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Relation of Agricultural Price Policy to
Economic Growth and Income Distribution Objectives

by

Donald R. Kaldor

June 1965

RELATION OF AGRICULTURAL PRICE POLICY TO
ECONOMIC GROWTH AND INCOME DISTRIBUTION OBJECTIVES

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Iowa-Peru Mission

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SUMMARY

Two broad objectives seem to dominate economic policy discussion in Peru -- the objective of increasing real national income (economic growth) and the objective of reducing income inequality. Agriculture's contribution to the economic growth objective can be increased (1) by improving the efficiency with which the agriculture sector allocates and uses its products and resources and (2) by investment to increase the quantity and quality of resources available for farm production. The pricing of agricultural products has an important role to play in maximizing the income gains from both sources.

If agricultural prices are used as an instrument for redistributing income, however, their capacity to encourage an efficient use of agricultural products and resources will be impaired. In addition, prices are an inefficient instrument for redistributing income because they provide very little control over the incidence of the income redistribution effects. In general, non-price instruments (e.g., progressive income tax) provide much more control over the incidence of income redistribution effects and are more compatible with the economic growth objective than the price instrument. The conclusion is that agricultural price policy should be designed to strengthen the capacity of prices to encourage an efficient allocation and use of agricultural resources and products and that non-price instruments should be used to achieve the objective of reducing income inequality.

While a generalized system of administered agricultural prices may, in theory, offer a superior alternative to free-market pricing, this may not be true in practice, particularly in developing economies. The efficient operation of such a system requires a large amount of reliable information and a high degree of technical and administrative skill -- resources which typically are very scarce in developing economies with high opportunity costs. Moreover, it requires a favorable political climate -- one in which (a) the government is strongly committed to an agricultural price policy based on supply-demand criteria and (b) the price setting agency is free from political manipulation. These are stringent requirements. If these conditions are not reasonably well satisfied, a modified free-market pricing system is likely to offer better results than a generalized system of administered agricultural prices. With a modified system of free-market pricing, the goal of agricultural price policy would be to improve the functioning of free markets by government efforts to remove or redress the weaknesses of free markets in practice. A number of specific actions designed to achieve this goal are outlined.

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RELATION OF AGRICULTURAL PRICE POLICY TO
ECONOMIC GROWTH AND INCOME DISTRIBUTION OBJECTIVES^{1/}

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Two broad objectives seem to dominate economic policy discussion in Peru -- the objective of increasing real national income and the objective of reducing income inequality. These objectives are reflected in ongoing efforts to create, uncover and exploit new income earning opportunities and to change the distribution of income and wealth. Agricultural price policy has significance for both objectives.

In this paper we will attempt to analyze some of the interrelations between agricultural price policy and economic growth and income distribution objectives and to evaluate the role of agricultural price policy in achieving these objectives. This will require some background discussion of agriculture's contribution to economic growth and the problem of income inequality. The relevant ideas will be presented in as simple and nontechnical manner as possible.

Agriculture and Economic Growth

In a static sense, agriculture makes its maximum contribution to real national income when it produces the kinds and quantities of products most consistent with the relative intensities of product demands using no more of the economy's resources than necessary to get the job done. By minimizing the input of resources used to satisfy the needs for agricultural products, the largest amount of resources is made available for the production of nonagricultural goods and services. This permits the highest level of living above subsistence needs and the largest investment out of current income.

Over time, the problem of meeting the needs for agricultural products with a minimum amount of the economy's resources breaks down into two major processes. First is the process of augmenting the forces that create opportunities for increasing the productivity of agricultural resources. Second is the process of adapting or reorganizing the agricultural sector so that the opportunities for real income gain made possible by the forces of rising productivity are fully exploited. Of course, both processes must go on at the same time if agriculture's contribution to over-all growth is to be maximized, given the level of investment. Within each broad process are numerous subprocesses, involving knowledge generation, skill creation, incentives and rewards, institutional arrangements and so forth.

In general, highly developed economies (e.g., the United States) have agricultural sectors characterized by strong forces creating opportunities for increasing agricultural productivity. Currently, their most pressing problem is not that of strengthening these forces. Rather, it is the problem of reorganizing the farm sector so that the opportunities for income gain already present can be fully exploited.

^{1/} A paper prepared for the Directorate of Agricultural Economics, Ministerio de Agricultura, Lima, Peru.

On the other hand, the forces creating opportunities for rising agricultural productivity are weak in many of the less well developed economies. As a result the stream of new income earning opportunities made available to farm producers is small and the income gains offered by these opportunities are meager. Their most pressing problem seems to be that of strengthening the forces which generate opportunities for large income gains and to develop the institutional arrangements which permit these opportunities to be fully exploited.

Increasing Agriculture's Contribution to Economic Growth

Essentially, there are two approaches to the problem of increasing agriculture's contribution to national economic growth. Since these approaches are not mutually exclusive, there is an important question of the proper mix for an optimum development strategy. One approach focuses on tightening the efficiency of the agricultural sector in allocating and utilizing existing products and resources. Much of the apparatus of modern economics has been developed with this kind of focus in mind. In highly developed economies, a large part of the efforts of agricultural economists is absorbed in research and extension (information dissemination) activities relating to this approach.

