developed countries is also capital intensive. But agriculture is different. There are alternative means of economic organization in agriculture which permit greater flexibility in production processes. Factor proportions (land, labor, and capital) can more nearly be utilized in a manner consistent with their relative cost and availability. Market imperfections continue to obstruct more rational use of factors, but it is precisely at these imperfections (in land, labor and capital markets) that land reform is directed.

A key element in the above argument concerns the factor proportions to be used in agricultural production. As one writer says, "...the assumption of only a few alternative processes and a quite limited range for substitution of factors does not seem to fit well the technological characteristics of a number of important industries, as, for example, agriculture." If factor substitution is possible over a fairly wide range, as here hypothesized, then the problem of

major misallocations of resources is likely to be found in various market imperfections. The large, often redundant agricultural labor force in most Latin American countries lacks the economic and political power to gain control (either ownership or rental) over sufficient land and capital resources to increase its productivity. Nevertheless, present distribution patterns show a gross misallocation in terms of resource availabilities--too much land and capital and too little labor on the large farms, and too little land and capital and too much labor on the small farms. In Latin America, it is typical to find from 30-40 percent of the active agricultural population living on and working less than 10 percent of the land.[12]

Why don't farmers with large extensions of land employ more labor? There are many possible reasons. Farm owners may have outside interests that hold greater economic importance for them than farming. Abundant labor is not always cheap labor; minimum wages and a variety of social welfare laws may make the price of labor higher than it would be in their absence. A large unskilled hired labor force becomes difficult to manage on labor intensive enterprises. It also increases the risk in dealing with expensive machinery, improved livestock, and modern production practices which require constant use of judgement on the part of laborers. Given these circumstances, owners of large farms will frequently reduce their labor force and move in the direction of capital intensive, mechanized operations with a relatively small force of skilled workers (supplemented when needed by seasonal labor).[13] On the apparent assumption that a

developed agriculture must have the factor proportions now existing in the agriculture of the developed countries, government policy often encourages importation of farm machinery through favorable foreign exchange rates. Furthermore, most of the credit goes to the large farm sector (more credit worthy by bankers' standards), with inflation often making effective interest rates minimal or even negative. Resource misallocations and poor performance are not suprising given the underlying assumptions and the monopolized control over land and capital, but the profitable course for the individual entrepreneur results in costs to society which cannot forever be postponed.

Reasoning from analogy, U. S. and European experience with farm enlargement and mechanization provides support for this type of development, but only if one ignores the widely differing situation with respect to factor proportions and real factor costs (in contrast to existing factor prices which are often controlled and distorted by some of the above policies). Given the rapid population growth (and the inevitable continuing absolute increase in farm populations in most of the developing countries)[14] and the inadequate labor absorptive capacity of industry, agriculture must be organized to provide much more productive employment than it does at present.[15]

The size of farm operating units in agriculture is a basic determinant in the development of a labor intensive agriculture. Data from India, the U. S. (Illinois), and Chile show the following relationships: the smallest farm group has 1.6, 74, and 1.1 acres

while the largest farm group has 15.6, 219, and 16.6 acres per worker, for the three countries respectively.[16] These data certainly indicate some adaptation to the factor proportions existing in each country. They also, however, illustrate the greater employment capacity of small farm units, even though output per man may be (and usually is) lower on the small units. These figures also suggest the wider range of production techniques: for example, the ratio of acres per man on large over small farms is about 3 in the United States but ranges from 10 to 15 in the cases of India and Chile.

In a study of the Chateaulin area of Brittany, the following results are reported: "When one moved from holdings of less than 5 hectares to those of more than 25, the number of workers per 100 hectares fell from 105 to 18.7, the number of per-annum working hours per hectare from 1,500 to 480. Working capital also fell, but less markedly, from 210,000 to 119,000 francs, and gross yield from Index 163 to 88 (average for the area: 100)."[17]

Commenting on the Mexican case, Dovring notes that small-scale, labor intensive production is less costly than large-scale production in terms of the goods that are scarce in the Mexican economy. The large private farms are using more of the hardware that might otherwise have been invested toward even more rapid industrialization of the country. "There is no doubt," concludes Dovring, "that the owners or holders of large private farms make a good income by using more machines and somewhat less labor, but they render a less useful service to the struggling and developing economy of a low-income, capital-scarce economy."[18]

