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**Agroforestry Participation: A
Comparison of Organizational Levels in Two Salvadoran
Rural Communities**

by

Julius Salegio



**A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment
of the requirements for the degree of Master of Science**

in

Rural Sociology

Department of Rural Economy

**Edmonton, Alberta
Spring 2001**



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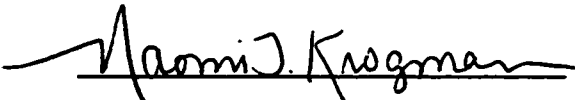
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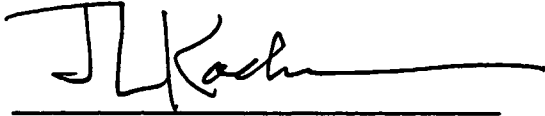
University of Alberta

Faculty of Graduate Studies and Research

The undersigned certify that they have read, and recommend to the faculty of Graduate Studies and Research for acceptance, a thesis entitled *Agroforestry Participation: A Comparison of Organizational Levels in Two Salvadoran Rural Communities* submitted by Julius Salegio in partial fulfillment of the requirements for the degree of Master of Science in Rural Sociology.


Naomi Krogman, PhD (supervisor)


Debra J. Davidson, PhD


Jerry L. Kachur, PhD

Date Approved by Committee: January 3, 2001

Dedicado a los que nunca sabe nadie de donde son; a los vendelotodo, a los comelotodo,
a los tristes mas tristes del mundo, a mis compatriotas, a mis hermanos y hermanas
Salvadoreños.

Dedicated to those whose homes are not known; to those who sell anything and
everything; to those who would eat anything; to the saddest people I know, *my fellow*
countrymen, and Salvadoran *brothers* and *sisters*.
(Excerpt from Poem of Love by Roque Dalton, poet and martyr)

Abstract

In this study, a total of 48 participants were interviewed: 23 farmers were interviewed in two rural sites: 15 farmers were from the community Dr. Guillermo Manuel Ungo (community #1), and 8 farmers were from the community Los Melendez. Also, a total of 25 agroforestry promoters, 13 from non-governmental organizations and 12 from governmental organizations, were interviewed in the capital city. The research encompasses the following objectives: to identify barriers and incentives to the participation of small farmers in agroforestry projects on Salvadoran hillsides, and to make a comparison of the two mentioned communities with different levels of organization to understand how organizational levels of communities influence participation in agroforestry projects. The research therefore aimed to identify social and organizational characteristics needed for the design of agroforestry projects in both communities.

Acknowledgments

In a sense, this thesis has been over four years in the making. The essence of this thesis was built on the writing of my undergraduate research paper after a trip to El Salvador in December of 1995. At the time, the emphasis of the research paper was placed on Dependency theory. Many theories have attempted to explain poverty in Latin America. This research examines poverty in two rural communities of El Salvador, but one of its main objectives is to explore solutions to poverty among small rural farmers.

This thesis is the effort of many individuals, including family and friends. I wish to acknowledge those who have contributed their time, effort and support throughout the different stages of the process. First, I will begin by acknowledging my uncle Luis and my aunt Ceci without their critical support, I would not have got to this point. They were opportune and made sure I completed my undergraduate degree first, in 1996.

I need to acknowledge the significant contributions of Bonnie and my Dad who also made sure I completed my graduate journey. Again, their significant contribution was crucial for the completion of this thesis. *Padre*, thank you for your intellectual mentorship and advice. Bonnie thank you for listening to my frustrations and complaints.

There were many times when I felt overwhelmed by school work and wanted to give up. Fortunately, Evelaine was there to give me support and encouragement to continue and finish my courses. Evelaine, this thesis is also your making. Without your long hours of editorial assistance prior, and during this research process, this thesis could have not been completed. Thank you for believing in me and for being there. I love you with all of my soul. I would also like to thank Geneviève, Evelaine's sister, for the long

hours contributed to the editing of this thesis and Anne-Marie, Evelaine's mom, for her encouragement and support throughout the process.

I need to acknowledge the contributions of individuals in the department of Rural Economy at the University of Alberta. I wish to thank Dr. M. Veeman for facilitating and making this journey a reality. Thank you for supporting me and lobbying on my behalf to get the IDRC grant. I must also thank my supervisor, Dr. N. Krogman, for helping me with the IDRC grant, and for all the support throughout this journey. You have been a great support in fulfilling my academic dreams and helping me pursue my career goals. Two other professors, Dr. D. Davidson and Dr. J. Kachur, provided me with strategic insights for the write up of this thesis.

I would like to thank my sister Krissia and brother Yuri who were there for me when I needed their assistance in El Salvador. Krissia, thank you for arranging interviews for me. *Hermano* thanks for allowing me to drive your car even when you needed it.

I must thank my Grandmother, MamaHaydée, for allowing me to stay in her house in San Salvador. Staying at her house was crucial for completing interviews in the capital area, and for commuting to the rural communities. Also, this thesis is a reflection of our farmer roots and our connection to the land, which has been the source of so many accomplishments. Because of the land, we have received an education, fulfilled many dreams and have had good health. Thank you Mamenche and MamaHaydée for sharing the riches of the land and for teaching us the need to be grateful for what we have.

I also need to thank Roberto and Enrique who have always been a source of inspiration in my life to complete my educational goals in Canada. Needless to say, back in 1988 when I first came to Canada, *mute* and *deaf* as my father put it, I always dreamed

of going to school, but it seemed like an unattainable goal. Education has opened my mind and the world to many opportunities and brilliant thoughts.

I must also thank the people at CATIE and PAES in El Salvador for their contribution to this project. Thank you Lupita and Senora de Escamilla for your administrative support. Ing. Juarez and Dr. Faustino, thank you for your contribution to my research orientation and my understanding of agroforestry projects in El Salvador. Thank you for giving me the freedom to work under the PAES mandate.

In the field, I need to thank Miguel Valle, my gatekeeper and mentor. Thank you Miguel for giving me your unconditional help. Your support was crucial for interviewing all of the small farmers, as well as some agroforestry promoters in San Salvador. It was a pleasure working side by side with you on the hillslopes. It was a rewarding experience, you provided me with a new and brighter appreciation of Salvadoran landscapes. This thesis is a reality because of you. Although there were several research constraints, you remained loyal throughout the entire interviewing process.

I also need to thank my current work supervisor Dr. N. Parker at Portage College for supporting me to complete this journey. Thank you for your encouragement and advice.

To all my *compatriotas* and *hermanos* Salvadoreños, small farmers and organizations I visited and interviewed, thank you for your collective contribution to my understanding of agroforestry development in rural El Salvador. I sincerely wish the small farmers in both communities a successful future promoting and implementing agroforestry projects.

I hope that the discussions in this thesis help shape better policies in rural development. I certainly wish that national initiatives can work side by side with locals and small farmers to improve their livelihoods. On a more personal level, I hope that this thesis is useful for a better and greater understanding of Salvadoran rural life. Finally, I would like this research thesis to be seen as a testimonial account of small farmers, and hopefully will serve to challenge environmental policy makers to respond to small farmers' needs.

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1. Introduction

1.1 Overview

For decades now, there have been disturbing warnings about the increasing rates of soil degradation and deforestation in Central America. Recommendations for intervention have been mostly technical in nature. More recently, scientists examining deforestation and land degradation are finding that the social and cultural values and the efforts of farmers must be considered if the trend is to be reversed. This study attempts to explain some of the social incentives and disincentives to hillside agroforestry in El Salvador, and the role of these in agroforestry participation.

1.2 Problem Definition

Although El Salvador had an economic growth rate of 6.7% between 1991 and 1995, the agricultural sector had grown the least, with a growth rate of only 2.5%. This slow rate of economic growth leaves many doubts regarding the long-term capability of this sector to increase salaries and employment in rural areas (PAES, 1998). Pressure to intensify agricultural production to provide adequate income, population growth and the rapid increase of nontraditional exports have expanded hillside¹ occupation. Land use patterns on Central American hillsides have degraded these areas, and because of high rates of soil loss, hillside farming has jeopardized prospects for sustainable agriculture (Celis, Vedova and Ruano, 1997).

Agroforestry is an option to regenerate soils and improve the economic conditions of rural Salvadoran farmers who cultivate hillsides. Agroforestry, according to the

¹ Hillsides are defined as terrain with a more than 15% slope (Acevedo et al., 1995).

International Council for Research in Agroforestry, ICRAF², refers to “all land-use practices and systems in which perennials are deliberately grown on the same land management unit as annual crops and/or animals” (Gholz, 1987:1). While this definition is general, it allows for the inclusion of both traditional and modern variations of agricultural practices.

There are several more specific definitions of agroforestry. For the purpose of this research, it can be defined as the collective name for land-use systems where woody perennials are integrated with crops and/or animals on the same unit system (Leakey, 1996). This integration can be either of a spatial mixture or temporal sequence. Agroforestry combines agricultural and tree crops of different longevity, from annual to biannual and perennial plants (Vergara in Gholz, 1987). These plants can be organized either temporally (crop rotation) or spatially (intercropping), to maximize and support aggregate yields.

1.2.1 The Use of Sloping Lands

Vergara (1987) suggests that the increased pressure on land is the main cause for the loss of sustainability of upland swidden cultivation. The opportunity to rotate fields decreases, and farmers increase cropping periods and shorten fallow periods until swidden agriculture becomes a settled cultivation. Thus, longer cropping of hilly sites results in more severe soil and nutrient loss.

