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## THE ECONOMICS OF INVESTMENT IN RURAL DEVELOPMENT: PRIVATE AND SOCIAL ACCOUNTING EXPERIENCES FROM LATIN AMERICA

by

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## I. The Private and Social Benefits of Rural Development

Latin America has had a long and unusually rich experience with rural development projects (RDPs). Such projects were introduced in virtually every country of the continent starting in the early 1970s as land reform initiatives were brought to a halt by either successful implementation or, more commonly, by increasingly effective opposition to the continuation of this approach to the resolution of agrarian economic and social problems. Yet, the record of rural development has been, at best, mixed. While there are a number of scattered success stories that can be identified, most RDPs have had disappointing results and have failed to pass the market tests of sustainability and replicability.

Many reasons have been identified to explain this generally unsatisfactory outcome, and the list is long indeed. Yet, the single most important necessary condition for success is clearly that the new opportunities and recommendations offered by RDPs be individually profitable for the households involved. In addition, for public investment in RDPs to be sustainable and replicable, it must be socially profitable for the region or country where it occurs. Social and individual profitability must hold jointly as necessary conditions for success: first, for public investment in RDPs to happen (including financing them through loans provided by international

organizations such as IFAD) and, second, for individual adoption of the project's recommendations to follow.

It is the thesis of this paper that there are many more situations where RDPs are profitable socially than privately because of the important positive externalities which they create. These externalities take the form of intersectoral and final demand linkage effects, ecological effects, and social effects. If these effects are properly accounted for, even though some are clearly very difficult to quantify, the social internal rate of return of many RDPs can compare favorably with that of other public projects. Further, if part of the next social gains which positive RDP externalities create are taxed to subsidize households in adopting RDP recommendations, projects can be made individually profitable for the households involved creating the necessary condition for adoption. It is this extension of the field of application of privately and socially profitable RDPs, through the social accounting of externalities and an optimum scheme of taxes and subsidies, that we explore in this paper.

We develop this argument by reviewing in part II the conditions under which RDPs have been made privately profitable at the level of the project itself. In part III we develop the logic of the accounting needed to capture linkage, ecological, and social externalities. In both parts II and III, we illustrate each of the cases analyzed with specific RDP experiences in Latin America. Finally, in part IV we discuss some of the specific difficulties that emerge in the management of RDPs which require the internalization of an externality in order for the recommendations made to project clientele to be privately profitable.

## II. Privately Profitable RDPs

For RDPs to advance new opportunities which are privately profitable, it must permit removal of a set of constraints which were preventing the households from adjusting from one equilibrium to another or from ever reaching a situation of equilibrium. The first situation would, for instance, occur in the context of changes in the terms of trade due to stabilization policies (such as provoked by the debt crisis or by the end of an oil or commodity boom) and the consequent need for structural adjustment; the second is the ancestral condition of Latin American peasants who have been kept marginalized from equal access to public goods and public institutions.

Whether underinvestment comes from the existence of transactions cost or from the adverse result of collective action, it, however, has markedly different implications for the management of remedial RDPs. If it is due to transactions costs, such as an overall underinvestment in public goods, elimination of these costs creates net social gains that can be to the benefit of all after proper compensations. Investing in removing these constraints should thus not be the source of major social conflicts, even if the benefits are not equally distributed in the end. This is not the case if underinvestment in public goods for peasants has its origins in rent-seeking activities adverse to them. In this case, distributional struggles are involved, and enough political power will have to be mobilized in favor of RDPs to lead to resource reallocation toward them, a more difficult proposition.

The RDPs as compensating for disequilibria can be looked at as having their origins to two types of situations: underinvestment in public goods and constrained access to markets and institutions.

## 2.1. Underinvestment in Public Goods for Peasants

The two most important forms of underinvestment in public goods which can be relaxed by RDPs and have proved to create conditions for private profitability are agricultural research and infrastructure.

