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Research Planning Framework:

Central America Regional Program



■ Broadening Access and Strengthening Input Market Systems

B A S I S

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Central America Regional Program

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RESEARCH PLANNING FRAMEWORK

I. INTRODUCTION

The Consortium for Applied Research on Market Access (CARMA), with the Land Tenure Center at the University of Wisconsin-Madison as its Management Entity, has been implementing USAID's Broadening Access and Strengthening Input Market Systems (BASIS) program. This Collaborative Research Support Program (CRSP) strengthens US and host-country research capacity through collaborative programs of research and training on the interactions of land, water, labor, and financial markets and their impact on poverty and resource conservation. Central America is one of the regions where a research program is being implemented, and El Salvador is the initial country in that region where research activities are focused.

A reconnaissance mission to El Salvador in January 1997 by Dr. Claudio Gonzalez-Vega, BASIS Research Program Leader for Central America, confirmed the importance of this country as a site for BASIS research.¹ Strong support for BASIS from the Government of El Salvador, the USAID/El Salvador Mission, and the Salvadorean research community was mobilized at that time. The Fundacion Salvadoreña para el Desarrollo Economico y Social (FUSADES), a private, non-profit, non-partisan organization created in 1983, was selected as the local research counterpart.

El Salvador is an attractive site for a BASIS research program for several reasons:

- 1) It is a politically critical task for El Salvador to meet the challenges of rapid economic growth, share the fruits of growth widely, and protect the environment without compromising macroeconomic stability, social reconciliation, and democratic institutions. The urgency of this task provides a receptive milieu for the immediate use of research results in policymaking.
- 2) The Government of El Salvador has been implementing major economic and political reforms to respond to accumulated failures of policies, markets, and institutions and to achieve broadly-based, environmentally-sustainable economic growth, alleviate poverty, and enhance food security. There are numerous opportunities in this environment to monitor the consequences of policy reforms, to test hypotheses about the impact of alternative interventions, and to advise the authorities on potential revisions of policy design and implementation.
- 3) El Salvador is a small territory where the costs of field research are reasonable and where most logistical obstacles to field research should be surmountable. Indeed, applied research has already been undertaken on key problems of agricultural production, poverty, rural development, financial deepening, and environmental degradation in El Salvador by both

¹ See the *Central America Reconnaissance Mission Report*, BASIS, May 1997, available from the BASIS Management Entity and at the BASIS website <http://www.wisc.edu/lrc/basis.html>

domestic and foreign scholars. These investigations offer baseline data and tentative hypotheses for future BASIS research.

The reconnaissance mission concluded that the economic history of El Salvador offers unusual opportunities to study interactions of land, labor, and financial markets, and the impact of their performance on poverty and on resource-use decisions. The collaborating host-country organizations identified during this first mission were enthusiastic about BASIS, and they were willing to participate with a strong voice and a capable research capacity in determining and implementing the research agenda. Some of the organizations were willing to contribute resources to the BASIS research program. Substantial levels of funding were expected from sources such as the USAID Mission in El Salvador, the Ministry of Agriculture, the Central Bank of El Salvador, and possibly the Banco de Fomento Agropecuario (BFA), as long as the research agenda funded was found to be relevant for Salvadorean policymaking. A dialogue with representatives of these organizations to promote and obtain a coincidence of interests on the BASIS research agenda is ongoing.

To consolidate this progress, two additional visits to El Salvador were undertaken before the completion of the planning phase and prior to the November 1997 meeting of the BASIS Technical Committee (TC). First, a two-week planning mission was conducted in the second-half of June 1997, including Dr. Gonzalez-Vega, three other researchers in the areas of natural resources, gender, and institutions, and a representative of the Management Entity.² The purpose was to design the research agenda for El Salvador, define an implementation schedule, confirm the selection of FUSADES as the collaborating research organization, identify other research and impact organizations in El Salvador, choose research teams, ascertain the levels of additional funding available, prepare budgets, and complete memoranda of understanding. While most of these objectives were accomplished, additional details needed further consideration during a follow-up visit.

Second, Drs. Douglas Southgate and Gonzalez-Vega visited El Salvador in October 1997 in order to ratify and consolidate the proposal prepared by the June planning mission.³ Their visit was preceded by an evaluation by Sarah Gammage of the availability of household data sets. The purpose of these visits was to complete a well-designed agenda that would allow the initiation of research immediately after the November meeting of the TC and to further confirm the offers of additional resources from local organizations.

The present report documents the results from the first planning mission in June and subsequent visits, and it outlines the research agenda offered to the TC in November 1997.

II. PLANNING PROCESS

The five-person planning mission to El Salvador from 16-30 June 1997 included the following persons:

² See Annex A for the schedule of visits.

³ See Annex B for the schedule of visits.

- Dr Claudio Gonzalez-Vega, Director of the Rural Finance Program at the Ohio State University and BASIS Research Program Leader for Central America,
- Dr Michael Roth, representing the Land Tenure Center at the University of Wisconsin-Madison and BASIS Research Coordinator,
- Dr Neil McMullen, representing Institutional Reform and the Informal Sector (IRIS) at the University of Maryland,
- Dr Douglas Southgate, Professor of Agricultural Economics and Director of International Programs at the Ohio State University, and,
- M Sc Sarah Gammage, representing the International Center for Research on Women (ICRW)

Members of the planning mission

- held several sessions among themselves to agree on the scope and perspective for the research agenda from the point of view of the US researchers,
- participated in several meetings with FUSADES researchers and officials to discuss the nature and extent of the expected collaboration,
- visited several NGOs and universities to discuss the relevance of research topics, collect results from earlier research, and identify non-FUSADES research collaborators (these organizations included PRISMA, FUNDE, FUNDAUNGO, PROPEMI, Financiera Calpia, and the universities UCA and ESEN),
- met with representatives of the USAID Mission and the Government of El Salvador to discuss levels of support to the BASIS research agenda. Visits to the USAID Mission, CRECER, Ministry of Agriculture, and the Agricultural Policy Unit, the Central Bank, Ministry of Natural Resources and the Environment, Green Project, and BFA were included in this effort, and,
- organized, jointly with FUSADES, a one-day workshop on the BASIS research agenda. Gonzalez-Vega, Southgate, and McMullen made presentations at this workshop and discussed research frameworks with their Salvadorean counterparts ⁴

III. RESEARCH FRAMEWORK

A The Basic Issues

The point of departure for the planning mission was the identification of key features of the Salvadorean economic and political system that offer fruitful opportunities for BASIS research. Several striking initial conditions and some recent historical events in El Salvador were

⁴ See Annex C for the workshop agenda and list of participants

identified as significant influences on land, labor, and financial market performance, rural poverty, and resource conservation in this country. These key initial conditions include

- high density of population (intense human pressure on land),
- a shallow stock of human capital, as a result of underinvestment in health, education, and other types of human capital formation,
- low productivity of labor in agriculture and widespread rural poverty,
- a war-damaged infrastructure and non-neutral wealth constraints on access to capital,
- weak institutions, outdated legal systems, and shortcomings of the state's organizational framework (a potentially shallow stock of social capital),
- limited availability of natural resources, and,
- a degraded natural resource base and heavily polluted environment

Recent economic and political changes have been rapid in El Salvador. The country's remarkable recent economic and political evolution has resulted from transitions from

- the economic decline and social conflicts associated with the civil war to the economic reconstruction, social reconciliation, and democratic processes that have emerged from the Peace Accords, and,
- the interventionist, fiscally-unsustainable, protectionist regime associated with import-substitution industrialization within the framework of the Central American Common Market to a growing and stable outward-oriented economy, through the implementation of an ambitious program of macroeconomic stabilization and structural adjustment policies

In this context, the most basic research question for the BASIS agenda is whether El Salvador's recent economic and political success will be sustainable beyond these transitional stages. That is, the question is whether the new policies and institutions will be capable of maintaining rapid economic growth, social development, and environmental improvements as the country continues along its path of stable macroeconomic management, increasing integration into the world economy, and development of democratic institutions. The basic assumption is that the efficient and equitable performance of land, labor, and financial markets is central to the success of these efforts.

The specific research questions are, therefore, the extent to which existing degrees of access to input markets by different sectors of the population and the performance of labor, land, and financial markets can contribute to the achievement of sustained and equitable economic growth. Operationally-relevant answers to these questions will require an examination of structural features of these markets and of the consequences of the policy reforms adopted as well as an evaluation of the additional interventions that may be required to consolidate the process of structural transformation.

B. Consensus on the Diagnosis

As a preamble to the design of the research agenda, the planning mission attempted to identify fundamental weaknesses in the performance of land, labor, and financial markets in El Salvador and in the institutional framework that supports the smooth operation of these markets. This effort involved a review of the literature and discussions with informed Salvadorean counterparts. The planning mission was able to arrive at a consensus on the diagnosis, which was expected to guide the design of the BASIS research agenda and which revealed four prominent features of the Salvadorean rural economy. These features represent the initial conditions relevant for the BASIS research agenda.

1 Land market disequilibrium

The planning mission observed a clear and important disequilibrium in the land market, which results in a sub-optimal use of this scarce resource and sharply reduces the productivity of agriculture. This disequilibrium is reflected in a quite evident fragmentation of the market for land.

On the one hand, there are lands which appear to be grossly underutilized. That is, there appears to be an implicit excess supply of this resource, given present uses of land at these locations. These exploitations occupy some of the best lands in the country in terms of the quality of soils, access to water, gradient, and access to infrastructure. A large proportion of these exploitations are owned by agrarian reform cooperatives. The planning mission was able to observe evident symptoms of this underutilization of land during field trips around key portions of the country. In some places there is urban-agricultural competition for these lands, reflecting the demand for real estate resulting from the remittances from Salvadoreans abroad.

On the other hand, there are lands which appear to be grossly overutilized. That is, there appears to be an implicit excess demand for land, given present uses of this resource at these exploitations. Most of these exploitations are in economically marginal and environmentally fragile lands, where the productivity of land is low but the potential for environmental damage is high. Most of these overutilized exploitations are associated with small subsistence (corn and beans) agriculture in poor soils on hillsides. Many of these exploitations are owned by the poorest and least-educated individual farm-household owners. Low productivity, poverty, and resource degradation go hand in hand at these locations.

In principle, well-functioning markets should provide arbitration opportunities to reduce these divergences among rates of return at different exploitations across the economy. Through efficient markets, resources would be reallocated from (overutilized) lands earning poor returns to (underutilized) lands offering high returns. The allocation of resources in the economy would improve as a result. That this seems not to be happening in El Salvador reveals major weaknesses in the market for land in that country.

BASIS research will identify the sources of these inefficiencies in the market for land (including instances of market failure, policy failure, or incomplete institutional frameworks), it will explore the ways in which inefficiencies in other markets and limitations of the existing institutional framework for other markets contribute to this result, and it will suggest recommendations about actions to reduce the degree of fragmentation in the market for land and lessen the negative consequences from this fragmentation.

2 Shallow rural financial markets

The planning mission confirmed earlier observations of little financial deepening in the rural areas of El Salvador. Limited access to formal credit for poor but potentially creditworthy borrowers reflects wealth biases embodied in financial policies and lending technologies. Credit constraints reduce rural investment and opportunities to use land better. The authorities have been concerned with expanding the frontier of rural finance, but the state-owned formal rural lenders have not been sustainable and their effective presence in rural financial markets has been declining. Rural deposit mobilization has received little attention, despite the importance of remittances from abroad in the rural areas.

