

**CO-ORDINATING THE PLANNING AND IMPLEMENTATION FOR GROWTH
AND EQUITY OBJECTIVES IN RURAL DEVELOPMENT AGENCIES:
A CASE STUDY FROM COLOMBIA**

Jacqueline A. Ashby and Douglas H. Pachico¹

Where several distinct agencies are charged with bringing a variety of services to the agricultural development of a particular zone, implementation of a consistent set of policies by all the concerned agencies as well as the acceptance of these policies by farmers, can be complicated by tradeoffs between differing growth and equity objectives, differing concepts of costs and externalities, and differing time discount rates.

This paper presents a case study of how three agencies and local farmers have responded to the complexities of implementing mutually consistent policies for achieving objectives of growth, equity, and resource conservation in a regional watershed project area in an erosion zone in Cauca, Colombia. It considers interactions between agencies and farmers and tradeoffs between soil conservation and agricultural productivity.

First, the study area and data collection are described. Second, the objectives and policies of three institutions responsible for different aspects of agricultural development in the region are discussed. Third, farmer response to policy implementation at the local level is analyzed; the incentives facing farmers frequently lead to behaviour at variance with official objectives. Finally, some implications of this study for problems in planning and implementation are considered in the context of growth and equity objectives.

The Study Area and Data Collection

The study area in Cauca Department, Colombia, is in a region of hilly terrain at 1400-1600 metres. The Department has a concentration of small farms (89 percent less than 20 ha.) which produce mainly cash crops (e.g., coffee, cassava, sisal) on relatively poor soils.

Within two subregions of this Department, interviews were carried out with a sample of 102 farmers to provide data on farmer practices, costs of production, and yields. Farms in the sample area average 10 ha. in size (86 percent less than 20 ha.). An average of 1.75 ha/farm is under cassava, and 1.56 ha. under coffee. The farming system typifies the process of agricultural involution characteristic of small farms using traditional technology in low income countries, reflected by increasing population density, a secular decline in soil fertility and yields, and increasing intensity in use of land and labour inputs.

Interagency Co-ordination

Three agencies with a responsibility for achieving various social welfare objectives in the study are discussed. Each has clearly defined goals, rational policies for attaining them, and a strong cadre of competent motivated technicians. Nevertheless, the coordination of efforts of these agencies to prevent contradictory policies is often a challenging task.

The Federación Nacional de Cafeteros (FEDECAFE) is an autonomous association of coffee producers. In quest of its broad objective of promoting the interests of its members--the coffee farmers of Colombia (93 percent of whom are minifundistas)--FEDECAFE is extensively involved in export marketing, research, technical assistance, and credit for coffee and other crops produced by its members.

A critical concern of FEDECAFE has been the maintenance of a stable market for coffee, both to protect small coffee producers from income distortions wrought by wide fluctuations in the world coffee market, and to preserve a strong position for Colombian coffee in world markets. These are difficult objectives to achieve both because a low income elasticity of demand for coffee results in fairly sluggish growth in international consumption, and also because a low price elasticity of demand can lead to rapid and severe price changes (Ridler). Although world coffee prices quadrupled after the Brazilian frost of 1975, creating a short term bonanza for Colombian coffee producers, FEDECAFE planners have been concerned about the supply response of coffee producers to these transitory high prices. It therefore tried to regulate the supply of coffee to avoid market saturation and lower long run income to coffee producers by imposing constraints on the internal rise in the price of coffee and by a vigorous programme of diversification to induce coffee farmers to enter other activities.

Detailed soil and land use studies have been undertaken by FEDECAFE to develop recommendations about areas most appropriate for coffee or for diversification to other crops. Soils and topography make the Cauca study area unsuitable for high yielding monoculture coffee systems. Because it is a marginal coffee zone, FEDECAFE curtailed assistance in the area, choosing to discourage increased coffee production in a high cost zone subject to severe erosion problems.

Diversification into greater cassava production in the study area was not, however, recommended, due to perceived grave erosion where cassava is cultivated (FEDECAFE, p. 68). Instead, promotion of reforestation and horticultural crops (tomatoes, beans, and fruit) was suggested.

