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Policy Options

Natural resource degradation effects of poverty and population growth are largely policy-induced: the case of Colombia*

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ABSTRACT. The sustainability of natural resource use is influenced by population pressure, but this exercises a much less critical impact than the overall policy framework. In Colombia, various agricultural and other policies whose effect is to constrain the poor's access to land encourage environmental degradation. A case is made in favour of the new land reform process that Colombia is launching.

Introduction

Observers are often struck by the joint occurrence of growing rural populations, rural poverty, and degradation of the natural resource base used by the poor. As a result, population growth and poverty are often seen as the causes of natural resource degradation. Reductions in population growth rates and migration to urban areas are seen as possible solutions, along with assistance to the farming population with soil conservation.

Of course, it is urgently necessary to reduce population growth and assist poor farmers with resource management problems in many countries. In this paper, however, we argue that many other policy options exist. They consist in the removal of adverse policies that have as their *joint consequence* the reduction of economic efficiency, an increase in poverty, and natural resource degradation. The removal of these policies thus would be a *win-win-win* situation in which the same policy changes could lead to more growth, reduced poverty and more sustainable natural resource management.

We first discuss the Boserup hypothesis, which suggests that higher population and market access lead to improvements in natural resources rather than their deterioration. Using recent studies of the Machakos district in Kenya and soil degradation in Ethiopia, we illustrate the depen-

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dence of the Boserup effects on the policy environment that governs investment incentives of farmers.

With this background we examine growth, the use of land and labour, and the degradation of marginal natural resources in Colombian agriculture. We demonstrate with data that the use of land and labour in Colombia has been driven in highly inefficient directions by a variety of agricultural, land and rural finance policies and programmes. These have prematurely and dramatically reduced employment opportunities in the sector, leading to an increasing concentration of poverty in rural areas and increased resource degradation on hillsides and on the Amazon frontier. Binswanger (1989) described similar phenomena in the Brazilian Amazon. We show that labour policies have not contributed in major ways to these adverse trends, but that instead the misallocation of land and labour, and an exceptionally high female unemployment rate in rural Colombia, are the consequences of the same policy factors. We then turn to various policy options to correct the misallocation of resources, reduce poverty and reduce the pressure of unsustainable farming on hill and in tropical forest areas with marginal land resources.

The Boserup effects

Judgments about the sustainability of farming often give too much weight to assumptions about the 'carrying capacity' of the resource base. A recent example of this 'neo-Malthusian' bias is Cleaver and Schreiber (1994). However, there is no clear evidence about what constitutes a threshold level of population pressure. Nevertheless, it is indisputable that population growth influences farming technique, investment in land and land use on the toposequence.

As a statement about the nature of the population dynamic in agricultural systems, Boserup's hypothesis remains compelling: as land becomes scarcer in relation to labour, and access to markets improves, agriculture is intensified, the net result of this process being higher agricultural production per unit area (Boserup, 1965). Rather than deteriorating, the land resource base improves in the process.

The Boserup effects of population growth and improved market access lead to

- the intensification of land use;
- a shift from hand-hoe to plough;
- the increasing utilization of organic and inorganic fertilizer;
- a shift to integrated crop-livestock systems;
- investment in land and irrigation facilities;
- an increase in agricultural labour use; and
- higher agricultural production per unit area.

This hypothesis is consistent with much research on the development of farming systems (e.g. Ruthenberg, 1980), and has received empirical support from an Africa-wide study (Pingali *et al.*, 1987), a study of erosion in the rangelands of Tanzania and Botswana and smallholder settlement areas of Zimbabwe, and an in-depth longitudinal study of the Machakos district of Kenya (Tiffen *et al.*, 1994).

Much of the literature on the Boserup effects treats these beneficial relationships as if they were mechanical relationships, brought about by compelling physical and biochemical relationships, and by individual utility-maximizing behaviour within the constraints set by the natural world. We argue that the Boserup effects are far from automatic. We view them as the outcome of investment decisions by farmers. In order to come about, the investments require a positive incentive regime, and access by farmers to soil and water resources and to markets. If these conditions are denied by adverse policy regimes, impoverished peasants are forced to mine the land resources, rather than augment them. This will be especially damaging if they only have access to marginal land or to humid tropical forest frontiers.

Various authors have analyzed soil conservation as an investment strategy, with consideration of the economic and policy factors underlying erosion. Anderson and Thampapillai (1990) and Barbier and Bishop (1995) review these factors. In this article, discussion of the policy effects is consistent with this tradition.

Policy conditions for Boserup effects: Machakos vs. Ethiopia

Before turning to the Colombia case we use an African comparison of the workings of the Boserup effects.

The Machakos study of Tiffen *et al.* (1994) is the most recent of a wealth of studies documenting the Boserup sequences. Machakos is a semi-arid district in Kenya with poor to middling agroclimatic conditions. In Kenya, the best land was reserved for white settlers. Colonial policy obliged the native population to derive their food supply from a greatly reduced land base. Natives were forbidden to grow the most remunerative cash crops and therefore lacked incentives from the market. In the 1930s, the region was characterized by heavy soil erosion and declining yields. Today, however, Machakos supports a population almost six times as large as in 1932, and agricultural output per unit area (in constant maize units) has increased almost tenfold. Crop yields have risen. Cash crops and horticultural products were successfully introduced (Tiffen *et al.*, 1994). There are more trees, more soil conservation works and greater use of organic manure than in the 1930s.