In the case of West Pakistan, Johnston and Cownie make a strong case for employment of more labor rather than more tractors in agriculture. They argue that "the existence of yield-increasing innovations which are neutral to scale and consistent with the existing systems of small scale agriculture increases the advantages of the labor-intensive, capital-saving alternative."[19]

Additional cases could be cited, but the evidence is quite clear that a small farm agriculture can absorb more labor than a large farm agriculture.[20] Some have cautioned that a small farm agriculture of peasant proprietors may lead to an excess of capital equipment on small holdings (i.e., much duplication and under-utilization of buildings and equipment).[21] However, the Japanese case shows clearly that technology can be adapted to fit small farms if research is specifically directed to achieve these results.[22] Or, on the other hand, a reorganization of a large farm system on cooperative or communitarian principles can be designed to assure both labor absorption and efficiency in the use of capital.

Earlier, we spoke of the confusion in reasoning from analogy with U. S. and European experience with respect to farm enlargement and mechanization. We also noted that agricultural production processes have characteristics which make many comparisons with developments in industry invalid. Let us explore this latter point in more detail.

The superiority of a large farm system argued on the basis of economies of scale is essentially a Marxian conception, and Marx was an industrial economist who paid little attention to the special

nature of the production processes in agriculture. Marshall and Mill expressed serious doubts about the analogy, but as Owen has pointed out, "It is probably fair to say that most economists have since attempted to resolve his [Marshall's] dilemma by avoiding it."[23]* Also, Ruttan mentions that "the failure of Marxian economists to test their commitments to large scale farming against empirical data has frequently been noted."[25]

A key factor is the difference in the investment process in agriculture and industry. On this point, Raup comments:

> The process of economic growth in agriculture follows a distinct pattern. In its early stages, slow gains in capital stocks predominate. Investment decisions are typically made in small segments, spread over many seasons or gestation periods. Impressive amounts of capital are formed, but by many small, plodding steps. This is quite different from the large-scale, dramatic investment programs emphasized in much current economic development planning. The image of development conveyed by a hydroelectric dam or by a steel mill is misleading if applied to agriculture. Capital formation in farming is rarely concentrated either in space or time. It accumulates by an incremental process that is best described as accretionary.[26]

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* With regard to the nature of employment in agriculture, Owen quotes John Stuart Mill: "Agriculture...is not susceptible of so great a division of occupations as many branches of manufactures, because its different operations cannot possibly be simultaneous. One man cannot be always ploughing, another sowing, and another reaping. A workman who only practiced one agricultural operation would be idle eleven months of the year. The same person may perform them all in succession, and have, in most climates, a considerable amount of unoccupied time."

Mill's insight has been elaborated by Brewster.[24]

The development of a nation's livestock herds is a good example. But likewise is the use of available labor (due to the sequential nature of operations noted above in which slack periods inevitably occur) to construct buildings, drainage ditches, fences, maintenance of irrigation systems, etc. Raup concludes:

> Wherever there is surplus agricultural labor and shortage of working capital the task of the land tenure system is to put people to work. This is when proposals for land distribution are most strongly compelling.
>
> The prospect that subsequent economic development may create nonfarm employment opportunities has led many economists to condemn land distribution programs because of the "uneconomic" size of farm units that may result. In the long run this argument may have validity. In the shorter run, the waste of capital-forming potential represented by underutilized labor is the more serious concern. In this sense, the political pressures leading to drastic land distribution programs may also be good economics.[27]

It is very difficult to make a case for large scale, labor extensive units in farming at low stages of economic development, especially in countries with a high man-land ratio. "Under a labor technology, costs cannot be cut by increasing the size of farm. Most of the cost economies from using modest capital items are largely exhausted as soon as the bullock team, horse or camel which provides the power are fully employed."[28]

This statement presents the rationale for recommending farm enlargement under one set of circumstances (e.g., in the U. S.) and farm subdivision with smaller units (or in any event a more labor intensive agriculture) under another set of circumstances (e.g., in

Latin America). The choice depends largely on the existing factor proportions and their relative real cost to society. What is good (i.e., profitable) for the individual entrepreneur may entail disastrous social costs.*

The small farm cannot divert the cost of unemployed (or underemployed) labor onto society as can the large farm or industry working primarily with hired labor. It thus becomes a better vehicle for what Owen has referred to as farm financed social welfare.[29] A small farm agriculture (or one organized in such a way as to provide a greater correspondence between private and public costs and benefits) also has advantages in providing a more equal distribution of income and thereby an enlarged demand for the growing industrial sector.