This policy of discouraging greater cassava production was consistent with the goals and policies of the Cauca Valley Corporation (CVC), which has a mandate to manage soil and water resources in the Cauca river basin. It is a major generator of hydroelectric power, supplies irrigation water, undertakes flood control projects, and has overall responsibility for conservation of soil, water, and forest resources in the region.

The CVC has a 5-year plan for soil conservation, reforestation, and improved crop and livestock management. In the area covered by the study, emphasis is given to restricting farmers' land use and soil management practices originating in the traditional slash and burn methods of cultivation which characterize the techniques used by farmers to expand cassava production in the area.

Land use policy developed by CVC on the basis of soil survey recommended cultivation of cassava only on slopes below 20°, utilization of strip contour ploughing and live barriers, and, where suitable, promotion of horticultural and tree crops. An important aspect of measures to prevent soil degradation in the region is the requirement that farmers obtain official permits to clear land or cut trees. Fines are levied for burning or clearing uncultivated land without an official permit.

Control of farmers' traditional slash and burn practices, as is analyzed in detail in the next section of the paper, amounts to a policy of restricting the growth of cassava production in the study area which is based around the rotation of cultivated plots with uncultivated land.

The third institution with a key role in agriculture and resource management in the area is the Instituto Colombiano Agropecuario (ICA). ICA is part of the Ministry of Agriculture and is charged both with undertaking agricultural research to develop improved production technologies and with subsequently conducting technical assistance and credit programmes to ensure that farmers enjoy increased incomes and welfare from the use of new technologies. Its policy is to make credit available, but conditional to ICA's recommended practices. Thus, the availability of subsidized credit provides ICA with a

powerful incentive to encourage farmers to adopt ICA recommended technology, which includes sound soil conservation measures.

Since short term increase in farmer incomes and welfare is the principal criterion by which ICA can judge the effectiveness of its research, extension, and credit programmes, there is a strong congruence of objectives between ICA and its client farmers, both seeking increased agricultural output and higher incomes to farmers from improved technology.

FEDECAFE concentrates on encouraging a favourable market for Colombian coffee with neither coffee nor cassava production in the study area being viewed as viable in the long run. CVC has goals of preserving electrical generating capacity, controlling floods, and providing irrigation downstream from the study area. ICA has objectives of improving agricultural productivity in the study area through new technology.

All these organizations recognize that there is a strong need for consultation and agreement upon a mutually consistent set of policies to avoid their working at cross purposes. An interagency coordinating group therefore agreed on a joint strategy towards agricultural development and natural resource management. Given the undoubted gravity of soil erosion in the area, and its marginal status as a coffee producer, credit and technical assistance services were restricted to the promotion of horticultural crops where the topsoil was still adequate. Protective reforestation was recommended for heavily eroded soils, and neither coffee nor cassava was to receive official support. However, sustained application of the agreed strategy became increasingly difficult.

FEDECAFE and the CVC are aware that they, respectively, must bear the costs of surplus coffee production and a deteriorating watershed, and neither heavily discounts these future costs. Both are willing to share with farmers some of the current costs of diversification and erosion control, but for both the bulk of these costs are externalized. In contrast, ICA does not so strongly internalize future erosion as a cost, though it clearly recognizes that it is a problem. For ICA the current costs, in terms of farmer incomes and agricultural output, are more pressing than the discounted future costs of erosion.

Farmer Response to Policy Implementation

Agreed on interagency policy towards the study area had three components: diversification away from coffee and cassava to horticultural crops through technical assistance and credit was to be promoted, clearing uncultivated land for cassava production was to be opposed, and continued cassava production on eroded soils was to be discouraged.