The interactions among markets are evident in this environment. Historically, access to formal rural credit has been limited by lack of clear title to land and by high transactions costs for all market participants. Limited access to financial services has influenced, in turn, both household labor supplies and land-use decisions. Moreover, the politicization of the state-owned financial institutions has resulted in high default rates and their decapitalization, thereby eliminating the possibility of permanent access to financial services even for established clients. Informal financial markets have been generally active, but there are many perceptions of monopsony power associated with interlinks between credit and marketing transactions.

These trends persist. While private commercial banks provide about three-quarters of all formal credit to agriculture, they have fewer than 2,000 clients, compared to about 20,000 borrowers from the state-owned BFA. Adding to these numbers the clients of other formal intermediaries, for a grand total of about 25,000 borrowers, this total represents less than 10 percent of all agricultural enterprises in the country. The share of agricultural producers with access to formal credit was close to 10 percent already in the early 1970s.

Major financial policy reforms have not immediately resulted in greater formal financial deepening in the rural areas of El Salvador. While these policy reforms are a necessary condition for rural financial market deepening, they are not sufficient given the difficulties and high costs involved in developing financial markets. For this, both sustainable organizations and cost-effective financial technologies are required.

After years of heavy dependence on donor and government funds, the state-owned financial organizations that serve the rural areas (BFA and FEDECREDITO) have been told to mobilize their own funds and to make efforts to achieve financial viability. Recent restructuring efforts have not been sufficient, however, to transform them into sustainable rural financial intermediaries.

In contrast, new microfinance lending technologies for the delivery of agricultural credit have been adapted, with technical assistance from the German firm Internationale Projekt Consult, by Financier Calpia, which has developed innovative mechanisms for reaching small farmers in El Salvador.

Financiera Calpia has been able to overcome fractures in the culture of credit repayment resulting from paternalistic NGO interventions and government debt pardoning. A few other NGOs have also made important contributions to the development of new lending technologies and are reaching important segments of the rural population. For this reason, the most promising research issues on rural financial markets in El Salvador appear to be related to an understanding of these new lending technologies, the specific ways in which they resolve information, incentive,

and contract enforcement problems in financial markets, and the conditions for their replication by other intermediaries

3 Crossborder labor markets and persistent rural poverty

Rural poverty continues to be pervasive in El Salvador. Of the total rural population surveyed in early 1996 by FUSADES, 45 percent are poor and 19 percent are extremely poor. Poverty is mostly associated with low levels of human capital formation and with the low productivity of labor in agriculture, as documented by the FUSADES-World Bank study of agricultural policies and rural poverty in El Salvador⁵

Understanding trends in rural poverty is of considerable interest to the Salvadorean authorities. Measurements of poverty and controversies about trends in poverty are key components of debates about the consequences of macroeconomic stabilization and structural adjustment policies on vulnerable sectors of the population. Measurements of poverty and of its geographic and demographic concentration are important in monitoring the effects of specific (education, health, infrastructure) interventions. Donors are interested in geographic patterns of poverty as an instrument in targeting assistance.

The gender dimensions of poverty are also relevant, and key questions about the best way to approach gender-related differences in wealth, occupation, access to inputs, and education are concerns for the authorities. Because of the civil war, gender roles in El Salvador have changed, but it remains important to assess differences in degrees of access to markets and institutions based on gender.

Poorly-educated and landless households employed mainly in agriculture are the poorest segment of the rural population. Poverty and human capital formation are closely linked. The rural households in the FUSADES survey reported extremely low levels of education for the adult population. Agricultural incomes increased little, however, with additional levels of education. This suggests that the productivity of labor in agriculture is both low and stagnant. This issue deserves further analysis.

Moreover, rather than being associated with higher income from on-farm activities, higher levels of education were associated with higher salaried income from non-farm occupations. The greatest returns to education for the rural population seem to result, therefore, from equipping this population with skills that enable them to take higher-paying non-farming jobs. Indeed, the rural non-farm sector provides a significant share of employment and of household income. Since non-farm employment appears to be a route out of poverty, the challenge is to increase access of the poor to labor markets where these opportunities exist.

The interactions across markets are evident here as well. Labor markets in El Salvador reach beyond the country's borders, given massive migration abroad. Remittances from abroad are received largely by the middle- and higher-income households, however, not by the extremely poor. Actually, households who are close to the poverty line and who have benefited from remittances have shifted out of the population of the poor. Moreover, due to lack of savings and

⁵ See The World Bank, *El Salvador Rural Development Study*, Report No. 16253 ES, Sector Leadership Group, Central America Department, Latin America and the Caribbean Region, Washington, D.C., April, 1997. Main Report and Technical Annexes.

marketable skills, the poor are less likely to migrate, and their families are less likely to receive remittances. These facts underscore the importance of an active, well-functioning rural labor market and of improvements in the provision of rural financial services to enhance the level of savings and investment out of remittances.

4 Human capital, social capital, and natural resources tradeoffs

The planning mission was able to observe symptoms of severe environmental degradation in El Salvador. These symptoms include erosion, loss of the plant cover, threats to aquifers, and the sedimentation of rivers and lakes. Traditional responses supported by some Salvadorean professionals are the proposal of government incentives for the adoption of conservation practices, such as tree planting, the erection of natural barriers, and minimum tillage by farmers located in environmentally fragile lands. Green taxes, fees, and subsidies have been recommended by some.

While these measures are useful, however, they do not provide a long-term solution to many environmental problems. Given market forces and the poverty of the farm-households involved, these incentives are frequently ineffective, behavior is difficult to monitor, and the proposed subsidies levy heavy fiscal burdens that are incompatible with macroeconomic stabilization. Rather, the central problem is the excessive human pressure on land in El Salvador, and the key research question would concern why these farm-households are located in environmentally fragile lands in the first place.

The importance of market interactions is evident in this situation as well. Some of the decisions to locate in marginal lands are related to the imperfections of the market for land identified earlier. Other location decisions are related to constraints on access to financial markets, which are correlated to wealth through features of the existing lending technologies. Other decisions are related to constraints on access to labor markets, given low levels of education. Opportunities to migrate abroad are also constrained by financial and human capital endowments.

Processes of human capital formation are thus central to the alleviation of poverty, to the environmentally sound production of agricultural and forestry goods, and for participation in labor markets through more remunerative off-farm occupations. Social capital formation (social trust, definition of property rights, mechanisms for contract design and enforcement, institutions that support the operation of markets or collective action), is critical for the efficient performance of factor markets and for resource conservation. Historically, human capital formation has been shallow in El Salvador, and the civil war deteriorated the stock of social capital. Recent policies are attempting to build up both human and social capital.⁶

IV. RESEARCH AGENDA: KEY QUESTIONS ABOUT INSTITUTIONS AND MARKET PERFORMANCE

The identification of key features of the rural economy of El Salvador by the planning mission was shared with Salvadorean researchers and was confronted with their hypotheses during the

⁶ See Annexes D and E for discussions of human capital, poverty and resource conservation and of the importance of social capital formation for a country such as El Salvador.

BASIS workshop held on 25 June 1997 at FUSADES. The potential research topics that emerged from the diagnosis were then matched with the research interests and capacities of the US and Salvadorean researchers attending the workshop to ascertain the feasibility of the research agenda to be proposed. The actual research activities to be developed during the first year of the project were contingent on the availability of funds and the conditionalities arising from the sources of funding.

The research agenda emerged, therefore, from an intense process of consultation and from the development of a consensus among a diverse pool of researchers. The views of representatives of host-country organizations and their priorities with respect to research results relevant for policymaking were also considered. The outcome of this process has been a research agenda that focuses on key problems in land, labor, and financial markets and that incorporates crosscutting concerns with gender, environmental degradation, poverty, and social capital formation. The central questions to be addressed by this research agenda are discussed next.

A Land Markets and Factor Market Constraints to Productivity Enhancement

Explanation of the sharp land market disequilibrium in El Salvador that was identified by the planning mission requires research on three potential sources of problems:

- 1) institutional framework for land market operations and other dimensions of social capital formation,
- 2) decision-making processes affecting the supply of land, and,
- 3) factor-market restrictions that constrain the demand for land.

1 Institutional framework and social capital

Despite important improvements in the legal framework that regulates transactions in the market for land and the exercise of property rights on land, including the possibility to transfer those rights (sell and buy) or to offer land as collateral for loans (mortgage), there are still important legal barriers to land market transactions in El Salvador. Moreover, critical institutions that support the smooth operation of land markets (cadastre, land registry) also require further improvements to facilitate agile market transactions.

This component of the research agenda will identify remaining obstacles to land market transactions that may explain the land market disequilibrium identified by the planning mission. Research results will allow recommendations to the authorities about ways to overcome these obstacles. This component of the research agenda will also explore if there are implicit or explicit subsidies that artificially promote speculation in real estate and if the adoption of well-designed land taxes (*impuesto predial*) may promote the transfer of underutilized land to other owners with better opportunities to cultivate it profitably. The role of the municipalities in land-use decisions and in land taxes will also be discussed.

In addition, this component of the research agenda will address limitations of the existing social capital that may restrict the ability of land markets to operate efficiently. These restrictions may include political attitudes with respect to the threat of concentration of landholdings, political attitudes with respect to the transferability of agrarian reform benefits, regulations (or the lack of

them) with respect to patterns of urbanization, the political feasibility to foreclose on the land mortgaged by defaulting borrowers and the like. Research results will suggest spheres for special attention in processes of social capital formation.

2 Agrarian reform cooperatives and land-use decisions

Some of the most striking instances of underutilization of some of the country's best lands are associated with the behavior of the agrarian reform cooperatives. It is widely believed that while these cooperatives own at least 30 percent of the (most productive) land in the country, they contribute less than 8 percent of the agricultural output.

This is surprising, since the agrarian reform cooperatives have had better access than other farmers to subsidies and to credit and other input markets. The productivity of the Salvadorean agricultural sector is heavily dependent, therefore, on land-use decisions by these cooperatives. These land-use decisions are mostly dependent on the governance structure of the cooperatives. An additional determinant of these decisions may have been the process of debt pardoning that has taken several years.

The basic research questions, therefore, are

- 1) Why are the best lands in the country not being used better?
- 2) Why, if they are not being cultivated profitably, are they not being transferred to others, given the acute scarcity of land in the country?

The central hypotheses are that the processes of decision-making at the cooperatives may lead to non-productive uses of the land that they control and that power structures within the cooperatives create barriers to the transfer of land. Expectations created about the rents to be earned from the pardoning of debt may also influence these decisions.

The democratic structure of the cooperatives (one person, one vote) has resulted in generalized free-riding by the membership at large in the decision-making processes of the cooperative. The resulting void has allowed the boards of directors, elected for two-year periods, to exercise substantial power within the cooperatives and to significantly influence the land-use and land-transfer decisions of the cooperative. The objective functions of these politically-active officers of the cooperative may not necessarily coincide with the most efficient decisions on land use and resource conservation.