The necessary investment incentives to bring about these effects are associated with the following conditions which have been assured since independence:

- an agricultural policy which, compared to other African countries, taxed the sector lightly;
- access to international markets for coffee, and to domestic markets for other cash crops;
- infrastructure construction associated with rural development projects;
- access to non-farm and urban employment opportunities in Nairobi;
- ability to finance investments from sales revenues and labour incomes;
- security of tenure, provided initially by the traditional communal tenure, and later via land titles;
- new food production technology, especially for maize;
- locally adapted soil conservation technology and farmer-led initiatives to implement it.

Recent cross-section studies of Ethiopia, on the other hand, find that areas where population density significantly exceeds carrying capacity are characterized by high indices of soil degradation (Grepperud, 1994).¹ Longitudinal studies similar to those in Machakos would be required to prove that in these areas there had not been the beneficial sequence of Boserup effects. Nevertheless, a comparison of policies and programmes prevailing in the two countries over the last thirty to forty years is instructive.

Ethiopian farmers were heavily taxed throughout the period via a great diversity of methods. Rural infrastructure construction was limited. Access to international markets and even to domestic markets was often disrupted. Employment opportunities in the rural non-farm and urban economies were extremely limited by the lack of agricultural and economy-wide growth. Periodic famines led to asset depletion and further undermined the peasant's ability to mobilize investment resources.

There was no security of tenure at any time during the period. Under Haile Selassie the farmers were tenants at will, rather than holders of secure ownership or usufruct rights. Under the communist regime the state was the owner of the land; usufruct rights were never securely granted; and peasants were subject to dislocation from villagization programmes and forced migration, and were subject to pressures to collectivize.

There was very little availability of improved technology in food-grains. And there were very few programmes aimed at developing and disseminating improved soil conservation techniques among peasant farmers.

The sharp contrast in policy regimes, and natural resource outcomes between Kenya and Ethiopia shows that Boserup effects are not an automatic response to population growth or market access. Instead they require a policy and institutional regime which provide peasants and commercial farmers with favourable incentives, as well as income earning opportunities on and off the farm to enable the financing of investments in production inputs, technology and conservation activities. With this background we now turn to our main example of the impact of policy on land degradation and poverty, Colombia.

¹ Grepperud states in his abstract: 'This paper tests the population pressure hypothesis (PPH) for the Ethiopian Highlands using quantitative methods. The hypothesis posits that, under comparable physical conditions, heavily eroded areas occur in highly populated regions. A soil erosion severity index (SESI), (a proxy variable for soil erosion), was chosen as the dependent variable. Because the dependent variable is categorical and ordinal, an ordinal cumulative logit model was chosen for the analysis.'

'Two alternative variables were applied to reflect population pressure: the ratio of rural population to arable land and the ratio of the population-support capacity to rural population (PSC/RP). For the first ratio, the effect on the level of soil erosion seemed linear and weak, because substantial increases in population density were needed to increase the odds of an area being classified as more seriously eroded. For the second ratio, a reciprocal transformation improved the explanatory power of the model, suggesting a hyperbolic relation between the ratio and the soil erosion index. The probability of an area being classified above any given level of soil erosion increases rapidly as a rural population exceeds the population-supporting capacity of its region.'

The case of Colombia

In Colombia, unsustainable farming of the Andean slopes has long been recognized as a problem (Posner, 1981).² In 1950, Lauchlin Currie led a World Bank mission to Colombia. This mission 'noted for the first time on a national scale the extent to which flat, apparently rich, bottomlands were occupied by low-intensity livestock ranching estates, while slopes steep enough to make cultivation a hazard to life were occupied for crop farming' (Blakemore and Smith, 1971, p. 232; see also Currie, 1965). The situation has not improved since then. In many areas, the Andean slopes are being denuded of vegetative and soil cover; the resulting loss of moisture retention has an adverse effect on stream flow, reducing the availability of water for agriculture, for both poor farmers on the slopes and richer farmers in the valley bottoms. In the scattered indigenous reserves (what remains from the colonial *resguardos*), there is an acute problem of holding fragmentation: deprived of access to land elsewhere, Indian farmers are carving up their resource into *microfundia*. In the Amazon and Orinoco basins, and on the Pacific coast, pressure is rising to put unstable lands of intrinsically limited fertility under annual crops.

According to Currie (1965), forty years ago the problem was caused by too many poor, inefficient farmers working on the slopes. The solution both to rural poverty and to resource degradation was to encourage migration of the surplus rural population to the towns, leaving the land to be worked by fewer, more technically sophisticated farmers. Since then, the number of poor people in rural Colombia has more than doubled, despite massive rural-urban migration (World Bank, 1995). Three out of four poor people in Colombia now reside in rural areas. Poor farmers are still to be found working the slopes.

Recently the natural rate of increase of the rural population has fallen substantially, helping to raise wages and reduce the absolute level of pressure on the resource base. Since 1985, the rural population has begun to decline in absolute terms for the first time. But the overall pattern of growth has failed to absorb what Currie perceived as 'surplus rural labour'. Poor farmers continue to have limited access to good land, and therefore continue to exert pressure on the slopes (and on equally fragile land in the Amazon-Orinoco basin).