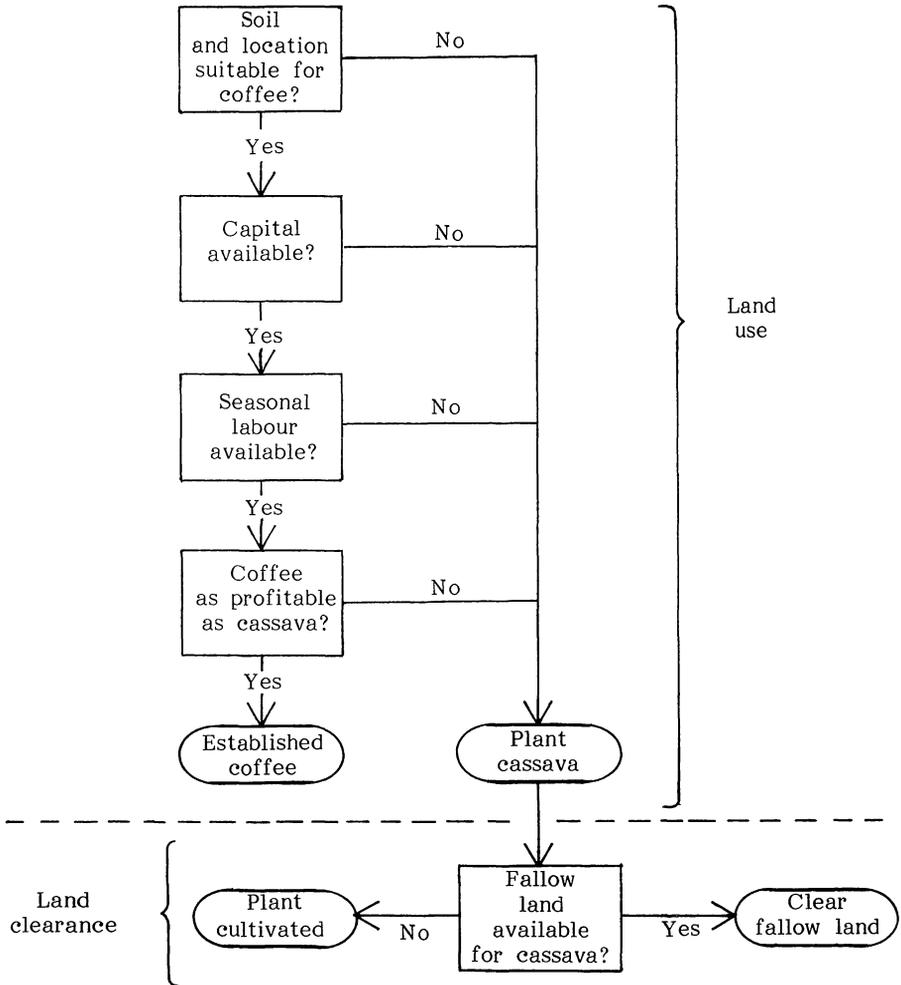
Withdrawal of credit and technical assistance does appear to have dampened investment in coffee in the study region, where only 15 percent of the sample farmers received credit for coffee, compared to 35 percent of neighbouring farmers outside the restricted zone. Only 30 percent of farmers in the area under credit restrictions reported expanded coffee production in the past 5 years, compared to 49 percent in the neighbouring region.

Promotion of the horticultural crops recommended as alternatives to cassava faced several obstacles. Horticultural crops require a high initial capital investment compared with cassava. They are higher risk crops, susceptible to disease. Markets are difficult for small farmers to enter and extreme fluctuations in prices are common. Many potential ICA clients in the area did not have suitable soils or access to water. In contrast, demand and prices were rising for locally processed cassava starch traded by middlemen to food processors in urban centres.

Survey data show that cassava continues to be the major crop for farmers in the study area, accounting for 41 percent of their cultivated area. In part this is due to strong demand and rising prices for cassava starch, but degraded soils as well as capital and labour constraints leave farmers without more profitable alternatives.

Farmers' decisions about aspects of cassava production are depicted in flow chart form in figure 1. Where soils, capital, and labour are limiting, farmers plant cassava rather than coffee. When fallow land is available, farmers prefer to clear fallow land for cassava rather than to continue to cultivate cassava on previously cropped land.