It is well known that there has been a notable bias in the allocation of public funds to agricultural research away from the types of farming systems which peasants use and the crops which they produce. This is due to a variety of reasons that include (1) the difficulty of performing farming systems research (FSR) since it has to address simultaneously a large number of objectives and of combinations of activities; (2) the low benefit/cost ratios due to the high location and household specificity of particular farming systems; and (3) the lack of effective small farmers' lobbies to raise and stabilize public resources for FSR. There exist, in Latin America, a number of examples of successful technological innovations that have served as the basis for privately profitable RDPs. The success of several of the Integrated Rural Development (IRD) programs in Colombia, for instance in Antioquia, has been due to the effective role of ICA in FSR. In Chile (CET), Honduras (CATIE), and the Dominican Republic (Plan Sierra), highly profitable small-scale food production farming systems have been devised based on a combination of traditional knowledge and modern science in the farmers' fields. Successful technological change in peasant food production can also benefit marginal farmers and landless workers who, as net buyers of food, benefit from lower food prices. These social groups also benefit from employment creation if technological change raises the demand for labor.

Public investment in infrastructure accessible to peasants has also proved to be a necessary condition to make private investment in peasant agriculture profitable. Most particularly, investment in small water projects has served

to significantly relax the land constraint on small farmers. Small-scale irrigation projects of both the Ministry of Agriculture and an NGO like CESA in Tungurahua, Ecuador, have brought remarkable economic success to the communities benefited. Infrastructure investments have often been made through food-for-work programs of the World Food Program complemented with the appropriate capital goods and managerial assistance. This approach to public work programs has proved to be highly successful among ethnic communities of the Altiplano where a strong tradition of communal labor still prevails. Access roads to isolated communities is also a key complement to profitable private investment in these regions. The PIDER program in Mexico has thus had a strong focus toward investment in roads for the marginal areas of peasant concentration.

## 2.2. Constrained Access to Institutions

The most important constraints on small farmers are in their access to additional resources (especially land) to credit, information, and markets (especially for products, new inputs, and insurance). Because these constraints have been more effective on them than on commercial farmers, their shadow prices are often higher in the former farms than in the latter. If RDPs are successful in relaxing these constraints, they often can insure high private profitability. Since the constraints originate in market failures, they can be removed either by creating the missing markets or by institutional innovations through which access to these factors is provided.

It is clear that some of the most successful RDPs have been the ones that have been able to serve as vehicles for access to additional resources to land-constrained small farmers. This has been the main thrust of the POLONORESTE project in Brazil which has, through private land development

agencies, permitted colonization of new frontier land (Lacroix, 1985). A recent evaluation of the integrated RDPs in Colombia similarly shows that projects have been more successful when they have helped peasants increase the land under cultivation or when they have focused on households with larger holdings, less resource scarcity, and greater security of tenure (Valencia Gonzalez, 1982).

The pioneer Puebla RDP in Mexico has proved to be successful, in spite of failing to generate technological innovations, because it created an institutional innovation in access to credit (Redclift, 1983). Small farmers, previously marginalized from access to institutional credit, were organized in "solidarity groups" to collectively obtain loans with the land title of one single group member as the only collateral requirement. Access to credit, in turn, permitted adoption of locally known HYV-fertilizer technology. Those farmers who previously had access to credit were not significantly benefited by Plan Puebla. The RDP in El Palmar, Colombia, was also relatively unsuccessful in introducing new technologies and mainly benefited peasants by giving them access to abundant low-cost credit and, through that credit, to fertilizers, pesticides, and improved seeds (Reinhardt, 1987). In Ecuador credit can be obtained by organized peasant communities from a special section of the Central Bank, FODERUMA, with only the signatures of community officials and Ministry of Agriculture technicians, but no collateral requirements. The rate of devolution of these loans has proved astonishingly high, especially if distributed to women. Finally, projects, such as the Caqueza RDP in Colombia, have attacked through contractual arrangements the market failure in insurance for peasant crops. Through a scheme of "share risk," peasants only pay for modern inputs, with a premium, if yields are above the average level with traditional technology. If the tendency to underreport yields can be held in

check--another transactions cost--and management costs are not excessive, this institution can be effective in inducing less risk-averse behavior toward modern technology among peasants.

Finally, access to the production of new products, particularly labor-intensive export crops, has been at the basis of some of the most successful RDPs. This generally requires access to both new technologies and new markets. In many situations, this has been insured through vertical contracts with multinational agribusiness firms. Institutional innovations of this type have emerged in the production of vegetables for exports in Guatemala (Von Braun, Hotchkiss, and Immink, forthcoming) and in fruit production for exports in Chile (ETA, San Felipe).