The other approach focuses on the process of increasing the quantity and quality of agricultural resources by investment, i.e., devoting resources to upgrading the level of technical and management knowhow, to developing and supplying new, more productive forms of reproducible inputs and to expanding the input of existing kinds of farm resources. Here the stock of economic knowledge is much smaller -- theoretical ideas are less well developed and measurement techniques are far less satisfactory. Nevertheless, a growing number of economists believe that this is the approach which offers the really big income payoffs in the developing economies.

A. Agricultural efficiency

The potential payoffs in the efficiency approach depend on how badly the agricultural product producing sector is utilizing its present resources and on how badly the agricultural marketing sector is allocating products in trade and consumption. Here we will consider some of the kinds of inefficiencies that can exist. The question of how much inefficiency actually exists can be answered only by empirical investigation. The identification and evaluation of these inefficiencies is a necessary step in planning the optimum use of resources devoted to increasing agriculture's growth contribution from this source. Only then can priorities be established and efforts be directed at the removal of those inefficiencies offering the largest gains in real income.

1. Inefficiencies in trade and consumption^{1/}

An efficient allocation and use of agricultural products in trade and consumption requires that the incremental (marginal) net value of a product (after allowance for costs of transport, processing and storage) be approximately the

^{1/} In the discussion of inefficiencies, it is assumed that prices are at market clearing levels and that consumers are free, within wide limits, to allocate their incomes as they see fit.

same among different consuming centers, among different time periods, among different uses and among different users. Evidence that incremental net values differ points to an inefficiency in the allocation and use of the product. Some examples may help.

Suppose that the price of a given quality of potatoes in Cañete was persistently below the price in Lima by more than the cost (actual or potential) of moving potatoes from Cañete to Lima. This would be presumptive evidence of an inefficiency in the spatial allocation of the potato crop. Or, suppose that the price of rice in Lima persistently rose during the crop year (period between harvests) by much more than the cost of storing rice during this period. This would be presumptive evidence of an intertemporal (between time periods) inefficiency in the use of rice. If storage facilities did not exist and they could be constructed at a cost per unit of rice, which was less than the price rise, an investment in storage facilities would be economic. A storage operation also would tend to temper the seasonal swing in rice prices. Or, suppose the price paid for a given quality of sugar was found to be persistently lower when used for candy making than when used on the family table. This would be presumptive evidence of an inefficiency in the allocation of sugar among uses.

The magnitude of these inefficiencies would depend on the size of the price differentials and the responsiveness of different demands to a change in price. If demands were highly responsive and price differentials were large, the income gains from removing the inefficiencies would tend to be large also. On the other hand, if demands were insensitive and price differentials were narrow, the gains would tend to be small.

The primary requirements for removing inefficiencies in trade and consumption are (1) a flow of information that permits decision makers to evaluate the costs and returns associated with activities (buying, selling, storage, processing and transport) which will have the effect of reducing these inefficiencies and (2) freedom and capacity to engage in these activities. In other words, there must be information on the size of the new income earning opportunities and the ability to exploit these opportunities. The requirements are essentially the same whether the private sector or the public sector takes the initiative in removing the inefficiencies. A well designed agricultural price policy can play an important role in digesting and transmitting information about such opportunities.

2. Inefficiencies in utilizing existing resources in agricultural production

Possible inefficiencies in agricultural production (on farms) are of three main kinds: (a) inefficiency in the combination of inputs (resource mix), (b) inefficiency in the composition of agricultural output (product mix) and (c) inefficiency in the level of agricultural output (relative size of the agricultural sector). The removal of these inefficiencies may involve a reallocation of resources within farms, among farms and between farms and nonfarm firms.

a. Inefficiency in resource mix. An efficient allocation and use of existing agricultural resources implies, among other things, that the output of each farm product be produced at minimum resource cost. If it is possible to increase the output of one or more farm products without increasing the input

of any resource by reallocating resources among farms or among products, the output of agricultural products is not being produced at minimum cost. For if the output of one or more products can be increased, the old collection of output could be produced with less total input of resources. Evidence that resource returns in the production of a given product vary among farms producing the product indicates that the output of the product is not being produced at minimum cost.

Producing a given output of a product at minimum cost means that the output should be distributed among farms in accordance with the opportunity cost of producing the product on each farm. If opportunity costs vary among farms, the output on low-cost farms should be expanded relative to the output on high-cost farms. If the product price were set on the basis of production costs, so that low-cost farms received a lower price than high-cost farms, there would be little incentive for low-cost farms to expand production relative to that of high-cost farms. As a result, the total resource cost of producing the product would not be minimized.

b. Inefficiencies in product mix. An efficient allocation of available agricultural resources also implies that the relative quantities produced of different agricultural commodities should be geared to the relative demand intensities for these products. This requirement will be satisfied when the returns to comparable resources are about the same in the production of different agricultural products. Evidence that resource returns in different lines of agricultural production are persistently different indicates an inefficiency in the product mix.