Are there other solutions? Improving the techniques used by hillside farmers on marginal land may be part of the story. However, while low-cost technologies exist, little progress has been made in diffusing them, largely because incentives are lacking: on marginal lands small farmers may have insufficient incentives to invest in soil conservation (Ashby, 1985). Even if better, more cost-effective techniques for hillside farming are developed, these will at best be a palliative. To devise an appropriate solution it is necessary to look beyond the hillsides. The challenge is to improve access by the rural poor to less fragile, more fertile lands at lower elevations, and to extend the opportunities for off-farm rural employment.

² Taking Mexico, Central America, the Andean countries and the Caribbean as a whole, Posner estimates that 30 per cent of peasant households farm steep slopes, generating 20-40 per cent of the output of annual crops.

We will show below that it is necessary to change the agricultural policy framework that influences the operation of land and labour markets.

The prescriptions of Currie to accelerate rural-urban migration and to turn farming over to large-scale modernized commercial farmers have been pursued in Colombia for over forty years. They have led, not to significant reductions in rural poverty, but to a further concentration of the poor in the countryside. They have also led to an extremely low utilization of both the land and the labour resource, and a low overall productivity of the agricultural sector compared to its enormous potential. The urban migration approach to solving rural poverty and resource degradation has been a complete failure.

The low propensity of Colombian agriculture to absorb labour

Agricultural development in Colombia has involved substantial misallocation of resources: land has been very unevenly exploited, and farm output growth has absorbed less labour than might have been expected. Over the last forty years or so, compared to other countries in the same per capita income range, the growth of farm employment has been exceptionally low in Colombia (Syrquin and Chenery, 1989; Misión de Estudios del Sector Agropecuario, 1990, pp. 4-14). Between 1925 and 1950, by international standards, the decline in Colombian agriculture's share of GDP and of the labour force was comparable to that of other countries in the same per capita income range. But from the early 1950s onwards this picture changed abruptly: the relative importance of farm employment fell off at a much faster rate than would be projected on the basis of international evidence concerning the correlation between employment and GDP shares (Figure 1).

In Colombia, the growth path of agriculture has been extremely capital- and labour-intensive. Between 1950 and 1987 agriculture's annual growth rate was impressive, averaging 3.5 per cent. Capital inputs to agriculture grew at an average annual rate of 2.8 per cent, land area devoted to agri-

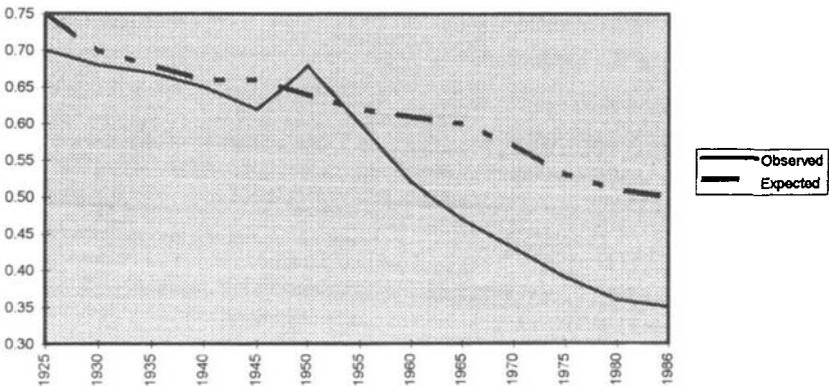


Figure 1. Share of primary sector in total employment. Source: Misión de Estudios del Sector Agropecuario (1990), pp. 4-14. These findings are an extension of earlier work by Syrquin and Chenery (1989).

Table 1. Colombia: sources of farm sector growth, 1950-87

Period	Farm GDP	Growth rates			Contributions to growth			All factors	Productivity
		Area	Capital	Employment	Area	Capital	Employment		
1950-55	3.03	1.15	-0.37	2.09	0.22	-0.13	0.96	1.05	1.98
1955-60	4.08	0.68	1.26	0.21	0.13	0.44	0.10	0.67	3.41
1960-65	2.77	1.31	2.44	0.67	0.22	0.81	0.34	1.36	1.41
1965-70	4.94	2.17	4.68	1.29	0.41	1.87	0.53	2.81	2.13
1970-75	4.33	2.03	6.51	-3.91	0.38	2.60	-1.60	1.39	2.94
1975-80	4.58	1.67	4.96	2.75	0.28	2.18	1.05	3.51	1.07
1980-84	0.89	1.80	0.93	0.66	0.27	0.45	0.24	0.96	-0.07
1984-87	3.53	0.48	1.97	0.76	0.07	0.95	0.28	1.30	2.23
1950-87	3.52	1.41	2.80	0.57	0.25	1.15	0.24	1.63	1.89

Source: World Bank (1996).

culture and livestock by 1.4 per cent and employment by only 0.6 per cent (Table 1).

The sector's relatively low propensity to absorb labour is reflected in the land use pattern. Crop farming has captured a relatively small proportion of the natural resource base. Sixteen per cent of Colombia's land area is suitable for crops but less than 4 per cent is actually cultivated. Livestock rearing is overextended: 13 per cent of the territory is deemed appropriate for pasture but 35 per cent of the land is put to this use. Small farmers with limited access to good quality flat land may end up deforesting marginal land on the Andean slopes. Only about one-half of Colombia's agricultural and forestry lands is still forested, whereas it is estimated that two-thirds of it is only suitable for forestry and should be left under tree cover (IGAC, 1988).