Widespread experiences with RDPs have thus shown that, when these projects are directed at correcting disequilibria in the level of investment in public goods accessible to peasants and at relaxing constraints in their access to factors of production, private profitability can eventually be insured. The necessary condition for successful adoption of project recommendations and for sustainability and replicability of projects is thus insured at the level of the project itself.

Additionally, there exist projects that are not profitable for the households involved but that are socially profitable because of the externalities they create. These externalities can be due to linkage effects, ecological effects, and social effects. We analyze them in the following section.

## III. Projects that Create Externalities

### 3.1. Linkage Externalities

There are types of RDPs that create strong external effects in the rest of the economy through backward, forward, and final demand linkages. Thus, the

social accounting of these projects--at market or social prices--can make them profitable investments even if they are not profitable for the individual households involved. If the supply of specific sectors of the economy is demand constrained, the backward and the final demand linkages effects unleashed by a project that creates these demands can be contabilized as external effects. The recent studies of agricultural demand-led industrialization (ADLI) by Mellor and Lele (1973) and by Adelman (1984) pertain to this category of projects. In those, it is shown that a reallocation of public investment away from services, social overhead, and consumer manufacturing toward small and medium farms, together with productivity growth in agriculture, create agricultural incomes which increase the demand for industrial mass consumption goods. The result can be a higher growth rate, less poverty, and a more equitable distribution of income. If adoption of productivity-enhancing technologies by peasant households were not profitable for them at market prices, part of the net social gains which the growth strategy creates could be taxed to subsidize their adoption.

If, by contrast, the supply of specific sectors of the economy is constrained by the level of agricultural supply, it is the forward linkages of agriculture that create externalities. This is particularly relevant for RDPs located in regions with considerable resource immobility and high transportation costs so that the cost of relaxing the agricultural supply constraint by trade is too high. In Plan Sierra in the Dominican Republic, resuming the rational exploitation of forests permitted reactivation of a highly labor-intensive local furniture industry. In the south of Ecuador, the RDPs of CREA in Cuenca have effectively stimulated cheese manufacturing through milk production, fruit processing through the expansion of orchards, and weaving through the production of sheep. Here again, the social benefits derived in

the forward industries could, if necessary, be partially taxed to subsidize the production of supply-constrained agricultural raw materials.

The calculus of the optimum taxes and subsidies involved with RDPs that generate linkage externalities is illustrated with Latin American data in Table 1. We contrast the private and the horizontal expansion of cassava production through slash-and-burn, the vertical expansion of cassava production through the adoption of fertilizers, and the reforestation of idle land. We see that the two cassava projects are privately profitable and consequently do not need subsidies to be successful. The forward linkage effects created by cassava production are small (1.09), as only minimal processing is involved, and the social rates of return are consequently also positive but not very much larger than the private rates. The private profitability of reforestation depends on the rate of discount at which the project is evaluated. At a low discount rate of 2 percent, reforestation is privately profitable and does not require subsidization. Because the forward linkage effect of forestry is very large (1.92), as wood products serve as inputs for many industries such as furniture and construction, the social rate of return is significantly higher. At a discount rate of 5 percent, reforestation is not privately profitable. The external effect is, however, sufficiently large so that it is possible to tax some of the external gains to subsidize reforestation in order to make it privately profitable. At a discount rate of 8 percent, however, reforestation is both privately and socially unprofitable. Consequently, there does not exist a scheme of taxes and subsidies that could make reforestation privately profitable. These examples serve to illustrate the fact that the field of application of RDPs can be extended through partial taxation and subsidies as in the above case where the rate of discount in reforestation projects is 5 percent.