Sloping lands include areas dominated by moderate and steep slopes (Young, 1990). They form a unique type of tropical environment with specific problems such as erosion. The introduction of agroforestry practices can provide a remedy for highly

² ICRAF was the first international institution dedicated to agroforestry. The Council seeks to increase awareness of the potential of agroforestry and to develop a national organization to support agroforestry

eroded areas in conventional farming of sloping land. Practices such as barrier hedges³, hedgerow intercropping⁴ and multistory tree gardens⁵ offer the potential for cropping on steep land while also allowing for soil regeneration. For example, in the Ntcheu district of Malawi, cultivation has extended to slopes due to great population pressures. Barrier hedges have been introduced to make maize cultivation sustainable on an area that would normally be classified as non-arable (ibid.).

While no significant research has been conducted on the history of agroforestry in Central America, several methods of mixing trees with food crops are known to have been practiced by pre-Colombian indigenous peoples (Budowski in Steppeler and Nair, 1987). Among these practices was the managed fallow in shifting cultivation⁶, the tropical mixed homegardens⁷, and the mixing of trees and crops along ditches (*chinampas*) found from Mexico to Guatemala. There were also combinations of heavily pruned pines with food crops, and shade trees in cacao fields (ibid.).

Agroforestry initiatives have evolved slowly in Central America because agroforestry has not been a priority of local governments or universities (Steppeler and Nair, 1987). This trend began to shift as graduates from the Tropical Agronomic Center

activities.

³ Trees are planted on soil-conservation areas such as grass strips, bunds and terraces (Nair, 1993).

⁴ It involves zonal, as opposed to mixed, arrangements of components, in which the components occupy definite zones, usually strips of varying widths. In alley cropping, there are single or multiple rows or strips of woody plants, which is managed so as to restrict its growth in the form of a hedge.

⁵ These refer to mixed tree plantations consisting of conventional forest species and other commercial tree crops, especially tree species, lending a managed mixed forest appearance.

⁶ It refers to farming or agricultural systems in which land under natural vegetation is cleared, cropped with agricultural crops for a few years, and then left unused while the natural vegetation regenerates. While the cultivation phase is about 2-3 years, the regeneration phase, known as fallow or bush fallow phase, is about 10-20 years. The clearing is accomplished through the slash-and-burn method (Nair, 1993).

⁷ They consist of an assemblage of plants, which can include trees, shrubs, vines, and herbaceous plants, growing in or adjacent to a homestead or home compound (Nair, 1993).

for Research and Training (CATIE)⁸ returned to their countries of origin and started working on local projects. The first papers⁹ focused on identifying several agroforestry practices in the region. CATIE has now completed an evaluation of approximately 40 agroforestry projects in Central America. None of these projects were located on hillslopes (Kass, 1998).

Hillside topsoil can not sustain intensive cultivation. However, these slopes grow 86% of the subsistence crops such as corn, beans, and sorghum. Sloping lands also grow approximately 87% of permanent crops, most of which is coffee, and about 80% of pastureland. Hillslopes are therefore a fundamental component of the Salvadoran economy and of the lives of Salvadoran people (Acevedo et al., 1995). Consequently, alternative agricultural methods to current practices must be investigated and implemented. Agroforestry has great potential as an alternative on steep lands (ibid.). For example, ICRAF has participated in advisory and collaborative projects in Rwanda, Ethiopia, Nepal and Malawi, which have shown that sloping lands have one of the greatest potentials for agroforestry.

Biophysical, socio-economic, and cultural differences influence hillslope land use from one Central American country to the next (Kass, 1998). In order to design more biophysically appropriate and socially acceptable land uses, these differences need to be understood and accounted for in the design of agroforestry projects. Although some farmers have reported reasons for supporting agroforestry practices, (such as for the

⁸ CATIE (Centro Agronomico Tropical de Investigacion y Ensenanza), based in Costa Rica, is a regional agroforestry organization covering most of the Central American countries. It has initiated considerable efforts since 1979 to promote agroforestry (Steppler and Nair, 1987). These efforts included organizing workshops, training courses and seminars in Costa Rica as well as Mexico, Colombia and the rest of Central America. It also has the largest number of agroforesters in the region.

regeneration of soils and obtaining better yields), they are nonetheless frequently reluctant to adopt agroforestry. Trees may need to grow several years before there are any economic gains, reducing the appeal of planting trees. Furthermore, rural farmers often lack the technical, financial and organizational support to conduct a successful agroforestry project (ibid.).

1.3 Research Focus

The present research compares the social barriers and the incentives to farmer participation in agroforestry projects in two Salvadoran communities with different organizational levels. Social science can enhance research and development on agroforestry to bridge the gap between laboratory studies and what is of practical application in the field (Rochelau, 1999). This research found that if a local community is organized around local efforts in promoting soil regeneration and tree planting, agroforestry is more successful. These organized local efforts are crucial to the long-term development of agroforestry in El Salvador.

The literature discusses that one of the main barriers that prevents farmer participation in agroforestry is land tenure. By the late 1970's, export crop development resulted in the concentration of the most fertile lands in a few hands. Small farmers have not benefited from this export model. As the concentration of land increased, tensions rose over scarce land resources, which led to twelve years of civil unrest. This civil unrest resulted in the organization of rural communities throughout the country by key political leaders. These historical, social and political developments have shaped organizational levels and have resulted in some rural areas being more organized than

⁹ Such papers include Castillo and Beer (1983) for the Kuna Indians in Panama; Budowski (1981) and Fournier (1981) for Costa Rica; Martinez (1982), Leiva and Lopez (1985) for Guatemala; Campos Arce for

others. This manifestation was due to the social and political support some farmers provided to the rebels of the Farabundo Marti National Liberation Front (FMLN)¹⁰. Although the civil war ended with the signing of the peace accords in Chapultepec, Mexico¹¹, the legacy of this rural organization lingers on. Areas that were more socially organized during the conflict continued organizing after the peace accords and have hence been more successful at incorporating sustainable projects. Rural communities can benefit from such organization to further promote agroforestry development.

1.4 Objectives

This project identifies barriers and incentives to the participation of farmers in agroforestry projects on Salvadoran hillsides. Two rural communities were compared on the basis of their different organizational recent histories to determine whether these differences influenced the participation of farmers in agroforestry projects. The research therefore aimed to identify social and organizational characteristics needed for the design and successful implementation of agroforestry projects in both communities. La ciudadela Dr. Guillermo Manuel Ungo (community # 1) and el canton los Melendez (community # 2) were chosen for this study. According to Valle (1999) and my reconnaissance work in both communities, communities # 1 and # 2 have different histories of organizing around community projects. Community # 1 appeared to be more organized than community # 2. Farmers from community # 1 reported that they had been supported and organized by members from the FMLN during the civil war. Community # 2, on the other hand,

Hillsides, and Rodriguez et al (1983) for Guatemala, Honduras and Panama.

¹⁰ The FMLN, a leftwing national front, originated as a result of fifty years of authoritarian military regimes. Five clandestine organizations composed the FMLN: Liberation Popular Forces (FPL), Revolutionary People's Army (ERP), National Resistance (RN), Communist Party (PC), and the Central American Revolutionary Workers Party (PRTC) (Armstrong and Rubin, 1993).

was under close scrutiny by the government and therefore developed less community organization. The purpose of the study is to establish whether the organizational difference between the two communities influenced farmers' participation in hillside agroforestry.

1.5 Significance of the Study

While a significant amount of research has been conducted on the technical aspects of agroforestry, very little agroforestry research has focused on the contributions of the social sciences to the success of agroforestry in rural areas. The significance of this study relates to understanding the role of individual and collective incentives and barriers to agroforestry projects in degraded areas. There is a need to understand what barriers farmers face and what incentives seem to entice them to adopt agroforestry projects. Social science tools can be very effective in determining these barriers and incentives. In terms of farmer involvement, the study explored how the current organization levels of community # 1 and # 2 relate to agroforestry development. From this analysis, new ways of building on organization, enhancing local capacities, and empowering farmers are explored. The idea is to explore, through the use of social science research tools, the role of organization in agroforestry projects and how it can increase the long-term involvement of farmers in agroforestry projects.

¹¹ Among many other things, the peace accords transformed the FMLN into a political party and allowed other groups and organizations to participate in the political democratic process of the country (Bran and Ogaldes, 1996).

1.6 Study Limitations

Although the rural communities where the interviews were conducted have been previously introduced to soil conservation practices and reforestation projects, they have only recently been exposed to agroforestry projects. Trying to qualitatively assess farmers' participation at this point seems premature. The agroforestry project that I was examining was implemented in January 1999. Thus, trying to determine whether or not the organizational level has an impact on farmers' participation is a challenge given participants were only just recently taking advantage of the project. This study would have been strengthened with more time to assess the reasons for farmers' participation in this specific project in community # 1 and in community # 2.

The time of year during which the study was conducted also presented constraints. During the rainy season (May through July) the majority of farmers are on errands to obtain agricultural inputs for their corn fields and are starting their planting season. For this reason, my ability to collect information from a wide range of farmers in each community on their agroforestry participation was limited.

Farmers' short responses and suspicion of this research proved to be another constraint. I can speculate that farmers from these two communities were suspicious because of their past experiences during the civil war. During that time of turmoil, many farmers disappeared or were killed because of their support of the guerrillas or of the government. Likewise, agroforestry promoters in the capital city were suspicious when I called, and several of them did not return my calls or refused to meet with me.