Quasi-rents have also resulted from the substantial subsidies (including credit subsidies and loan forgiveness) targeted for the cooperatives. This has created incentives to erect barriers to entry by new members and, as a result, members of the cooperative typically represent a small proportion of those cultivating the cooperative's land. This has forced potential members not allowed to enter the cooperative to rent land from the cooperative. This has allowed cooperative members to earn rents from the land without engaging in direct cultivation. These arrangements may not lead to the best use of these lands.

Moreover, the Government of El Salvador recently offered opportunities for the cooperatives to adopt one of several organizational modalities:

- fragmentation into private plots,
- a mixed structure of private plots and collective lands,

- the securitization of land rights into transferable certificates of actual participation (shares), or,
- collective management and cultivation

The first two modalities were preferred by a large margin by the boards of directors entrusted with the decision. It would be important to understand the objective functions of these decisionmakers and the implications of the resulting choices on the efficiency of land use.

The research agenda will address incentive structures for the decisions to buy and sell cooperative land, either by the cooperative or individual members, for the decisions to rent cooperative land to others, and for the decisions to cultivate cooperative land in particular ways. This component of the research agenda will use concepts of the new institutional economics (in particular principal/agent and rent-seeking theory) to study the governance structures and the processes of decision-making by the agrarian reform cooperatives and the implications of these elements of organizational behavior on land productivity.

Results from this research will lead to recommendations about how to restructure the agrarian reform cooperatives in order to facilitate productivity enhancement at their lands. To the extent that elements of social capital formation may contribute in this process, the conditions for their development will be explored.

3 Factor market constraints on land purchases and productivity enhancement

The sub-utilization of land may be corrected by land sales to other farmers willing to cultivate more profitable crops, by renting the land to those who have better opportunities to cultivate it profitably, or by modifying the cooperative's decisions on land use. Limited access to other factor markets may constrain each one of these decisions. This component of the research agenda will attempt to identify critical constraints emerging from non-uniform access to factor markets. Key constraints may emerge from lack of access to credit and from the terms and conditions of land renting contracts. Research will explore the implications of these constraints on land use and land conservation, and it will attempt to identify relevant gender differences in how binding these constraints are.

A generalized disincentive to acquire land and intensify cultivation may be the low profitability of agriculture in general. The FUSADES/World Bank set of studies has identified several macroeconomic and microeconomic sources of the low profitability and slow rate of growth of the agricultural sector.

The potential real overvaluation of the colon (at least compared to purchasing power parity indexes of a decade or so ago) seems to be a key macroeconomic influence, while lack of adequate marketing channels and the slow adoption of technological improvements are prominent among microeconomic determinants of the low profitability of agriculture. The BASIS research agenda will use results from the FUSADES/World Bank studies, but it will address these questions only as they are directly related to the performance of factor markets.

This component of the research agenda will focus on two potential sources of market constraints, namely differential degrees of access to credit and the conditions of rental contracts.

On the one hand, it will examine the determinants of access to formal credit and other sources of funds, such as household savings and flows of remittances, for financing land purchases and intensification practices through adoption of non-traditional crops and new cultivation.

technologies. Recommendations about how to overcome credit market constraints and about how to promote channeling remittances to productive investment will emerge from this topic.

On the other hand, this research component will attempt to identify how the terms and conditions of renting contracts and interlinked market transactions may constrain investment in rented land, the adoption of new technologies or the shift to non-traditional crops, and the adoption of conservation practices. This component of the research agenda will use concepts of the new information, incentives, and contract theories to organize the empirical investigation.

B. Innovations in Technologies to Broaden Access of the Poor to Financial Services

This component of the research agenda will examine options to lessen the credit constraints that may be associated with less efficient land uses and labor market participation by rural household decisions. Both access to credit and to deposit facilities will be considered. Analysis of the role of deposit facilities will be linked to the allocation of funds from remittances from abroad.

Constraints on access to financial services by the rural poor emerge from incorrect policies, non-viable organizations, and inappropriate financial technologies. Earlier research on rural financial markets in El Salvador has focused on policies (the consequences of financial repression and of financial liberalization) and on organizations (the institutional weaknesses of the state-owned rural financial intermediaries and on proposals to restructure them or to revise their organizational design).

By postponing a debate within BASIS on policy and organizational design issues to a second stage of the project, this research component attempts to focus on the appropriateness of existing financial technologies for the supply of financial services to the rural population of El Salvador. To approach this issue, the research agenda will attempt to address questions related to the supply and demand for rural credit and the role of social capital in facilitating financial market transactions.

Supply-side issues will be related to the development of cost-effective lending technologies to reach the rural poor. Innovation in lending technologies is the most important research question in financial markets because, unless costs and risks are reduced, the effective cost of loans for small rural producers will remain prohibitive or the sustainability of the financial organizations will not be guaranteed.

Demand-side issues will refer to the profile of the rural borrowers being presently reached by different formal financial intermediaries, in particular by the innovative organizations. Social capital issues will ask to what extent both the legal framework and the stock of social capital facilitate or prevent rural financial deepening.

1 Innovations in lending technologies

Lending technologies are developed to address information, incentive, and contract enforcement problems that create uncertainty about the probability of loan repayment and that constrain the emergence of financial transactions or lead to credit rationing.

These information (adverse selection) and incentive (moral hazard) problems are particularly acute in the rural areas of El Salvador, and the resulting risks and transactions costs are

frequently prohibitively high Existing lending technologies have attempted to overcome these difficulties by requiring (real estate) collateral Collateral-based lending, however, introduces a wealth bias in access to credit and on capital formation, as only those with prior wealth gain access to loans for further wealth accumulation Many creditworthy but asset-constrained farm households cannot take full advantage of their productive opportunities because of the credit constraint

In the past decade, however, microfinance organizations in several countries have developed new information-and-incentive-based lending technologies that have allowed them to experience significant gains in outreach and sustainability in lending to the urban poor In recent years, a few of these organizations have begun to adapt these technologies to lending in the rural areas, in general, and for agriculture, in particular These experiments offer new avenues for supplying financial services to the rural poor Financiera Calpia in El Salvador is a world-renowned pioneer in developing these financial innovations

This component of the research agenda will examine in detail the lending technology of Financiera Calpia, i e , it will describe the lender's production function, in order to understand how the new technologies resolve the information and incentive problems typical of rural financial markets The solutions developed by this intermediary in the supply of agricultural loans will be contrasted with those developed in other parts of the world, and the conditions for the replicability and dissemination of these technological innovations will be explored

The elements of the lending technology of the state-owned BFA will then be identified and contrasted with those of the technology developed by Financiera Calpia in order to extract recommendations about technological improvements that could improve the performance of the BFA The interactions between lending technology and organizational design that allow the lending technology to be successful and recommendations on organizational design for the BFA will allow BASIS researchers to engage in debates about the future of this intermediary

Contract enforcement is one of the difficulties that a lending technology must overcome Elements of social capital (trust, respect for contracts, legal resolution of conflicts, lack of arbitrariness) are critical to reduce the transactions costs that emerge in contract enforcement This component of the research agenda will explore ways in which social capital formation is needed in El Salvador to reinforce the operation of rural financial markets

2 Borrower profiles

It is important to understand the comparative advantages of the new lending technologies with respect to serving particular market niches To clarify this issue, this component of the research agenda will construct a profile of the borrowers of Financiera Calpia and the BFA, and it will contrast their socioeconomic features with those of the rural population at large, as they are captured by the rural poverty survey undertaken by FUSADES in early 1996 and by the proposed new survey to be implemented in early 1998 This will allow a determination of the segments of the population that may benefit from dissemination of the new lending technologies, and it will suggest new challenges for innovations in lending technologies so as to move the frontier toward clientele not yet reached by these organizations

This component of the research effort will also establish the extent to which the different terms and conditions of loans from these intermediaries influence investment, production, labor supply, and other key decisions of the borrowing farm-households An understanding of the behavior of

borrowers facing different contract structures is important in policy decisions. The analysis will also identify alternative sources of financial services for the clientele of these organizations.

C Determinants and Dynamics of Poverty

Most discussions about rural poverty in El Salvador result from static, cross-section measurements of poverty at a particular point in time and from comparisons about the proportion of the population under a given poverty line at various points in time. Cross-section analyses allow the researchers to identify correlations among poverty levels and potential determinants of poverty, but they do not take into account specific unusual household circumstances (shocks) at the time of the measurement and the evolution of poverty for particular households.

A dynamic vision of poverty is essential, however, to understand the circumstances that push a household out of or into poverty. In particular, it is important to identify factors that contribute to the reproduction of poverty across generations. This understanding can be obtained only from a panel of observations, where the same households are revisited at periodic intervals. This will be attempted by the development of a panel of three observations (1996, 1998, 2000) for a sample of rural households. The initial observation of the panel will come from the First National Rural Household Survey implemented by FUSADES in 1996.

1 Dynamics of poverty

The main purpose of this component of the research agenda is to generate a panel of observations for Salvadorean rural households and to derive implications about the dynamics of poverty. Questions about the reasons for changes in household poverty status, the role of different types of shocks, and variations in the importance of several determinants of poverty can then be examined.

The performance of land, labor, and financial markets is critical in the determination of poverty and in changes in poverty status. Factors such as the availability of employment opportunities, access to financial services, access to product and input markets and public services and infrastructure may predispose a household to poverty and affect decisions about the use of natural resources. The panel of household observations can show light on how policy and institutional changes influence the patterns of poverty.

2 Gender and female-maintained households

Any discussion of poverty and differential access to land, labor, and financial markets must include a gender perspective. Markets may be absent or fail in different ways for men and women. Men and women are differently poor and differently dependent on natural resources. There are qualitative and quantitative differences in the extent of their poverty, their access to productive opportunities, their mobility, and their relationships to the resource base. This component of the research agenda will investigate these differences.

A specific gender question would be whether female-maintained and male-maintained households face different constraints in accessing factor markets, in allocating labor to productive activities, in undertaking productivity-enhancement investments, and in transforming human capital. Female-maintained households are those where women generate or receive (via extra-household transfers) in excess of 50 percent of household income. Determining the gender

composition of the portfolio of income earners in the household may prove critical in predicting the transition of that household from poor to non-poor

Demographic indicators reflect the constraints faced by different types of households in being absorbed into the labor market. Female-maintained households may face labor constraints that limit their agricultural productivity, their expenses in human capital formation, their ability to bear risk, and the conservation of farm soil. A rigorous analysis of the portfolio of female and male maintained households may be critical in identifying policies that will support the transition from agriculture to non-agricultural occupations among the rural poor.

Various probabilistic models could be estimated to compare the impact of different degrees of access to factor markets on rural poverty. A multivariate analysis of the determinants of poverty provides several insights into hypotheses about the implications of different definitions of female-headed or female-maintained households. Logistical models can be used to test these hypotheses.

3 Remittances

Remittances from abroad increase household income. While remittances may thus be a critical factor lifting households out of poverty, remittances may be lumpy and intermittent. Remittances may thus have important effects on the household's labor supply, by raising reservation wages. Remittances will also affect the supply of labor from the household by changing the strategies for diversifying incomes and dealing with risk.