Suppose that returns to resources in rice production were persistently higher than returns in cotton production. This would be presumptive evidence of an inefficiency in the mix of agricultural products. Removing this inefficiency would involve a shift of resources from cotton production to rice production. This shift would expand rice production and reduce cotton production and tend to bring resource returns in rice and cotton into line by lowering returns in rice production and raising returns in cotton production. In removing all such inefficiencies, the mix of agricultural products would be geared to the strength of the relative demands for these products.

c. Inefficiency in the level of agricultural output (relative size of the farm sector). To be most efficient, how large should the agricultural product producing sector be in relation to the nonagricultural sector? The agricultural product producing sector will be of optimum size when the level of agricultural output persistently clears markets at prices just high enough to cover the opportunity costs of the inputs used in production on well-organized farms. Another way of saying much the same thing is that returns to resources on well-organized farms should be approximately the same (after allowance for any non-income values) as the returns earned by similar quality resources in the nonfarm sector of the economy.

Evidence that returns to resources on well-organized farms (when markets persistently clear) are out of line with returns earned by similar resources in nonagricultural employments indicates an inefficiency in the level of agricultural output (relative size of the farm product producing sector). If returns on farms

are low in relation to returns in nonfarm employments, the level of agricultural output is too large (the agricultural sector is using too much of the economy's resources). On the other hand, if returns on farms are high in relation to those in nonfarm employments, the level of agricultural output is too small (the agricultural product producing sector is not absorbing enough of the economy's resources). Removing this kind of inefficiency involves either increasing or decreasing the resources absorbed by the farm sector, depending on whether the farm sector is too large or too small. Transfers of resources, particularly labor, between the farm and nonfarm sectors are generally the most difficult ones to achieve because they typically require changes in kinds of employment and residence.

Maximum efficiency in the use of available agricultural products and resources requires the removal of all the inefficiencies enumerated above as well as some others. With existing agricultural resources and technical knowledge, the removal of such inefficiencies would give a "one shot" increase in real national income. Inefficiencies in the use of existing resources, however, are a potential source of economic growth only as long as they exist. Once they are removed (assuming they do not reoccur) there can be no additional income gain from this source. This would be the situation in a stationary economy (one not subject to permanent growth forces, especially net investment) which had succeeded in achieving allocative efficiency. National income in such an economy would reach a maximum, based on existing resources and technical knowledge, but it would not exhibit any growth. Per capita income could be high or low, depending on the amount of resources, resource productivity and population. But all the possible income would have been squeezed out of available resources.

In an economy subject to permanent growth forces, inefficiencies in the allocation of existing resources are constantly being generated so there is a continuous stream of opportunities to tighten allocative efficiency. If the institutional arrangements for guiding and encouraging resource reallocations are highly effective and if other requirements for adaptation are reasonably well satisfied, there may be relatively little inefficiency in the economy even though the permanent growth forces have been strong. On the other hand, inefficiencies may be wide-spread in an economy subject to weak growth forces, if the conditions for resource adjustment are not well satisfied. An effective pricing system is one of the requirements for a minimum of allocative inefficiency under conditions of economic growth.

B. Agricultural investment

The critical variable determining the strength of the permanent growth forces is investment (i.e., the process of devoting resources to activities which generate new permanent income streams or opportunities for new permanent income streams). The size of the total permanent income stream generated by a given level of investment depends on how the investment resources are allocated among and utilized within alternative investment outlets. Basically, this is a matter of costs and returns. To maximize the permanent income stream from a given total investment, each outlet should absorb investment resources until the expected incremental net return falls below the expected incremental opportunity

cost -- the expected incremental net return offered by the next best investment outlet. The crucial steps in the rational allocation of investment resources are (1) the identification of investment alternatives, (2) the estimation of expected costs and returns, (3) the implementation of investment plans and (4) keeping investment plans up to date and consistent with changing market and technological conditions.

Prices enter the investment process primarily in the evaluation of investment alternatives and in adjusting investment plans for changing conditions. Prices (or their equivalent) are needed in estimating costs and returns. They also function to guide and encourage revisions in investment plans so that plans are made more consistent with supply-demand developments and an efficient allocation of investment resources.

The importance of developing a sound basis for making public and private agricultural investment decisions cannot be over-emphasized in economies where the agricultural sector typically employs a large share of the total resources and produces a high proportion of the national income. Because of the scarcity of investment resources in developing economies, there is added reason for the exercise of great care in the identification and evaluation of agricultural investment alternatives. Here research has an important role to play.

Agricultural investment resources can be devoted to increasing productive capacity on farms, in the farm input supply sector and in the farm marketing sector (transport, storage, processing and retail distribution). In broad terms, investment alternatives on farms include (a) old (existing) forms of reproducible farming inputs, including capital imbedded in land, (b) new, more productive forms of reproducible inputs (assuming they are available) and (c) technical and decision-making know-how by labor-management. In the farm input supplying sector, investment may involve the production of additional quantities of existing forms of inputs and/or reductions in the supply prices of these inputs. It may involve research and development activities which give rise to new, more productive forms of reproducible farming inputs and the production of these inputs at the lowest possible supply prices. And, it may also involve the generation of technical and management knowledge and the dissemination of such information to decision makers.

In the agricultural marketing sector, investment resources may be devoted to producing more and better (lower cost) facilities for storing, transporting and processing agricultural products and for their distribution in retail trade. They also may be devoted to the improvement of product quality and to the development of new processed products.

Although not usually identified as an agricultural investment alternative, investment resources may be used to remove inefficiencies in the allocation and use of existing agricultural resources. For example, insofar as current inefficiencies stem from imperfect knowledge of the terms on which alternatives are offered (prices) investment in activities that improve market information can help to reduce these inefficiencies and thereby increase agriculture's contribution to economic growth.