Another challenge of doing research in El Salvador is the high crime rate; daily kidnappings, murders, robberies, and break-and-enters are the norm. My research was

inhibited because of the many extra precautions that had to be taken throughout my stay.

1.7. Organization of the Thesis

Chapter Two presents an overview of the study setting with a detailed characterization of agricultural policy in El Salvador. Included is a discussion of environmental problems such as deforestation and its social impacts. As well, there is a discussion of the potential of agroforestry systems to regenerate the soil and provide food and nutrition for rural peoples. The chapter concludes with a definition of agroforestry and the use of agroforestry practices on sloping lands.

Chapter Three begins with a general introduction of the social and economic benefits of agroforestry. Barriers and incentives to farmer participation in agroforestry are discussed. Land tenure is examined as a barrier to farmer participation. Economic barriers such as profitability, lack of markets and labour are also discussed. Technical barriers in terms of resources, technologies and expertise for carrying out agroforestry projects are outlined. An overview of socio-cultural barriers (such as gender) are presented. Finally, the organizational capacity to implement agroforestry projects is reviewed. This organizational capacity section addresses land ownership patterns, leaders, family units, community structure as well as local farmer commitment and involvement in the design of agroforestry.

Chapter Four provides an overview of how the research was conducted. The chapter begins with a brief description of the geographic location of the study. The methods used and the objectives of this research are outlined. Research activities carried out throughout the three month period are discussed. This includes a description of: instrument used, selection of the district, selection of rural communities, reconnaissance

visits, research design, sampling, research procedures, data analysis, trustworthiness, and ethics. Finally, the limitations and strengths of the study are described.

In Chapter Five, the findings of the study are presented. More specifically, barriers and incentives to participation of farmers from community # 1 and # 2 in agroforestry projects are described. Chapter Five also discusses the findings in its theoretical application and association to the barriers, incentives and participation themes presented in this study. Finally, the chapter concludes with a summary of findings and discussion, and a brief presentation on the socio-political context of agroforestry, time of agroforestry, the interview process, and crime and violence.

In Chapter Six, a discussion of the sociological implications of agroforestry research is presented. Finally, suggestions for future research, and concluding remarks are discussed.

2. Study Setting

2.1. Historical Background

In 1881, agrarian laws¹² were enacted that began a process of converting communal lands into private lands, the majority of which were found in the Western and highland areas of El Salvador (North, 1985). The Salvadoran state also supported coffee production for export to replace the declining international market for indigo, the local traditional export. Communal farmers responded slowly to this change, as they could not compete with private farmers (ibid.). Communal farmers, lacking access to credit and natural resources, could not afford the use of the land for export crops such as coffee, which requires up to five years to mature and produce the first harvestable fruit (ibid.). Over time, lands were increasingly taken over by large wealthy estate owners to cultivate crops for export. While some trees were left to provide shade for coffee cultivation, large forested areas were cleared to increase cropping area and productivity (Beer, 1997). Consequently, communal farmers were displaced onto the least fertile lands. These areas, the majority of them on hillslopes, have been over-used resulting in severe environmental degradation in the form of soil erosion and loss of soil nutrients.

2.2 Coffee, Sugar, and Cotton Production

After the agrarian laws were enacted, the Salvadoran government intensely promoted rural development through export cash-cropping practices. Salvadoran governments and wealthy landowners considered coffee cultivation to be the best way to increase economic growth and wealth in the country. Coffee became the leading source

of export by the beginning of the twentieth century, becoming a source of government tax revenue, domestic capital formation, rural employment and economic activity (Paige, 1993). The functioning of the economy depended entirely on the production of coffee. The Salvadoran elite considered coffee *a gift of God* (ibid.). A member of ABECAFE (Asociacion Salvadorena de Beneficiadores y Exportadores de Café or the Salvadoran Association of Export Coffee Growers) replied, "If coffee is good, the economy is good; if it is bad, the economy is bad" (ibid. 14). The coffee elite, or wealthy farmers, argued that coffee would take El Salvador towards industrial development and that it would benefit all citizens. Paige holds that coffee growers and exporters saw no need to change the agrarian model that had kept El Salvador underdeveloped for over a century (ibid.). Rather, coffee growers and exporters further increased coffee production. Paige operates from a development theory perspective, which acknowledges that the core develops at the expense of the peripheral rural areas.

By the 1970's, coffee world prices had dropped and production costs had increased. This led the wealthy farmers to add sugar cane and cotton as new agricultural exports. Sugar cane was produced along the upper Lempa River Valley and in the northern portions of San Vicente (Kincaid, 1987). Because sugar production was capital intensive, poor rural farmers could not compete in this market, forcing them to sell their land to larger commercial landowners. The price of sugar cane eventually became as dynamic as that of coffee (Arias, 1988). The cultivation of this crop further deepened the growing financial dependency of the country on the export industry. In fact, by 1971, the land area under sugar cane production had increased from 5,000 hectares to 28,000

¹² This included the right to sell land that resulted in many communal farmers to lose their properties to money lenders and lawyers. During this time, the army consolidated its role in the political spectrum of the

hectares (North, 1985). In addition, the exporting of cotton promoted investment in the industrial sector. Cotton fiber and cottonseed oil made the local manufacturing of textiles and margarine possible (ibid.). Arias (1988) suggests that by the late 1970's the Salvadoran economy depended completely on exports to finance its imports, its reproduction and its accumulation.

The introduction of cotton and sugar cane led the wealthy farmers' demands for land and to the increased value of agricultural property. Two changes in land tenancy became evident as a result of the expansion of cash crop export: the decrease in the poor farmer residency on lands, and the increase in the leasing of the land to the farmers (Gordon, 1989). By the 1960's, the new structure of land tenure concentrated land titles among a few Salvadoran wealthy families. The rise of cotton and sugar cultivation converted the land into extensive cattle and grain "*haciendas*," forcing a large-scale expulsion of the peasants who occupied those lands (Kincaid, 1987). By 1971, landholding under traditional tenancy agreements declined by 77 per cent. While farms larger than 500 hectares accounted for 15 per cent of agricultural land, about 50 percent of farmers were less than one hectare in size and occupied less than 4 per cent of the total agricultural land (Browning, 1983). *This study focuses on the farmers found on these small plots of land.* Government statistics showed that 70.5 per cent of the peasant population owned only 6.2 per cent of the land. Cotton cultivation grew to 85 per cent in areas with over 200 hectares. Demand for land to grow cotton in the coastal region and sugar in the central and northern regions of El Salvador created a price increase for leasing land. Wealthy landlords began to prohibit the residency of poor farmers on their land (ibid.).

country (White, 1987).

In the most fertile lands, the agricultural sector was geared toward external markets. Rural poor farmers were neglected in the security of land tenure, access to credit or markets, pricing policies, and technical assistance (ibid.). The effect of this land use policy was that a small number of large and medium-size farms accounted for the production of major export crops and a large number of small farms or single plots were cultivated with subsistence crops. There was a remaining population of landless poor farmers who were displaced from their means of subsistence. Their dependency was in the form of temporary employment, often through "*destajo*," on privately owned farms. Landless poor farmers were forced to join the already migrant landless city workers.

The support for export cash-cropping resulted in changes to the rural employment sector. The work day was lengthened because payment was made per specific task (Arias, 1988). This task is referred to as a "*destajo*". Work by "*destajo*" was labour intensive and energy consuming, and extended the work-shift by incorporating the entire family. Because payments were based on "*destajo*" during the coffee harvest, the average daily salary per worker barely reached 55 per cent of the minimum average salary that was officially established at the time (ibid.). From 1880 to 1910, agricultural salaries fluctuated between two to three cents (US) per day. By 1913, the Salvadoran state approved a minimum salary of nine cents (US) per day. By 1964, the minimum salary had reached twenty-five cents (US) per day (ibid.).

The new leasing process no longer allowed farmers to cultivate basic grains for subsistence on the landowners' land. While the poor farmer's cultivation of subsistence grains was reduced by a third, the leasing of land to grow cotton and sugar cane increased by nine per cent. Consequently, these transformations affected the composition of the

poor farmer ownership of land and had severe impacts on the environment. The intensification of export agriculture in the most fertile lands drained the soil of its nutrients because wealthy farmers cultivated more land and small farmers were confined to small plots to cultivate subsistence grains (White, 1973).

In El Salvador, cultivation and export of cash crops as well as inappropriate agricultural practices (e.g. intensive farming and pesticide use) have resulted in soil degradation and rural poverty. As soil is degraded, it becomes less productive, and as a result, farmers are unable to sustain their yields. Decreasing yields lead to decreased crop productivity and consequently increased rural poverty. From 1968 to 1983, monocrop cultivation for export represented between 21 and 26 percent of the Gross National Product (GNP); prices have stayed the same since 1962 (Arias, 1988). Monocrop cultivation has been controlled and supported by 51 families in a country of approximately 6 million people (Juarez, 1995).

The large majority of the rural population has not benefited from export agriculture. The concentration of land ownership among a small percentage of the population, and the lack of resources (such as technology and credit) available to small landholders has resulted in poverty. In response to these obstacles, farmers have over-cultivated their small plots of land. These land practices have further contributed to soil degradation and rural instability.

