AGRICULTURAL POLICY AND INCOME DISTRIBUTION IN COLOMBIA

by Wayne R. Thirsk

I. INTRODUCTION

Making the distribution of income less unequal and achieving higher levels of total output per capita are two of the major goals of economic performance in less developed countries. However desirable these ambitions might be, an enormous volume of literature in economics has stressed that simultaneous satisfaction of both goals may not be possible. There may be a basic incompatibility between these objectives of economic policy if higher output levels require greater income inequality or if measures which provide more equal incomes also produce reductions in total income.

Empirical work by Simon Kuznets has confirmed that in the early stages of economic development and sustained growth the distribution of income appears to widen markedly.[1] Only at a much later stage of development is there a change towards less inequality in incomes earned. Although the discovery of initial divergence and later convergence in income distribution has aroused considerable speculation and curiosity on the part of economists, only very tentative explanations for it have been advanced so far. Most of these refer to the relative abundance of labor in the early stages and the positive role an unequal income distribution plays in promoting saving and capital accumulation, which will eventually make labor a scarce factor of production. Although it is imperfectly understood, Kuznets's observation is widely accepted as almost an immutable law of economic development and growth.

Reaction to the constraints imposed on economic policy by the apparent trade-off in economic goals has frequently involved attaching greater weight to one or the other of them. Some groups now draw a distinction between growth and development and argue that the latter requires raising the relative income of the very poor regardless of the growth rate achieved. They are prepared to accept slower growth rates of output in pursuing the income distribution objective. Others reject this position in favor of growth-promoting strategies and see the distributional issue as posing a challenge to the flexi-

Mr. Thirsk is Assistant Professor of Economics at the University of Manitoba.

bility of fiscal policy. They would rely on a variety of fiscal measures to redistribute market incomes to lower income groups as the best means of reconciling the conflict in objectives. Groups with above average incomes who benefit in particular from economic growth would be taxed to finance income transfers and government expenditures that aid low income members of the economy.

While there may be a great deal of truth to the conflict notion as a broad description of development trends, it is probably dangerous and misleading to view it as inevitable in the context of specific policies affecting particular sectors of the economy. In Latin America, policies to promote and accelerate the process of economic growth have typically relied upon import substitution efforts and rigorous governmental influence in the sectoral distribution of resources. Colombia's recent economic experience is ample testimony of such broad governmental impact. Government policy in that country is the dominant force in the setting of foreign exchange and interest rates, the variety of effective tax and subsidy rates for different firms and industries, minimum wage regulations, tariffs, and quantitative trade restrictions. In short, there is a wide panoply of laws regulating many kinds of market transactions. In affecting the terms under which different economic groups and sectors may have access to resources, these restrictions frequently distort the use of resources and prevent their efficient allocation in the economy as a whole. Economists traditionally have been intrigued with describing and measuring the loss in economic efficiency or the welfare cost of this kind of policy discrimination. Only recently has much attention been devoted to the consequences these actions may have for income distribution. Since they normally work to raise the relative price of abundant factors (especially labor) and thus reduce demand for them, it is becoming increasingly recognized and accepted that these policies accentuate inequalities in income. If this is true, a shift in existing government policy may be able to achieve both a higher level of total output and less inequality in income distribution. It may lie within relatively easy reach of governments in less developed countries to eliminate much of the competitive relationship between growth and income distribution and to impose a stronger complementarity between these goals.

In what follows there is a review and discussion of some research seeking to assess the efficiency and equity aspects of some major government policies that are important in influencing the direction of development in Colombia's agricultural sector.[2] These policies consist of measures to affect the distribution of physical capital resources through land reform and subsidies to large farm purchase of capital goods (mechanization) and the distribution of human capital in the form of access to educational opportunities. In addition, there are rural credit policies which affect the pattern of use of variable

production inputs such as seed and fertilizer, and agricultural price support policies, which determine the returns farmers receive from the sale of output. In each of these five policy areas some empirical evidence is marshaled to see whether it offers any support for the basic hypothesis that a reconstruction of existing policies could both equalize the distribution and raise the level of total income. With but one possible exception, subsequent sections strongly suggest that a transfer of real resources to smaller farms and less policy favoritism towards larger ones would be not only equitable but efficient as well.

II. AGRICULTURAL PRICE SUPPORTS

As in many countries, Colombia's experience with agricultural price supports originated in the depression of the 1930s in response to severe balance of payments difficulties. Thereafter, price supports became part of an overall import substitution strategy of economic development in which the agency responsible for setting and maintaining domestic price levels sought to achieve self-sufficiency in agricultural production. This agency relied on its nearly exclusive right to import agricultural commodities under a system of foreign exchange licensing in order to validate its system of price supports. Levels of support were determined annually on the basis of estimates of the average cost of domestic production, including a normal rate of return on investment.