For a given level of agricultural investment, what is the optimum investment mix -- what allocation of investment resources will maximize agriculture's contribution to real national income? Unfortunately, the answer is not clear, even for the more developed economies where there has been some effort to find an answer.

In the United States, practically none of the very large increases in farm output over the past 15 years can be explained by changes in the measured inputs of land, labor and capital. Typically, the increase is attributed to "technological advance." However, this provides no operationally useful information in making decisions on how to induce such an increase. There is a rather strong presumption, supported by very fragmentary evidence, that much of the increase in farm output has been associated with large past investments in (a) research and development activities which have produced many new, more productive forms of reproducible farming inputs and (b) general and agricultural education which has greatly improved the technical and management knowhow of United States farmers. While research and education may have been the key activating forces, nevertheless, many other conditions were favorable for increasing output, including cost-price relationships, credit facilities, adequate supplies of the new inputs and a marketing system that could handle a larger output of farm products.

A small but growing number of agricultural economists are arguing that, in general, the payoffs from agricultural investment in developing economies are highest for investments in farm people (primarily education but also health), somewhat lower for investments in research, development and production of new reproducible farming inputs and lowest for investments in old (existing) forms of reproducible inputs. Professor T. W. Schultz in his studies entitled Transforming Traditional Agriculture and Crisis in World Agriculture presents the case for this view. While this is a reasonable general hypothesis on the basis of existing knowledge of the agricultural sectors in developed economies, the facts needed for a strong test are not yet at hand. It is clear, however, that the evaluation of alternative agricultural investment outlets must play a large role in any serious effort to step up agriculture's long-run contribution to economic growth in developing economies. Undoubtedly, this is one of the most fruitful areas of applied agricultural economic research in Peru.

Agricultural Product Pricing in Relation to Growth

The pricing of agricultural products serves important functions in organizing and coordinating economic activities in the agricultural sector. Prices help to move agricultural products through the channels of trade into consumption. In this way, they influence the distribution of products over time and among areas, uses and users. In production, prices help to allocate resources between agriculture and the nonagricultural sector and among different lines of agricultural production. Thus, they influence the level and composition (mix) of agricultural output. Agricultural prices also function to distribute income among agricultural producers and between the agricultural and nonagricultural sectors of the economy.

In most countries, it has been the income distribution function of prices which has been emphasized in the formulation of agricultural price policy. However, when prices, rather than other instruments, are used to redistribute income, they cannot function effectively in distributing products in trade and consumption and in allocating resources in agricultural production. The usual result is that total real income is needlessly sacrificed in the process of changing the distribution of income among families and individuals.

Product allocating function

If prices are to efficiently allocate agricultural products in trade and consumption, they must reflect temporary (current) supply-demand conditions in all markets. Essentially, this means that prices should be at market-clearing levels -- levels at which quantities demanded by buyers are equal to quantities supplied by sellers. If a price is higher than the market-clearing level, some supplies go unsold and some sellers end up with more stocks than they prefer to hold at that price (an excess supply). If a price is lower than the market-clearing level, some buyers are unable to satisfy their demands so they end up with more money or other products than they prefer to have at that price (an excess demand).

With prices at market-clearing levels in all markets, assuming that all supply-demand conditions are fully reflected, the output of agricultural products will tend to be distributed most efficiently over time and among areas, uses and users. By "most efficient" is meant that no other distribution of output -- given the ownership pattern of output and the personal distribution of income -- would permit all buyers and sellers to get a higher level of satisfaction (utility) from this output. In this way, an effective agricultural pricing system contributes to an efficient utilization of agricultural products and thereby to economic growth.

Suppose agricultural prices were set above market-clearing levels and that they were maintained at these levels by a government buying program. Since there would be an excess supply in the market, the government would have to remove part of the supply in order to maintain price. In the case of perishable products, the government could either destroy the amount removed or move the supplies into lower valued uses (uses not reflected in market demand at the support price). In both instances, there would be some economic waste. If the quantity removed from the market were destroyed, clearly no one would get any benefit from the excess supply. If the excess supply were diverted into lower valued uses, it would mean that consumers would get less of the product in the forms they prefer. Thus, consumers would not get as much satisfaction from the output as they would have gotten if part of the supply had not been diverted to lower valued uses.

In the case of storable products, the government might simply add the excess supply to existing stocks. However, if stocks already are at economic levels, the addition to stocks would reduce the marginal value of the product in inventory below its marginal value in current consumption. As a consequence, the allocation of the product over time would not be most efficient and an inordinate amount of resources would have been put into storage facilities.

For effectively performing the product allocation function, agricultural prices at the wholesale and retail levels have to be sufficiently flexible so they can fully reflect short-run changes in supply-demand conditions, including those of a temporary nature. In general, the amount of price flexibility needed at the wholesale and retail levels (excluding marketing margins) will be greater than the amount needed at the farm level to perform the allocation functions in production.

Resource allocating function

Agricultural prices perform the resource allocation function by guiding and encouraging producers to use the resources at their disposal in the most efficient manner (to maximize income). If prices are to perform this function effectively, the signals they give producers must be reasonably accurate and certain so they provide a sound basis for planning the use of resources. In addition, the rewards implicit in agricultural prices must be such that they induce producers to act in ways that result in an efficient use of resources.