2.3 Agricultural Policies

2.3.1 Key Trends in Agricultural Change

The preexisting distribution of income, assets and power has strongly influenced agricultural policies in El Salvador. Income distribution in the country is mainly driven

by the structure of land tenure and by the effects the rural landless and land-poor have had on urban and labour markets (Pastor and Conroy, 1995). In addition, economic diversification in the 1980's resulted in the decline of the agricultural sector, and considerable growth in commerce and services. While this decline was in part due to the war, it was also in part due to a sharp shift in relative prices for agricultural products. For example, in the 1980's, agriculture's share of GDP, including agroprocessing, stood at 35%, whereas in 1993, agriculture and animal husbandry represented approximately 9% and agroprocessing 11% of the GDP, totaling 20% of the national GDP (Acevedo, Barry, and Rosa, 1995).

2.3.2 Deterioration of Prices and Credit Availability in Agriculture

A deterioration of trade in agriculture, coupled with the decline of coffee prices and basic grains have influenced the decline of importance of agriculture to the GDP (Acevedo, Barry, and Rosa, 1995).

Even though El Salvador's agricultural sector was affected by the political and economic crisis of the 1980's, by the end of that decade the sector had begun the process of recovery. From 1990 to 1993, agriculture, animal husbandry and agroprocessing grew at a rate of 4.6% per year. This growth included the production of subsistence grains and of export of crops (except for cotton). Because of the continuing deterioration of relative prices, this recovery of production has not been sufficient to prevent the slide of the nominal GDP in the agricultural sector (ibid.).

By 1993, the price index had dropped to 75% of the 1989 level and to 35% of the 1980 level. While agriculture's significance dropped in the 1980's and early 1990's, exports generated by agriculture and animal husbandry still account for more than 50% of

El Salvador's total export earnings. Coffee continues to be the main grain, accounting for 37% of total exports. Agriculture, animal husbandry, and agroprocessing employ more than 50% of El Salvador's active population. Agriculture and the husbandry sector alone absorb 34% of the labour force (ibid.).

Lack of agricultural credit and technical assistance have been longstanding barriers for rural farmers. For example, prior to 1989, rural credit included subsidized interest rates and a comprehensive complex structure of lines of credit. From 1980 through 1988, the real volume of credit granted to the agricultural sector shrank down to 44%, and its share of total bank credit fell from 30% to 13.5% (Acevedo, Barry, and Rosa, 1995). Coffee cultivation absorbed more than 70% of the credit extended to the agricultural sector. Also, the banking system provided little credit to small farmers, except for the Banco de Fomento Agropecuario, which allocates a share of its lending to subsistence farmers. The formal financial sector only covers the credit of approximately 20% of small farmers.

2.4 Agrarian Structure

2.4.1 Land

The availability of arable land is about 0.7 hectare per rural inhabitant actively engaged in agriculture. The agrarian reform process that started in 1980 redistributed approximately 295,000 hectares of land, about one-fifth of the country's arable land (Acevedo, Barry, and Rosa, 1995). This agrarian reform of the 1980's¹³ was composed of three phases. Phase I expropriated farms of over 500 hectares. Phase II, which was

¹³ The Agrarian reform was introduced to alleviate the extreme poverty levels of farmers in rural areas. Access to land has often been a critical issue and source of conflict in El Salvador. In the eighties, it was believed that the introduction of land reform would deter civil unrest and promote social compromise (Moreno, 1991).

never implemented, would have extended its reform to holdings of 100 to 500 hectares, including many of the coffee *haciendas*. Phase III attempted to transfer land titles to tenants on rented lands. Approximately 85,000 rural families benefited; this represents 10% of the country's total population. Because the last agricultural census was completed in 1971, it is difficult to determine the effects of the agrarian reform and of the civil war on El Salvador's agrarian structure (Acevedo, Barry, and Rosa, 1995).

In addition, had the land transfer program included in the Peace Accords been fully implemented¹⁴ it would have provided land to approximately an additional 47,000 beneficiaries. Nevertheless, this would have been clearly insufficient to solve the problem of rural landlessness (Acevedo, Barry, and Rosa, 1995). For example, the full implementation of the Peace Accords could have benefited 75,000 adults, but it would still have left roughly 300,000 people, more than half of the agricultural rural farmers, without land. This would have been no different than the agrarian situation at the beginning of the civil war.

Access to land seems to be one of the main factors affecting household income (World Bank, 1998). On average, a rural household would require an increase of 10% in land ownership to boost per capita income by approximately 4%. Farmers would require 2 to 5 ha of land in order to bring them up to the extreme poverty line, and approximately 12.6 ha of land to surpass the poverty line. These estimates show the limitation of land redistribution in alleviating poverty among small farmers, and outline the importance of non-land factors in reducing rural poverty.

2.5 Environmental Problems in El Salvador

2.5.1 Land Degradation Problems

Subsistence agriculture in El Salvador has traditionally been synonymous with rural poverty (Acevedo et al., 1995). Today the families who attempt to survive on very small farms are extremely poor (McCulloch and Futrell, 1988). The World Bank (1998) estimates that the average per capita income in the rural areas is about \$460 US per year. These poor farmers are frequently located in areas not suited for any of the export crops. Thus, the current pattern of land use has remained similar to the private land use in colonial times, with the critical exception that current over-use of much of the land has resulted in soil depletion.

In El Salvador, land degradation is believed to be one of the most important natural resource management problems across the country (World Bank, 1998). Land degradation has resulted in reduced agricultural productivity and sedimentation of rivers, lakes and reservoirs. Soil degradation affects about 31% of fields farmed by farm households. Approximately 53% of fields on moderate slopes, and as many as 83% of fields on steep slopes are affected by degradation. Thirteen percent of the fields on steep slopes are expected to suffer severe yield declines and 9% are expected to suffer moderate yield declines. Agricultural practices, especially on the hillsides, have therefore had tremendous environmental impacts (Acevedo et al., 1995).

As previously mentioned, El Salvador has seen tremendous environmental degradation from past development patterns. This has led to widespread deforestation, soil erosion, sedimentation of waterways, and unchecked contamination of surface water

¹⁴ The Peace Accords included a component on land reform because many guerrilla and army combatants were of rural origin and needed some land for survival. Also, access to land was one of the critical points

(Acevedo et al., 1995). This deterioration of natural resources is most obvious in the rural regions, particularly in the north and east. The sloping lands of the country are being over cultivated due to economic desperation. This results in greater soil erosion and low soil moisture. While there is a great need to increase support to basic grain producers, this support must take into account that hillside agriculture provides both food and hydrological services to the country (ibid.).

2.5.2 Deforestation

The World Bank estimates that 35 per cent of the disappearance of closed forests in Latin America can be attributed to the conversion of forests to agricultural uses (Barraclough and Ghimire, 1995). Slash-and-burn (swidden) agriculture is one cause of deforestation. However, long fallow swidden farming has been found to be sustainable as long as enough forest is left available for longer rotations on good soil. In the case of El Salvador, deforestation has resulted in small scattered patches of forest (covering 12 per cent of the land area), with approximately 2 per cent of original tropical forest remaining in protected areas (Juarez, 1995). As the forest ratio available per family is seriously affected by land alienation and population growth, fallow periods are shortened (Barraclough and Ghimire, 1995). Shortened fallow periods lead to lowered yields and to the loss of nutrients in secondary forests¹⁵. Thus, cultivators are forced to clear fragile soils and steep slopes and to use these areas for longer periods of time. In El Salvador, hillsides cleared of forest cover have been overused for agriculture, resulting in an increase in the loss of topsoil (Barry and Rosa, 1996). Topsoil loss is accelerated when

that led rural people to take up arms in the first place (Bran and Ogaldes, 1996).

¹⁵ Secondary forest is the regrowth after major disturbance. Regenerating forests, when not cleared or managed, will often mature into secondary forest. In El Salvador, coffee plantations are a good example of secondary forests that have shady and fruit trees (Sustainable Agriculture, 1993).

adjacent tree cover is removed. Tropical forest soils are shallow and easily eroded when cleared of trees because trees provide forest foliage, undergrowth and a rooting system that protects the soil from erosion. The removal of trees breaks down the soil's capacity to resist the impact of tropical rains, heavy surface-water flows, and groundwater infiltration. Uncontrolled downhill runoff results in flooding, and an increased sedimentation of rivers, lakes and reservoirs. The erosion of fertile topsoil also leads to reduced yields, requires more labour and can increase costs in local agricultural systems (Barracough and Ghimire, 1995). These and other mechanisms result in the decay of traditional farming systems and the increase of rural poverty.

2.5.3. Social Impacts of Deforestation

Deforestation, due to forest clearance or degradation, results in a subsequent reduction of forest supplies for local people (Barracough and Ghimire, 1995). These products may include fuel, construction materials, fodder, fibres, food and medicinal plants. Fuelwood appears to be the most crucial. Fuelwood is consumed by approximately 98% of rural households, with an average of 3.1 kg/person/day, and provides 92% of household energy requirements for cooking and heating in Salvadoran rural areas (Juarez, 1995). Scarcity of fuel supplies can result in higher prices, which most heavily affects the poor. Scarcities of construction materials, forest fodder, litter, reeds and thatching can have similar negative results (Barracough and Ghimire, 1995). Adaptation mechanisms can, however, compensate. For example, in rural Java, Indonesia, agroforestry practices have increased fuelwood supplies where traditional sources of fuelwood have been lost.

Short-term social impacts are considered different than those that appear over decades or several generations (Barracclough and Ghimire, 1995). The social impacts of deforestation, at local levels, may appear to be direct, easily observable and quantifiable. However, most social impacts cannot be clearly separated from social impacts of the broader social processes that result in forest clearance. Market changes, fluctuating prices, technology, public policies, demographic factors, land inequality, labour and marketing relations all interact to affect forest clearance and degradation.