Agricultural policy-making in Colombia shows substantial elements of 'large farmer bias'. First, public investment patterns and the orientation of the trade regime have combined to favour livestock and grain crops, neither of which are intensive in their use of labour. Second, credit policies have tended to discriminate against small farmers: only about one-third of this group are currently able to obtain loans from the formal sector. There is no sign that past practices favouring large-scale farms in credit policies are being corrected.³ Third, tax policies have converted agriculture into a tax shelter for both income and capital gains taxation, providing incentives for the holding of land for portfolio reasons, rather than for agricultural production.

By subsidizing capital inputs and the livestock sector the Colombian government has sponsored a strategy that discriminates against small farmers. Tractor subsidies have encouraged shedding of labour: already, by the early 1970s, one-quarter of the cultivated area was mechanized. Public irrigation schemes have tended to favour the larger producers; and, because much of the land in the irrigation districts is devoted to pasture and grain crops, which use less labour than higher-margin crops, employment generation has been much less significant than it might have been.

Cattle-rearing spread rapidly in the immediate postwar period. The area under pasture grew from 12.1 million hectares in 1950 to 26.7 million hectares in 1986. (In the same period the area under crops increased from

³ Law 101 of 1993 offers a mandate for indefinite continuation of credit subsidies and low interest rates for agriculture: the policies do not facilitate small farmer access to credit, most of the subsidies being captured by larger farmers. Because it is mostly large farmers that qualify for working capital loans, they will reap the lion's share of the subsidy; the law implicitly discriminates against small farmers. Chronic farmer indebtedness is a major problem, and was exacerbated by the drought and world price downturn of 1992. There has been very little success in recovering overdue loans from large producers who have borrowed money from Caja Agraria, the state-owned agricultural credit agency: of the total value of overdue loans (Col\$150 billion), half is attributable to large producers; most of the money recovered has come from small producers. Refinancing schemes have been poorly targeted and may have helped to postpone necessary adjustment in the sector, setting a precedent which might discourage larger producers from repaying loans.

2.6 million to 4.3 million hectares.) The Caribbean region accounted for 38 per cent of the growth in pastures, while the Andean valley bottoms accounted for a further 30 per cent. There was also rapid growth of the pastoral area in the eastern savanna (centred on Meta): by the mid-1980s, one-half of all cattle pasture was located in the sparsely populated area east of the Andean ranges (Misión de Estudios del Sector Agropecuario, 1990, p. 83).

The livestock sector has been more protected than the crop sector, helping to account for its rapid expansion. Between 1980 and 1992, beef and milk absorbed 82 per cent of the total support (price plus non-price interventions) that the government conferred on a group of nine farm commodities (LATAD, 1994). Expansion of cattle rearing has been land extensive, favouring the creation of large estates: the rate of growth of the herd has only slightly exceeded the rate of growth of the area in pasture. The off-take rate remains very low—50 or 60 per cent of that achieved in Argentina and the United States. The extensive livestock sector occupies large amounts of arable land of the 'lower slope' type discussed above, land which could be developed for intensive agriculture by the construction of road infrastructure. Much of these lands will also need drainage. The large estates favoured by policy have simply not got the necessary labour resources to make these investments.

Narrow access to land and employment in rural areas has increased the propensity to violence. While not the only cause of rural violence, narrow access has contributed significantly to Colombia's extremely violent history over the past half century. The propensity to violence has a negative feedback on investment and employment. Rural insecurity probably reduces the incentive to invest in agriculture and, more importantly, skews the pattern of investment toward activities that are relatively non-intensive in the use of labour. The supervision costs and incentive losses typically associated with hired labour are even greater in an environment where hired workers may initiate or collude in violent reprisals against employers. This disincentive may encourage landowners in areas of arable potential to invest in livestock rather than crops; and it may reinforce the tendency for larger irrigated holdings to be placed under pasture or grain crops, rather than high-margin crops which require careful supervision and are intensive in the use of hired labour.

The negative impact of past agriculture and land policies

A number of policy interventions have circumscribed the poor's access to land. First, the scope for tenancy has been reduced. Beginning with Law 200 of 1936, and culminating in the *Ley de Aparcería* of 1975, a series of legal measures have had the effect, intentional or otherwise, of reducing the incentive for large landowners to lease out land to tenants (Table 2). The right of landowners to employ sharecroppers, other tenants and *colonos* was formally outlawed by Law 1a of 1968. This led to a precipitous fall in the use of sharecroppers and *colonos*, although they had not completely disappeared even by 1988. A less dramatic reduction occurred in the numbers of other tenants. These trends occurred even while agricultural area increased in the country as a whole. Much of the decline of sharecropping

Table 2. Colombia: changes in land tenure, 1960–88

	1960 (1,000 hectares)	1988 (1,000 hectares)	Growth (%)
Owners	18,995	29,117	53.3
Sharecroppers	1,100	273	-75.2
Other tenants	1,231	829	-32.7
Colonos*	2,889	554	-80.8
Other†	526	1,123	113.5

* Occupants of untitled land ('internal' and 'external' frontier).

† Includes squatters.

Source: World Bank (1996).

centred on the coffee-growing region (associated with an increase in the importance of small owner-operated farms) and on areas of the Caribbean lowlands, following clearance of the land for cattle rearing.

The steepest fall in rural employment, by 3.9 per cent per year, occurred between 1970 and 1975. This suggests that the 1968 law was the critical event and that, by the time the ban on sharecropping was reaffirmed in 1975, most of the expulsions of tenants and squatters had already occurred.