Rational planning of the use of available resources on the individual farm requires the formulation of price expectations (estimates of what prices will be when products are ready for market). Unless producer price expectations correspond closely to realized prices and producers view their price expectations with confidence, the planned use of resources will not turn out to be the income maximizing use of resources. Insofar as producer price expectations are based on recent price experience and insofar as recent price experience fails to accurately reflect underlying supply-demand developments, producers will not have the proper signals and incentives to produce the most efficient collection of agricultural products. As a result, inefficiencies will show up in the level and composition (mix) of agricultural output.

Suppose the producer price of rice was set persistently below market-clearing levels based on underlying supply-demand conditions and that the prices of crops closely competitive with rice in production were set persistently at market-clearing levels. This would imply a persistent excess demand in the rice market. Further suppose that producers had adjusted to these prices so that resource returns in rice production were about as good as those in the production of competitive crops. While the relative outputs of rice and competitive crops then would be consistent with their relative prices, the fact that there would be an excess demand in the market for rice indicates that consumers would prefer (be willing to pay for) more rice and less of other crops.^{1/} They would be willing to pay a higher price for rice in relation to the prices of competitive crops. If prices accurately reflected the relative intensities of these demands, the price of rice would be higher in relation to the prices of competitive crops, and then resource returns in rice production would be greater than those in the production

^{1/} In technical terms, the rates of substitution between rice and other crops in production would not correspond to the rates on consumption, indicating a lack of coordination between production and consumption and resulting in an opportunity to increase real income.

of competitive crops. Producers would tend to respond by increasing rice production relative to the production of other crops until relative returns were brought back into line. At this point the mix of products produced would be geared to the relative demand intensities and production and consumption would be fully coordinated.

In general, farm prices (prices at the farm level) for efficient allocation of resources in production do not have to be as flexible as wholesale and retail prices for the efficient use of products in trade and consumption. While both sets of prices must accurately reflect supply-demand conditions, the makeup of these conditions is somewhat different. For the efficient use of products in trade and consumption, prices must reflect all short-term developments influencing quantities supplied and quantities demanded. For example, above or below average weather which results in an abnormally large or small crop should be reflected in the pricing of products for an efficient distribution of output over time and among areas, uses and users. However, such a supply development should not influence producer price expectations in planning subsequent crops. Since this year's weather is not a good predictor of next year's weather, the planning of subsequent production on the basis of this year's (say) low price (large crop) or high price (small crop) would not give the most efficient use of resources in production. The effects of such temporary supply-demand developments on producer prices may be removed without interfering with the allocative function of prices in production. In fact, the tempering (e.g., by storage policy) of price effects of this kind can actually increase the effectiveness of producer prices in encouraging efficient resource use on farms.

Ideally, prices for investment planning should reflect supply-demand developments over the period in which the investment is expected to induce output effects. If an investment project itself will have significant effects on the supply-demand situation for farm products, price expectations should be formulated with and without the investment in order to properly estimate expected returns and costs. Long-term price projections usually are based on projections of supply and demand shifters and price-quantity relationships. Accurate historical data on market prices and quantities are essential in making such projections. If markets persistently exhibit excess demands or excess supplies, it becomes difficult to prepare reliable estimates of supply and demand relationships and thus accurate price projections for investment planning purposes.

Agricultural Price Policy and Income Inequality

In most countries, agricultural price policies have emphasized income distribution objectives. Generally, developed countries have used agricultural price policy to redistribute income from the nonagricultural sector to the agricultural sector. This frequently has been done by supporting farm prices, directly or indirectly, above market-clearing (temporary supply-demand) levels. Developing economies, on the other hand, typically have employed agricultural price policy to redistribute income from the agricultural sector to the nonagricultural sector, usually by holding prices to consumers below market-clearing levels. In both instances, the economizing functions of prices have been impaired.

Factors determining the personal distribution of income

In a market economy, based largely on private property, the amount of money income which a family or single individual receives (excluding personal gifts) depends on three factors: (1) the quantity and quality of resources, including labor services, owned and offered for productive activities, (2) the earning rate (average return or price) paid for each kind of resource^{1/} and (3) the tax and transfer policies of the government. The amount of real income depends on the amount of money income and the prices of things bought.

Efforts to change the personal distribution of income, therefore, might focus on changing (1) the patterns of resource ownership, (2) the earning rates for resources (via changes in input or product prices), (3) the incidence of government tax and transfer payments, (4) the relative levels of consumer prices and (5) some combination of these. Each possibility has different consequences for economic growth.

Some instruments for redistributing income may increase real national income; others may reduce the "size of the pie" to be divided up. Among the latter, some may have large income reducing effects whereas others may have small income reducing effects. Since increasing real national income and reducing income inequality are both considered desirable social objectives, an instrument which reduces income inequality and at the same time increases real national income is preferred to one which reduces income inequality and lowers real national income. It also follows that as between two instruments equally effective in reducing income inequality, both having adverse effects on real national income, the one with the smallest income reducing effect is preferred.

Redistributing income via prices

As an instrument for redistributing income, prices have two main weaknesses. First, they provide very little control over the incidence of the income redistribution effects. In many instances, the effects may be perverse, i.e., they may increase income inequality. Second, when prices are used to redistribute income, they cannot effectively perform the functions of allocating products and resources. As a result, the allocative efficiency of the agricultural sector is impaired. Here we will consider how effective agricultural prices are as an instrument for reducing income inequality.