When examining social impacts, it becomes crucial to identify various social groups (Barracclough and Ghimire, 1995). While indigenous forest peoples and poor farmers may experience somewhat different challenges, they may suffer similar impacts from the disappearance of their habitat. Social impacts vary across social class, status, gender, age, occupation, ethnicity, nationality and according to different rights and obligations of landowners, renters and sharecroppers. When faced with deforestation, large landowners will have better options than do poor farmers.

Within the local context, social relations have been frequently conditioned and perpetuated by access to land, water, markets and other sources of power (Barracclough and Ghimire, 1995). However, even the most isolated local communities are being slowly incorporated into the broader national and international networks that include exchange, production and political relations. Thus, linkages between different local groups and strata with external social actors play a greater role in influencing isolated communities. Even though these non-traditional agricultural systems¹⁶ can be sustainable in some circumstances, the economic and social costs may be too high to sustain the

¹⁶ Non-traditional agricultural systems may include planting flowers, and/or fruit for export.

system and they may become non-viable during periods of fallen prices and political unrest.

2.6 The Potential for Agroforestry Systems

2.6.1 An Option for Regenerating the Soil

Humid tropical ecosystems are considered fragile and prone to environmental degradation and loss of productive capacity when disturbed by humans (Vergara in Gholz, 1987). The transformation of a natural ecosystem into an agroecosystem results in nutrient loss and usually exceeds the natural inputs by a substantial amount. Nutrient removal can be caused by: (a) forest cutting and biomass exportation (i.e., logging prior to cropping); (2) increased erosion and runoff caused by exposure to rain and wind, and a loosening of the soil surface through cultivation; and (3) massive nutrient transfer through frequent harvest of annual crops (ibid.).

Mechanical and vegetative methods are alternative ways to reduce erosion and nutrient losses from fragile upland sites (Vergara in Gholz, 1987). For the purpose of this research, only the vegetative method will be covered as it applies to the cases under study. There are two types of vegetative methods to soil conservation (ibid.). First, careful replacement of deep-rooted trees along contour lines can be used. These contour hedges can anchor and stabilize slopes and act as living erosion barriers. Soil particles will start to erode from the clear strips between the contour rows and lodge against the “live wall,” resulting in the formation of natural terraces. The second vegetative approach in part consists of reusing the biomass remaining after harvest to reduce or lessen nutrient transfer from the area. For example, leaves and branches of tree crops can

be spread on the field to conserve moisture and to protect it from both splash erosion and surface erosion (ibid.).

The introduction of nitrogen-fixing (N-fixing) trees, such as *Casuarina* and *Alnus* groups, can enhance natural inputs. Microbial agents, *Rhizobia* and *Frankia*, can also provide nitrogen. This method requires human intervention to select species with N-fixing capabilities (Vergara in Gholz, 1987). Agroforestry can mix nutrient and soil conserving trees as well as soil-forming, and soil-improving perennials with food crops.

2.6.2 Food and Nutrition

Small farmers live off of agriculture and the production of subsistence crops. (Ulate and Munoz, 1994). Small farmers are unable to produce the quantity and quality of foods and products they need to cover their basic necessities. The lack of food interferes with the appropriate growth and development of the individual, which can have an impact on individuals' ability to work. These conditions create a vicious circle of poverty, underdevelopment and malnourishment that limits small farmers' ability and opportunities to break the cycle (ibid.). The inclusion of nutritional goals in sustainable agriculture has advantages because it benefits rural families and results in greater environmental protection. Kidd and Pimentel (1992) add that integrated resource management systems may lead to nutritional improvement through the increase of food, fuel and cash. Human food supplies increase because of the available food produced on trees, availability of game due to the habitat created by trees, increased productivity of domestic animals because of the greater supply of fodder, the increased productivity of annual crops, and the availability of cash to buy food and fuel. Agroforestry can offer a variety of beneficial products such as fuelwood, wood for building, flowers, medicinal

products, roots, tubers, coloring, scents (Guevara, 1998). Moreover, this system provides an opportunity to produce a greater variety of foods, which could result in a better balanced diet for rural families. Home gardens, for example, can contribute to the strengthening and diversification of the rural farmers' diets. They provide the rural farmer with vitamins, iron, calcium, calories and proteins (Ochoa, Fassaert, Somarriba and Schlönlvisgt, 1998). These products can provide basic necessities, especially for women and children.

Agroforestry could also improve the nutrition of the landless farmers by giving them access to common and public lands on which to grow multiple-purpose trees (Kidd and Pimentel, 1992). For example, the flowers of *Yucaa elephantipes* and *Spondias purpurea* are eaten in El Salvador. The enhanced production of these flowers could provide greater nutrition to rural locals.

Agroforestry results in a greater abundance of fuel to cook food, which can contribute to improving nutrition (Kidd and Pimentel, 1992). If fuelwood availability is greater and is closer to home, rural farmers may have more time to spend on agriculture, on breastfeeding children, and/or earning cash. Other rural farmers whose land is too small for food self-sufficiency could improve their nutritional status through agroforestry. These small farmers could produce tree cash crops to supplement their work as wage laborers. For example, wage laborers in South Asia use tree growing on their small parcels to increase cash income (ibid.).

Medicinal plants also have an important role to play in agroforestry (Budowski, 1993). In Central America, researchers have studied traditional application of nutritional and medicinal plants. For instance, there have been agreements with pharmaceutical

producers who need the production of raw materials for teas. This is exemplified by a women's cooperative in the Sarapiquí area of Costa Rica that produces herbs used by various companies (ibid.). In the case of El Salvador, there are developments and initiatives to implement a project of urban agriculture that would have a component of medicinal plants¹⁷. The idea is to promote the cultivation of medicinal plants that can be processed to create various "value added" medicinal products. The medicinal plants project will also promote the creation of a market that can increase people's earning abilities and livelihoods (Pereira, Goitia, Perez, and Guerrero 2000).

Although the introduction of cash crops can result in positive effects, cash crops can take from three to four years between planting and harvesting, potentially leading to *transitional malnutrition* during times of food shortage (Kidd and Pimentel, 1992). For this reason, the tree species introduced in any agroforestry system must be carefully planned between the technical experts and local farmers to avoid such transitional problems and to take advantage of certain species that could be used during those three to four years of planting and harvesting.

Most tree selection in agroforestry has emphasized growing multipurpose trees, but this has resulted in the isolation of other species (Nair, 1997). Lately, there is new interest in "Cinderella" species, indigenous fruit trees, woody species that have medicinal products, ornamentals or species that produce high-grade timber. Although the value of these trees has been greatly appreciated by local people, such species have been largely over-looked by technical experts. Agroforestry research in the 21st century should therefore include the domestication, improvement, and exploitation of indigenous trees

¹⁷ The Balsamo Association, from El Salvador, with support from the Garden Institute in Canada have developed and designed a project of urban agriculture. Balsamo members intend to seek support for the

(ibid.). Domestication of those tree crops can increase yields, provide greater quality products, enhance commercial potential, but most of all provide food security and improve the nutrition of the farmers.

urban agriculture project from governmental and non-governmental agencies.

3. Literature Review

This research examines the social barriers and incentives of small farmers to participate in agroforestry projects in El Salvador and summarizes related literature that addresses these social factors.

3.1 Participation in Agroforestry

Michael Cernea (1985) looks at the role of community participation in natural resource management. He argues that governments and non-governmental organizations face key problems to initiate and implement sustainable rural development. These difficulties are not strictly technical, but rather more social and institutional in nature. The issue becomes how to involve and sustain the participation of people in a project. For participation to occur, it is necessary to identify who benefits and how beneficiaries are organized to implement the project. Financial investments alone can not determine a program's success. This point goes beyond merely the dynamics of individual adoption of innovations around tree growing to the complex process of collective participation. There is a need for sociologists to be more concerned with the dynamics of collective behaviour as well as to be aware of the systemic diffusion of collective innovations. Cernea further argues that sociology, as a discipline, can play a key role to address this challenge. Sociological discourse provides professional precision to the process of participation in natural resource management. Cernea adds that sociology can propose strategies for organizing *individual users* of natural resources into *user groups*, enabling these *user groups* to work as producers and managers to obtain increased benefits through group action.

Cernea (1985) adds that successful social forestry implementation can lead to cultural change in the behaviour of people with respect to planting and protecting trees. The strategic objectives embedded in the very concept of social forestry are as follows: to encourage large numbers of people to plant trees; to promote the kind of tree growing that will best supply fuelwood, small timber and grasses to the small producers themselves; to increase the income and benefits of forest products to poor people; and to improve environmental protection (Cernea, 1992). In other words, social forestry aims to influence a number of people to plant trees for fuelwood, and for soil buffers on their own to address their needs (ibid, 1992). He argues that successful social forestry development does not only involve individual initiatives and behaviours, but also the establishment of social structures, collective action and institutional development. One way for understanding the potential for social structures, collective action and institutional development is to use a map of influence.

WOLA (1998) suggests that this political Map of Influence can help identify the key actors and their level of influence (be it positive or negative) on the decision making process. In the Map of Influence there are a variety of actors such as people, organizations and institutions, all with a certain level of interest in the proposed project. The key political actors are government representatives, economic and social actors, markets, and the civil population. There are also governmental representatives (national, regional and local), political parties, individuals (friends and relatives of those who have the power of decision making), unions, NGO's, grass roots organizations, religious groups, professionals, the media, and foreign organizations or governments.