Because it is privileged to buy crops at world prices and sell at higher domestic prices and, to a lesser extent, because its normal price-stabilizing activities require buying low and selling dear, the price support agency earns trading profits that are used to finance the costs of operation and the costs of storage. Supply adjustments from crop inventories and imports provide the agency with ample leverage for controlling the movement of domestic prices. Except for wheat, which remains a sizable import item, the agency has been successful in reducing dependence on foreign sources of supply for a large number of crops. The price paid for greater autarky (economic self-sufficiency) is a structure of domestic crop production whose costs of output in many cases are substantially above world price levels. Some portion of this cost difference is attributable to persistent over-valuation of the Colombian peso, which artificially depresses the foreign exchange cost of imports. Moreover, in the case of one crop, cotton, an import substitution phase was soon followed by an export phase as the country acquired sufficient experience in growing the crop to be able to sell it in world markets without price assistance. For some crops, supply has shown a consistent tendency to outpace growth in demand, with a consequent accumulation of unsold output that eventually has been sold abroad at a loss. For example, in 1969 corn and rice inventories bulged and were reduced to more manageable size by

sale to foreigners with the aid of a budgetary subsidy worth 32.5 million pesos (about 1.82 million dollars). In the presence of an overvalued exchange rate, however, there is a strong resource allocation argument for export subsidies, one form of which is the losses sustained by a government marketing agency. Export losses would be inappropriate only if the implicit subsidy on export sales exceeded the extent of the overvaluation.

In analyzing the income distribution consequences of this price support program, consideration is given both to how different income groups earn their income and to how they spend it. This approach has the advantage of focusing on the change in the real income position of any income group that is produced by a change in price support policy. Previous studies have ignored the expenditure side of household accounts and have concentrated exclusively on how various programs affect the nominal earnings or income of farmers.[3] The methodology adopted for Colombia obliterates the distinction between rural and urban members of an income class and emphasizes redistribution among income classes regardless of the sector of the economy in which members of any class work or reside.[4] While it offers a desirably broad perspective on the redistribution question, the methodology neglects significant redistribution within income classes in order to emphasize that occurring between income classes.

Another important methodological matter revolves around the appropriate counterfactual situation. If the price support program were abandoned, what price situation would prevail in its absence? The simplest situation would be one in which domestic crop prices fell to world price levels. If this occurred, there would be much greater demand for imported crop commodities and consequent upward pressure on the exchange rate. Under these circumstances a meaningful price comparison would be with existing world price levels adjusted for depreciation of the Colombian peso. Since the extent of any depreciation is unknown, an interesting and policy-relevant base for comparison is the structure of world prices that would rule if the current overvaluation of the peso were removed. This would involve augmenting world prices by approximately 30-35%, which many economists judge to be a rough order of magnitude of the current overvaluation. In any event, without a fully specified model of the economy it is important to account for as many relative price changes as possible in comparing actual and hypothetical income distributions.

With the aid of an input-output model of the Colombian economy, it was possible to partition the agricultural sector into five income classes and eight price-supported crops, showing how much each income group spent on each crop and how much it earned in producing the crop. For each crop the data indicated that another dollar added to the price of the crop would cause larger increases in expenditures than in earnings for the low income

groups and greater additions to earnings than to expenditures for the high income groups. Because the poor invariably spend more on any crop than they earn in producing it and the reverse situation applies for the rich, eliminating the system of price supports would redistribute income from rich to poor in most cases. Only for rice and barley, in which cases adjusted world prices equal domestic market prices, would the rich-to-poor redistribution fail to occur. For one crop, beans, the income transfers would move the other way, because adjusted world prices exceed observed market prices. Because wheat is a large import item, all consumers and income classes, but especially lower ones, would benefit if price supports for it were removed. To put these results in a somewhat different light, continuation of the present program of price supports implies a continuous redistribution of income from poor to rich. The real burden of price supports is borne disproportionately by low-income consumers, while most of the benefits accrue to high-income producers.

An alternative way of viewing the matter is to examine changes in the functional distribution of income between owners of land and "owners" of labor. As a result of inelastic final demand, price supports raise the amount of total revenue to be divided between land and labor. Since labor is readily available in the agricultural sector and land is in relatively fixed supply, the impact of higher product prices will be felt in the form of higher returns to, and a larger income share for, the land input. As the ownership of land is much more highly concentrated than the ownership of labor, a higher income share for land implies more inequality in the distribution of personal incomes. Seen from another angle, the least labor-intensive farms stand to gain the most from price supports, and these farms comprise the larger ones with higher initial incomes.