III

It may be conceded that a small farm or reformed agricultural system has the above noted advantages--more employment, more equitable distribution of income, a wider and more relevant demand structure for the growing manufacturing sector, a better base for farm financed social welfare, and more rational (in terms of existing factor availabilities) investment policies in both the agricultural and non-

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* The individual entrepreneur may prosper, but unemployment grows. Some individuals will find their productivity and incomes increased, but there is no development. These discrepancies between private and social costs and returns are similar to those of an industry prospering at the same time that it incurs intolerable social costs by polluting the air and the water.

agricultural sectors of the economy. Yet all these advantages may seem less significant if increases in agricultural production, both for export and for feeding rapidly growing populations, are viewed as the key issue,[30] and if the problems of unemployment and re-distribution are thought to be resolved indirectly (rather than through policies directed specifically at their resolution) in the course of increasing agricultural output. We do not deny the great importance of increased agricultural production. And we agree with Ruttan's evaluation that "The demographic transition associated with the initial stages of economic development will define the major problem of agricultural development in most under-developed countries for the rest of this century."* But given the experience with agricultural modernization in Latin America, we doubt that it is feasible to institute a continuous process of development without specific attention to the growing problems of unemployment and re-distribution.

Why should many agricultural production technicians (and some economist too) fail to give adequate recognition to the problems of unemployment and re-distribution and concentrate instead on the more technical aspects of increasing production? (This is particularly true of U. S. technicians.) There is a general assumption that the large farm is more efficient. Given this assumption, it has been

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* Ruttan goes on to point out that "Demographic and economic forces are resulting in annual increases in the demand for agricultural output of 3-5 percent. Sustained rates of growth in the domestic demand or in the supply of farm products in this range are completely outside the experience of presently developed countries. The annual rate of growth of agricultural output in the United States has not exceeded 3 percent for a sustained period since 1860."[31]

natural to concentrate on ways and means of increasing the productivity of the larger farms through more favorable (incentive) cost/price ratios, improved practices, better markets, more credit, etc.*

Confusion arises as a result of the particular measure of productivity or efficiency employed. It is true that labor productivity is consistently higher on larger farms, but this is hardly a measure relevant to policy in a labor surplus economy. Higher labor productivity on large farms is primarily related to mechanization and labor-saving techniques. Land-saving technologies such as improved seed varieties, fertilizers, insecticides, and improved weeding can usually be applied equally well and efficiently on small farms. Under conditions of abundant rural labor and continuous rapid population growth, productivity per unit of land is the most relevant measure for policy purposes for the next several decades. Obviously it is the purpose of economic development to raise labor's productivity--but not only for the few. And in order to raise labor productivity broadly for all those now in farming and those yet to be absorbed by the agricultural sector, land and capital must be re-distributed

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* Speaking of U. S. research, Ruttan points out that "Research has been primarily oriented to providing information relevant to private rather than public decision-making. The same orientation is characteristic of American farm management and production economics specialists and U. S. trained farm management and production economics specialists working in less developed countries."[32] Ruttan does, however, list a number of exceptions to this in U. S. farm management research.

(i.e., land reform must be implemented).*

Let us then turn to some of the evidence on the relationship between farm size and output per unit of land.[34] Figures 1 and 2 present the results from a number of recent studies. In most cases measurement of output is in terms of gross value per unit of land. Value of output per unit of land above variable cost would be a better measure since it would minimize the distortions due to possible differences in amount of capital used by farms of different sizes.