The negative employment impact of closing the tenancy option might have been offset by redistribution of land to smaller farmers. But colonization and redistribution by the land reform agency, INCORA, has done little to change the overall agrarian structure. Since its inception in 1961, INCORA has redistributed relatively little land in areas of established settlement, concentrating instead on the colonization and titling of frontier lands. Since land on the frontier has tended not to be handed out in small parcels, colonization initiatives on this agricultural margin have failed to alter the overall picture of concentration. Between 1960 and 1988, the area occupied by holdings under five hectares declined from 6 to 5 per cent; the area in medium-sized farms (five to fifty hectares) rose from 24 to 26 per cent; and the area in larger farms (over fifty hectares) fell from 70 to 69 per cent.

One effect of the lack of tenancy and land reform options was to encourage land invasion. During the 1970s, there was a wave of illegal farm occupations, affecting 1,500–2,000 farms and roughly two-thirds of departments. From this point on, INCORA's work tended to centre on regularizing the claims of illegal invaders. But even this avenue for land acquisition was closed: Law 30 of 1988 banned INCORA from acquiring illegally occupied land.

The literature on farm size and productivity has established that factor productivity on farms operated primarily with family labour is typically larger than that of larger farms operated primarily with hired labour or tenants. Around 1970, the situation in Colombia was consistent with this generalization (Berry and Cline, 1979). Moreover, for any given level of resource use and output, the small family-based sector generates much more employment than the large-scale sector. When there is technical change, the optimal size of family-based operations tends to increase. But once

farm sizes have adjusted to the new technologies, the typical negative relationship reappears.⁴

Between 1976 and 1988, small farmer yields increased on average by 82 per cent, compared to an increase of only 2 per cent for medium and larger farmers. Much of this small-farmer yield response is based on adoption of scale-neutral input packages (primarily involving agrochemicals), successfully promoted by the extension component of the integrated rural development programme that was launched in 1976. The yield response is striking given that the volume of public resources channelled to the small farm sector was small compared to that garnered by larger farms. The level and speed of the response by small farmers suggests that the farm size-productivity relationship observed for the 1960s and early 1970s continues to hold.

If small family farms are more efficient than large farms relying on hired labour, why do large farmers not find it more profitable to subdivide their properties, and rent or sell these parcels to smaller farmers? The restriction on *leasing* has already been examined. Large farms in Colombia are not generally parcelled out and *sold* to small farmers because the market price of agricultural land typically exceeds the capitalized value of farm profits, since the value of farm land is only partly based on its agricultural potential. In all areas, land serves as a hedge against inflation. Its immobility makes it a preferred form of collateral in credit markets, conferring additional utility, particularly where production risk cannot be insured. In peri-urban areas, land holds out the prospect of higher returns from real-estate development than from farming. Finally, credit subsidies and tax write-offs are likely to be capitalized into land values (Binswanger *et al.*, 1995). Many of these non-farming benefits do not apply to small farmers, who do not usually have access to subsidized credit, and do not benefit from the value of land ownership as a tax shelter.

If the market price of land exceeds the capitalized value of farm profits, a poor smallholder or landless worker cannot finance the purchase of land out of farm profits, even if the owner, or a mortgage bank, were willing to advance him or her a loan covering the full purchase price of the land. Purchase would only be feasible if the productivity differential between small and large farms were huge; or if recourse were had to non-farm income; or if the purchaser were willing to exploit unpaid family labour, devoting the imputed labour earnings to the land purchase.

This hypothesis is borne out by a study of fifteen *municipios* located in distinct agricultural and agrarian systems in Colombia (Suárez *et al.*, 1993). The study demonstrates that the market for land is highly segmented, failing to transfer land from large to small farmers. There is a very active land market among large landowners, more active indeed than in the United States,⁵ and an active market for the sale of small parcels between small-

⁴ Recent studies confirm the earlier findings and provide a theoretical rationale for the observed relationship based on incentives issues and missing markets. This literature is summarized by Binswanger *et al.* (1995).

⁵ In Colombia, in 1990 and 1991, about 5 per cent of farm land was sold (Suárez *et al.*, 1993). The percentage of farm land transferred on average each year is 3 per cent in the United States, 1.5 per cent in Britain and in the white sector of South Africa and 0.5 per cent in Ireland and Kenya (Moll, 1988, p. 354).

holders; but there are few transactions between the two groups. However, the evidence presented in this study may not be statistically representative of the different regions covered. Thus, there are good grounds for making a closer, more precise evaluation of this phenomenon of segmentation.

One serious flaw of past approaches to land reform in Colombia and elsewhere was the failure to recognize that the market segmentation and inflated prices of land are themselves policy consequences. They are affected by macroeconomic conditions, non-farm investment options, tax policies and agricultural policies (see Binswanger, 1989). Correcting the maldistribution of land must start with the elimination of these distortions. This will enable land markets to work better, and will make any land reform programme more affordable to governments and beneficiaries.

In Colombia, better collection of agricultural income taxes and capital gains taxes on farm land would reduce the attractiveness of land as a tax shelter, thereby tending to lower its price.