The Washington Office for Latin America - WOLA (1998) argues that political influence can make a difference in promoting social change. This political influence refers to planned efforts by the organized communities to influence the national and public policies through persuasion and lobbying. This political influence is a flowing process that looks at policies, projects, community behaviour and change. Its main purpose is to generate access and to influence those who have decision-making power.

The next step is to organize the potential of political actors. Organization can activate the behaviour of individual actors, and it is this area that Cernea argues needs more attention. There is a need for a clear sociological understanding of the type of organization involved to sustain site-specific projects. Existing social structures and units may need to be strengthened and mobilized, and in other cases, new organizations may need to be established and mobilized. Kenny-Jordan (1994) determined that a variety of participation methods and organizing efforts characterized social forestry projects in South America. He found that highly organized communities had unique social histories, knowledge levels of agroforestry and participation approaches. For example, in Honduras and Nicaragua, it was found that a *campesino-a-campesino* (farmer-to-farmer) training system proved to be successful (Utting, 1993). Farmers were the instructors themselves and those that had more experience taught the less experienced. This system facilitated a collection of methods and information related to improved conservation and land management. The *campesino-a-campesino* training system not only facilitated communication and ensured that new practices drew on local knowledge, it also ensured that local groups influenced decision-making and the planning processes.

Perez (1994) argues that understanding local knowledge is crucial for appreciating the relationship between the inhabitants and their surrounding environment. Such understanding is essential in the implementation of agroforestry projects because it ensures that projects are relevant to the participants and the context in which they must satisfy their basic needs.

In the 1990's the Salvadoran agricultural sector was decentralized and this allowed greater farmer participation in community organization, municipalities and schools. Small farmers were encouraged to identify their needs and find collective solutions to their problems. Increasingly Salvadoran farmers' have developed their capacity to analyze and process information, access technology and build knowledge (Silva and Hernandez 1999). Finally, by working in groups small farmers have taken advantage of collective approaches to agroforestry development. Utting (1993) adds that organization and leadership may influence the success of rural development projects. For example, the participation of farmers in successful tree nurseries took place in communities with a specific level of organization, and where the leader was active and involved in the community.

3.2 Units of Social Organization

Fundamental to any innovative program is a unit of social organization that is capable of sustaining that project¹⁸ (Cernea, 1992). Cernea adds that the formation of groups is crucial to the success of developmental programs involving natural resources. He goes on to add that in order to ensure short term use and the long term sustainability of jointly owned resources, the owners need to subject themselves to the same norms,

¹⁸ Projects need to engage rural users into groups of coordinated action by looking at group formation, leadership, participation in decision making, intragroup structures, incentives and benefit distribution.

rights and restrictions. When in a group, farmers need to be a structured social group, where members influence, help and mutually control each other. In the absence of such structures, this could leave space for unchecked and counterproductive individual free-riding behaviour (ibid.). Cernea argues that planners of social forestry projects fail to realize that the inclusion of such factors have to be embedded into the design of such projects if they are to be successful. Cernea (1992) maintains that there is no specific recipe to identify and select social actors. Sociologically sound projects must be tailored and based on the sociological contexts of each region.

The most important factor in the design of agroforestry programs is the appropriate identification of the unit of social organization to undertake the program (Cernea, 1985; 1992). Social units of organization can be existing social groupings, such as the family household, groups set up to plant and protect trees, or groups that were established for purposes other than forestry. Establishing a social group requires a process of selecting members, a desire to participate, a perception of self-advantage and co-responsibility, and the setting up of an enduring social structure with well defined functions (Cernea, 1985). The formation of enduring units of social organization is crucial for tree growing because trees require structured support over an extended period of time (long production cycle). These small-scale organizations increase the ability of individual members to maximize the cumulative impact of their contributions to achieve objectives that might otherwise not be attained (ibid.). Cernea (1995) adds that social forestry strategies need to be open to various social actors such as families and multi-group structures to widen investments and resources. He also argues that projects such as agroforestry require both public and private investments.

Cernea (1995) maintains that the tree projects must include the enhancement of farmers' economic incentives, cultivation skills as well as organizational capability. Roling (1982) argues that governments have to organize agricultural producers who then become effective partners with governments in the design of development projects. For example, in Tanzania, villagers were trained and became successful decision-makers who then planned their own development (ibid). Silva and Hernandez (1999) also argue that to implement projects more efficiently local knowledge needs to be complemented with general information from others actors, regionally, nationally, and internationally.

Central to these social prerequisites is the implementation of a unit of social organization, or a structure capable of sustaining an innovation (Cernea, 1985). Although financial inducements are important, they are not sufficient. The impact of an agricultural innovation is not automatic. Other important social factors include: purposeful patterns of social organization for conserving natural resources and/or for producing new resources; existing land tenure systems that are either conducive or restrictive to the mentioned innovation; ownership rights to and distributive arrangements for the newly developed resources; authority mechanisms for collective decision-making and for mobilizing group (or individual) action; social perceptions, attitudes, and political power that affects the distribution of generated benefits; and the influence of external change agents (ibid). Organizations are necessary at village and sub-village levels through which contact with outside agencies can be fostered. The use of farmers' committees has allowed the collective/joint determination of local priorities to implement plans at the village level (Garforth, 1982).

When farmers act as economic agents, they can achieve for their members

significant economies of labour needed for tree production in activities such as planting, cultivating, protecting, harvesting, and transporting (Cernea, 1995). Also, organized groups may in some cases lease lands under state control for tree planting, and may invest labour in planting and protecting trees in those lands with relatively low costs. In other words, group-based strategies in combination with public-sector support can make better use of dispersed resources. Lusk and Parlin (1991) argue that organizational design may have a public or private character. Lusk and Parlin further argue that the main emphasis in organizational design should be to promote a balance between public management and the private market.

Within the tree-production cycle, small farmer groups can enhance the productive capacity of their members (Cernea, 1995). Some technological needs can be more easily solved by groups. Taking care of and protecting tree plantations against theft, fire and destruction over long periods of time and over large areas, can be managed more efficiently by groups. Groups are and can be powerful motivators for the action of individual members (*ibid.*). For example, in Hojancha, Costa Rica, a socio-economic crisis (due to a big increase in the population and changes in land use) led residents to become organized to face land use challenges (Ramirez, 1994). Local leaders decided what, how, when and where to face this crisis. They did so by obtaining the full participation of the community. Social forestry in the area was strengthened and succeeded due to this emphasis on participation (*ibid.*). The Hojancha experience was replicated in other areas. New groups and organizations were created to implement agroforestry projects. The success of these groups was so overwhelming and beneficial

that they needed to be coordinated by a single organization to plan and identify forestry projects (ibid.).

3.3 The Concept of Participation

Fassaert (2000) argues that the concept of participation suggests community involvement in problem identification, solution finding, solution implementation and the sharing of local knowledge. He adds that most projects lack true widespread participation. Geilfus (1998) presents us with the *ladder of participation*, which gradually goes from *complete passivity* (non-participation), to *participation* (self-development) (See figure A). The success would depend, among other things, on the opportunity for decision-making, the level of organization of the people, the flexibility of the institution, and the availability of all the actors involved. This process of success would include agroforestry promoters who must change some old assumptions and working methods to adapt to a dynamic client group.

For participation to be successful, a dynamic process needs to be created in which the roles of the agroforestry promoters and members of the community must change (Geilfus, 1998). Currently, the traditional approach, the *vertical method*, is characterized by research methods that extract information from the people without their active participation. Under the vertical method, local people do not have a say in the decision-making process. Institutions and agroforestry promoters generally have many communication problems with the community. For example, agroforestry promoters and local people may not use a common language, which can lead to distrust. Across institutions, there is often jealousy, which inhibits the sharing of information and ideas. Language barriers and distrust can make it more difficult for community members to

become informed and access crucial information (ibid.). Parlin and Lusk (1991) point out that the *bottom-up* design can help advocate the development, expansion or rehabilitation of small-scale community based systems. Parlin and Lusk (ibid.) maintain that this *bottom-up* approach is very promising for local ability to operate and manage sustainable projects.

Geilfus (1998) argues that there is a new type of facilitator who can make a difference in agroforestry implementation. This new professional is known as the “facilitator of development.” The role of this facilitator of development is to share experiences, to support people to use their skills, to assist them based on what they view as their needs, and to support them in determining the most appropriate solutions to their problems. The process of participatory communication ensures the flowing of triangulated information from different perspectives and members of the community. There are conscious and dedicated professionals who have demonstrated the success of these new methods. Freire (1990) holds that the extension agent should be a communicator who facilitates the learning process by helping farmers to recognize and verbalize their problems and to seek assistance from other agencies to solve them.

3.3.1 Tools of Participation

Geilfus (1998) presents four tools of participation that are necessary in the effective participation process. These tools of participation are group dynamics, visualization, interview, as well as oral communication and field observation. Field research may be used to gather group and context information prior to using the visualization exercise. First, group dynamics are crucial to obtain people’s effective participation; farmers are encouraged to identify their common problems and offer

solutions to those problems. Second, visualization involves graphic representations that can increase the participation and consensus of people who share various educational backgrounds. Third, interview and oral communication with select key informants and groups can provide triangulation of information from various perspectives. Similarly, Kenny-Jordan (1994) argues that the most important aspect of agroforestry social development entails eliciting by community members their own plans, examining their previous conditions, and learning from them how they are now and how they would like to change in the future.