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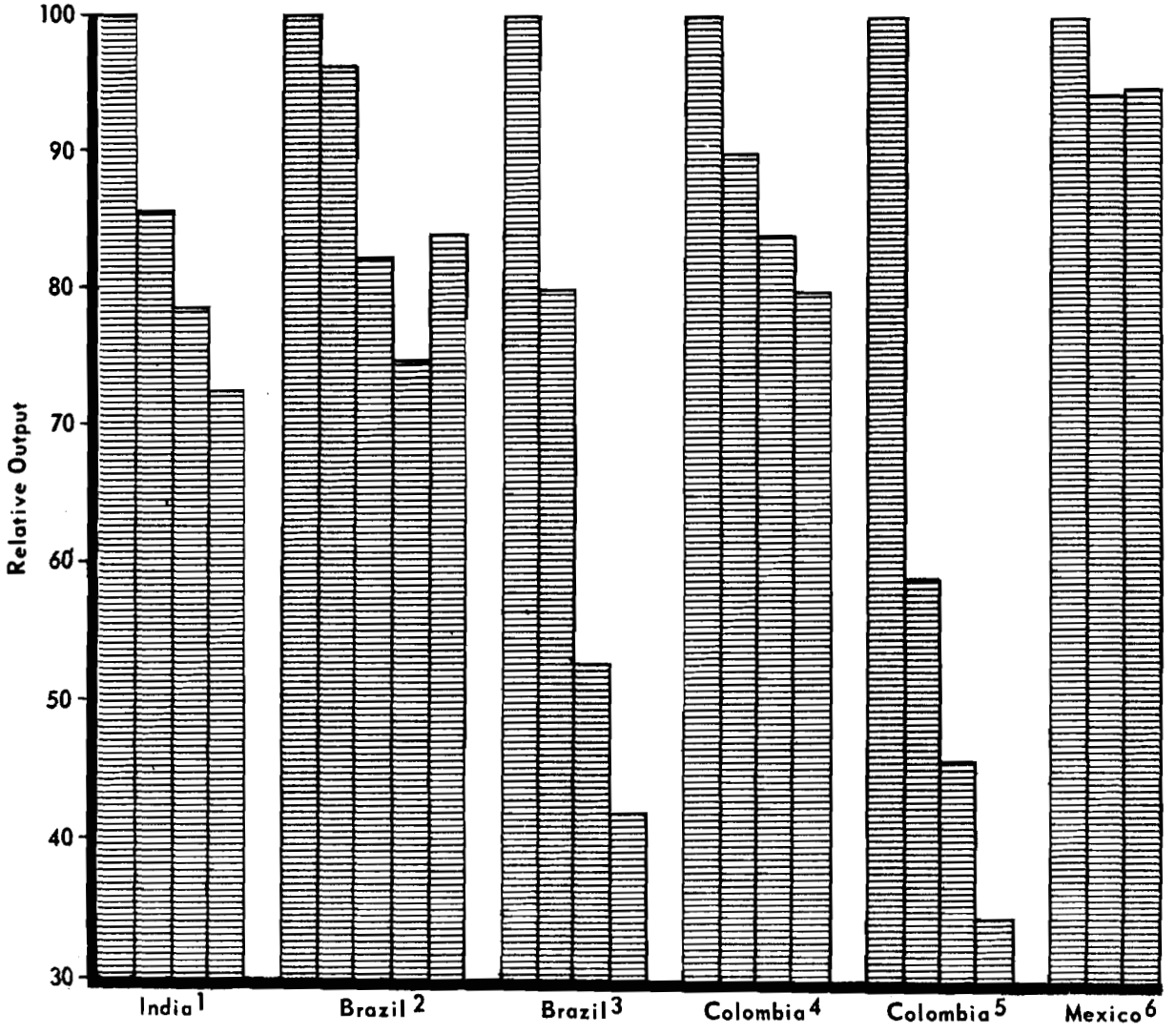
* On the above points, Erven Long has stated the case well when, writing on Indian agriculture, he notes: "Literally hundreds of American studies have confirmed that larger farms normally have correspondingly higher operator incomes, i.e., higher returns to the managerial and labor contributions of the farm operator and his family. In common usage this has erroneously been too often taken to be synonymous with greater 'efficiency,' leading to the conclusion that large farms are more 'efficient' than small farms. They are! But only with reference to management and labor, i.e., with reference to returns to the human agent. They are not necessarily the most 'efficient' in the use of other (non-human) resources. In the United States and similarly developed countries, this error creates little difficulty because the human agent is from a social viewpoint the most scarce factor of production. Much more importantly, in the United States maximum returns to the human agent in agriculture, which is obviously the economic goal of the individual farmer, is also roughly congruent with the broad objectives of public agricultural policy. And since management and labor are usually supplied by the same social unit, the individual farm family operator's net income is the most relevant measure of the relative efficiency of farms of different sizes. Maximum operator's income serves as an adequate criterion of both private and public policy action. The situation in India and similar countries is very different."[33]

OUTPUT PER HECTARE FOR FARM SIZE GROUPS



(For each Country, bar at left represents output per hectare for smallest farm size group. Bars to the right represent successively larger farms with their output per hectare expressed as a percent of that of the smallest size group)

1_/ /_India_7 Erven J. Long, "The Economic Basis of Land Reform in Underdeveloped Economies," Land Economics (May 1961), pp. 113-123. The paper uses data for the mid- and late 1950's gathered by the Studies in Economics of Farm Management, Ministry of Food and Agriculture, Government of India, New Delhi. Output as gross value in rupees per acre. Long classified actual farm sizes into four size groups--smallest, second smallest, second largest, largest--for each of eight areas in seven states, and presented output per size group as the average of the eight areas. (Data from more than 1,000 farms from seven states).