A further problem is that past agriculture credit policies and recent credit initiatives are not conducive either to holding down the price of land or to bringing more land onto the market. The agricultural investment incentives recently adopted (Law 101 of 1993) will mainly be captured by large farmers, giving them a competitive edge in relation to small farmers. Past instances of blanket rescheduling of credit have helped keep alive inefficient large farms which could fruitfully be parcelled out and sold off to small-farmer groups. A better approach would be to provide financial assistance for restructuring the assets and liabilities of potentially viable large farms, coupled with financial incentives to the owners of unviable farms to leave the agricultural sector, their land being made available for purchase by small farmers.

An important factor tending to push up the price of land, one that is specific to Colombia, is the laundering of money from drug trafficking. It is estimated that, in the late 1980s, the traffickers were investing 8–23 per cent of their cocaine revenues in the purchase of land and had accumulated nearly one million hectares (equivalent to 3 per cent of the farmed area). Most of this land was in the departments of Cordoba, northern Antioquia, Caqueta, Meta, Sucre, Atlantico and Casanare, and was used for cattle rearing (Bejerano, 1988). One way to tackle this problem would be to place the onus on would-be buyers of large tracts to demonstrate that their cash had been obtained by licit means; failure to provide satisfactory proof would result in an embargo on the sale of land.

Labour policies

To what extent have inflexible and distorted labour markets contributed to the misallocation of land and labour in Colombia, and thereby aggravated the deterioration of resources on slopes and at the frontiers of the rain-forest? Labour markets may be said to be efficient when there are signs of integration between urban and rural sectors and between different rural localities. Integration suggests a trend toward lowering of wage differentials between localities and sectors for workers with comparable skills.

The urban–rural wage differential in Colombia is low: wages in construction are only about 10 per cent higher than those in agriculture. The

recent social security reform will probably tend to push up the cost of hiring workers in the urban formal sector; this will reduce the take-up from the informal sector, a trend which may induce greater slackness in the urban labour market, tending to keep wages for unskilled work close to those prevailing in the rural sector.

Inter-regional rural-to-rural migration has also been substantial, and there is little evidence of regional segmentation of rural labour markets. In addition, there is a substantial amount of temporary inter-regional migration, associated with contracting of casual labour for harvesting sugarcane, coffee, cotton and other crops; but this involves men much more than women. As a consequence male rural unemployment rates are very low, about 2 per cent.

On the other hand, rural female unemployment rates are very high. According to a 1993 household survey,⁶ in the countryside, 12 per cent of women looking for work were unable to find it, compared to only 2 per cent of men. This differential is extremely high by international standards. Rural unemployment was particularly acute among young women: 25 per cent of under-25s were unable to find work. In towns, the gender disparity was much narrower: 6 per cent of men and 9 per cent of women were unemployed.

It may be true that there is a long tradition of women working as day labourers (e.g., in the coffee harvest). Also, between 1973 and 1985, the share of women in the economically active population of rural areas rose from 14 to 32 per cent (Berry, 1992). However, females are less able to respond to demand for short-term workers, because they often have young children to care for, which tends to reduce their mobility. Although women have less propensity than men to remain in rural areas, among those that do remain the rate of unemployment is much higher than it is for men.

The particularly high unemployment rate of rural women cannot be explained as a consequence of the low labour absorption of Colombian agriculture, since this affects both men and women. It is partly a consequence of social norms which discourage participation in off-farm work, except in specific operations such as the coffee harvest, but it may be aggravated by inadequate access to land of the households. This hits the relatively immobile women more severely than the more mobile males. The usual response to slack labour demand would be to increase the use of unpaid family labour on the farm. For families having insufficient farm land, either as tenants or as owners, this option does not exist.

This brief review suggests that rural labour markets or labour market policies are not a major cause of the misallocation of land and labour in Colombia. The disquieting feature of extremely high female unemployment may be a consequence of the agricultural and land market policies discussed previously, which cause low labour absorption and inefficient land use patterns.

⁶ CASEN survey, Departamento Nacional de Planeación, Bogota, 1993. Results reported in Reyes and Martinez (1994).

Temporary shocks in rural labour markets

Although the rural labour market appears reasonably flexible, temporary shocks to the farm sector can still have major adverse employment effects. In 1992–3, the combination of severe drought and a sharp downturn in world prices seriously depressed the sector. The employment impact was probably greater than it would have been if the rural demographic transition had already been fully negotiated. Although the rural population has declined in absolute as well as relative terms since 1985, the population of working age increased at an annual average of 2.9 per cent between 1985 and 1990, much higher than in previous periods. This reflects the relatively high rural birth-rates of the late 1960s.

Between 1990 and 1993, the number employed in agriculture fell from 2.3 million to 2.2 million. The loss of agricultural employment (–54,000 jobs) was more than offset by the growth of employment in the ‘rural non-farm’ sector (+163,000 jobs). Within the farm sector, employment trends varied significantly by type of crop. Between 1990 and 1993 the non-perennials witnessed a contraction of 19 per cent, most of this related to the declining profitability of cotton, rice and vegetables (and, to a lesser extent, maize, sorghum, soybeans and wheat). Coffee contracted by 2.4 per cent. Other perennials grew by 9 per cent: falls in the employment generated by cassava, *panela* and cocoa were more than offset by increases in bananas, plantains, oil palm and sugarcane.⁷

The impact of contraction is strongest on those households which depend significantly on rural wage incomes. In 1993, 57 per cent of rural household heads had worked for a wage, and wage earnings made up 46 per cent of rural household income. A larger proportion of the rural labour force was self-employed (58 per cent); but incomes from these activities accounted for only 37 per cent of rural household income. Wage employment was a much more significant source of income in the Caribbean region than in other rural areas.