Uses of remittances for consumption or for investment will also influence the household's future wealth. If a large proportion of the remittances is devoted to consumption, this may reveal that the household expects the remittances to be permanent rather than transitory income. This has important implications for savings rates in the rural areas.

The proportion of households that receive remittances is very uneven across the country. Differences in the demographic characteristics of households receiving remittances are indicative of constraints that these households face in generating income, investing in migration, and participating in labor markets. This component of the research agenda will link remittances to participation in labor, land, and financial markets.

D Locational Decisions and Resource Degradation

Damage to soil, natural habitats, and other renewable natural resources arouses widespread concern in El Salvador. Reduced access to clean water and related declines in environmental quality depress living standards in the countryside, where half the country's population resides and where poverty rates are very high. In addition, depletion of the environmental base for crop and livestock production impedes development of the agricultural sector, which employs nearly a third of the national work force.

Deterioration of renewable resources cannot be blamed exclusively on farming, ranching, and other lines of rural work. The flow of untreated sewage from San Salvador, for example, contributes substantially to pollution problems in the Lempa river, which is the country's main waterway. Likewise, the impacts of soil erosion and the loss of water resources and natural habitats are by no means confined to the countryside. Deforestation and soil loss in upper

watersheds, in particular, reduce the availability of hydroelectricity and clean water everywhere, in urban and rural areas alike

Investigation of the extent, consequences, and causes of renewable resource depletion is at an incipient stage in El Salvador. World Bank researchers lamented the scarcity of reliable evidence concerning erosion rates and the agricultural impacts of soil loss in various parts of the country. In their view, some accounts of the threat to farmland—that 75 percent of the national territory is undergoing degradation, for example—may be exaggerated.

Data collected in the FUSADES's 1996 survey indicated that a sizable majority of Salvadorean farmers do not experience soil erosion of the sort that results in severe or even moderate productivity impacts. Those data also reveal that quite a few farmers apply conservation measures. Cultural practices (e.g., minimum tillage and leaving crop residues in place) are used, and stone walls, ditches, and other modifications have been made on more than half the fields with moderate or steep slopes.

Most of the few researchers examine factors relating to the adoption of soil conservation measures. Explanations based on farmer ignorance and a lack of appropriate conservation alternatives, they find, are not very convincing.

Also, limited access to formal credit does not seem to have much of an influence, since formal credit is used mainly to finance production and real estate purchases but never to pay for erosion control measures. Privately-owned fields, which comprise the vast majority of the FUSADES survey sample, appear to be managed better than rented parcels, although the differences are not dramatic. Linkages between poverty and soil conservation appear to be important and merit further investigation.

Under this component of the research agenda, linkages between factor market inefficiencies and soil management practices will be examined. Adoption decisions, though, should not be the exclusive, or even the primary, focus of research addressing the causes of land degradation in El Salvador. As Heath and Binswanger emphasize, renewable resource deterioration in Latin America has at least as much to do with the agricultural colonization of fragile environments as it does with the choices among land use and soil management options made by the residents of those areas.

Furthermore, excessive occupation is induced by a public policy regime that, in various ways, prevents small farmers, who comprise virtually all fragile-land colonists, from competing for land that is better suited to crop and livestock production. Agriculture's de facto tax exoneration, which augments what wealthy individuals are willing to pay for farmland, is one element of the distortionary policy regime. Likewise, credit subsidies tilt the competitive playing field against small farmers since they are unlikely to use their holdings to extract loans that carry a low rate of interest, are likely to be forgiven, or both.

These observations are directly applicable to El Salvador. Even if conservation ditches, minimum tillage, and other measures were widely accepted by those who exploit the country's steeply-sloped upper watersheds, soil loss and water run-off in those areas would continue to be excessive. Furthermore, the families and individuals who occupy El Salvador's fragile lands constitute the most deprived and poverty-stricken segment of the country's rural population. For them, avenues of escape are foreclosed not just by a lack of skills needed to compete for more

remunerative employment but also by policy-induced distortions in factor markets that allow others to bid away land and other productive assets

The fundamental linkage between rural poverty, which results from inadequate human capital formation and related productivity-enhancing investment, and colonization of hillsides and other fragile environments needs to be established clearly, through empirical research

This will allow a viable strategy to be devised for improved standards of living and renewable resource conservation in the countryside. Needless to say, accelerated human capital formation must be a centerpiece of such a strategy. But because many years are required for improved education and public health to yield economic and environmental benefits, investments in human capital must be complemented by immediate policy reform aimed primarily at improving factor market efficiency. This component of the research agenda addresses both long- and short-term measures for relieving the pressure that the rural poor exert on El Salvador's fragile lands

1 Economic mobility and the rural poor

Research on factor market performance in the Salvadorean countryside will shed light on environmental issues mainly by clarifying impediments to the economic mobility of the rural poor. Mobility being defined in sectoral as well as spatial terms, the specific concern of environmentally-related analysis will be to identify factors influencing a rural household's decision to practice agriculture in remote and steeply sloped areas, which lend themselves poorly to crop production

One general hypothesis has to do with the linkage between rural poverty and human capital endowments, on the one hand, and choices regarding physical location and economic activities, on the other. The null hypothesis would be that poor individuals and families that lack skills are just as likely as more affluent households to raise crops in marginal areas

Another set of null hypotheses relates to the impacts of factor market distortions. One such hypothesis would be that households with access to formal credit are just as likely as those lacking access to practice agriculture in remote and fragile environments. Adoption of erosion control measures will also be examined, with hypotheses relating to the influence of causal factors widely believed to be important

All data used in the first year of the study will have been collected during the two FUSADES rural household surveys, both the one conducted in 1996 and the other to be carried out in early 1998. Those data indicate household choices among occupations, in agriculture as well as other sectors. They also reveal how survey respondents have fared in the competition for land, distance from passable roads and slope (which is a satisfactory indicator of erosion risks) being reported. In addition, respondents were questioned about the adoption of conservation measures and also the nature of their participation in labor, capital, land, and other markets

At most, minor modification of the questionnaires to be used in the 1998 survey will be needed to facilitate research with an environmental focus. Careful attention to the development of a conceptual framework is required since causal relationships among human capital endowments, factor market participation, occupational and locational choices, and resource management are varied and complex. Once a sound framework has been developed, hypothesis testing will proceed using the 1996 and 1998 data sets

The possibility of using alternative data sources in the study of settlement of El Salvador's fragile lands will also be investigated in 1998. One option might be to identify those lands with the aid of an existing geographic information system (GIS), if one with suitable national coverage exists, and then to use FUSADES survey data to analyze settlement of those areas. If no such GIS is available, the possibility of developing one, with partial support from BASIS, could be pursued.

V. SUMMARY OF RESEARCH AGENDA

The proposed research agenda focuses on the massive disequilibria and institutional failures that characterize the market for land in El Salvador. Proposed research will establish the extent to which failures of decision-making processes at the agrarian reform cooperatives lead to underutilization of the best land, while the constrained decisions of poor farm-households lead to overutilization of environmentally fragile lands.

This research topic will investigate dimensions of the legal and institutional framework (including social capital) for land markets, the organizational design and power structures at the land reform cooperatives, and constraints on land transfers and land use emerging from failure in financial and other factor markets. Proposed research will also identify elements of new lending technologies developed by Salvadorean financial intermediaries that facilitate access to financial services for the rural poor and may improve land uses.

A profile of poverty and human capital formation will emerge from the Second National Rural Household Survey. These data will allow analysis of the dynamics of poverty, the identification of the market niches served by alternative financial intermediaries, and a discussion of the geographic location and labor market decisions of poor farm-households which cause pressures on fragile lands. A gender perspective will be added to all dimensions of this analysis.

VI. STRATEGY

FUSADES has been confirmed as the key Salvadorean research organization. Sub-agreements will be developed by FUSADES with FUNDAUNGO, FUNDE, and UCA to engage them as additional research organizations. The Ministry of Agriculture, the Central Bank, BFA, ESEN, and Financiera Calpia will be key impact organizations. Several of these will contribute funds to a common pool, to be added to the funding from the USAID Mission. CARMA researchers from the Rural Finance Program at the Ohio State University, IRIS, and ICRW are most likely to be the US investigators.

Research implementation will begin immediately after authorization of the research plan by the BASIS TC at the November 1997 meeting. The Management Entity will formalize sub-agreements with FUSADES and the Rural Finance Program at the Ohio State University, and with other CARMA organizations that may be involved in the research effort. FUSADES will, in turn, sign sub-agreements with FUNDAUNGO, FUNDE, and UCA.

The USAID Mission has already transferred \$35,000 to FUSADES and has appropriated \$50,000 for an add-on through USAID/Washington for the implementation of the Second

National Rural Household Survey The Ministry of Agriculture, the Central Bank, and possibly BFA will disburse their contributions directly to FUSADES no later than in early 1998

The resources mobilized directly from Salvadorean sources will be added to the funds from the BASIS core and the USAID Mission to build up a common pool of funds for implementation of the research agenda

Design of the Second National Rural Household Survey will take place during December 1997-January 1998 US and Salvadorean investigators from the various research organizations involved in the program will meet to design questionnaires, agree on sampling, and contribute to other preparatory activities for the survey The research methodology will be further discussed in January 1998

The FUSADES survey team that implemented the First National Rural Household Survey will undertake the field work during February, visiting the same households, and taking advantage of favorable climatic conditions prevailing that time of the year The earlier survey was also implemented in February (1996), just before the planting period in March

Research on the legal and institutional framework under the leadership of FUNDAUNGO will begin in January 1998, and research on the organizational design of the agrarian reform cooperatives will begin later in the year, according to the availability of US collaborators for the local researchers The analysis of the new lending technologies will be conducted in March-April, at the peak of the demand for loans before the planting of the next crop Questionnaires for the borrower surveys will be designed at this time and the surveys will be implemented in April-May

In turn, the data set from the rural household survey will be available for analysis three months after the completion of the field work (late May) and the data set from the borrower survey will be available in early July Poverty, human capital, location decisions, access to credit, and other analyses from the survey data will be implemented in June-August A First National Seminar on BASIS Research Results will be organized in October, for presentation of preliminary results from each one of the investigations

At the time of the National Seminar, a more detailed research agenda will be discussed for the activities for the following year This will tentatively include further analysis of the consequences of failure in financial and other factor markets on land use and activity location decisions The discussion of financial markets will move from characterization of lending technologies to an analysis of the organizational design of rural lenders Further analysis of labor markets will be linked to longer-term strategies for rural poverty alleviation

Because the rural household survey will not be repeated in 1999, a larger volume of funding for additional analysis of the existing database will be expected for that year The hope is that the rural household survey will be repeated in early 2000, however, in order to complete a panel of three observations per household The repetition of the borrower survey in the year 2000 will also allow an examination of impacts of access to credit

VII. SCHEDULE

Early December, 1997

Rural household survey preparation mission

January, 1998	Final discussion of survey design Initiation of land market institutional study
February, 1998	Implementation of rural household survey
March-May, 1998	Setting up the rural household panel database
March-April, 1998	Field work for the analysis of lending technologies Design of borrower surveys
April-May, 1998	Implementation of borrower surveys
June-July, 1998	Setting up the borrower database Field work for the analysis of agrarian reform cooperatives
June-August, 1998	First-round of analysis of the data Preparation of draft reports on research results
September, 1998	First BASIS Seminar in San Salvador Design of Research Agenda for the following year
October, 1998	Completion of set of papers from the first round of analysis, with comments from First Seminar Initiation of the second-round of analysis of the data

VIII. FUNDING

Several sources will contribute funds for the development of the research agenda. Certain conditionalities are associated with some of the funding, but the approach adopted here in principle is to consider the total level of funding as a general pool and then to implement research in such a way that the outputs required by the contributors are delivered as agreed.