2_/ /_Brazil_7 Roger G. Johnson and Reuben C. Buse, A Study of Farm Size and Economic Performance in Old Santa Rosa, Rio Grande do Sul, Land Tenure Center Research Paper No. 27 (Madison: University of Wisconsin, August, 1967), pp. 40-61. Output as net sales per productive hectare, in thousands of cruzeiros (1963). Actual farm sizes included in each size class are: 1) 0-10 ha.; 2) 10.1-20 ha.; 3) 20.1-40 ha.; 4) 40.1-100 ha.; 5) more than 100 has. (Sample of 311 farms).

3_/ /_Brazil, 1950_7 Solon L. Barraclough and Arthur L. Domike, "Agrarian Structure in Seven Latin American Countries," Land Economics (November 1966), pp. 391-424. Also issued as Land Tenure Center Reprint No. 25 (Madison: University of Wisconsin, 1966). Output as percent of value of sub-family (smallest) farm production per cultivated hectare. The authors classed actual farm sizes into four groups: sub-family, family, multi-family medium, and multi-family large. (Based on National Census data).

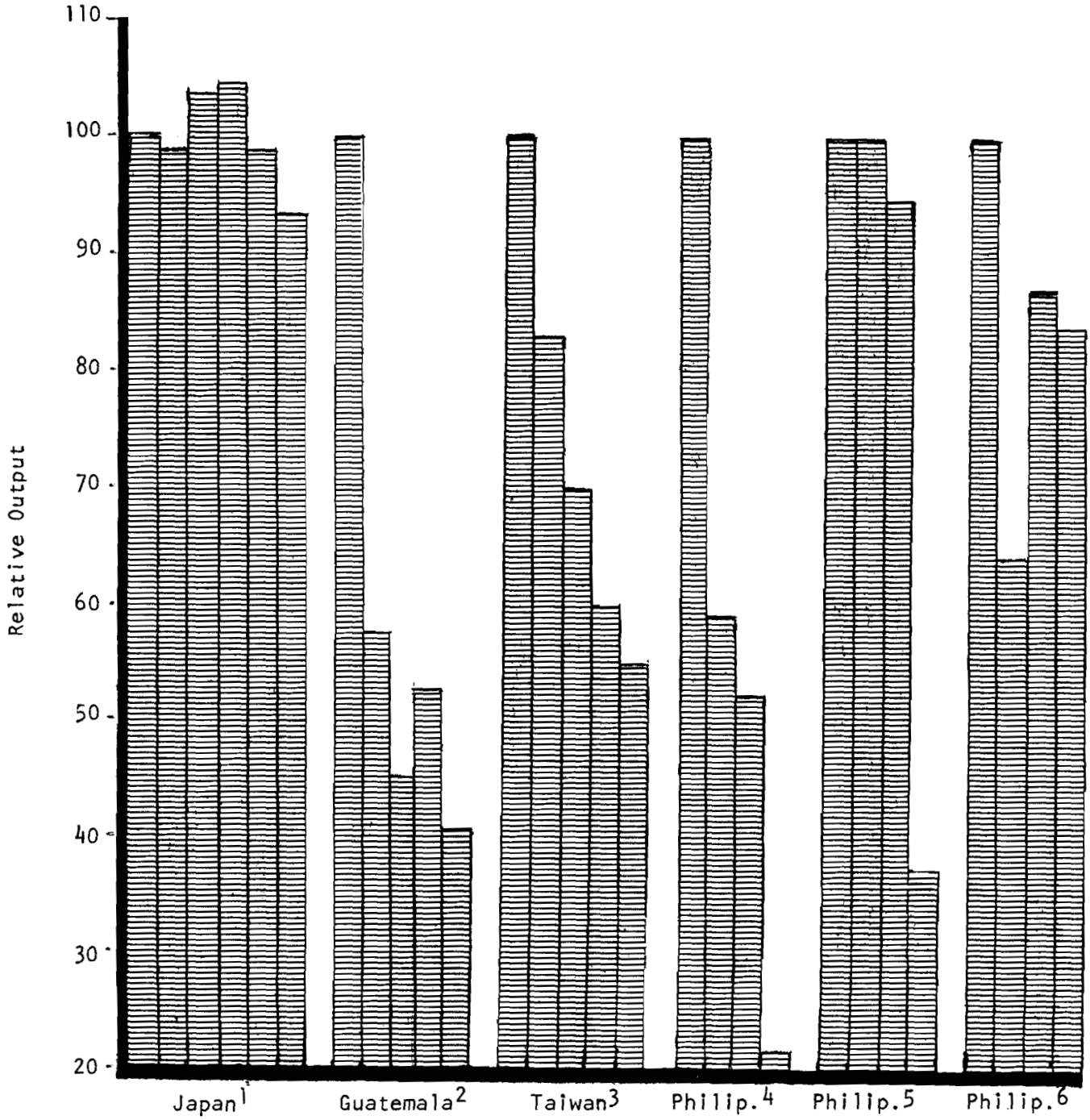
4_/ /_Colombia, 1960_7 Ibid., using same measures of output and same farm size criteria. (Based on National Census data).