This brief overview suggests that labour market rigidities are not a major problem in Colombia. However, there is an urgent need to find adequate ways of responding to sharp downturns in rural labour demand occasioned by periodic agricultural crises associated with import surges and price slumps. The second issue is how to ease female unemployment. Policy interventions could usefully stress the creation of an enabling environment for rural non-farm enterprise, including broader opportunities for female employment; and promotion of public works programmes to alleviate temporary downturns in the agricultural demand for labour.

The case for land reform

Government interventions to drive up the demand for labour in periods of a temporary downturn will do little to cure the fundamental misallocation of land and labour resources in Colombian agriculture. Nor will interventions to improve the productivity of hillside agriculture of poor farmers be sufficient. More radical approaches are required. A strong case can be

⁷ Refers to changes in the number of man-days (*jornales*) worked in each crop per year. Source: CEGA (1993).

made for reorienting and revitalizing the Colombian land reform. First, migration away from the countryside has not—contrary to the initial expectations of Colombian policy-makers—served to eliminate rural poverty, nor has it reversed the tendency of small farmers to cultivate steep slopes in an unsustainable manner. They need access to some of the more fertile bottom-land currently used for extensive livestock grazing. Second, putting land into the hands of the rural poor will help to defuse one of the causes of rural violence, and may thereby help to promote investment in agriculture. Third, the evidence suggests that small farmers in Colombia have high productivity if given access to land resources, markets and agricultural services. They are capable of significant further productivity gains. Putting more land in the hands of small farmers is likely to generate efficiency as well as equity gains, helping to raise the competitiveness of Colombian agriculture.

Land reform is a highly appropriate response to this problem of segmentation. An alternative would be to create incentives for larger estates to hire in more labour—for example, by reducing capital investment and livestock subsidies. But rural violence would still reduce the propensity for large farmers to hire labour; and, even in the absence of violence, the supervision costs associated with using hired labour would make these estates less efficient than small farms using family labour. Therefore, there are good grounds for facilitating the subdivision and sale of estates to small farmers. Leasing to small farmers can also be encouraged, but incentive problems will make these farms somewhat less efficient than small owner-operated farms.

Land reform will only work if there are complementary measures designed to reduce the 'non-farm' incentives for holding large estates, reducing the wedge between the price of land and the capitalized value of farm profits.

In addition, we have seen that INCORA, the parastatal land reform agency, has been inefficient in carrying out much land reform. This ineffectiveness can be attributed to four causes:

- (1) The major episode of redistributive land reform occurred in the 1960s, initiated at the end of the civil war known as the *violencia* in 1958. After that initial spurt, budget allocations for the purpose of land reform dried up.
- (2) Land acquisition was based on expropriation of insufficiently used farms, a divisive process fraught with endless litigation. As a consequence, INCORA was a slow and poor buyer of land, acquiring mostly already invaded and/or marginal lands, often at inflated prices.
- (3) Selection of land reform beneficiaries, land allocation and farm development were carried out by a centralized bureaucracy in paternalistic ways. Beneficiaries got incomplete rights to land and poor services.
- (4) INCORA continued to allocate frontier land to favoured individuals in large units, rather than as family farm units, thus reproducing the unfavourable agrarian structure at the frontier. Its settlements of smallholders on the frontier suffered from the same kind of centralized and paternalistic bureaucratic approaches as its land reform programme.

Given this less than encouraging record, it is clear that future land reform efforts must be based on radically new approaches which are cheaper, faster, more decentralized and more participatory. The government of Colombia has therefore recently taken steps to revitalize the land reform, and to change the way it is administered. It has introduced new legislation (Law 160 of 1994) which proposes to use the land market for land reform.⁸ Beneficiaries would buy land directly from large farmers, using grant and loan resources provided by the government. Land allocation on the frontier would be restricted to family farm plots for poorer groups. The legislation also decentralizes land reform administration and makes it much more participatory. On the other hand, little consideration has so far been given to the policy issues discussed above, which affect the efficiency of land markets.

Evaluating Law 160

The new law provides for the poor to be given grants to buy land. Persons deemed eligible for grants are allowed to identify land that they want to buy and to negotiate a price with the owner. This marks a clear break from the previous arrangement whereby INCORA would buy up land and transfer it to beneficiaries. The centre piece of the new initiative is the provision for direct negotiation between buyer and seller: INCORA would facilitate these negotiations but would not buy land except as a last resort. INCORA may compulsorily purchase land (a) on behalf of indigenous or other designated target groups, (b) to protect the environment, and (c) when beneficiaries are unable to reach agreement with landowners who previously agreed to sell to them.

The grant for land purchase will amount to 70 per cent of the cost of buying a 'family-farm' holding; beneficiaries would cover the remaining 30 per cent of the purchase price through loans which INCORA would help them to negotiate. A substantial grant element seems justified in order to offset the wedge between the market price of land and the capitalized value of farm profits. The size of the wedge is a function of the severity of policy distortions; complementary measures (outlined above) are needed to reduce these distortions. Under the new arrangement the loan component would not be so large as to saddle beneficiaries with a high debt/asset ratio, compromising their ability to secure working-capital credit.