In addition to redistributing income, price supports impair the overall efficiency of resource allocation in the economy. The size of the efficiency cost is indicated by the discrepancy between domestic crop prices and adjusted world prices. This price margin measures, under a reasonably nonrestrictive set of assumptions, the extra resource cost of producing a commodity domestically rather than purchasing it indirectly through the sale of exports abroad. The extra cost is the price paid for pursuing the goal of self-sufficiency and failing to specialize production according to the free trade concept of comparative advantage. For wheat, soybeans, and corn, the cost of diversification was estimated to be about 5% of the total domestic value of output. With respect to the total value of all crop output, it would be an even smaller percentage. It seems safe to conclude that the efficiency cost of the price support program is not unreasonably high, although it is a cost which is paid with no offsetting benefit of a less skewed income distribution.

III. AGRICULTURAL CREDIT

Credit is an important means by which farmers acquire command over the use of productive inputs such as seeds, fertilizer, pesticides, and farm machinery. The use of credit to purchase large and indivisible, multi-period resources in the form of farm machinery and equipment is examined in the next section of this paper. Here attention is concentrated on how the credit-financed allocation of intermediate inputs, essentially seed, fertilizer, and irrigation, affects the distribution of farm incomes. There are many facets to this issue and only some of the myriad channels by which credit influences distribution have been subjected to empirical testing. In general, income distribution will be affected by who receives the credit or the size and kind of farm on which it is used, the price paid for its use, the productivity of the inputs financed by credit, and the particular type of input purchased. Each of these matters is discussed in turn in the context of Colombia's credit markets.

The price paid for institutional credit in Colombia is regulated by government at artificially low interest rates. About one quarter of Colombian farmers receive credit from some type of institutional lender. The semi-official agricultural bank, the Caja Agraria, accounts for slightly more than one half of the outstanding loans to agriculture, most of which have gone to relatively large farmers. Private banks likewise bias their lending activities in the direction of large farmers. The single source of institutional finance for smaller farmers is the supervised credit program of the land reform institute, which has accounted for about 5% of total loans outstanding and has benefited perhaps 35,000 families during the period 1964-1972. This is a small fraction of the approximately 850,000 small farmers (those controlling fewer than five hectares) who produce about 20% of all crops and 15% of all livestock.

A prominent characteristic of the credit market is a system of obligatory investments imposed on financial institutions for the purpose of controlling the allocation of credit to specific sectors. For example, private banks are legally required to set aside 15% of their deposits for agricultural loans. Credit controls of this and similar types are needed to force funds to flow toward agricultural activities paying lower loan rates than those charged in the non-agricultural sector. These controls have succeeded in siphoning off a growing share of total loan capacity for agriculture. Currently agriculture owes about 35% of total loans outstanding, compared to its share in Gross Domestic Product of about 30%.

Maintaining low nominal and real rates of interest has several implications for income distribution. Low real rates of interest typically generate an excess demand for loans and force lenders to ration their lending capacity. In deciding on who is to receive credit, lenders will not be influenced by the

productivity of the loan, since this is not reflected in the rate paid by the borrower, and will instead be swayed by other considerations, such as the credit-worthiness of the borrower. By choosing this loan strategy the lender is protected against risk of default, but the result is an institutional bias in favor of large landowners who control more net worth. Through access to cheap lines of credit there may be an income transfer to wealthy borrowers from poor savers who do not have alternative outlets for their savings. In addition, many high yielding investment projects on small farms may go unrealized for lack of financing. As long as the return on the use of credit exceeds its cost, the allocation of more credit to small farmers represents a transfer of income-earning resources to them. If this credit is instead allocated to large farmers, they may use it to finance new capital-intensive technologies which diminish the demand for labor, including that of small farmers, and to increase their output levels, thereby reducing the prices small farmers receive for their output. Regardless of who receives the credit, if it is productive and augments total output, consumers (particularly poor ones who spend most of their income on food), will share in the increase in output by being able to purchase at lower prices.

There are two other less obvious links between credit allocation and income distribution. First, the use of credit to promote growth in output of particular crops and to alter the overall composition of crop output will have an effect on income distribution depending on the labor intensity of different crops. For example, fertilizer could be competitive with the employment of labor if it has a high payoff in stimulating advances in the output of land-using, labor-saving crops. Secondly, the distribution of credit between large and small farmers may have serious consequences for the distribution of incomes between small farmers and landless workers. A larger share of credit garnered by small farmers that have surplus labor capacity may harm landless workers to the extent that small farmers hire less labor per dollar of credit than do larger farms. Opposing any such tendency, however, would be the withdrawal of labor services from the labor market by small farmers, so that the net effect on landless labor is in doubt.