The funding available for 1998 will be allocated to two different tasks:

- 1) production of the data sets from the surveys as a public good that is generally available for various research tasks and which results from a number of joint contributions to their design, and,
- 2) a series of specific analyses that build on the data from the surveys and on other sources of information.

The budget as presented here makes explicit separation of these two parts, given the joint and multilateral production-multiple use of the data sets in contrast to the bilateral collaborations that will typically produce the specific analyses. Thus, although implementation of the logistics of the survey will be the responsibility mostly of FUSADES, given their earlier undertaking of the First National Rural Household Survey, these data sets are a common enterprise, while the specific analysis will be produced by smaller teams within the framework of the overall research agenda.

IX. TENTATIVE BUDGET NOVEMBER 1997-OCTOBER 1998

A Uses of Funds

	Nov-Apr	May-Oct	Total
1 Data sets	158,000	15,000	173,000
a 1 Rural Household Survey	110,000	10,000	120,000
Design	28,000		
Field work	82,000		
Data manipulation		10,000	
a 2 Calpia Borrower Survey	48,000	5,000	53,000
Design	16,000		
Field work	32,000		
Data manipulation		5,000	
2 Analyses			262,000
b 1 Land markets	44,000	65,000	109,000
Institutional analysis	10,000	25,000	
Agrarian reform cooperatives	34,000	40,000	
b 2 Financial markets	19,000	40,000	59,000
Lending technologies	7,000	20,000	
Borrower profiles	12,000	20,000	
b 3 Poverty	34,000	60,000	94,000
Dynamics of poverty	24,000	35,000	
Location decisions	10,000	25,000	
3 Logistics	15,000	40,000	<u>55,000</u>
c 1 Administration	15,000	15,000	
c 2 Seminar		25,000	
TOTAL	270,000	220,000	490,000

B Sources of Funds

OSU carryover	55,000		55,000
BASIS core	150,000	150,000	300,000
USAID Mission	35,000	50,000	85,000
Ministry of Agriculture	5,000	5,000	10,000
Central Bank	20,000	20,000	40,000
TOTAL	265,000	225,000	490,000

The total budget for the November 1997-October 1998 period is \$490,000, under prevailing assumptions concerning the sources of funds. The amount budgeted for the construction of the data sets is \$173,000, which is equivalent to 35 percent of the total. Analysis of the performance of different markets will cost \$262,000 (53 percent), while the administrative support and seminar expenses amount to \$55,000 (11 percent).

Of the amounts that are expected, 72 percent or \$355,000 would come from the BASIS core, including \$55,000 that have been saved from the budget for project development activities. The contribution of the USAID Mission amounts to \$85,000, equivalent to 17 percent of the total. Of this, \$35,000 had already been committed to FUSADES at the end of the earlier fiscal year, while \$50,000 will be transferred through BASIS via Washington. Salvadorean sources have contributed \$50,000, equivalent to 10 percent of the total.

ANNEX A: SCHEDULE OF VISITS, 1997 PLANNING MISSION

16 June.

- 1 00 p m Dr Claudio Gonzalez-Vega arrives in El Salvador
- 3 00 p m Organizational meeting at FUSADES (Jaime Acosta, Director of Department of Economic and Social Studies)
- 7 00 p m Dr Douglas Southgate arrives in El Salvador

17 June

- 8 00 a m Meeting at FUSADES to discuss results from earlier research and rural household survey (Jaime Acosta, Margarita de Sanfeliu, Anabella de Palomo, Maria Cristina Euchner, Mauricio Gonzalez Orellana)
- 1 00 p m Sarah Gammage arrives in El Salvador
- 1 30 p m BASIS team meeting
- 3 00 p m The BASIS team and Mauricio Gonzalez visit PRISMA (Herman Rosa, Nelson Cuellar, Doribel Herrador, Clemente San Sebastian, phone (503)-298-6852)
- 5 00 p m The BASIS team and Mauricio Gonzalez visit FUNDAUNGO (Ricardo Cordoba, Executive Director)
- 7 30 p m BASIS team meeting

18 June

- 8 00 a m The BASIS team and Jaime Acosta visit the Ministry of Agriculture (Vilma de Calderon, Vice-Minister and staff)
- 10 00 a m Meeting at FUSADES to discuss survey research methodology (Margarita de Sanfeliu, Anabella de Palomo, Mauricio Shi)
- 11 30 a m Dr Claudio Gonzalez-Vega and Jaime Acosta visit the graduate school ESEN to discuss dissemination activities (Mirna Lievano de Marquez, Rector)
- 1 00 p m Dr Neil McMullen arrives in El Salvador
- 1 30 p m BASIS team meeting
- 3 00 p m The BASIS team and Jaime Acosta visit PRISMA (Deborah Barry, President, Herman Rosa, Clemente San Sebastian)
- 4 30 p m Visit by USAID officers (Dr Mary Ott, Sandra Lorena Duarte, Roxana Blanca) to the BASIS team at FUSADES headquarters
- 7 00 p m Dr Michael Roth arrives in El Salvador
- 7 30 p m BASIS team meeting

19 June

- 7 30 a m The BASIS team meets with Dr Juan Belt, USAID/Global/Economic Growth Center to discuss policymaking processes in El Salvador
- 8 30 a m The BASIS team and Anabella de Palomo visit the USAID Mission (Ken Ellis, Mission Director, Dr Mary Ott, Economic Growth Team Leader, Dr Nolvvia Saca, Dr Peter Gore, Ana Luz de Mena and others)
- 10 30 a m Dr Claudio Gonzalez-Vega, Dr Neil McMullen and Jaime Acosta visit the Central Bank (Francisco Lopez, Financial Intermediation Manager, Gladys Carmona)
- 11 00 a m Dr Douglas Southgate and Sarah Gammage visit the Green Project (Dr Carlos Aguilar)
- 2 00 p m A BASIS team (Southgate, McMullen, Gammage) visits the Agricultural Policies Unit (UAPA) at the Ministry of Agriculture (Edgar Cruz Palencia, Hugo Ramos, Edwin Aragon and team members, phone (503)-279-1942)
- 3 00 p m Dr Claudio Gonzalez-Vega and Dr Michael Roth meet with FUSADES staff on logistical arrangements and to plan the workshop (Jaime Acosta, Anabella de Palomo)
- 8 00 p m BASIS team meeting

20 June

- 6 30 a m Dr Claudio Gonzalez-Vega meets with Sarah Gammage and Dr Neil McMullen on research design
- 7 30 a m Dr Claudio Gonzalez-Vega visits Financiera Calpia (Silke Muffelman, phone (503)-260-6856)
- 9 30 a m A BASIS team (Gonzalez-Vega, McMullen, Southgate) visits FUNDE (Alfonso Goitia, Executive Director)
- 10 00 a m Dr Michael Roth and Sarah Gammage visit the Green Project to ask about data sets
- 11 30 a m Dr Claudio Gonzalez-Vega and Jaime Acosta visit the Central Bank (Gino Bettaglio, Deputy Governor, phone (503)-271-0011)
- 1 00 p m Sarah Gammage leaves
- 1 30 p m BASIS team meeting
- 2 30 p m The BASIS team visits the Ministry of Natural Resources and the Environment (Dr Miguel Araujo, Minister)
- 4 30 p m The BASIS team visits UCA (Rafael Pleitez)
- 7 30 p m Dr Claudio Gonzalez-Vega and Dr Douglas Southgate meet with Dr Hugo Ramos and Richard Clark from the CRECER project

21 June

- 7 30 a m Dr Claudio Gonzalez-Vega meets with Dr Juan Belt and Jose Siman to discuss policy reforms in El Salvador
- 9 30 a m The BASIS team makes a one-day field trip along the Eastern coastal lands

22 June.

- 10 30 a m Dr Claudio Gonzalez-Vega meets with Dr Juan Belt, Dr Carlos Lovo, and Evelyn de Lovo to discuss Salvadorean policymaking

23 June

- 8 30 a m The BASIS team makes a one-day field trip along coffee plantations in the San Miguel area and the Lempa River dam
- 4 00 p m The BASIS team visits a CENTA technical assistance center (Juan Santos Garay, Adan Turcios, Carlos Humberto Garcia and other staff members)

24 June

- 8 30 a m The BASIS team and the FUSADES team meet to discuss elements of the research agenda and methodology and plan the workshop
- 2 00 p m The BASIS team meets with Dr Eduardo Nuñez, FUSADES Executive Director

25 June

- 8 00 a m One-day BASIS workshop at FUSADES

26 June

- 8 00 a m BASIS team meeting
- 1 00 p m Dr McMullen, Dr Southgate, and Dr Roth leave
- 2 00 p m Dr Claudio Gonzalez-Vega meets with FUSADES researchers to summarize results of the workshop
- 4 00 p m Dr Claudio Gonzalez-Vega, Margarita de Sanfelu and Anabella de Palomo visit the USAID Mission to report on the results of the workshop (Dr Mary Ott)
- 7 00 p m Dr Claudio Gonzalez-Vega meets with Dr Ricardo Cordoba (FUNDAUNGO)

27 June

- 8 00 a m Dr Claudio Gonzalez-Vega meets with FUSADES researchers to examine research budgets
- 12 00 a m Dr Claudio Gonzalez-Vega makes a presentation to FUSADES' Economic and Social Research Council on the BASIS agenda (Jorge Zablah, President of FUSADES Board of Directors, Juan Jose Gutierrez, Claudio Cohen, Leonel Mejia, Mario Luis Velasco, Brarineto Paggi, Eduardo Nuñez, Marlon Perez)
- 2 30 p m Dr Claudio Gonzalez-Vega meets with Jaime Acosta and Anabella de Palomo to discuss final details on the mission's results
- 8 00 p m Dr Gonzalez-Vega leaves

ANNEX B: SCHEDULE OF VISITS, 1997 SECOND PLANNING MISSION

20 October

- 1 30 p m Dr Claudio Gonzalez-Vega and Dr Douglas Southgate arrive in El Salvador
- 3 30 p m Planning meeting (Jaime Acosta, Director of Department of Economic and Social Studies)

21 October

- 8 00 a m Meeting at FUSADES to discuss current economic events in El Salvador and their relevance for the preliminary research agenda (Jaime Acosta, Margarita de Sanfeliu, Anabella de Palomo, Edgar Cruz Palencia)
- 11 00 a m Meeting at FUNDE to discuss agrarian reform and gender issues (Alfonso Gortia, Alberto Enriquez)
- 2 30 p m Meeting at FUSADES on the research agenda continues (Jaime Acosta, Margarita de Sanfeliu, Anabella de Palomo, Edgar Cruz Palencia)