Suppose we look at the case where agricultural prices are persistently held above market-clearing levels on grounds of reducing an income disparity between farm and nonfarm people. With this policy, farm producers would receive higher prices for their products and consumers would pay higher prices for food and fiber.

^{1/} In some cases, the earning rates are established directly in the market, e.g., the wage rate paid for a particular kind of labor service. In other cases, the earning rates are established indirectly in the market through imputation or as a residual, e.g., the average return on capital tied up in plant and equipment. On farms, the short-run earning rates on land, labor and capital are imputed returns established indirectly in the market via product prices and other factors.

This would involve a redistribution of real income from the nonfarm sector to the farm sector. Farm producers in the aggregate would have more real income and nonfarm people in total would have less real income (constant money income and higher prices for agricultural products).

But what about the effects within the aggregates? In general, the increment in total real income in the farm sector would be distributed among farm producers in almost direct proportion to the amount of output sold by each producer. A large producer would get a relatively high proportion of the increment and a small producer would get a relatively small proportion of the increment. If a large fraction of agricultural output were produced by a relatively small number of producers, most of the increment in total farm income would go to relatively few people.

Would this increase or decrease income inequality within the farm sector? Clearly, absolute differences in farm family income would increase. The reason is that there is a high direct correlation between farm family income and the amount of output the family has to sell. A family with a large output would have a high income and would receive a large absolute increase in income as a result of the price policy. On the other hand, a family with a small output to sell would have a low income and would receive a small absolute increase because of the price policy. So the price policy would have the effect of increasing absolute differences in income. The bulk of the increment in total farm income could go to families that already have relatively high incomes.

In the consuming sector, the distribution of the decrease in total real income among nonfarm people would tend to be proportional to the expenditure on agricultural products. While all consumers would experience some drop in real income, families that spend a large amount on agricultural products would tend to experience a large drop in real income and those that spend a small amount would tend to experience a small decline. Since the amount spent on agricultural products tends to be larger for high-income families than for low-income families, the price policy would tend to reduce real income differences among nonfarm families.

Without more information about the personal distribution of national income, it is not possible to reach a firm conclusion on what the overall effect would be on income inequality. It is clear, however, that such a price policy would redistribute some income from poor families in the nonfarm sector to richer families in the farm sector and from richer families in the nonfarm sector to poor families in farming. This, of course, points up the difficulty of controlling income redistribution effects induced via the price system.

In the second case, let's suppose that agricultural price policy tries to maintain agricultural product prices below market-clearing levels on grounds that many urban consumers are poor. Under such a policy, there would be a redistribution of real income from farm producers to consumers of agricultural products. Farmers would get less for their products and consumers with the same money income could buy a larger collection of agricultural commodities.

Within the farm sector, large producers would experience a much bigger absolute decline in real income than small producers. As in the first case, the proportional change in real income would tend to be quite similar for large and small producers. While farm families generally would have less real income under this price policy, absolute income differences among farm families would tend to diminish.

Within the consuming sector, consumers who spend a large amount on agricultural products would experience a larger absolute gain in real income than those who spend a small amount. Because the amount spent on agricultural products tends to be related directly to the level of family income, high-income consumers would experience a larger absolute increase in real income than low-income consumers, even though all consumers of agricultural products would receive some increase in real income. So in trying to raise the real income of low-income consumers via agricultural price policy, much of the income transferred to the consuming sector would tend to go to higher income consumers.

Again, without more information about the personal distribution of real national income, it is impossible to say what the net effect would be on income inequality. But there would be some transfer of income from poor farm families to richer nonfarm families and from high-income farm families to poorer nonfarm families under a policy of maintaining agricultural prices below market-clearing levels.

Non-price instruments for reducing income inequality

In general, non-price instruments for reducing income inequality give more control over the incidence of income redistribution effects and they are more compatible with the economic growth objective than the price instrument. They may have other disadvantages, however. Most of these non-price instruments involve the government's authority to collect and disperse tax funds. Because of space limitations, we can allude to only a few of these non-price instruments here.

One of the most powerful is the progressive income tax.^{1/} Even if the disbursement of funds collected under a progressive income tax were neutral with respect to income distribution, the fact that high-income people pay a larger tax than low-income people would reduce differences in disposable income. If the income tax is progressive, the proportion of income paid as tax will be higher for high-income people than for low-income people. Thus, the reduction in absolute income differences could be large. A consideration of the expenditure side opens up additional opportunities to reduce income inequality. Some of these can make a positive contribution to economic growth.

^{1/} In general, commodity and sales taxes tend to be regressive, i.e., the amount of tax paid makes up a larger proportion of income for low-income people than for high-income people. Thus, the use of such taxes tends to increase income inequality.

For example, suppose that some of the revenue collected under a progressive income tax were used to support free public education, and as a result children from low-income families who have not been going to school now receive an education. This would tend to raise the income earning capacity of these people, both absolutely and relative to that of other people. Consequently, they could make a larger contribution to real national income which they would receive as personal income and at the same time income inequality would be reduced. Thus, investment of public resources in education and training would tend to contribute to both objectives. Investment in improving the health of low-income families may also have complementary effects on economic growth and income inequality.