5_/ /_Colombia, 1966_7 Emil Haney, "The Economic Reorganization of Minifundia in a Highland Community of Colombia," Ph.D. thesis in progress, Department of Agricultural Economics, University of Wisconsin. Output as gross value per hectare, in U.S. dollars. Actual farm sizes included in each size class are: 1) less than one ha.; 2) 1-2.99 ha.; 3) 3-9.99 ha.; 4) more than 10 has. (Sample of 203 farms in a highland community of Colombia).

6_/ /_Mexico, 1960_7 Folke Dovring, "Land Reform and Productivity: The Mexican Case, A Preliminary Analysis." AERR-83, Department of Agricultural Economics, Agricultural Experiment Station, University of Illinois, November 1966, 17 pages. Also issued as Land Tenure Center Paper No. 63 (Madison: University of Wisconsin, January 1969), pp. 2-10. Output as gross value per hectare of arable land, in pesos. Actual farm sizes included in each size class are: 1) less than five hectares in the private sector (average about 1.45 has.); 2) ejido lands averaging about seven hectares per ejido member (only about two percent of 1.6 million ejido members engage in collective farming); 3) more than 5 has. in the private sector (average about 27 has.). (Based on National Census data).

Figure 2

OUTPUT PER HECTARE FOR FARM SIZE GROUPS



(For each Country, bar at left represents output per hectare for smallest farm size group. Bars to the right represent successively larger farms with their output per hectare expressed as a percent of that of the smallest size group).

1. [Japan, 1960] Changes in Agriculture in 26 Developing Nations, 1948-1963, ERS Foreign Agricultural Economic Report No. 27 (Washington, D. C.: US Department of Agriculture, November 1965), pp. 35-44. The author uses data from the Japanese Farm Household Survey of 1960. Output as total receipts per cho minus fertilizer costs per cho, for seven crops. Farm sizes are classified into six groups: 1) less than 0.3 cho; 2) 0.3-0.5 cho; 3) 0.5-1.0 cho; 4) 1.0-1.5 chos; 5) 1.5-2.0 chos; 6) more than 2.0 chos. One cho is slightly larger than one hectare.

2. [Guatemala, 1950] Comité Interamericano de Desarrollo Agrícola, Tenencia de la tierra y desarrollo socio-económico del sector agrícola, Guatemala (Washington, D.C.: Pan American Union, 1965). Output as value product per utilized hectare for nine selected crops, in U. S. dollars. Farms are classified into five groups: micro farms, sub-family, family, multi-family medium, and multi-family large.

3. [Taiwan, 1965] Raymond Christensen, Taiwan's Agricultural Development: Its Relevance for Developing Countries Today, ERS Foreign Agricultural Economic Report No. 39 (Washington, D.C.: Department of Agriculture, April 1968), p. 41. Output as net farm income per chia, in thousand N.T. dollars. Actual farm sizes are: 1) under 0.51 chia; 2) 0.52-1.03 chias; 3) 1.04-1.54 chias; 4) 1.55-2.06 chias; 5) over 2.07 chias. One chia is 0.9699 hectare.