Figure 1. Flow Chart of Farmers' Decisionmaking in Land Use and Clearance



Several factors contribute to the attractiveness of maintaining a rotation of cassava with this fallow land, in particular soil fertility declines and buildup of soil-borne disease and pests over successive cassava crops. The decline in average yields reported by farmers for the first and successive cassava crops is shown in table 1. There are economic incentives for farmers to continue clearing new land for cassava rather than continue cultivating a plot, even using fertilizer at current levels of farmer technology. Although labour costs for clearing and weeding decrease for successive cassava crops, the net cash return is lower, while the marginal rate of return on the additional capital required for planting newly cleared land (144 percent) is over three times that obtained on cultivated land with farmers' methods of applying fertilizers (38 percent).

Table 1. Returns to Cassava on Previously Fallow or Previously Cultivated Land

Plot History	Fertilizer Applied	Yield (kg/ha)	Cash Crops (pesos/ha)	Net Cash (pesos/ha)
Previously fallow	No	9,959	19,754	23,654
One or more prior cassava crops	No	6,708	13,890	15,155
One or more prior crops	Yes	8,424	19,254	17,222

With cassava such a profitable and widespread crop, its exclusion from credit and associated technical assistance prevented ICA from servicing an estimated 80 percent of its potential clients. Since farmers who receive credit are required to follow ICA recommended cultural practices, barring credit weakened ICA's ability to achieve other key parts of the interagency programme.

The agencies therefore had to revise their mutual strategy to let ICA serve its clients and to increase its capacity to reach farmers with recommendations designed to improve soil conservation. It was agreed that credit and associated technical assistance for cassava would be restored to the region so that objectives of discouraging the production of cassava on steep slopes and the clearing of new lands could be better accomplished through technical assistance tied to credit.

Nevertheless, farmers continue to cultivate cassava on steep slopes, and extension tied to credit has not yet been effective in combating this problem, as much official credit actually goes to cassava planted on steep slopes.

Conclusions

Differences among agencies and farmers in goals, costs, and time horizons have strong equity implications. Due to the profitability of cassava production, especially on newly cleared land, limitations on cassava cultivation impose high current costs in foregone income to farmers in the region. Likewise, farmers perceive many erosion control practices (e.g., contour ploughing and live barriers) as raising their costs but not their current incomes.

The tradeoffs involved in decisionmaking have some important equity aspects. The farmers of the study area have such low incomes that they are unlikely to accept losses from undertaking crop diversification and soil erosion practices when the principal immediate beneficiaries may be coffee producers in prime lands, urban electricity consumers, and valley farmers on irrigated land.

Success in improving resource conservation practices in the area may thus be critically dependent on identifying and extending to the farmers new agricultural technologies that compensate them for the costs of modifying their current behaviour, and providing farmers with sound short run economic incentives for better erosion control practices. Despite some differences in goals and internalized costs, FEDECAFE, CVC, and ICA all fundamentally recognize that policies that attempt to improve resource management practices solely or primarily through credit restrictions or withdrawal are unlikely to be successful because the costs of switching from coffee and cassava to other crops are currently high for farmers, as is also the cost to the institutions of trying to coerce cooperation. Renewed emphasis must be placed on agricultural research, to create new technologies to provide new sources of income streams which will compensate farmers for the costs of stricter soil and water conservation.

Note

¹Sociologist, International Fertilizer Development Centre (IFDC), and Economist, Centro Internacional de Agricultura Tropical (CIAT). The views expressed in this paper are the authors' and are not intended to reflect those of the above institutions. The paper was read by Rafael Posada.

References

- FEDECAFE, *Estudio de Zonificación y Uso Potencial del Suelo en la Zona Cafetera del Departamento del Cauca*, Bogotá, 1978.
- Ridler, N. B., "Coffee and Its Economic Role in Selected Latin American Countries," *Desarrollo Rural en las Américas*, Vol. 12, 1980, pp. 157-163.

OPENER'S REMARKS—A. Richards

All the papers were very informative. Since I know relatively little about the individual countries studied, my comments are limited to some of their implications.