TABLE 1

Optimum Tax and Subsidy to Internalize Linkage Externalities, Latin America

| Activity per hectare | Units | Cassava | | Forestry (reforestation) | | |
|---|---|---|---|---|---|---|
| | | Horizontal expansion by slash and burn | Adoption of fertilizers | | | |
| Discount rates | percent | | | 2 | 5 | 8 |
| Change in gross output | U.S. $/hectare | 965 | 165 | 1,096 | 438 | 203 |
| Change in costs | U.S. $/hectare | 725 | 152 | 764 | 689 | 654 |
| Private rate of return | percent | 33 | 9 | 44 | -36 | -69 |
| Forward linkage multiplier | | 1.09 | 1.09 | 1.92 | 1.92 | 1.92 |
| Change in total output | U.S. $/hectare | 1,052 | 180 | 2,105 | 842 | 389 |
| Social rate of return | percent | 45 | 18 | 176 | 22 | -40 |
| Maximum possible tax | U.S. $/hectare | 87 | 15 | 1,009 | 403 | 186 |
| Minimum subsidy needed | U.S. $/hectare | 0 | 0 | 0 | 251 | 451 |
| Rural development projects feasible | | | | | | |
| Without subsidy | | Yes | Yes | Yes | No | No |
| With subsidy | | Not needed | Not needed | Not needed | Yes | No |

Sources:

For cassava: J. Ashby, "The Social Ecology of Soil Erosion," Rural Sociology Vol. 50, No. 3 (1985) pp. 377-396.

For forestry: P. Thege, Swedforest Consulting A.B., Danderyd, Sweden.

Many of the activities linked to agriculture through backward, forward, and final-demand linkages can be produced in small-scale, labor-intensive, decentralized industries located in the rural areas and with low import content. Particularly if rural areas have captive resources (regional surplus labor), regional linkage effects will permit valorization of resources with zero opportunity cost. If agricultural resources are, in addition, in limited availability relative to the population, promotion of nonagricultural activities linked to agriculture is likely to be the only viable strategy to reduce regional poverty.

### 3.2. Ecological Externalities

A typical situation across Latin America is one where poor peasants practice an ecologically destructive agriculture high in the watersheds while large commercial farms are located on irrigated flatlands in the valleys below. Because of the severe land constraint which they face in attempting to generate their subsistence needs, peasant households must mine the soil and create considerable soil erosion. Sedimentation, in turn, accumulates in the water reservoirs, thus compromising the hydroelectrical and irrigation programs for the lower parts of water basins. In a situation where the opportunity cost of oil and food imports has sharply increased with stabilization policies forced by the debt crisis, this externality created by peasant poverty is increasingly costly. Many countries, such as Ecuador, Colombia, and the Dominican Republic, have found that dam construction was often uneconomical as long as soil erosion by peasants in the watersheds continued unabated.

The ecological externalities created by the failure of rural development can be the surest way of obtaining financing for RDPs. The social value of water for downstream users determines the "price" of a cubic meter of

sediments in the reservoirs (Southgate, 1986). This, in turn, determines the maximum subsidy that society should be willing to transfer to peasants to induce them to adopt soil conservation practices such as reforestation, contour farming and terracing, and organic practices like mulching and soil-covering crop mixes. If the maximum tax that downstream water users are willing to pay (per cubic meter of foregone sediments) is larger than the minimum subsidy necessary to make privately profitable the adoption of soil conservation practices by peasant households (that will reduce sedimentation by at least one cubic meter), then RDPs that internalize ecological externalities can be individually profitable. Such a scheme has been successfully implemented by the Cauca Valley Corporation in Colombia, an institution that controls both the upstream and downstream parts of the watershed. When the two parts of the watershed are not unitized, a tax on electricity and irrigation water must be levied downstream to be transferred to a regional RDP upstream that will, in turn, subsidize the adoption by peasants of soil conservation practices.

The data for Plan Sierra in the Dominican Republic presented in Table 2 illustrate the types of calculations that permit establishment of the levels of subsidies that should be transferred to RDPs that produce ecological externalities. Sedimentation per hectare (column 1) shows that the most problematic activities in terms of external costs are, in decreasing order, food crops, sisal, coffee, pastures, and forests. Multiplying these data by the area planted in each of these activities gives the total sediment contribution of each. The greatest source of sedimentation is, by far, food crops, in spite of the very small area planted (3.2 percent of total area), followed by extensive livestock (pastures), sisal, and coffee, with forests as the best alternative for soil conservation. Using the gross value of