However, it may be that a 70 per cent subsidy is too large. First, it entails a major fiscal cost, which the state may not be well placed to bear. Second, it could be argued that if the policy distortions are removed, less purchase subsidy would be needed. Also, the size of the subsidy may encourage persons to apply for it even when they have no intention of continuing to farm.

In the past, the agrarian reform ceded ownership of public lands on the frontier in large tracts, thus failing to redress the overall problem of rural

⁸ Between 1995 and 1998, the intention is to facilitate the purchase of one million hectares by 69,900 families; and to title five million hectares of frontier land, benefiting 178,600 families. The total number of beneficiaries is estimated at 1.2 million, or 13 per cent of the rural population.

property concentration. Under the new law, land on the frontier will be parcelled out in family-farm units. Persons whose net worth exceeds 1,000 minimum wages will not qualify for these homesteads; nor will agrarian reform officials. These provisions represent a significant break with the past, holding out the prospect of a more equitable distribution of land on the frontier.

There are a number of weaknesses in the new law. First, holdings sold off under the auspices of the land reform may not be sold or rented for twelve years after the transfer: this moratorium seems excessive. The stipulation is unlikely to be enforceable, and, to the extent that it is enforced, will needlessly restrict the flexibility of land and labour markets. It should be recognized that some of the newly created farm enterprises will inevitably fail; and farmers who fail must be allowed to exit.

Second, it is not clear that government needs to make the award of grants conditional on purchase of a 'family-farm size' holding, or to restrict the scope for subsequent subdivision of such holdings. The proposal denies the option to the poor of buying a 'sub-family farm' and supplementing farm revenue with income from off-farm sources. Arguably, there is no need to fix a minimum acceptable holding size. INCORA could simply pay 70 per cent of the land purchase cost up to a maximum amount, rather than fixing a target farm size. This would incidentally remove the need for time-consuming and costly surveys to determine, for each locality, what area of land is needed to support a farm family.

Third, the present law reopens the possibility of regularizing the tenure status of persons who have invaded land. This is valid: past invasions need to be resolved. But, in regulating the law, it will be important to create incentives to acquire land through the market, rather than by invasion: ensuring that title is granted more quickly if land is not invaded; and using the provision of infrastructure as leverage—concentrating investment on areas where land transfer has been effected through market negotiation, not invasion.

Fourth, private property rights are deemed to lapse if land is abandoned, unsustainably exploited or used for illicit purposes (e.g. cultivation of narcotics). The new law indicates, for example, that 'mere tree-felling' is not a sufficient indicator of 'adequate exploitation'. However, there is much room for discretionary interpretation of what constitutes proper use of the land. The best way round this problem is to remove the policy distortions which encourage people to hang on to large tracts of land: changing the incentive structure will work better than trying to regulate land use.

Fifth, the new law makes no attempt to alleviate restrictions on leasing, which entail substantial equity and efficiency losses, and which have resulted in so much premature eviction of labour from the sector. Opposition to leasing is based on the perception that, in the past, such arrangements (particularly sharecropping) were exploitative. Evidence from around the world suggests that sharecropping is often a way for differently endowed enterprises to pool their resources for mutual benefit, overcoming credit constraints and helping to manage risk. Safeguards could be adopted against the possibility of small-farmer exploitation. Minimum standards

for tenancy contracts may be appropriate. These contracts could be enforced by municipal arbitration councils whose judgment would, in the last resort, allow for appeal through the courts. Arbitration councils would provide statutory representation to all parties involved in disputes concerning labour, tenancy, mortgage and land sales contracts.

While the law presents a great promise for a new wave of land reform, significant policy problems in the law itself, and in other agricultural policies which favour large-scale farms, will have to be addressed. Only then will land reform's potential to reduce both poverty and land degradation be fully realized.

Conclusion

This article has argued that rural poverty, inefficient resource allocation and natural resource degradation are joint phenomena, often induced by a common nexus of policy failures which favour the modernization of large-scale farming at the expense of more efficient and employment-intensive family farms. The policy nexus has as an additional adverse consequence: the concentration of impoverished populations with few investment resources on marginal lands, at tropical forest frontiers and on erodible hill-sides. Eliminating the adverse policy nexus should be the highest priority, rather than the reduction of population growth, the relocation of the impoverished population to the cities, or the improvement of farming techniques on the marginal lands.

Of course, eliminating the privileges of rural elites that are embedded in these policies is an extremely difficult task. These policies did not come about by accident, but as the consequence of a historical evolution which involved bargaining among politically strong groups which looked out for their interests at each point of time. Analyzing the joint consequences of the policies may help in the reform effort, but is unlikely to be sufficient. Peasants have been poorly articulated in the Colombian political process, and steps must be taken to provide them with a greater input into policy-making.

There are very few checks and balances when it comes to agricultural policy-making: the power of large farmers, articulated through the commodity associations (*gremios*) and through Congress, is in no way offset by countervailing peasant or consumer lobbies. It is striking that peasant organizations are given very little scope by government to intervene in the policy dialogue. The Ministry of Agriculture is dominated by the *gremios* and by Congress and spends much of its time responding to demands from commercial farmers—primarily, producers of importable goods—for greater protection and subsidies. Policy-making therefore, tends to focus on short-term issues of crisis management; there is little pressure on the government to address issues of long-term strategy or poverty reduction. Unless some political actors see it is in their interest to bring poor peasants more strongly into the policy process, reforms of the policy environment and land reform will continue to be a slow process.

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