There seems to be three principal themes: (1) the adverse ecological consequences of smallholders' private, rational decisions, and what government agencies try to do about them; (2) biases in the allocation of public and private research funds; and (3) the implementation of projects. Underlying each of these is the larger theme of the difficulties which inequitable distribution of resources, especially land, create for agricultural development.

In Ashby and Pachico's paper, I particularly like the stress on the role of poverty in creating a low rate of time discount, which in turn leads farmers to engage in farming practices which degrade the soil and undermine long term productivity. The question, of course, is what can be done about this unhappy state of affairs. An implication of the paper is that any attempt to correct the problem without providing smallholders with alternative survival or reproduction strategies is bound to fail. The Colombian government's attempt to promote horticultural crops, and smallholders' resistance due to the risks and lack of credit available to them, neatly illustrate this point. The authors note that the agricultural beneficiaries of the kind of conservation measures which the government tried to promote would be richer farmers, often holding the high quality, valley bottom land.

The analysis could have been somewhat deeper, examining why some farmers are confined to the marginal lands on the slopes, what historical process generated the unequal access of the productive resources, whether there have been any attempts at land reform in the area, and which farmers the government represents or listens to. These political and economic questions need answering to give a fuller picture of initial conditions which affect the interplay of small farmers and government agencies.

The proposed solution (improved research to find alternative crops) seems to be no solution at all unless these questions, particularly the one of whose interests the government pushes, are answered, as the paper by Silva on Brazil illustrates.

Silva shows very clearly that some crops receive more research attention than others. In particular, those crops which are grown by well-to-do farmers (unsurprisingly) receive more attention than those grown by smaller farmers. It is perhaps worth noting that the allocation of agricultural research funds followed more or less the same direction as the Brazilian economy as a whole with respect to outward versus inward emphasis: export crops up to 1950, then domestically consumed crops, then export crops again in the 1970s. Overall, the pattern of underinvestment in research in food crops, especially in "wage foods" (crops consumed by the poor) is both plausible and depressing. This conclusion is reinforced in that maize, which did receive some attention, was grown as a fodder crop and for livestock. Silva suggests that agricultural research in Brazil has led to greater inequalities.

The Sumatran case analyzed by Dillon and others stands apart somewhat from the Latin American papers. It appears that there was or is more complementarity between food crops and export crops than in the other cases. It was unclear whether this complementarity was only short term.

It seemed that rice could be intercropped with rubber trees. Is this true only in the early phases of the trees' growth? If so (and the paper was not clear on this), the situation is very reminiscent of the case of Nigerian (Yoruba) cocoa farmers where after the cocoa trees reach their fifth year or so, their shade makes it impossible to grow food crops on the plots. However, the farmers are able to obtain their food in the market, and to hire labour to care for the trees. More details about how the small farmers obtain food would be welcome.

The paper also shows us how the smallholders overtap, or display their short time horizons rather like Colombian farmers. But without more information about the market for foodstuffs and other consumer goods and about the price ratios of rice and rubber, it is difficult to assess this problem.

Although the authors lament the absence of family planning in the area, some families face a labour constraint. Once again, this may be a case of private rationality generating long term, socially irrational outcomes. Finally, as in the Latin American case, the question arises of which farmers the government favours.

All three papers would benefit from a more explicit focus on the political and social determinants of government policy.

OPENER'S REMARKS—J. B. Wyckoff

The Silva paper applies a total factor productivity model to measure agricultural productivity in Brazil. While the model provides some information, its usefulness in examining growth and equity problems of development can be questioned. The level of aggregation involved obscures the measurement of the impacts of the various development policies and makes it impossible to assess how the policy variables affect growth. The model also provides no measure of equity; i.e., distributive impacts. It is also usual to adjust the log variables to give the highest R^2 rather than enter them on an a priori basis.

The paper's conclusions attribute significant positive impacts to research while concluding that extension activities have no significance. Silva concludes this while admitting to a high level of multicollinearity between the research and extension variables. His rationale for attributing the impact to research rather than extension is unconvincing. It would be interesting to know how research results are being transmitted to farmers without an effective extension programme. While the number of publications resulting from the research is used as a measure of its productivity, there is no similar measure, such as number of meetings held, or number of farmers contacted, for extension.