Because of exclusionary credit market practices that may restrict their opportunity to purchase intermediate inputs such as seed and fertilizer, the marginal productivity of these inputs may be highest on smaller farms in Colombia. The relative abundance of complementary labor on these farms also works in the same direction. A limited test of this hypothesis was performed with the aid of statistical production function analysis which permitted the estimation of marginal products on different sized farms. The test was limited by the available data on credit use, which described only a narrow range of fairly small farm sizes and which did not readily allow inferences to be drawn about the productivity of intermediate inputs on much larger farms. There is some evidence, however, that larger farms utilize even greater

amounts of credit per hectare than is suggested by the sample data. In this case the statistical results will admit of some broad, if somewhat tenuous, generalization. For what they are worth, the results of the production function analysis indicated that in six of twelve cases (crop-region combinations) the marginal productivity of credit was significantly higher on smaller farms. In another four cases the estimated marginal productivity was also higher on smaller farms but the difference was insufficiently large to be significant at the 95% confidence level. These findings receive corroboration from some independent studies of Brazil, which discovered that the financial system directed a much higher fraction of credit to large farms displaying inferior productivity. It is possible that the results for Colombia illustrate a deficiency in the supply of long-term credit for the acquisition of land. No lending institution in Colombia provides financing for this purpose. Perhaps intermediate inputs are more productive on smaller farms because they substitute for land purchases that would otherwise be made. Nonetheless, for a number of crops and regions a reallocation of credit based on productivity criteria appears to offer some scope for reducing income inequality.

IV. FARM MECHANIZATION

Since the late 1940s the use of tractors and other farm machinery in Colombia has grown at close to an annual rate of 20%, so that by 1964 mechanized crop production accounted for almost 50% of total crop output (excluding coffee). Over the same period real wages in the rural sector displayed a barely perceptible rate of growth. The stimulus to mechanization has had its origins not so much in increasing labor scarcity as in government policies which have cheapened the cost of farm machinery. Both interest rates charged by lenders and empirical estimates of the rate of return to capital indicate that users of farm capital enjoy a subsidy relative to capital users in other parts of the economy. If the subsidy is measured as a fraction of either the rate of return or the cost of capital in non-agricultural activities, it is of the order of about 40%. In addition, farm machinery receives favorable tax treatment in that it is exempt from the wealth tax and faces a much lower tariff (2%) than is levied on other imports of capital goods.

Colombia's agricultural sector is composed of two distinct subsectors, a large farm group producing either crops or cattle and a collection of much smaller farms specializing in various crops. For any given crop, small farms are observed to use a great deal more labor per hectare than larger farms. Between very small crop farms and large cattle ranches as much as ten to fifteen times more labor per unit of land is used on the former than on the latter. The wide variation in factor proportions reflects different technological choices in addition to different products. Larger farms producing any crop employ higher ratios of machinery to labor. According to the 1960

census of agriculture, nearly 70% of all tractors were owned on farms of more than fifty hectares and, although small farmers tend to rent machinery services from larger farms, there is still a wide discrepancy in the use of farm machinery by farm size. From the same census data it has been estimated that the use of tractor horsepower per unit of labor increases by about 12% for every 10% increment in farm size.

Given the opportunity of small farmers to rent machinery services, the evidence suggests that small farmers may value their own, or their family's, labor services at something less than the price large farmers pay for labor. Since the value that small farmers place on their own labor is likely to correspond more closely to the real cost to the economy of using labor than does the market wage, the concentration of farm machinery on large farms suggests that rural labor markets do not function well in allocating resources. Small farmer demands for machinery services are significantly less than those of larger farmers and are of a much more selective nature. When they hire the services of farm machinery, small farmers appear to use it almost exclusively for land preparation. Since this operation is crucial to improved yield performance and is more difficult or costly to perform with either human or animal labor, it may prove useful to confine mechanization to the land preparation phase with the aim of achieving a significant output gain at a relatively small cost in lost employment.

From a sample of individual farms it is possible to put together a picture of the input ratios found on large-scale mechanized operations. Farms in this class appear to use about 1-1.4 tractor horsepower per cultivated hectare, 7.5-8 tractor horsepower per man-year of employment, and, averaging over the different labor requirements for cotton, rice, and corn, about 35-40 man-days per hectare. Comparing these input demands to those on unmechanized farms at the same output level and holding other aspects of farm technology constant, the transition towards mechanized farm operations appears to result in a labor saving of about 50% for most crops. In other words, a 50-60 horsepower tractor with a full complement of field equipment probably replaces the services of from six to eight farm workers.