TABLE 2

Optimum Tax and Subsidy to Internalize Ecological Externalities, Plan Sierra, Dominican Republic

| Activity | Rate of sedimentation | | Area | Total sedimentation | Number of farms | Sedimentation per farm | Gross value | | Minimum subsidy to reforest | Maximum possible subsidy | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Production | Sedimentation per ton | | Direct shadow value[a] | Full shadow value[b] |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | tons per hectare per year | hectares per ton per year | percent of total[c] | $10^3$ tons per year | | tons per farm per year | pesos per hectare, 1984 | pesos per ton | | pesos per hectare | |
| Forest | 0.07 | 14.0 | 49.7 | 9.3 | [d] | | 47[e] | 671 | 0 | 0 | 0 |
| Secondary forest | 0.07 | 14.0 | 21.2 | 4.0 | | | | | | | |
| Pasture | 1.80 | 0.56 | 17.0 | 81.8 | 4,500 | 18.2 | 141 | 78 | 94 | 69 | 104 |
| Coffee | 1.90 | 0.53 | 3.0 | 15.2 | 4,500 | 3.4 | 1,500 | 789 | --[f] | -- | -- |
| Sisal | 21.00 | 0.05 | 0.5 | 28.1 | 351 | 80.1 | 345 | 16 | 298 | 837 | 1,256 |
| Food crops | 33.00 | 0.03 | 3.2 | 282.3 | 15,000 | 18.8 | 685 | 21 | 638 | 1,317 | 1,976 |

[a]Direct shadow value of electricity only; equal to 40 pesos per ton of sediment.

[b]Full shadow value of water including electricity, irrigation, and their multipliers; equal to 60 pesos per ton of sedimentat.

[c]Total area = 293,350 hectares.

[d]Blanks indicate no data available.

[e]Present value with a 5 percent discount rate.

[f]Dashes indicate not applicable.

Sources:

Cols. 1 and 2: Dianne E. Rocheleau, "An Ecological Analysis of Soil and Water Conservation in Hillslope Farming Systems: Plan Sierra, Dominican Republic," Doctoral Dissertation, University of Florida, Gainesville, 1984.

Cols. 3, 5, and 7: Plan Sierra Survey, Plan Sierra, Santiago, Dominican Republic, 1984.

Cols. 4, 6, 8, 9, 10, and 11: Calculated.

production per hectare (column 7) as a first approximation for net income to owner-operators per hectare, the data in column 8 give the private benefit of a ton of sediments for upstream users where the RDP is organized. The highest value of a ton of sediments is when they originate in coffee production followed by forestry.

We use, as a first approximation, data on the shadow value of sediments for the downstream areas of the watershed estimated by Southgate for Ecuador. Measuring the direct use of water in hydroelectrical production only, the shadow value of a ton of sediments appears to be of the order of 40 pesos per ton of sediments. If the shadow value of water includes, in addition, its value for irrigation as well as all the downstream multipliers that both electricity and irrigation produce, the shadow value of water would easily be above 60 pesos per ton of sediments. The minumum subsidy to induce upstream producers to reforest is given in column 9 as the loss in income associated with shifting from the current activities into forest. The maximum subsidy which society is willing to pay is the shadow value of the reduction in sedimentation implied by each of these shifts. At a shadow price of water of 40 pesos (column 10), upstream producers of food crops and sisal should be subsidized to abandon these activities. It does not pay downstream water users to subsidize livestock producers into reforesting because the minimum subsidy to make the shift individually profitable to them is above the maximum socially possible subsidy. At the more realistic water-shadow price of 60 pesos (column 11), downstream users should subsidize not only food and sisal producers but also extensive livestock operators to abandon these activities and shift to forestry. With the actual transfer of these subsidies, an RDP that promotes reforestation can make its recommendations privately

profitable and thus acceptable for peasant households. Therefore, it significantly broadens the field of application of feasible RDPs.

Externalities created by ecologically destructive peasant practices induced by poverty are not only confined to national boundaries. Overgrazing in ecologically fragile areas leads to a desert-like condition and to climatic changes. Deforestation in tropical forests leads to loss of species. These externalities are particularly difficult to "price" because their effects are geographically diffused and often long term. They are also difficult to tax because the institutions which produce them and bear their consequences are generally not related through common legal systems. Yet, they can often be a powerful argument to generate international aid for RDPs and to make these projects individually profitable.

### 3.3. Social Externalities

There are many situations where the social cost of poverty can be reduced by successful RDPs. This is what Wynn Owen had called "farm financed social welfare" in his classical article, "The Double Developmental Squeeze on Agriculture." This is the case both when a minimum subsistence level must be insured through welfare schemes and when the failure of rural development creates negative externalities through urban and international migration.