22 October

- 8 00 a m Meeting at FUSADES to discuss the design of the household survey (Jaime Acosta, Margarita de Sanfeliu, Anabella de Palomo, Mauricio Shi)
- 2 00 p m Visit to the Ministry of Agriculture to discuss their interest in the research agenda (Vilma de Calderon, Vice-Minister and staff) Funding offered confirmed
- 4 00 p m Visit to the Central Bank to discuss interest in the financial component of the research agenda (Gino Betaglio, Deputy Governor, and Gladys Carmona) Funding offer confirmed
- 8 00 p m Meeting with Financiera Calpia representatives to secure the collaboration of this organization (Silke Muffelmann, Sigfrido Aristoteles Esperanza, William Bonilla) Ample cooperation expected

23 October

- 8 00 a m The BASIS researchers and Anabella de Palomo visit the USAID Mission (Dr Mary Ott, Economic Growth Team Leader, Tully Cornick, Dr Nolvía Saca) Funding for the rural household survey is discussed
- 10 30 a m Claudio Gonzalez-Vega meets with FUSADES staff to discuss administrative issues for BASIS (Jaime Acosta, Anabela de Palomo)
- 11 00 a m Dr Douglas Southgate visits Peter Gore at the USAID Mission
- 5 00 p m Claudio Gonzalez-Vega makes a presentation to the Board of Directors of the Banco de Fomento Agropecuario to seek their collaboration

8 00 p m Meeting with Dr Hugo Ramos to discuss cooperation between BASIS and the USAID-sponsored project CRECER

24 October

8 00 a m Meeting at FUSADES on the research plan (Jaime Acosta, Anabela de Palomo, Margarita de Sanfelu)

11 00 a m Discussion at FLACSO on research proposal on rural poverty (Dr Carlos Briones)

2 00 p m Discussion at FUNDAUNGO of research proposal on the institutional framework for land markets (Dr Ricardo Cordoba, Evelyn Martinez)

4 30 p m Discussion at UCA on the design of the financial market studies (Rafael Pleitez)

25 October

11 30 a m Dr Claudio Gonzalez-Vega and Dr Douglas Southgate leave El Salvador

ANNEX C: PLANNING WORKSHOP, 25 JUNE 1997

A Agenda

8 00 a.m.	Claudio Gonzalez-Vega, "The BASIS Research Agenda in El Salvador Components and Modus Operandi "
8 30 a.m.	Jaime Acosta, "The Rural Sector in El Salvador An Overview and Results from the FUSADES-World Bank Study "
10 00 a.m.	General discussion on the implications for the research agenda
11 00 a.m.	Douglas Southgate "Resource Conservation Issues in El Salvador "
12 00 p.m.	General discussion
2 00 p.m.	Claudio Gonzalez-Vega, "Rural Financial Markets and Factor Market Interactions in El Salvador "
3 00 p.m.	General discussion
4 00 p.m.	Neil McMullen, "Social Capital Formation in El Salvador "
4 30 p.m.	General discussion
5 30 p.m.	Selection of research priorities

B List of Participants

Jaime Acosta, FUSADES	Gladys Martinez, Central Bank
Max Anaya, UAPA-Ministry of Agriculture	Julia Evelyn Martinez, FUNDAUNGO
Amy Angels, UAPA-CRECEC	Guadalupe Mazzini, FUSAI
Aida Arguello, FUSADES	Neil McMullen, IRIS
Carlos Briones, FLACSO	Abraham Mena, UAPA-Ministry of Agriculture
Gladys Carmona, Central Bank	Raul Moreno, FUNDE
Gilberto Casanova, FUSADES	Anabela de Palomo, FUSADES
Ricardo Cordoba, FUNDAUNGO	Rafael Pleitez, UCA
Aristoteles Esperanza, Financiera Calpia	Jorge Pleitez, UAPA-Ministry of Agriculture
Carolina de Franco, FUSADES	Juan Carlos Rivas, FUSADES
Claudio Gonzalez-Vega, Ohio State University	Herman Rosa, PRISMA
Mauricio Gonzalez, FUSADES	Michael Roth, University of Wisconsin
Susan Kandell, FUNDE	Margarita de Sanfelu, FUSADES
Mercedes Llort, Chamber of Agriculture	Clemente San Sebastian, PRISMA
Evelyn de Lobo Consultores Asociados	Douglas Southgate Ohio State University
Carlos Lobo Consultores Asociados	

ANNEX D: ECONOMETRIC ANALYSIS OF THE CAUSES OF FARMLAND DEGRADATION IN EL SALVADOR

by

Douglas Southgate and Jeffrey Hopkins, Department of Agricultural, Environmental, and Development Economics, the Ohio State University

A. Farmland Degradation in the Salvadoran Countryside Research Issues

In El Salvador, as in many parts of the developing world, waste and misallocation of scarce renewable resources take a severe toll. Reduced access to clean water and fuelwood depress living standards in the countryside, where half the population resides and where poverty rates are very high. In addition, depletion of the environmental base for crop and livestock production impedes development of the agricultural sector, which employs nearly a third of the national workforce. By no means are the impacts of renewable resource depletion confined to rural areas. Deforestation and soil loss in upper watersheds, for example, reduce the availability of hydroelectricity and clean water everywhere, in urban and rural areas alike.

Investigation of the extent, consequences, and causes of renewable resource depletion, in general, and of farmland degradation, in particular, is at an incipient stage in El Salvador. In an annex to a recently completed study of rural poverty in the country, Pagiola and Dixon (1997) lament the scarcity of reliable evidence concerning erosion rates and the agricultural impacts of soil loss. They also examine some of the factors influencing farmers' adoption of soil conservation measures.

Explanations of excessive erosion based on farmer ignorance and a lack of appropriate conservation alternatives, the two investigators find, are not very convincing. Also, limited access to formal credit does not have much of an influence, since formal credit is used mainly to finance production and real estate purchases but never to pay for erosion control measures. Privately owned fields, which constitute the vast majority of the survey sample, appear to be managed better than rented parcels, although the differences are not dramatic. Finally, Dixon and Pagiola (1997) point out that linkages between poverty and soil conservation also appear to be important.

These findings, like those of McReynolds, Johnson, and Geisler (1994), Sain and Barreto (1996), and other researchers, should be regarded as preliminary, and Dixon and Pagiola (1997) strongly recommend that additional research be conducted. The study we propose to carry out is a response to their call for in-depth investigation of the driving forces behind farmland degradation.

Our study will be distinct from previous research in methodological terms. For example, Sain and Barreto (1996) merely tried to determine where on a sigmoid (i.e., S-shaped) logistics curve describing the adoption of conservation measures groups of farmers in three parts of El Salvador could be placed, no true causal analysis, linking adoption to various factors, was undertaken. Dixon and Pagiola (1997) had the data needed to analyze how various factors

influenced individual households' adoption decisions, but they chose to take an aggregative approach. As is indicated below, we will use rural household survey data to undertake precisely the sort of analysis that Dixon and Pagiola (ibid) chose to forego.

We also intend to address another shortcoming of previous research, in El Salvador and other places, which is its primary, even exclusive focus on farmers' decisions to adopt or not adopt conservation measures. As Heath and Binswanger (1996) emphasize in a paper focused on Colombia, renewable resource deterioration in Latin America has at least as much to do with the agricultural colonization of fragile environments as it does with the choices among land use and soil management options made by residents of those areas. Furthermore, excessive occupation is induced by a public policy regime that, in various ways, prevents small farmers, who comprise virtually all fragile-land colonists, from competing for land that is better suited to crop and livestock production. Agriculture's de facto tax exoneration, which augments what wealthy individuals are willing to pay for farmland, is one element of the distorted policy regime. Likewise, credit subsidies tilt the competitive playing field against small farmers since they are unlikely to use their holdings to extract loans that carry a low rate of interest, are likely to be forgiven, or both.

Heath and Binswanger's (1996) observations apply throughout Latin America, not to mention many other parts of the developing world. Even if conservation ditches, minimum tillage, and other measures were widely accepted by those who exploit steeply-sloped upper watersheds, soil loss and water runoff in those areas would continue to be excessive. Furthermore, the families and individuals who occupy fragile lands in places like El Salvador constitute the most deprived and poverty-stricken segment of the country's rural population. For them, avenues of escape are foreclosed not just by a lack of skills needed to compete for more remunerative employment but also by policy-induced distortions in factor markets that allow others to bid away land and other productive assets.

The fundamental linkage between rural poverty, which results from inadequate human capital formation and related productivity-enhancing investment, and colonization of hillsides and other fragile environments needs to be established clearly, through empirical research. This will allow for a viable strategy to be devised for improved standards of living and renewable resource conservation in the countryside.

B Research Objectives and Hypotheses

A thorough understanding of farmland degradation problems in El Salvador requires an integrated analysis of various causal factors: impacts both on small farmers' settlement of areas where erosion risks are high and on their adoption of conservation measures. The study we propose involves precisely this sort of analysis.

One general hypothesis has to do with linkages between rural poverty and human capital endowments, on the one hand, and choices regarding physical location and economic activities, on the other. The null hypothesis would be that poor individuals and families that lack skills are just as likely as more affluent households to raise crops in marginal areas. By the same token, the former group would be just as likely as other groups, no more and no less, to adopt conservation measures.

Another set of null hypotheses relates to the impacts of factor market distortions. One such hypothesis would be that households with access to formal credit are just as likely as those lacking access to practice agriculture in remote and fragile environments. Similarly, we will test null hypotheses that specific policies, including but not limited to those identified by Pagiola and Dixon (1997), have no effect on the adoption of conservation measures.

C Research Approach

To undertake hypothesis testing, an econometric model will be developed, which relates to sorts of dependent variables—a household's location in marginal locations prone to erosion as well as its decisions about land use and soil management—to an interrelated set of independent variables. Among the latter would be the household's endowments of human capital, its access to formal credit, and so forth.

The econometric model will be estimated using data collected by FUSADES and cooperating organizations in a pair of rural household surveys, one conducted in 1996 and the other carried out in early 1998. Those data indicate households' choices among occupations, in agriculture as well as other sectors. They also reveal how survey respondents have fared in the competition for land, distance from passable roads and slope (which is a satisfactory indicator of erosion risks) being reported. In addition, respondents were questioned about the adoption of conservation measures and also the nature of their participation in labor, capital, land, and other markets.

To guarantee the collection of data needed for econometric analysis of the causes of land degradation, the questionnaires used in the 1998 survey were reviewed by Douglas Southgate, a faculty member at the Ohio State University and natural resource economist with considerable experience in Latin America. The questionnaires used in 1998 were modified in November 1997, before surveying began, in response to his comments.

The availability of longitudinal household-level data from the survey will allow us to test whether resource management decisions, which are affected by locational decisions, are heterogeneous among different groups of farmers. With panel data, the problems of using classical ordinary least squares (OLS) estimation procedures is that all observations are pooled, implying a homogenous sample. However, groups from within the sample, distinguished from one another by the quality of land they farm, the amount of human capital they possess, and their location relative to services and infrastructure may have group-specific "fixed effects" on the adoption decision. Ignoring the effect when it is present, such as with classical OLS models, results in biased coefficient estimates. Alternatively, a "random effect" model, in which variations within groups and among groups are distinguished, can be formulated to test whether groupings are appropriate.