A more refined substitution ratio, using service flows instead of stocks of men and machinery, indicates that a single tractor hour can replace, depending on the specific operation or task involved, somewhere between three and five man-days. Substitution rates of this magnitude were not necessarily realized in Colombia because in many instances mechanization was associated with a change in output composition whereby land use was switched from cattle to crops. Since cattle raising uses even less labor than mechanized crops require (approximately fifteen man-days per hectare in most regions), the diffusion of mechanical technology among large farms probably resulted in an increase in labor demand. Another facet of Colombian experience, however, is that the subsidy to the use of farm machinery

has been applied to a sector which is more capital-intensive than the non-agricultural sector as a whole. It is this aspect of the subsidy which is largely responsible for the negative impact mechanization has had on employment and income equalization.

To understand this result, consider a qualitative description of some of the economic adjustments that follow in the wake of granting a capital subsidy to large farms. At existing crop prices, large farmers will find it profitable to increase their planned levels of production as a result of diminished production costs. Higher output levels will be translated into lower crop prices in agricultural product markets. Lower priced capital will be substituted for labor and will stimulate a demand for the complementary input of mechanizable land. Cattle ranches will supply the new demand for land. Ranchers will relinquish control of some mechanizable land and substitute land less suitable for mechanization in its stead. As some land is bid away from cattle and transferred to crops, its relative price will rise, moderating the demand for capital and encouraging greater use of labor on large crop farms. With the higher price of land, the relative price of cattle will be greater than before and will elicit still greater consumer demand for crops. The shift in the composition of output will augment the demand for labor, since crop production employs more labor per hectare than does cattle raising.

The non-agricultural sector will find that capital otherwise supplied to it will be diverted instead to the capital-intensive large farm crop sector. With less capital, the rate of return earned on capital in the non-agricultural sector will increase. The higher price of capital will lead to higher output prices for the non-agricultural sector and will shift more consumer spending to crops and cattle. Because non-agricultural activities are on average more labor-intensive than large farm crops, the alteration in output mix will be associated with a reduction in labor demand. Offsetting this tendency is the very tight linkage between money wage rates and the prices of crop output. For unskilled labor, money wage rates deflated by the price of crop goods display virtual stability over the post-war period. When crop prices decline, money wages would be expected to follow suit, occasioning a greater demand for cheaper labor in all parts of the non-agricultural sector. How income distribution is affected by these product and factor market adjustments will depend on the relative size and strength of the various repercussions. On the face of it, owners of capital and land appear to benefit from the resulting increase in the price of capital and the return to mechanizable land. Labor may also stand to gain, however, if it is able to escape the low incomes earned on small farms by finding employment in other higher paying sectors where labor demand rises.

To sort these matters out more finely it seems there is no alternative to more rigorous quantitative analysis. Elsewhere I have constructed a small general equilibrium model of the Colombian economy and used it to simulate

the employment and relative price effects of subsidized farm mechanization.[5] The simulations proved to be reasonably robust in the sense that most of the results were little affected by alternative assumptions about the appropriate size of different parameters. For every simulation there was a significant increase in the utilization of all of the inputs employed by large crop farms: capital, land, and labor as well. The number of people occupied on small farms—where labor is assumed to go if employment cannot be obtained in other sectors—depended crucially on the ability of non-agricultural sectors to absorb more labor when the price of labor relative to the price of non-agricultural goods was reduced. Capital/labor ratios invariably rose in large farm crop operations and fell in the other sectors outside agriculture. Without exception the prices paid for land, capital, and non-agricultural goods increased relative to the price of labor.

Overall the predictions of the simulation model appeared to mirror the trend of observable events in Colombia reasonably well: fast rates of growth of mechanized crop output and of all the inputs used in this sector; disappointing employment growth in non-agricultural sectors (though mechanization is only partially responsible for this result); a switch of some level, productive land from cattle to crops; increased labor productivity in mechanized crops coupled with steady or declining labor productivity in small farm operations; modest deterioration in the relative price of crops, and a higher relative price for the service of land.

One of the more interesting results is the strong possibility that greater labor employment on large crop farms can coincide with diminished employment prospects for small farmers, even though the shift in output from cattle to crops will increase labor demand. The explanation for this result is that reduced employment opportunities in non-agricultural activities may overwhelm the expansion of employment on large crop farms. Despite the induced movement to a greater labor/output ratio in non-agriculture, total employment in this sector may well be less, due to a lower level of output.