Geilfus (1998) argues that the tools of participation can be used in the various stages of an agroforestry project. In the needs assessment process, these tools are useful to determine people's problems and their respective solutions. These tools make sure that this planning process is accessible to all. The tools can be used in the implementation process, including during the monitoring and adjustment changes, and the evaluation process. Finally, Geilfus (1998) adds that this participation process is an instrument for *conscientization* and *mobilization* of the people. While conscientization refers to the process whereby farmers become aware of their own reality, mobilization describes the farmers' actions to find solutions to their problems. Freire (1990) argues that it is crucial to get to know people's reality and their awareness of that reality because this ensures that their specific views are respected. The participation process does not end with the implementation stage. Rather, the participation process is adjusted and completed throughout the entire process of the agroforestry projects' continued operation. This adjustment is executed based on the needs of the people in the project, recognizing that needs might change over time. Lave and Wenger (2000) point out that understanding, of

a person to participate, is entwined with the specifics of the community, available tools, and activities. In other words, farmers can learn as they participate with the community (history, assumptions, cultural values, rules, and patterns of relationship), available tools (objects, technology, languages and images), and the activities (purposes, norms, and practical challenges).

3.4 Barriers to Participation in Agroforestry

3.4.1 Land Tenure

Historically, Salvadoran agrarian structures have been characterized by the most and best lands being held by a few wealthy families and the ownership of the least fertile lands by small farmers. Small farmers, who could not improve their rural quality of life, were further excluded from agricultural benefits, gains and credits (Funde, 1997).

In the early 1980's, a process of agrarian reform resulted in an increase in the number of small farmers (*minifundization*) from 35.9% to 40.7% of the population. The current national agrarian land available represents 1,556,568 hectares. While 79.0% of this land is privately owned (approximately 1,229,248 hectares), the other 19.7% is part of the reformed sector, land distributed in the form of cooperatives and small plots (approximately 306,794 hectares) (Funde, 1997). The final 1.3% of land is part of the national protected areas. Evidently, the process of agrarian reform led to important changes in the structures of land ownership. Currently, there are more than 230,000 small farmers who own plots smaller than 2 hectares. There are over 40,000 small farmers who own between 2 and 5 hectares, and only 4,200 small farmers who own over 50 hectares (Funde, 1997).

Spatial issues may affect agroforestry in many ways. The location of roads, areas and patterns of land-use, and the organization of natural and man-made features, all play a part (Burch and Parker, 1992). Moreover, space restrictions affect the options available to small farmers, many of whom own plots of land only 2 ha in size. This limited size results in conflicts between the sustainable practice of planting trees and the cultivation of subsistence crops (Barry, Rosa and Cuellar, 1996).

For many households, agricultural-related activities are the main source of survival (World Bank, 1998) and access to land is crucial to household income. El Salvador is a very small country, and is one of the most populated nations in Latin America. A substantial proportion of small farmers cultivate low quality land in ways that deplete the soils of nutrients. There is a coexistence of three prototypes of land tenure structures: small farmers, larger commercial farms, and land reform cooperatives. Agricultural land in the land reform cooperatives, when given the necessary resources, is more productive than other agricultural land in El Salvador. Land occupied by cooperatives has a higher per capita occupation in it than land occupied by small farmers. Farmers from cooperatives also have better access to credit and agricultural inputs than do individual farmers. However, only 8% of the country's agricultural production is from land reform cooperatives.

Agrarian reform is generally evaluated economically, yet in El Salvador it is also a controversial social and political issue (World Bank, 1998). El Salvador has a relatively high labour/land ratio resulting from the scarcity of land. In rural households, small farmers and landless rural workers have the same level of poverty. The percentage of farmers and landless workers in extreme poverty is almost the same, at 27% and 30%

respectively. The advantage farmers have over landless workers is that they own their land and are therefore not susceptible to the landowners' demands.

The lack of land tenure security can reduce on-farm investment and consequently lower farm productivity (World Bank, 1998). The World Bank holds that land titling and registration may enhance farmer productivity and income. It may provide incentives for attached investments and improve access to credit by using land as collateral. This could improve the functioning of land markets through reduction of transaction costs of land conveyances and long term rentals. Land security requires title registration and complementary measures to prevent land invasions, to promote leasing and to foster cooperatives to rent land openly (ibid.).

After the war ended some lands were allocated to farmers as *pro-indiviso* (cooperative ownership), but the social organization of such ownership was reported to be weak and not providing enough incentives to individual farmers to contribute their labour to long term land improvement efforts. Thus, the World Bank intervened to transform the cooperative arrangement into a free land market project that facilitated individual farmer ownership (Baumgartner, 1997). Although many former combatants and former soldiers received their land titling and registration, they put up their lands for sale and had no desire to be farmers.

An important incentive is defining the land-tenure system and protecting the land rights of tree producers (World Bank, 1998). Similarly, Cernea adds that tenure of trees needs to be defined and secured legally. Also, modern environmental by-law regulations, in developing countries, have introduced disincentives that limit farmers rights to cutting and harvesting trees planted on their own land. In El Salvador, environmental by-laws •

require permission to harvest trees that have been planted (Diario Oficial, 1998). Such regulations, protecting trees or land, may contradict farmers' wishes to harvest certain trees at certain times and act as a disincentive to planting trees.

3.4.2 Economic Barriers

3.4.2.1 Profitability

The success of persuading farmers to practice conservation through integral agroforestry depends on the economic rewards, which is directly affected by their tenure over land and natural resources. Nair (1990) argues that immediate income from a land-use system is fundamental in paving the way for social acceptability of that system. Studies of small-scale forest-based enterprises have shown that these enterprises are among the top three employers of rural places, especially resource-poor and landless people. In various farming communities, products from trees are often considered commodities. A survey conducted with 300 farmers in Nigeria demonstrated that while the prospects were high for the acceptability of incorporating tree planting into the local farming system, social acceptability depended on cost-sharing devices between government and small farmers, effective extension services and the potential economic benefit from the trees (ibid.). Farmers argued that they would be willing to plant trees if seedlings were obtained at no cost, if intercropping did not interfere with crop yields and if there was a possibility to earn an income from the trees.

Kidd and Pimentel (1992) argue that small farmers value trees because they represent a source of free wood. Also, farmers recognize fruit, fodder, medicines and non-woody products, such as latex, palm oil, cocoa, vanilla, nuts, spices, gum and ornamental plants, as equally important to wood. Juarez (1995) suggests that Salvadoran

small farmers who use agroforestry can benefit by obtaining products such as wood, posts, fruit, fodder, honey and medicines. The sale of these products has the potential to alleviate widespread rural poverty for Salvadoran small farmers who have limited incomes. Farmer's level of poverty can interfere with the acceptability of long-term conservation projects and agroforestry because many farmers cannot afford to wait long periods of time for tree products. Small farmers need quick income returns as incentives to accept agroforestry practices.

3.4.2.2 Lack of Markets and Marketing Skills

The awareness of agroforestry as a crucial land-use technique in the tropical regions has grown over the past 10 to 15 years. This research's significance is both practical and conceptual. Recent studies of small-scale enterprises suggest that they are among the top three employers of rural people, especially resource-poor and landless people. Studies conducted by the Food and Agriculture Organization, FAO (1987) have reported that the major constraint preventing such enterprises from succeeding are inadequate access to markets and raw materials, marketability of trees and tree products, and poor organizational and management skills (Nair, 1990). These studies suggest that efficient rural sustainability through agroforestry can be implemented if policies support the establishment of adequate market systems as well as the development of basic marketing skills.

Direct income from a land-use system is an important issue for predicting the social acceptability of its use (Nair, 1990). Processing and/or sale of agricultural commodities are fundamental sources of off-farm income for many societies. Local markets must absorb the expected increases in production at stable prices (Bunch, 1997).

Although rural families would consume their first increases in production, later production might be sold. The program may have to include some aspect of marketing into the transportation, storage, and processing of the products. There are several other issues to be considered in potential agroforestry markets (ibid.). Markets must be identified in terms of their operation, availability and control. There is a need to find out the availability of tree products through the black market and co-operatives. The transportation, processing and manufacturing capabilities need to be identified. In farming communities, products from trees (such as fuelwood) may be a free commodity. Appropriate market provisions for meeting the local needs for locally produced and available products must be made as the marketing opportunities for such goods are created and expanded (ibid.). For example, some development projects that have promoted the sale of fuelwood have assumed that a shortage of fuelwood would drive people to buy it, when in fact they would most likely seek out alternative sources, such as agricultural by-products. This can result in ineffective projects that are economically unsuccessful (Nair, 1990)

There are several points that must be taken into account when implementing a new technology to create adequate markets (Bunch, 1997). First, market prices must be both adequate and reliable because the profitability of any production beyond that of subsistence would be based on the nature of local markets. Before any technology is considered, market prices and fluctuations must be reviewed. Prices at harvest time are the only ones relevant to small farmers.

Second, the markets must be available to small farmers (Bunch, 1997). Due to small farmer's limitation in transportation and the quantity and quality of their products,

they may find access to markets impossible. City supermarkets demand a quality of products and conditions of delivery that may be difficult for the small farmers to provide.