Econometrically, fixed effects models can be constructed using the dummy variable technique. The random effect model is more complicated, but can result in more powerful hypothesis tests as degrees of freedom are not exhausted as in the fixed effect model. A Hausman test can be used to weigh whether the fixed or random effects model is more appropriate.

D Timetable

One year will be needed to carry out the proposed study, which will begin on or about 1 July 1998 and conclude on 30 June 1999

The first three months will be devoted to developing the general structure of the econometric model of rural households location and adoption decisions, in consultation with FUSADES and other Salvadoran institutions involved in BASIS

Actual estimation of the model will take place during the second three months, from October through December 1998, with results to be available and hypothesis testing to be concluded at the end of the year

From January through March 1999, a draft report of findings will be prepared, which will be presented in San Salvador at a meeting attended by representatives of BASIS partner institutions. In response to comments on the report received before, during, and after that meeting, it will be revised in May and June of 1999

Simultaneously, proposals for complementary and follow-up research will be prepared and submitted in 1999. For example, the possibility of using alternative data sources in a study of settlement of El Salvador's fragile lands needs to be investigated. One option might be to identify those lands with the aid of an existing geographic information system (GIS), if one with suitable national coverage exists, and then to use FUSADES survey data to analyze settlement of those areas. If no such GIS is available, the possibility of developing one, with partial support from BASIS, could be pursued

E Personnel

A natural resource economist, Douglas Southgate has been a professor of agricultural economics and natural resources at the Ohio State University since 1980, which was the same year he received a Ph.D. from the University of Wisconsin. He has written more than a dozen book chapters and seventeen refereed journal articles addressing watershed deterioration, deforestation, and other environmental problems in the developing world. His second book published by Oxford University Press, *Tropical Forest Conservation—An Economic Assessment of the Alternatives in Latin America*, will be released in May 1998. His first book, *Economic Progress and the Environment* (coauthored by Morris Whitaker and published in 1994), drew heavily on his Joint Career Corps assignment with USAID in Ecuador from 1990 to 1993. Aside from Ecuador, Dr. Southgate has worked in twelve Latin American and Caribbean countries, conducting research and consulting for USAID, the World Bank, the Inter-American Development Bank, the Ford Foundation, and the International Institute for Environment and Development. He has also directed Ohio State's Latin American Studies Program and its International Studies Center.

Jeffrey Hopkins is a doctoral candidate in the Ohio State University's Department of Agricultural Economics whose dissertation, which will be finished around the middle of 1998, addresses linkages between US commodity exports and the use and management of the country's land resources. In addition to being a graduate research assistant, he has held a Foreign Language and Area Studies (FLAS) fellowship, which enabled him to achieve

advanced fluency in Spanish Between undergraduate studies at Miami University of Ohio and graduate school, Mr Hopkins worked in Guatemala as a Peace Corps Volunteer

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ANNEX E: NATURAL RESOURCE CONSERVATION AND THE FORMATION OF HUMAN AND SOCIAL CAPITAL. THE LINKAGES IN EL SALVADOR

by

Douglas Southgate, Department of Agricultural, Environmental, and Development Economics,
the Ohio State University⁷

A. Introduction

Although the number of books and articles addressing sustainable economic development is growing large, the reasons why destruction of forests and other natural resources occurs on a grand scale in poor countries remain the subject of active debate. One explanation, which is stressed in the environmental economics literature, is that standard indicators of macroeconomic performance, which are used routinely by decision-makers in and out of government, are flawed.

As a number of economists have observed, one of the most commonly used macroeconomic indicators, net national product (NNP), does not treat physical capital even-handedly (Solow 1992). To arrive at NNP, deductions are made for the depreciation of equipment, buildings, and other assets made by human beings. However, depletion of oil deposits, standing timber, and other kinds of environmental wealth is neglected entirely. This means that a country can raise NNP, conventionally defined, in the short run by exhausting its natural resources, even though its long-term economic prospects might be severely impaired in the process.

To illustrate the bias of standard macroeconomic measures, Repetto et al (1989) have demonstrated that much of the Indonesian economy's apparent expansion through the middle 1980s resulted from deforestation, soil erosion, and above all else the depletion of fossil fuel deposits, when natural resource accounting is done, actual rates of growth turn out to have been much lower.

There have been other refinements in the conceptualization and measurement of economic progress. Although the role of natural resources is not stressed in many of the recent contributions to the literature on economic development, those contributions provide a framework for understanding why environmental degradation, generally, and habitat loss, specifically, are often excessive.

⁷ Interchange with other members of the BASIS team—Claudio Gonzalez-Vega (team leader), Sarah Gammage, Neal McMullen, and Michael Roth—was highly enlightening. Also very helpful were interviews and discussions with USAID personnel and Salvadoran researchers, who are too numerous to list here. I am particularly grateful, though, for the assistance provided by Jaime Acosta, Anabella Larde de Palomo, and their colleagues at the FUSADES. Of course, I take exclusive responsibility for all the paper's errors and omissions, and the views expressed are mine alone and are not necessarily supported by USAID, BASIS, the Ohio State University, or FUSADES.

For example, Romer (1986) has examined the shortcomings of neoclassical growth models, originally developed during the 1950s. Underlying the neoclassical approach is the idea that improvements over time in living standards are linked to the accumulation of productive assets, which is reasonable enough.

Moreover, capital usually has been treated as a homogenous quantity, something that is manufactured and physical more often than not. However, the empirical models derived from theorists' work lack explanatory power. That is, attempts to estimate linkages between different nations' growth rates and their respective endowments of machinery and other manufactured capital have not met with much success. Romer (1986) contends that poor empirical results often can be traced to the neglect of less tangible assets, like human capital.

No cause of poor economic performance in Latin America and other parts of the developing world is more important than inadequate human capital formation. More often than not, providing too little support for education and health and sanitation services, which are all especially deficient in rural areas, has resulted from a fundamental misallocation of public sector resources. Over the years, enormous sums have been spent in Latin America on non-targeted consumption subsidies (most of which are captured by relatively affluent households), the military, parastatal corporations, and so forth. Inevitably, education, health, and sanitation expenditures have suffered. Consequently, there are now large numbers of people in the region who do not have the skills required for more remunerative and productive employment.

Aside from poverty and lost opportunities for economic growth, there is an environmental price to be paid where education and related human capital investments are not what they should be. Environmentally sound production of agricultural commodities and timber, it must be remembered, often requires sophisticated understanding and management of biological processes. Obviously, adoption of improved systems is discouraged if knowledge is lacking. In particular, human capital formation is essential to achieve the sustainable yield increases needed to forestall the agricultural economy's expansion onto land now covered with natural vegetation.

Environmental impacts also arise because inadequate support for education and health and sanitation services in rural areas impedes the movement of labor out of agriculture and into other sectors of the economy, typically into lines of work that involve less exploitation of natural resources. In particular, many rural people whose meager skills circumscribe their non-farm employment possibilities find that their best option is to resort to raising crops and perhaps some livestock along hillsides, in rain forests, and in other fragile environments.

As Schneider (1995) documents in a study of the Brazilian Amazon, mining nutrients in areas where forests are giving way to cropland and pasture is a relatively attractive option for Latin America's rural poor. By no means does this imply that the returns they derive from agricultural colonization are high. Except in advantageously located settlement projects, colonists' household incomes in the Brazilian Amazon only exceed the minimum wage, which in rural areas amounts to less than \$100 per month, by a factor of two or three (FAO/UNDP/MARA 1992).

The returns captured by agents of deforestation in northwestern Ecuador are similarly marginal. In a survey of approximately 165 colonists carried out in 1991, Southgate et al (1992) found that annual net cash flows in the region averaged just \$25 per hectare. Of those

settlers willing to name a price, the vast majority indicated that they would part with their holdings if offered just \$300 per hectare

That colonists indeed find it worth their while to migrate to remote frontiers because they lack the human capital required for more lucrative employment is revealed by surveys carried out in Ecuador. In the northeastern part of the country, average educational attainment for rural adults is less than three years (Pichon, forthcoming). This is comparable to what Southgate et al. (1992) have found among colonists' households in northwestern Ecuador.

Although it is of paramount importance, human capital scarcity is neither the only cause of rural poverty nor the only reason why overexploitation of renewable resources is a primary feature of economic activity in the Latin American countryside. Resource degradation also results from the underdevelopment of what economists refer to as social capital, which is defined to include the rule of law, courts, and related institutions that exist to make sure that contracts and property rights are respected. Without those institutions, of course, markets function anemically or not at all.

The role of social capital has received a lot of attention in the recent literature on growth and development. For example, Olson (1996) has observed that discrepancies between the economic performance of poor and rich countries cannot be explained only in terms of average educational levels, access to technology, the availability of machinery, and other kinds of human and physical capital. Slow growth and low living standards in places like the former Soviet Union, he argues, is caused mainly by the waste and misallocation of existing assets, which in turn have to do with the feebleness of capitalism's undergirding institutions.

Although Olson (1996) does not focus specifically on natural resources, his work furnishes an intriguing perspective on why there is not enough environmentally sustainable economic progress in the Latin American countryside. There is no denying that the resource endowments of Brazil, Venezuela, and many other countries in the Western Hemisphere are superior to what one finds in many parts of Asia and Africa, and Europe for that matter. However, social capital remains poorly articulated, which inevitably has environmental consequences.

The contribution that weak institutions make to tropical deforestation has been examined by Deacon (1994). He points out that governments of poor countries are often unstable, as reflected by frequent coups d'état and constitutional change, and tend to do a poor job of enforcing property rights. Furthermore, lawlessness plus a general lack of governmental accountability leads to excessive habitat loss, as an econometric analysis of land clearing in 120 countries demonstrates. Deacon's (ibid.) results corroborate the findings of a more narrowly focused study, in which settlers in the Ecuadorian Amazon were found to respond to the government's slowness in processing applications for formal land tenure by claiming land in the time-honored way—clearing away natural vegetation in order to exercise agricultural use rights (Southgate, Sierra, and Brown 1991).

By contrast, strong institutions make sustainable resource management possible. For example, the success that ethnic Japanese communities have enjoyed with agroforestry in the Brazilian Amazon is related in part to the cooperative organizations they have established, which provide technical assistance, credit, market information, and other services (Subler and Uhl 1990).

The factors driving habitat loss and other forms of environmental degradation in poor countries are highly complex and require much more investigation. No simple explanation (e.g., that poverty causes resource depletion or vice versa) comes close to being universally applicable. It is obvious, though, that there is a common set of causes leading both to poor economic performance (and rural poverty, in particular) and to the deterioration of renewable natural resources. Assigning specific weights to inadequate human capital and underdeveloped social capital may not be possible. Suffice it to say that the two are interrelated and that they lead jointly to the excessive depletion of natural resources just as surely as they combine to induce the waste and misallocation of physical capital made by human hands.

B Lessons To Be Learned in El Salvador about Environmental Depletion and Conservation

Nowhere are the consequences of meager human and social capital more clearly on display than in El Salvador, which with a national territory of only 21,041 square kilometers is the smallest country on the American mainland. Well into the 1980s, human fertility, which is closely linked to female illiteracy, was very high in El Salvador. But because of emigration, population growth was not that high, averaging just 1.8 percent per annum between the 1971 and 1992 censuses (DGEC 1977, DGEC 1995). Now that the civil war has ended, fewer people are leaving the country and demographic expansion has accelerated. From 1992 through 1997, the annual growth rate has been a little less than 3 percent (DGEC 1996). Even though one out of every six or seven Salvadorans now lives in the United States, the country is more densely populated, with 250 people per square kilometer, than any other independent state in the Western Hemisphere aside from a few small Caribbean islands (Panayotou, Faris, and Restrepo 1997).