Finally, the model gives no measure of equity considerations. While the paper discusses some possible equity implications, the model provides no help in determining the distributional impact of the programme on farmers.

The paper by Dillon et al. reports some very positive aspects of a development project. It is not often that results exceed planners' expectations, as they do in this case. It is also unusual for government to acquire or enhance reputation among both participants and nonparticipants in a development project.

Several questions could be raised about measures used to substantiate such statements as "electrification of remote areas, better flow of information, and improved health delivery have followed of their own accord" and "the project has served to demonstrate that growth...need not sacrifice greater equity."

Finally, the impact of prices on increased production is not discussed; neither is the cost effectiveness of this type of project as compared with possible alternatives.

Ashby and Pachico's paper demonstrates a classic case of development agencies' establishing "top down" project goals without examining the possible impact of their programmes on farmers' welfare, especially as measured by cash flow. The agencies' policy aimed at reducing land clearing when farmers' rates of return were three times those obtained by cultivating existing cropland led to the expected results. Losing contact with 80 percent of their potential clients because of the cassava policy adopted guaranteed the project's ineffectiveness.

The goal of discouraging production of coffee, a cash crop, was probably applauded by other Colombian coffee growers, as well as producers in other countries. However, farmers could not be expected to accept this, unless coffee

were replaced with another, more profitable, cash crop. The goal of eliminating cassava production in the face of rising market prices similarly makes little sense to farmers, regardless of the longer term value of erosion control.

The results of this project should be widely disseminated, as an example of how not to conduct development, and in this context it may prove extremely valuable.

RAPPORTEUR'S REPORT—Ralph D. Christy

In evaluating the returns to research and extension, several points need to be considered. Research institutions are concerned about establishing their scientific reputation and therefore often select research conditions (such as soil type, progressive farmers) where productivity is likely to be highest. Research should be geared towards examining the productivity of small, low income farms rather than large state owned farms. In Brazil, research expenditure alone may not be responsible for the growth in soybean production. A spillover effect from U.S. research is likely, so that returns to investment in research in Brazil should be discounted. Modelling the relationships between research and productivity poses problems in the identification of cause and effect; research may cause productivity to rise, but the increased productivity may in turn cause increased research expenditure. As the relationship becomes circular the exogenous variable is difficult to identify. The conclusion that extension had little effect in the Brazilian case is not surprising since research and extension could be expected to have the same goals.

The role of research and technology is to relax the constraints imposed by natural conditions. There are many spillover effects, difficult to isolate, but returns to research in Brazil are nevertheless high. The notion of a circular relationship between research and productivity is doubtful, especially when the total research expenditure is considered, although it may occur in research on specific commodities. Extension probably had little impact on productivity in the Sao Paulo case because research and extension activities are not closely related there.

Most studies show a high rate of return on research on major crops. Brazil's federal government has recently begun research on neglected crops. A budget of \$200 million per year is being invested, with 9 percent of the funds being allocated to food crop production of small farmers. The goal is to reduce production costs and increase output. Care is needed in measuring the costs and benefits of projects; most studies measure only the direct impact. Silva's study shows a 40 percent rate of return on agricultural research. Farmers are not the only beneficiaries; low income consumers also gain from the results of research.

The North Sumatra case illustrates the need to consider the criteria for allocating scarce resources among farmers in project implementation, especially where, as in that case, credit is an important variable. The project is particularly interesting because of its efforts to equate growth and equity. Farmers with less than 2 ha were given the option of growing alternative crops. The project has a special credit system which differs from usual banking procedures, allowing funds to be allocated to low income smallholders.

Provision of new technology required knowledge of farmers' environmental constraints. Projects should also consider their goals and objectives before attempting to implement new policies.

Participants in the discussion were Walter J. Armbruster (Session Chairman), R. J. Dancy, H. M. G. Herath, F. G. Jarrett, D. Paarlberg, V. Palma-Valderrama, R. Posada, and L. W. Sondakh.