After specifying how different functional income groups spend their income on crops, cattle, and non-agricultural goods, the simulation results were used to make an explicit calculation of the income redistribution implied by an altered pattern of relative prices. These calculations for alternative simulations uniformly produced the result that capital owners were the primary beneficiaries of the subsidy to mechanization. At least three quarters of their gain in real income was realized at the expense of workers and small farmers, who experienced reductions in their real incomes. Small farmers became worse off on two accounts. First, mechanization reduced the prices they received for the sale of their output and, in addition, the total demand for their labor services was reduced.[6] The latter effect by itself could depress the average income earned by small farmers by between five and ten percent.

Combining all sources of non-labor income, the analytic evidence strongly points to the finding that subsidized farm mechanization has had the effect of producing more pronounced inequality in the distribution of income, which would show a highly skewed pattern even without policies to promote greater farm mechanization.

There remains the question of determining how the progress of mechanization has affected the overall efficiency of resource allocation. Here a number of offsetting influences are at work. It is alleged that there is an external benefit associated with mechanization in the form of a reallocation of land from low productivity use in raising cattle to higher productivity uses in growing crops. Scattered empirical evidence available seems to support this claim. Thus while mechanization may make the allocation of labor and capital resources less efficient, the loss in efficiency may be more than offset by a more efficient allocation of land. The net outcome of these conflicting forces is indeterminate without further information, since everything depends on the size of the various factor market distortions and the extent to which mechanization changes the allocation of different resources.

From the results of the simulation's estimates of resource reallocation, it was found that the gains in total output ensuing from a better distribution of land were insufficient to outweigh the losses in total output attributable to a worse allocation of capital and labor. The welfare cost of the net loss in real income was less than 1% of gross national product in all cases. It is open to some debate whether or not losses of this magnitude should be considered relevant for policy making. One percent of gross national product is still a significant sum in absolute terms and indicates the absence of a socially profitable investment. Since external lenders have underwritten a large fraction of the cost of mechanization in Colombia, however, the welfare loss arises only in comparison with a neutral subsidy policy which did not offer any special incentives to the sectoral employment of capital. It is not so much that total real income has declined in response to mechanization policy as that it could have been higher without the discriminatory inducement to use more capital on large crop farms.

A summary judgment of the Colombian experience with mechanization would be that it has been an unfortunate investment with little to recommend it. It has yielded a negative social payoff and has acted to increase income inequality in a country which already had a highly skewed distribution of income before the investment took place. Elimination of the subsidy to mechanization should have the twofold benefit of equalizing income distribution and augmenting the level of total income. Removal of subsidy could be effected by the levying of a tax on purchases of capital for large farms or by the imposition of higher interest rate charges on the loans granted to buyers of capital used on large farms.

V. LAND REFORM

Although a measure of land reform occurred in the middle 1930s, it was not until 1961 that Colombia began serious efforts to increase the land base of small farmers. A creature of the comprehensive agrarian reform law of 1961 was a new land reform institute, INCORA, which was vested with broad discretionary powers and multiple functions. INCORA was empowered to assist Colombia's numerous and impoverished small farmers through infrastructural investment in remote colonization areas, irrigation and drainage projects, a supervised credit program, and, finally, through distribution of land in the public domain as well as of private land acquired by gift, voluntary sale, or expropriation. With so many options from which to choose, INCORA has been characterized as more nearly resembling a rural development agency than a vehicle for substantial modification of land tenure conditions. To some, the multi-faceted nature of INCORA is lamentable, since other activities may be used as a substitute for land redistribution and may provide an excuse for diversion of its administrative energies and financial capacities.

Among many distributive issues that might be considered, three have been singled out for discussion below. Could INCORA have been more effective in achieving its goals given the resources that were committed to it (INCORA receives about 20% of the total resources invested in agriculture from public revenue)? Will landless workers be helped or harmed by the efforts to improve income prospects for small farmers? What is the size of the gain in total agricultural output that a full-scale reform would bring, and what would be the division between land beneficiaries and urban consumers?

From an income distribution point of view, it is important that INCORA be guided by efficiency considerations in choosing among projects related to land acquisition, land improvement, and land extension (colonization). The distribution impact of a fixed INCORA budget will be greatest if the funds are allocated to the least costly methods of helping a poor rural family reach a particular income level. At current land prices it appears to cost less (per family settled at a given income) to acquire land by outright purchase than to engage in relatively more expensive irrigation and drainage programs. Colonization projects appear to cost even more since they require the provision of infrastructure which is already at least partially available in more settled parts of the country. If present cost estimates are valid, they suggest that INCORA could make more small farmers better off by spending more of its budget on large farm land acquisition and less on irrigation and colonization projects.