Economic performance has been positive in recent years. Structural adjustment began in earnest around 1990. Responding to the commercial opportunities created by freer markets, the Salvadoran economy grew by 6 percent per annum through 1995. Peak rates of annual expansion of more than 7 percent were achieved after the 1992 Peace Accords, which brought an end to a war that had lasted for more than a decade (Panayotou, Faris, and Restrepo 1997).

However, economic growth is showing signs of flagging, the rate for 1996 only amounting to 3 percent. Some of the blame can be assigned to the exchange rate distortions resulting from remittances sent home by emigrants. Those remittances exceed what the country earns from overseas sales of coffee, which is the leading national export (other than people), and according to local bankers have caused the Salvadoran colon to be over-valued by approximately 30 percent. As a result, incentives to compete in international markets have been weakened and imported substitutes for locally produced commodities are artificially cheap.

But emigration, remittances, and exchange rate distortions do not fully explain why El Salvador's domestic economy is not growing much more rapidly than is the country's population. Especially in rural areas, major inefficiencies result because misguided public policies and a dearth of social capital cause markets for various factors of production to be unduly rigid. Human capital scarcity takes a severe toll as well.

One public policy that has turned out to have adverse consequences is agrarian reform. Undertaken to alleviate social ferment in the countryside, it has had the effect of keeping prime farmland tied up in relatively large, unproductive holdings. About 30 percent of the country's agricultural real estate is controlled by agrarian reform cooperatives established during the 1980s (Shaw 1997). Nevertheless, an agricultural policy expert who works for USAID in El Salvador confirms the widely circulated claim that less than 10 percent of the country's crop and livestock output is produced by cooperatives (Hugo Ramos, personal communication, 1997). Shaw (1997) reports that 20 percent of El Salvador's very best farmland is cooperatively owned, and that three-tenths of that real estate currently sits idle.

Left to their own devices, members of at least some cooperatives could be counted on to sell off their holdings, thereby allowing land to be transferred to firms and individuals able to use rural real estate more productively. However, this sort of exchange is preempted by various laws and regulations. Only during the last couple of years have sales of cooperative land been permitted, but only to pay off debts incurred during the course of land acquisition (Shaw 1997).

Another option would be for cooperatives to begin functioning more like regular business enterprises—corporations for example. But this would require major improvements in social capital. As they currently stand, contract and property law in the Salvadoran countryside would not provide much “assurance” to shareholders in a corporation that had evolved from a cooperative. That is, owners could not count on their best interests to be respected consistently by managers and workers, given the weakness of courts and related institutions.

Currently, cooperative members appear to be responding to the social capital vacuum by refusing to invest and by selling whatever the law says is marketable (i.e., machinery but not land). When driving through the flat, fertile valleys east of the national capital, one is struck by the sight of primary irrigation canals leading up to the borders of extensive cooperatives, which have not organized their members to dig the secondary and tertiary canals needed to distribute water to individual fields. Likewise, farm equipment seems to have become extremely scarce on the coastal plains, where rich volcanic soils once supported a thriving cotton industry but where cooperatives now dominate and the land is severely underutilized.

A lack of social capital also appears to explain some of the inefficiencies and rigidities that characterize financial intermediation in El Salvador. Participation in rural credit markets is very thin in the country, with only 31 percent of farmers and rural households surveyed in early 1996 reporting having taken out a loan during the preceding five years (Lopez 1997). Government regulation is not the problem, now that interest rate controls are a thing of the past. Instead, limited lending in rural areas has a lot to do with poor business prospects in the agricultural sector, which in turn are related to an overvalued currency, inflexible real estate markets, and other distortions.

Furthermore, restricted financial intermediation seems to reflect a lack of confidence on the part of credit sources, both formal and informal, that borrowers can be obliged to repay. This is perhaps inevitable in a country that has gone through the sort of conflict and social dislocation that El Salvador recently experienced. (Of course, the fact that a recalcitrant borrower might own a weapon or can easily get hold of one also has to cross a lender's mind from time to time.)

Undertaking the policy reforms and making the social capital improvements needed to make factor markets work better would reduce rural poverty and also ease pressure on the natural resources on which poor people have come to depend. If land and capital markets were more efficient, real estate would end up in the hands of its highest and best users, including productive small farmers, and more investment would take place. Employment would increase, both on commercial farms and in the agribusinesses that serve them. This would benefit the rural poor directly and would cause at least a few of them to retire from the hillside plots where they now raise corn, beans, and a few other crops.

Notwithstanding its importance, however, improving factor market efficiency is not a sufficient condition for rural development that is socially broadly based as well as environmentally sustainable. Accelerated human capital formation also has to take place.

El Salvador's record in this area is poor. In 1990-91, health expenditures only amounted to 1.5 percent of gross domestic product (GDP). At 1.8 percent of GDP, spending on education was slightly higher, but still compared poorly with the support being provided in other countries. For example, schooling expenditures as a portion of GDP were 3.7 percent in Chile, 3.8 percent in Thailand, and 6.9 percent in Malaysia in 1990-91. Indeed, those three countries supported human capital formation better in 1960, when their standards of living were little better than what El Salvador's is now, education expenditures as a portion of GDP at that time were 2.7 percent in Chile, 2.3 percent in Thailand, and 2.9 percent in Malaysia (Panayotou, Faris, and Restrepo 1997).

El Salvador's poor showing in 1990-91 probably had something to do with elevated military expenditures. Since then, human capital formation has claimed a greater share of government funds, and local control of schools has been increased so that teacher absenteeism can be reduced and other measures for enhancing educational quality can be applied. However, the legacy of underinvestment endures. The country's human development index, which the United Nations calculates using data on average educational attainment, life expectancy and nutritional status, and related factors, is indistinguishable from the index for Honduras, which is the poorest country in Central and South America. Only in Haiti are conditions appreciably worse (Panayotou, Faris, and Restrepo 1997).

Education and health and sanitation services are especially deficient outside of San Salvador and other major cities, and the incidence of poverty in rural areas is well above the national rate, which is 50 percent (Lopez 1997). Econometric analysis suggests that meager human capital does not greatly affect the income received either by small farmers or landless agricultural laborers (ibid 1997).

In addition, Pagiola and Dixon (1997) contend that the shortage of skills in rural areas does not greatly impede the adoption of conservation tillage and other soil conservation measures. Of far greater importance are the impacts on inter-sectoral labor movements as well as small farmers' locational decisions. Lopez's (1997) econometric study reveals that the chances of finding non-agricultural work, which pays better, are positively related to educational attainment.

Rural families with limited employment prospects are particularly likely to make a go of farming on a small hillside plot. More of them are now doing exactly that in northern El Salvador, which was the scene of some of the worst fighting during the war and is also where the steepest land in the country is found. Since the 1992 Peace Accords were signed, small

farmers have been drifting back to the area, which had experienced a certain amount of land abandonment and forest regeneration

Information about demographic trends in El Salvador is spotty. Especially outside of cities and towns, carrying out a census in 1992, just as the civil war was ending, was difficult. In addition, several rural administrative districts, called *municipios*, have been recategorized as urban. Thus, census results indicating a contraction in the rural populations of El Salvador's three northern departments between the last two censuses are almost certainly exaggerated (Table 1). Regardless, it is clear that there has been a reversal during the past five years. Although separate projections are not available for urban and rural areas (DGEC 1996), it is reasonable to conclude that some of the population growth that has taken place in Cabañas, Chalatenango, and Morazan reflects an increase in the farming population. The increase may not be as great as rural demographic expansion in other parts of the country, but it is taking place nonetheless (Table 1).

Resettlement of the countryside is allowing El Salvador to continue holding the distinction of being the Western Hemisphere's second most denuded country, after Haiti. Aside from the coffee plantations where shade trees have been planted, only 2 percent of the national territory is forested (Panayotou, Faris, and Restrepo 1997).

Table 1 Annual population growth in El Salvador's three northern departments

	1971 to 1992		1992 to 1997	
	Urban	Rural	Total	Total
Cabañas	3.24%	-0.54%	0.33%	1.64%
Chalatenango	1.15	-0.31	0.13	1.66
Morazan	1.86	-0.35	0.14	1.30
entire nation	2.97	0.80	1.77	2.91

Sources: DGEC, 1977, DGEC, 1995, DGEC, 1996

C The Inextricable Ties Binding Habitat Protection to Economic Improvement in the Countryside

Environmentalists can learn a positive lesson of great importance in El Salvador, which is that improving the economic prospects of the rural poor can contribute substantially to the conservation of Latin America's natural habitats. That is, investing in human and social capital in rural areas should enable more individuals to find more remunerative jobs, usually

outside of agriculture Fewer people should find themselves relegated to subsisting on a small hillside holding, migrating to an urban slum in the hope of finding some sort of employment (informal more often than not), or settling on an agricultural frontier

By the same token, one cannot be optimistic about economic progress and habitat conservation in the Latin American countryside if human and social capital remain scarce In general, poverty will continue to be widespread in the countryside and the rural poor will take advantage of each and every opportunity that comes their way to exploit renewable resources Even where it is made available, full advantage will not be taken of technology required for the sustainable intensification of crop and livestock production

Neither will it be possible to deal with the market failure of deforestation if the plight of the rural poor is not addressed more effectively Efforts to pay for carbon sequestration and other environmental services provided by forests will be severely hampered by the costs of preventing encroachment by agricultural colonists Likewise, initiatives to police park boundaries and to promote nature-based tourism and the sustainable development of forest resources will not withstand the human onslaught unleashed if poverty continues to grip the countryside (Southgate, forthcoming)

Those who suppose that habitats can be protected merely by establishing nature reserves should keep in mind the geographic lengths to which poverty has driven the Salvadoran peasantry in recent decades During the 1960s, tens of thousands pushed their way into Honduras in order to carve farms out of the neighboring country's forests, military action was required to expel them Twenty years later, a much larger migration to the United States occurred If rural people desperate to support themselves and their families pay little heed to national frontiers, how much respect are they ever likely to show for park boundaries?

Putting a halt to deforestation requires the application of a broad array of remedies Under certain circumstances, nature-based tourism and the sustainable harvesting of timber and other forest products have a role to play Also, those who have migrated to agricultural frontiers should be encouraged to adopt agroforestry and other activities characterized more by resource management than by resource mining At a more general level, agricultural intensification needs to take place, so that increasing demands for crops and livestock can be accommodated with minimal encroachment on natural habitats In addition, ways should be found to reward those who protect tropical forests and the environmental services they provide

But for all these measures to succeed, capitalism's underpinning institutions must be strengthened and support for education and health and sanitation services has to be increased, especially in rural areas Indeed, accelerated formation of social and human capital, which is the key to broad-based economic progress, will have to be the cornerstone of strategies to conserve habitats and other renewable resources in El Salvador and other parts of the developing world

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