Where a floor to poverty is set by social welfare programs, the social cost of these programs can often be reduced by increasing the productivity of resource use by the poor themselves. This is, for instance, the case in Chile where guaranteed employment programs absorb some 20 percent of the active labor force in the rural areas. Since extension services have rarely focused on peasant farms, there typically exists a large productivity gap that can be captured on those farms, either by relaxing effective constraints or by modest

subsidies to the adoption of modern inputs. While this calculation has, to our knowledge, not been made in the Latin American context, in the Appalachian regions of Kentucky this justification for RDPs has been shown to be highly socially profitable. Assisting technological change on small farms both reduces welfare costs and increases tax revenues. Even with highly conservative figures on the adoption of technological change induced by RDPs and with commercial discount rates, the social cost benefit ratio is found by Smith, Hall, and Simon (1984) to be significantly greater than one. In this case, a modest extension effort would imply that three-fifths of those receiving public assistance would become ineligible, and the cost of welfare assistance would be reduced by two-thirds. Clearly, this reasoning applies more powerfully in countries with a more developed welfare state. This is why it is the European countries that tend to have the most comprehensive and expensive schemes of subsidies to RDPs.

Even where welfare schemes do not exist, the failure of rural development creates negative externalities that can be internalized by successful RDPs. Urban overcrowding, social unrest, and illegal international emigration are all associated with rural poverty. It is well known that massive amounts of national and international resources have been mobilized in support of RDPs in response to these pressures. This ranges from the financing of RDPs in the "pacified" areas of El Salvador, to the concentration of IRD projects by the Colombian government in the areas of guerilla activity, and to the organization of community development programs in the areas of Sendero Luminoso warfare in Peru. Just like with other externalities, the theory is that subsidizing RDPs may be less costly for society than the costs imposed on it by the failure of rural development.

It is also important to recall that many of the benefits from social investments in rural areas are captured, through urban migration, by the other sectors of the economy. For instance, many of the benefits from investment in education are transferred out of agriculture through the brain drain that comes with migration. The components of RDPs that increase human capital formation in the rural areas are thus also an important source of social externalities.

## IV. Contradictions of RDPs with Externalities

The existence of positive externalities associated with RDPs creates a broad set of opportunities to extend their field of profitable application. It requires, however, that these externalities be properly identified and taxed, and that the corresponding subsidies be effectively transferred to households in RDPs. The management of RDPs with externalities is thus particularly difficult and tends to be characterized by a set of contradictions which we identify in this section.

### 4.1. Differential Progress in Goals Implementation: Welfare vs. Production

Most RDPs contain both social welfare components--such as health, education, nutrition, access roads, and the promotion of grassroot organizations--and productive components--such as the diffusion of new technologies, credit programs, and soil conservation. A typical outcome of projects that needs to internalize externalities in order for their productive recommendations to be individually profitable is that their welfare components tend to run ahead of their production (with associated private income and soil conservation) achievements. This was the case in both the CVC in Colombia and Plan Sierra

in the Dominican Republic. While rapid advances in the social welfare components of the projects have been effective to create legitimacy with the recipient populations, and thus serve as an entry point into peasant communities, lags in success in reducing the externalities which motivate the funding of the projects expose them to criticism in the rest of the nation and to eventual budget reductions.

## 4.2. Contradiction Between Participation and Conservation

It is, by now, well established that the organization and participation of peasant households in RDPs are essential for the success and sustainability of projects. This is true not only for the implementation of the project but for the definition of its priorities as well. If the benefits of externalities are not properly internalized, and project recommendations such as soil conservation are not sufficiently individually profitable, extensive participation will play against the conservation objectives of the project. Not only will participation be used to promote the welfare, as opposed to the conservation components of the project, but some of the welfare programs such as the construction of access roads may play directly against the goal of conservation. Poorly surfaced roads in steep watersheds contribute heavily to sedimentation in reservoirs. They also serve to attract new settlers in the area and to push the agricultural frontier further up in the watershed. In addition, credit may be used to promote the planting of welfare-enhancing but soil-eroding crops, such as cassava, as opposed to being used for reforestation or the adoption of soil conservation practices. Thus, unless participation is promoted in a context where project recommendations are privately profitable, it is likely that it will play against the project's external goals which are at the basis of its funding.