4. [Philippines, 1963-64] Vernon W. Ruttan, "Tenure and Productivity of Philippine Rice Producing Farms," The Philippines Economic

Journal 5, No. 1 (First Semester 1966), pp. 42-63. From unpublished data of the Bulacan Survey of the U. P. C. A. Department of Agriculture Information Survey, Gloria Feliciano, Director. (Also published as Land Tenure Center Reprint No. 56, University of Wisconsin, Madison.) Output in kilograms per hectare per year. Farms were placed in four groups: 1) below 1.0 ha.; 2) 1.1-2.0 has.; 3) 2.1-3.0 has.; 4) above 3.0 has. Graph depicts relative productivity for share tenants in Barrio, Balatong B.

5. [Philippines, 1963-64] Ibid., using same measures of output and same farm size criteria. Graph depicts relative productivity for share tenants in Barrio Santol.

6. [Philippines, 1963-64] Ibid., using same measures of output and same farm size criteria. Graph depicts relative productivity for lease tenants in Barrio Santol.

However, in those cases where some such concept was used, the results are consistent with the gross concept.* In fact, using the gross concept probably understates the small farm's margin over the large farm.

The evidence shown in Figures 1 and 2 is generally consistent with the hypothesis that output per unit of land is inversely related to farm size. Some may say that this does not prove an inverse relationship between farm size and productivity per unit of land. However, the data do show that the general presumption of a highly positive relationship which underlies most land reform discussions is highly suspect.

In a Chilean study Morales analyzed output per hectare for farm size groups ranging from 10 to 500 hectares of irrigated land. In this study, soil quality, distance to market, and even type of farming were held constant. Even under these rigidly controlled circumstances there were no statistically significant differences in output per hectare for farms in the various size groups despite the fact that the

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* In the first Brazil case, Figure 1, the measure used was net sales per productive hectare. In Figure 2, in the case of Japan, the measure is total receipts minus fertilizer costs per unit of land, and in the case of Taiwan the measure is net farm income per unit of land. Note also Dovring's point made earlier that large farms use more of the hardware that might otherwise have been invested toward even more rapid industrialization. In the Indian case, Long notes that "Investigation of this point reveals, however, that empirically gross value of productivity per acre is equally adequate under Indian conditions. Variable capital inputs, in the form of seeds, fertilizers, insecticides, etc. are so small as not to affect comparisons, even if there were some consistent bias in relation to farm size--which there appears not to be."[35]

small farms had more difficulty (and less access) in obtaining credit and water for irrigation.[36]

The relationships shown in Figures 1 and 2 are cast in a static context. However, "the relationships revealed are the end products of such dynamics as have existed in the society."[37] In his analysis of Indian data, Long has suggested that similar analysis from societies whose agriculture has had more dynamics might be more relevant. The data from Mexico, Taiwan and Japan are especially revealing in this regard. As Long points out, "if data for such countries [as Japan] reveal a negative relationship between size-of-farm and gross value productivity per acre above variable capital costs as the end result of a highly dynamic agricultural development process, then indeed the presuppositions of most land reform discussions--and also of much technical assistance work--need intense re-examination."[38]

The data for Japan certainly are not inconsistent with this view. In fact the multiple cropping ratio is consistently smaller as farm size increases. Likewise for the case of Taiwan, Figure 2 shows a very consistent inverse relation between farm size and net farm income per unit of land. From 1940 to 1965, cultivated land per farm was reduced by almost one-half while output per hectare <u>more than</u> doubled.[39] The Mexican data are also consistent with this view. The <u>ejido</u> sector in 1960 had only one-fourth of the land but accounted for over one-third of all marketed farm produce. In terms of sales as a percent of total output, the ejido sector sold practically the same proportion (65.2) as did the large farm sector (67.7).[40]

It might be argued that the higher productivity per unit of land on existing small farms is no real evidence that new units to be created by splitting up large farms would achieve increased productivity. But the evidence available on post-reform experiences--in Mexico, Bolivia, Chile, Japan, Taiwan, Egypt--shows that although in some cases there was an initial drop, average productivity per unit of land increased rather substantially after these reforms. All cases involved a reduction in the average size of farm.[41]

There has been much discussion of the drop in agricultural output following the Bolivian revolution and reform, yet the evidence shows that this decline was not so much in output as in the amount marketed.[42] And in fact even the amount marketed was not reduced by as much as official statistics indicate because marketing channels were altered. Thus some of the produce marketed through the new outlets did not get counted since market reports were obtained only at the traditional points.