It is a somewhat puzzling feature of land reform programs that they do not extend to landless workers who are often at the bottom of the income scale. In Colombia the approximately 10% of rural workers who are virtually

without any land have never been considered as a target group for land reform activities. If small farmers have surplus family labor prior to reform, they may employ smaller amounts of hired labor on land transferred to them by reform than the former owners employed on the same land. Thus a change in the pattern of land ownership in favor of small farmers may result in a displacement of landless workers whose wages, employment, or both, would decline.[7] If this were to occur, land reform would have an ambiguous effect on income distribution, as incomes of small farmers would be enhanced at the combined expense of richer large farmers and poor landless workers. Whether this is a likely outcome is an empirical matter which depends in part on the size of the land reform parcel. For very small sizes, the demand for landless labor may be reduced as the land is used to employ family members more fully. Drawing on data from farm level analysis, it appears that small farms employ somewhat more hired labor per hectare than larger farms producing the same crop in a given region. The main reason for this result is that small farms engage in the production of relatively labor-intensive commodities, and, compared to large farms, do not rely on labor-saving methods of production. This evidence indicates that landless workers will not be harmed by land reform and could conceivably be in greater demand if the large expropriated farms had specialized in crops with low labor intensity.

A characteristic of Colombian agriculture is that larger farms tend to cultivate a smaller fraction of their land and operate with larger amounts of fallow than do small farms. Even though larger farms may enjoy higher yields on cultivated land, output per unit of total land area declines appreciably with increasing farm size. By combining underutilized land from large farms with underutilized labor from small farms, land reform should increase the level of total agricultural output. A more even distribution of labor than at present, and perhaps other variable inputs as well, over a given area of cultivated land, will have the same effect of raising total output. Estimates of this output contribution of land reform point to an increase on the order of about ten to fifteen percent. Urban food consumers, particularly low income ones, would share in this output benefit if marketed farm output also rose and relative food prices therefore declined. Estimates of the induced demand for food by small farmers, however, indicates that they will tend to capture all of the benefit from the gain in output. One cannot rule out the possibility that total marketed output will decline absolutely and reduce the real incomes of urban consumers of food. In fact, the poorer the land reform beneficiaries are, the greater is the probability of a smaller marketed output (because the owners themselves consume more), and the greater the prospect of harming the urban poor.

Many factors responsible for widely disparate rural incomes are in the end related to the skewed distribution of land ownership. A socially inefficient process of large farm mechanization would not have occurred if the initial distribution of land had been more equal. Moreover, deficiencies in the supply of rural education probably would have been remedied long ago if large landowners had resided on their farms and sent their children to local schools. Finally, price support policies would have a much less inequitable impact if they did not provide disproportionate rewards to some simply because they own more land and have more to sell than others. It is in this sense that land reform is the fundamental element in improving income distribution. Without it, many other policies affecting the rural sector make the distribution of income more unequal than it otherwise would be.

VI. RURAL EDUCATION

Two salient characteristics of the Colombian educational system are, first, the steadily growing participation at all levels of the population in the eligible age groups and, secondly, a marked disparity in educational opportunity between the rural and urban sectors of the economy in favor of the latter. Since the end of World War II, enrollments at every educational level have been increasing faster than the rate of population growth. Hidden in the aggregate numbers, however, is a significant difference in the educational distributions for rural and urban groups. Compared to urban areas, rural zones suffer severely limited access to education. The percentage of school-aged children (under fifteen years) attending rural schools is about one-half as high as in the cities. In 1964 more than two-thirds of rural schools offered instruction only through the second grade, while almost all the others went up only to the third grade. In contrast, 62% of urban schools provided the full five years of primary school. Moreover, less than 10% of secondary schools are located in rural areas.

Greater equality in educational opportunity would be expected under most conditions to generate a reduction in the inequality of labor incomes. Since the poor tend to participate in the Colombian educational system only at the primary level, an expansion of primary school enrollments, especially in rural areas, should produce greater income equality. Conversely, if university and secondary education were expanded instead, middle and upper income groups would benefit disproportionately, with the result of a more unequal distribution of labor incomes. In a country where political power is concentrated in the hands of the rich, one might expect educational spending to under-invest in primary education benefiting the masses and to over-invest in higher education primarily benefiting the rich. Empirical studies of the rate of return to education in Colombia indicate the existence

of such an investment pattern in urban localities.[8] The rate of return for urban primary schooling appears to be substantially higher than that for university education and well in excess of estimates of the opportunity cost of capital in the economy. In short, urban primary schooling is a profitable social investment, and considerations of economic efficiency would dictate larger expenditures for the education of the urban poor, which would raise their expected future incomes relative to the rest of the population.