### 4.3. Contradiction Between Economic and Political Time

While the discount rates of individual households will be largely determined by their market credit opportunities, the discount rate that applies to the social valuation of projects is not unique. In particular, while the economic valuation of social projects is typically done with low discount rates, making long-term projects such as reforestation possible, political projects have a much shorter outlook due to the short tenure of politicians and aid administrators. As a result, RDPs are too often under pressure to display quick results, even though they typically involve a long maturation period. Nowhere is this more true than in eco-RDPs. The result is that many good opportunities to implement RDPs with positive externalities are lost because of lack of continuity in the support of politicians and aid administrators.

### 4.4. Contradiction Between Successful RDPs and the Magnitude of Negative Externalities

It is important, here, to distinguish between RDPs that serve to create positive externalities, such as linkage effects and the reduction of social welfare costs, as opposed to projects that serve to internalize negative externalities, such as soil erosion and the sedimentation of reservoirs. For the first, greater success and extension of the clientele to which they apply will increase the magnitude of the beneficial external effect. For the second, however, success will help retain and attract more population in the watersheds as the RDPs improve the welfare of individuals. Since the negative externality is never fully eliminated, even with implementation of the optimum tax and subsidy, larger populations and the agricultural activities in which they engage will increase soil erosion. An excessively privately successful

RDP that is aimed at reducing negative externalities can thus terminate in increasing them.

## V. Conclusion

We have shown that a proper accounting and internalization of the many externalities created by RDPs can significantly extend their field of privately profitable application and hence their chances of success. Since society is interested in these external effects, the possibility of increased and sustained financing for RDPs is significantly improved, irrespective of (always ephemerous) welfare concerns for peasants. It remains, however, that many of these external effects are both difficult to measure and to tax. Measurement is problematic because many effects of RDPs are long term, indirect, and qualitative. Taxation is also difficult if the external effects are hard to visualize and the benefits highly diffused in the population. Implementation of a subsidy scheme is also difficult as it will require verification that the activities for which the subsidy is transferred as effectively fulfilled. Since supervision is costly, institutional mechanisms whereby peasants become liable for the external outcomes they create must be devised. This opens a broad field of institutional innovations in the design of RDPs that needs to be further explored.

# BIBLIOGRAPHY

Adelman I. "Beyond Export-Led Growth," World Development, Vol. 12, No. 9 (1984), pp. 937-949.

Lacroix, R. Integrated Rural Development in Latin America, World Bank Staff Working Paper, No. 716, Washington, D. C., January, 1985.

Mellor, J., and U. Lele. "Growth Linkages of the New Foodgrain Technologies," Indian Journal of Agricultural Economics, Vol. 23 (1973), pp. 35-55.

Owen, W. "The Double Developmental Squeeze on Agriculture," American Economic Review, Vol. 61, No. 1 (March, 1966), pp. 43-70.

Redclift, M. "Production Programs for Small Farmers: Plan Puebla as Myth and Reality," Economic Development and Cultural Change, Vol. 31, No. 3 (April, 1983), pp. 551-570.

Reinhardt, N. "Modernizing Peasant Agriculture: Lessons from El Palmar, Colombia," World Development, Vol. 15, No. 2 (February, 1987), pp. 221-247.

Smith, E., H. Hall, and D. Simon. Technical Aid to the Rural Farm Poor: Can It Make Economic Sense? University of Kentucky, Agricultural Economics Extension, No. 53, Lexington, February, 1984.

Southgate, D. "Estimating the Downstream Benefits of Soil Conservation in a Hydroelectric Watershed", ESO 1239, Department of Agricultural Economics, Ohio State University, Columbus, Ohio, February, 1986.

Valencia Gonzalez, S. "Experiencias de la Fase I del Programa DRI y Recommendaciones para la Fase II," Working Paper DNP-UEA-010, DNP, Bogota, Colombia, 1982.

Von Braun, J., D. Hotchkiss, and M. Immink. Nontraditional Export Crops in Traditional Smallholder Agriculture: Effects on Production, Consumption, and Nutrition in Guatemala (Washington, D. C.: IFPRI, forthcoming).

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# THE ECONOMICS OF INVESTMENT IN RURAL DEVELOPMENT: PRIVATE AND SOCIAL ACCOUNTING EXPERIENCES FROM LATIN AMERICA

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