We wish to be clear that we do not argue for small holdings per se or necessarily a family farm system. And certainly the man-land ratio in Latin America is immensely more favorable than in Japan or Taiwan and presenting evidence on these countries in no way is meant to suggest such small farm systems for Latin America. The evidence was presented to show that even in a system of extremely small holdings, the inverse relationship between farm size and output per unit of land exists.

We recognize the differences existing in Latin America today and those existing in Europe and especially in the United States and Canada at the time the family farm system was established in those countries. What is required for development is an agriculture organized in such a way as to (1) provide incentives for productive work and investment, and (2) use a combination of production factors consisistent with the cost and availability of these factors at a given time. What often leads to support of the case for a small farm system is that these basic requirements seem to be more easily met within such a system. However, this may be a judgement reflecting the cultural bias of U. S. technicians.

IV

In the United States, land tenure research has concentrated largely on improving leasing arrangements and on "modifications designed to help the tenant become an owner operator."[43] This has been a relevant focus for the United States. This research emphasis is also fitting for many of the landlord-tenant small farm systems in Asia (where land reform is also a simpler process than in Latin America since such a system is already characterized by small operating units and the key to reform is to sever the landlords' control over the tenants). But such a research emphasis does not get at the key issues in the Latin American situation. Here, if the agricultural sector is to make its contribution to overall development,

basic reorgainzation and redistribution of land and capital is required in order to : productively employ more people in agriculture, contribute more to capital formation in both the agricultural and the industrial sectors, and provide the income distribution necessary for broadening the market for locally manufactured goods as well as for the increased production from agriculture.[44]

As a minimum, even if major land distribution programs are not politically feasible at present, farm programs under most Latin American conditions require a shift to provide more specific aid to the existing small farm sector (elsewhere referred to as a policy of "contrived dualism" in contrast to the existing dualism).[45] "The immediate purpose of such programs is to create new and more secure income earning opportunities in rural areas. The longer term objective is to speed up the required structural transformation of the traditional agricultural system." "Over time it would be expected that the orgainzation and the political and economic power of the two subsectors would become more equal."[46]

Major policy steps need to be taken in four key areas: (1) allocation of land on the basis of its ability to employ labor, (2) development and introduction of new technology to increase employment and production, (3) modification of rural service structures to assure access to small farmers, and (4) provision for dual systems of capital and credit.[47] Programs introduced in the past several years in Southern Brazil[48] and in the Puebla project in Mexico[49] are most encouraging with respect to results achieved when specific attention is given to

the special needs and problems of small farmers.*

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* A team of economists from Iowa State University, in analyzing the Guatemalan agricultural sector, raised this question: "Where Should Corn Production Be Increased?" After carefully analyzing the prospects on the coast (with a large farm system) and on the central highlands (with a small farm system) and detailing all the expected consequences, they concluded that a major fertilizer program would have the most beneficient results if concentrated in the central region.

"The gains from a fertilizer program in the central region can be summarized as follows:

1) a rise in real income for producers using fertilizer from the 33 percent of additional production consumed at home;

2) an increase in cash income for these producers of Q 6,600,000 from the outlay of Q 2,500,000 for fertilizer, which would be available to purchase food, consumer goods and other farm inputs, thereby raising living standards and opening markets for industry;

3) more absorption of labor in corn production because there is less mechanization than in the coast and a larger production area would be involved;

4) prices and supplies of corn for deficit urban and rural markets equivalent to the program in the coastal region."[50]

Recognizing all the difficulties in carrying out such a program, they nevertheless conclude that "...fundamental questions can be raised about the desirability of a large-scale fertilizer program to increase production of a subsistence crop such as corn within a largely commercial subsector. The most serious question would appear to be the income effect on the vast majority of corn producers [as a result of corn price declines] who would be cut off from the new and more productive technology being applied by the fortunate few."[51]

The evidence presented in this paper supports the case for the productivity potential of a reformed agriculture. Given existing circumstances, there is no contradition in the need for farms to become larger in some countries and smaller in others. "The eventual goal of development policies may indeed be a large-farm agricultural system in an industrial economy. But such an end product must be achieved through a continuous process of reorganization and the use of production techniques appropriate to the factor endowments existing at particular points in time."[52]

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