No data or study exists which would permit this conclusion to be extrapolated to the rural sector. Perhaps the most that can be said with current knowledge is that rural primary schooling will be a worthwhile investment if it equips students with the skills needed to obtain and hold urban jobs. One study hints of a basic conflict between equity and efficiency in the provision of rural education.[9] It found that rural education had a significant payoff only in the rich, well-endowed regions of the country. In those areas primary education assisted small farmers in making more profitable production decisions because the correct production choice could result in much larger profits. In the poorer regions of the country, growth in output is severely constrained by adverse topography and poor soils which cannot be altered or offset by farmers' production decisions. The problem is that education seems to be complementary to inputs that are either missing or in deficient supply on farms in the poorest regions. Without them more education may not be helpful.

VII. SUMMARY

Agricultural price supports, land reform, credit allocation, farm mechanization, and rural education comprise a diverse set of policies whose analysis would not ordinarily share a single theme. My review of research in these separate areas has attempted to show that a more equal distribution of income in Colombian agriculture is not inconsistent with the achievement of higher levels of output. In most areas of policymaking there is some scope for better performance with regard to both equity and economic efficiency. In many cases what is required to achieve this end is an adjustment in current agricultural policies so as to give small farmers improved opportunities to acquire productive inputs and to remove from large farmers their privileged access to the same resources. If this were to happen the distinction between economic growth and development probably would no longer have to be made in describing the changes in the behavior of Colombian agriculture. Finally, a policy adjustment in the direction indicated would have the desirable effect of raising the demand for rural labor, increasing rural incomes, and thus of limiting the tide of rural-to-urban migration to a level that the cities could absorb without severe economic stress and dislocation.

NOTES

1. S. Kuznets, "Economic Growth and Income Inequality," *American Economic Review* **45**, no. 1 (March 1955):1-28.

2. A more complete description of this research is contained in the following discussion papers by Wayne R. Thirsk in the Rice University Program of Development Studies series: No. 33, "Income Distribution, Efficiency and the Experience of Colombian Farm Mechanization," 1972; No. 43, "Income Distribution Consequences of Agricultural Price Supports in Colombia," 1973; No. 51, "Rural Credit and Income Distribution in Colombia," 1974; No. 53, "Some Aspects of Efficiency and Income Distribution in Colombian Land Reform," 1974 (mimeograph).

3. See, for example, James T. Bonnen, "The Distribution of Benefits from Selected U.S. Farm Programs," *Rural Poverty in the United States: A Report of the President's National Advisory Commission on Rural Poverty* (Washington, D.C., 1968); Charles L. Schultze, *The Distribution of Farm Subsidies* (Washington, D.C.: The Brookings Institution, 1971).

4. Recent grumblings over the effect on food prices of the U.S. wheat sale to Russia illustrate the dangers involved in overlooking the expenditure side of household budgets. The U.S. Department of Agriculture, which engineered the sale, was concerned only with improving nominal farm incomes.

5. W. R. Thirsk, "The Economics of Colombian Farm Mechanization," unpublished Ph.D. dissertation, Yale University, 1972.

6. The model abstracts from the possibility that domestic production may be exported on world markets or be used to replace imports of crop goods. Except for cotton Colombia has not penetrated the world market for exports, and wheat is the only crop in which Colombia has not achieved virtual self-sufficiency.

If domestic prices were determined by world prices, the prices received by small farmers would not decline as production of large farm crops increased. Real wages earned in the non-agricultural sectors also would not decline, however, so that demand for small farm labor services would be even less under these conditions. If the expansion of large farm crop production either earns or saves foreign exchange, the investment capacity of the non-agricultural sector may be enlarged. If this were to happen, total labor demand would increase, making the smaller farmers better off. Through the channel of international trade it is feasible to establish a complementary, rather than competitive, linkage between investment in the agricultural and non-agricultural sectors. It is for precisely these reasons that mechanization of a crop on the margin of exportability may be a sound investment.

7. For a more complete analysis see R. Albert Berry, "Land Reform and Agricultural Income Distribution," *Pakistan Development Review* **11** (Spring 1971):30-44.

8. These studies are by T. P. Schultz, *Returns to Education in Bogotá, Colombia* (Santa Monica, Calif.: The Rand Corporation, 1968); and M. Selowsky, "The Effect of Unemployment and Growth on the Rate of Return to Education: The Case of Colombia," Harvard University Development Advisory Service, Economic Development Report No. 116 (November 1968).

9. Tom Haller, "Education and Rural Development in Colombia," unpublished Ph.D. dissertation, Purdue University, 1972.