Of course, income inequality may be reduced by using revenue collected under a progressive income tax for transfer payments to the poor. While such transfer payments probably would have a smaller national income reducing effect than distributing the same income via the price system, they would almost certainly make less of a contribution to the permanent reduction of poverty than investments which increase the income producing capacity of low-income people.

Income tax revenue might also be used to subsidize food consumption by low-income families under a food stamp program. Compared to a policy of holding food prices below market-clearing levels, this has the advantage of providing greater control over who gets the real income gain. Under a food stamp program, the real income gain can be restricted to those with low incomes. In fact, unless supplies of agricultural products expand sufficiently, prices would rise and consumers who did not participate in the food stamp program would experience some decline in real income.

Insofar as the available resources owned by low-income families were used less efficiently than those owned by high-income families, efforts to tighten the allocative efficiency of the economy would tend to have complementary effects on economic growth and income inequality. By tightening allocative efficiency in this situation, the incomes of low-income people would rise relative to the incomes of high-income people and income differences would diminish at the same time that real national income increased. Even though both groups were utilizing their resources with the same degree of inefficiency, the same result could be accomplished if the program to tighten allocative efficiency was focused on low-income families.

Role of Agricultural Price Policy

In the preceding discussion, it has been pointed out that when prices are used to redistribute income their capacity to encourage an efficient use of products and resources is impaired. In addition, prices are an inefficient instrument for redistributing income because they provide very little control over the incidence of the income redistribution effects. It has also been pointed out that there are non-price instruments which, in general, provide much more control over the incidence of the income redistribution effects and are more compatible with the economic growth objective than the price instrument. The conclusion is that agricultural price policy should be designed to strengthen the capacity of prices to encourage an efficient allocation and use of agricultural

products and resources and that non-price instruments should be used to achieve the objective of reducing income inequality. This would help to minimize inconsistencies and permit higher levels of attainment of both the growth objective and the objective of reducing income inequality.

If agricultural price policy is to serve the product and resource allocating functions, it means that the pricing of agricultural products must be based on supply-demand criteria. Prices based on old historic price relationships (such as parity prices in the United States) or on cost of production estimates (such as some support prices in Australia) will not, in general, satisfy the supply-demand requirement. Such pricing criteria are often justified on grounds of equity, i.e., they provide "fair" prices. Although there is great doubt whether prices based on these criteria could qualify as fair prices by any generally accepted criterion of equity, it is clear that they are not appropriate prices for the efficient distribution of products in trade and consumption and for the efficient allocation of resources in production. Because generally they are not in tune with supply-demand developments, these criteria result in excess demands or excess supplies. In the short run, an excess demand or excess supply would imply some inefficiency in the use of agricultural products. In the longer run, a persistent excess demand or excess supply would mean that the price signals and incentives transmitted to producers would not be consistent with the most efficient use of agricultural resources in production.

Free-market pricing

One possible price policy is to allow prices of agricultural products to be established in markets by bids and offers of buyers and sellers without government intervention. This may be called free-market pricing. If markets are well organized with substantial numbers of buyers and sellers who are well informed about current and future supply-demand developments, a policy of free-market pricing has much to offer. Such markets for agricultural products provide an efficient means for digesting and transmitting information about supply-demand conditions. They have a self-adjusting mechanism for making the decisions of buyers and sellers reasonably consistent. Thus, they have a capacity to establish market-clearing prices. Over time, they are capable of keeping values in line with changing supply-demand conditions. They provide a link between consumers and producers which is necessary if the allocation of resources in production is to be responsive to consumer demands.

In practice, free markets can have some significant weaknesses, however. If there are only a few buyers and they are widely scattered, each buyer may have considerable price making power. As a result, the prices established may not provide accurate signals and appropriate incentives to producers. Here the solution may be to introduce more competition into the market by increasing the number of buyers, or if this is inefficient, to use government administered prices. Even if buyers and sellers are numerous, they may be badly informed about supply-demand developments. As a consequence, prices may be very erratic and again they may not provide the proper signals and incentives for producers. Better communication and more information about supply-demand developments can help to solve this problem.

Since free-market prices, even when established in well developed markets, tend to strongly reflect current and near-term supply-demand conditions in contrast to long-term developments, they tend to be highly unstable. For example, a drought or abnormally favorable weather may induce large fluctuations in free-market prices. While such fluctuations usually are needed in the case of perishable commodities to efficiently move current supplies into trade and consumption, they add to producer price uncertainty and make free-market prices less effective in guiding and encouraging an efficient use of resources on farms. To deal with this problem, producer prices and consumer prices could be temporarily separated by use of a self-financing direct-payment program (see below).

In the case of storable commodities, private storage operations can help to temper this kind of price fluctuation, particularly within the crop year, if the private marketing sector is well organized. Partly because of future uncertainties, private storage operations usually function less effectively in tempering year-to-year price fluctuations emanating from the supply side. Here a price stabilization program involving government storage operations can help to reduce price instability and improve the allocating function of market prices.

Government administered prices

There are many possible kinds of government administered pricing programs for agricultural products, involving different pricing targets and different methods for achieving these targets. For this discussion, it is assumed that the goal of government pricing of agricultural products is to encourage the most efficient use of agricultural products and resources and that non-price instruments will be employed in reducing income inequality. This assumption, of course, precludes many possible pricing programs aimed at redistributing income.

As indicated earlier, pricing to encourage allocative efficiency requires that prices be established on the basis of supply-demand criteria. For product allocation, this means that prices should be set at market-clearing levels reflecting short-term supply-demand considerations. Essentially, these are the levels which the free-market would reach if buyers and sellers were reasonably numerous and well informed about supply-demand conditions. If buyers have considerable market power or if buyers and sellers have little supply-demand information, there may be an opportunity to improve the allocation of products by a policy of government administered prices. If because of poor communication the free market arrives at a market-clearing price only after much erratic price movement and if the government's supply-demand information is more complete than that of private traders, the government might be able to arrive at the market-clearing price more quickly. But the same result might be achieved more efficiently by simply improving the supply-demand information available to private buyers and sellers.

If there is considerable market power exerted by a few buyers in the free market and if the government has a reliable basis for estimating the demands of these buyers independently of their power to influence price, the government established price may be more consistent with allocative efficiency than the free-market price. Even in this instance, however, it is not perfectly clear that government administered prices are the answer. It might be more efficient for the government to encourage greater competition in the market, if this does not increase marketing costs.

The case for government pricing is clearer and stronger in relation to the problem of achieving the most efficient use of resources on farms. Because free-market prices tend to be highly unstable and strongly reflect near-term supply-demand developments, producer price expectations based on these prices tend to be quite inaccurate and highly uncertain. This impairs the effectiveness of free-market prices in guiding and encouraging an efficient use of agricultural resources. A government price to producers, announced prior to the time producers make their production plans, can greatly reduce price uncertainty, if the government has the resources and knowhow to maintain the announced price so that producers accept it for planning purposes. The reduction in price uncertainty itself can contribute to a more efficient use of agricultural resources. But the maximum contribution from such a pricing policy requires that the announced price be a closer approximation to the realized market-clearing price than the price expectations of individual producers. If the government announced price were to involve a larger error than the price expectations of individual producers based on their judgments, such a policy could lead to a less efficient use of agricultural resources. The government announced price could be estimated by market analysis in the price-making agency or it could be based on a short-term moving average of actual free-market prices. Considerable study would be needed to evaluate these alternatives.

To make such a pricing program workable and effective would require a temporary separation of producer prices and market prices at the wholesale level. There are two main reasons for this. First, the announced price to producers should be based on underlying (longer-run) supply-demand conditions to be most useful in improving allocative efficiency on farms. However, the efficient allocation of farm products in trade and consumption requires that prices be based on current and short-term supply-demand conditions. In general, these two sets of prices will be different so some means of temporarily separating producer and current market prices is necessary. Second, as a result of estimation errors, the announced price to producers may be higher or lower than the market price. So a method is needed for assuring producers that they will receive the announced price and not the market price. Probably the best device for this purpose is a direct-payment program. When the announced price is below the market price, a payment equal to the difference between the announced price and the average market price times the quantity sold could be made by producers to a government payment pool. When the announced price is above the market price, payments calculated on the same basis could be made from the government payment pool to producers. In this way, the forward pricing program could be largely self-financing. In the case of storable commodities, the forward pricing program could be coordinated with a storage program aimed at tempering short-term price fluctuations due to weather variability.

While a generalized system of administered agricultural prices may, in theory, offer a superior alternative to free-market pricing, this may not be true in practice. The efficient operation of such a system requires a large amount of reliable information and a high degree of technical and administrative skill -- resources which are typically very scarce in developing economies. Moreover, it requires a favorable political climate -- one in which (a) the government is strongly committed to an agricultural price policy based on supply-demand criteria and (b) the price setting agency is free from political manipulation. These are stringent requirements. If these conditions are not reasonably well satisfied, a modified system of free-market

pricing is likely to provide better results than a generalized system of administered agricultural prices. With a modified system of free-market pricing, the goal of agricultural price policy would be to improve the functioning of free markets by government efforts which remove or redress the weaknesses of free-markets in practice.

Improving the functioning of free markets

There are a number of specific actions that might be undertaken, short of a generalized policy of administered agricultural prices, to improve the pricing of agricultural products. The emphasis to be accorded each should be specified only after a careful examination of the operation of free agricultural markets in the Peruvian economy.

1. A program to increase market communication and the flow of supply-demand information to buyers and sellers, including farm producers.
2. A program to uncover and disseminate information on income earning opportunities in the transportation, storage, processing and retail distribution of farm products. Insofar as the private sector does not or cannot respond to such information, the public sector could undertake the necessary activities to exploit these opportunities.
3. A public storage program for major storable products designed to reduce year-to-year instability in prices and marketings (but not aimed at achieving any long-run price raising or lowering effect).
4. A program to uncover and eliminate any substantial private monopoly power in the markets for farm commodities. This may involve government efforts to increase competition (e.g., encourage producer cooperatives) or, if this is inefficient, government pricing or enterprise.
5. A forward pricing program for selected farm products of the kind mentioned above, implemented by direct payments. Forward pricing should be limited to prices received by farm producers through a temporary separation of annual producer prices and annual market prices, so market prices are free to fluctuate in moving supplies already produced into the channels of trade and consumption. In the case of storable products, the forward pricing program should be coordinated with the storage program.

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