Third, the market must have sufficient depth, which refers to the amount of supply the market can absorb without significant decreases in price (Bunch, 1997). In many cases, the markets are limited and are therefore greatly affected by fluctuations in prices and demand. Working with limited markets destroys enthusiasm for sharing knowledge and permits the market to have limits on the program's impact, as competition between farmers to sell their products in a limited market becomes fierce, and cooperation is seen as harmful. Also, limited markets discourage innovations among those farmers who lose money when the prices drop. It can also have a very alarming long-term negative impact on farmers' opinion of agricultural improvement as being short-term and unpredictable. This perception can impact future agricultural projects, as farmers may not believe the potential of a project and hence may not be willing to participate. Producing for markets with depth, on the other hand, can have a positive impact on farmers' willingness to participate in agroforestry projects. Such markets may not experience price fluctuations as dramatically as in limited markets and demand is more likely to be constant. Non-fluctuating and constant markets could help ensure the long-term success of agroforestry projects. Successes could increase motivation and willingness to participate and to cooperate. Markets with depth would most likely result in the cultivation of the traditional food crops of the country. Markets with depth could also steer agricultural production towards products, such as subsistence crops, that are easy to store and transport (Bunch, 1997).

3.4.2.3 Labour

Agroforestry innovations can also result in changes to labour patterns. Labour is a factor of consideration when people are deciding to adopt a new practice (Nair, 1990). The immediate need for extra labour can be a disincentive for adopting a new practice. Small holders and landless workers who depend on farm income are disadvantaged when labour peaks coincide with the sowing and harvesting seasons of main crops (Noronha and Spears in Cernea, 1985).

The cheapest labour in developing countries is that of the poorest people (Bunch, 1997). While capital-intensive technology could be advantageous for those with capital, labour-intensive technology might be cheapest for the small farmers. Mechanization is a capital-intensive technology that has become harmful to small farmers because it replaces “human labour” and consequently “threatens the existence of small farmers” (ibid., 106). Although situations do exist where the labour supply during certain months is critical, hence limiting production, Bunch (1997) argues small farmers are often better off without mechanization, given many farmers cannot repair the machines or obtain the parts they need to maintain their use.

3.4.3 Technical Barriers

3.4.3.1 Training, Technical Knowledge, and Education

The lack of adequate technical knowledge in agroforestry has previously been identified as a barrier in agroforestry projects. Utting (1993) suggests that farmers need more training, and personal, intensive services with frequent follow-up visits from agroforestry promoters. This might ensure farmers’ opportunities for success. Bunch

(1997) adds that farmers are more likely to be interested when there are visible successes in agroforestry.

The exchange of information between farmers and agroforestry promoters is crucial in the training of agroforestry technical knowledge. Technical knowledge must be taught using various methods that are available to the farmer. First, the use of dialogue to convey information is necessary for the exchange and discussion because this allows farmers to share their knowledge. Second, agroforestry promoters need to use language that is accessible to farmers to ensure the message is properly conveyed. Third, agroforestry promoters need to be practical when teaching technical skills. Thus, talks, audio-visual presentations, field days and visits to demonstration plots and farms may prepare farmers for their various tasks (Oseguera, 1999).

Education and training are also crucial incentives in agroforestry projects. Oseguera (1999) suggests that education promotes new methods that change behaviour, norms skills and strategies. In order to do this, Oseguera (ibid.) argues that small farmers need to examine their accumulated knowledge. Also, the learning experience strengthens the social consciousness of rural peoples. These learning and knowledge experiences facilitate the progressive understanding of farmers' problems through organizing and leads to the transformation of their thoughts and knowledge. Small farmers are capable of providing solutions and opportunities in their rural environments. Thus, education is important because it supports the innovative capacity of small farmers who are capable of finding their own viable solutions.

3.4.3.2 Access to Resources and Technology

Kidd and Pimentel (1992) argues that when resources are scarce, competing demands are unavoidable. In El Salvador, small farmers and large farmers generally have different access to natural resources. Obviously, wealthy farmers would be the most likely to introduce agroforestry practices because they have access to land and can afford to wait for the long-term benefits of agroforestry. Inaccessibility to natural resources and the existence of a degraded environment leads to widespread poverty (Vosti and Reardon, 1997). When the poor farmers depend on natural resources, degradation of those resources erodes farmers' entitlement to goods. Thus, small farmers would be more reluctant to try new agroforestry technologies.

Small farmers' successful implementation of agroforestry practices may depend on their desire to try sustainable practices, but also on the ability of governmental and non-governmental institutions to provide them with accessible agroforestry technologies. Utting (1993) argues that it is important to assess the size of farms, tenure arrangements and access to credit when introducing agroforestry. The small producer may also lack crucial information on how to use the new technology. For example, small farmers, who are primarily interested in investing time and energy and limited resources into the cultivation of subsistence crops, often lack secure claims to the land they farm. Consequently, they are often reluctant to plant trees. Thus, much depends on the small farmers' access to finance, inputs, and technical assistance, as well as market outlets for tree products.

Utting (1993) argues that technical assistance and extension services have a fundamental role to play in promoting agroforestry practices. Utting goes on to add that

many institutions have imposed generalized models of sustainable projects without considering the local farmers' traditional forms of agroforestry.

3.4.4 Socio-cultural Barriers

3.4.4.1 Government Policies

Government policies influence the type of economic development that is promoted within a country. In most cases, government policies promote intensive agricultural practices that have high capital costs and low returns for small farmers. The lack of policies that promote more sustainable practices hinders the implementation of agroforestry practices. (Nair, 1993). The Research Institute (IFPRI, 1991) formulated three main components to policy change. First, there needs to be an understanding of the current situation, problems and possible solutions. Second, the changes needed must be identified. Third, the policy instruments and mechanisms need to be defined to make the identified changes (Nair, 1993).

Policies are needed to stabilize and rehabilitate deforested areas. Accordingly, policies that support small farmers must also be created. Farmers face socio-economic and infrastructural constraints to adopt sustainable practices. Policies are needed to enable sustainable practices to be accessible and achievable for small farmers (National Research Council, 1993).

Government policies also need to strengthen the role of NGO's in the development of the country and its people. Small NGO's are often more efficient and more accessible to farmers. They can more easily address specific local needs and conditions (National Research Council, 1993). NGO's can provide the training and education that is the most relevant to communities. Strengthening ties between NGO's

and the government could be helpful by using resources more effectively. Local NGO's can also provide a link between community members, between communities, as well as with the government, researchers, universities and aid agencies (ibid.). Policies can also be created to strengthen ties between different NGO's and other groups (Pretty, 1995). NGO's could cooperate on projects, and sharing their expertise (National Research Council, 1993).

3.4.4.2 Women's Participation

Many researchers have found that women are important sources of information regarding forest products, plant properties, and traditional methods of forest management. Due to the division of labour by gender, women have different needs and interests in agroforestry. These needs and interests have not been adequately reflected in project planning (Sharma, Rowe, Grut, Kramer, and Gregersen, 1992). Government policies and NGO's regarding women's issues are also important. By providing policies and programs to promote women's roles in society and agriculture, a more balanced approach to agriculture may be attained.

Women can play a crucial role in effective forest management (Sharma, Rowe, Grut, Kramer, and Gregersen, 1992). In the past, when responsibility for forest protection and rehabilitation has been implemented at the community level, women have been fundamental advocates of better forest management. In areas of Latin America, women have been found to be more interested than men in raising trees for fuelwood and fodder extraction (ibid.).

Steppler and Nair (1987) argue that issues of local use and knowledge, land tenure, organization, landlessness, distance, marketing and labour all have gender

components. For example, in some rural households, men engage in seasonal wage labour and therefore are absent during the week. Agroforestry technicians can reach an agreement with husbands over the weekend, but this might exclude the wives who were not consulted (McCulloch and Futrell in Poats, Schmink and Spring, 1988) and who are left to do most of the work associated with agroforestry. Thus, the design and implementation of agroforestry must be gender-sensitive.

In El Salvador, gender issues are important to consider because it is considered by some, such as Moreira (1999), to be a patriarchal society. Only 10 to 16% of women own plots of land. Such gender bias is due to bylaws, discriminatory policies and socio-cultural norms that have favoured men as the sole owners of land during the agrarian reform process of the early 1980's. Approximately 25% of women in El Salvador are heads of households. In some areas this percentage increases to 60%. Women were excluded in regards to land rights in the Civil Code Bylaw of 1860, the Agrarian Reform Bylaw of 1980, the Peace Accords of 1992 and the Family Code created in 1994. Although there was not a clear discriminatory clause against women, women may have been excluded because they are not considered heads of households (ibid.).

The ongoing economic crisis has forced women to take on a more productive role in the rural areas (Moreira, 1999). Women's productive roles are viewed as less important than men's productive roles. This increasing productive role has not diminished women's reproductive role in the family through childrearing (nurturing, emotional and physical health and education), domestic duties (cooking, cleaning, and water fetching), and the cultivation of home gardens. Women tend to participate less than men in agroforestry projects (ibid.). Women do not have the time or information to

participate in agroforestry implementation. Also, women have been socialized to play specific roles such as working in nurseries or cultivating home gardens (ibid.).

3.5 Incentives to Participation in Agroforestry

Cernea (1995) argues that designing strategies around individual social actors, and building groups requires two fundamental elements: economic incentives, benefits to the social actors, and an awareness of the existence of agroforestry projects. Utting (1993) further states that incentives are intertwined with participation. All projects face the question of how to get farmers involved in projects and how to maintain that involvement.

3.5.1 Tree Species

The type of tree species promoted in agroforestry projects could act as either an incentive or a disincentive. Utting (1993) argues that in order for giving trees to farmers to work as an incentive, projects must respond to farmers wishes regarding tree species. If farmers do not feel that the projects' selected tree species meet their needs they may not be interested in planting those trees. Although the species farmers want to plant may not be the "best" from the promoters' point of view, it is crucial to respect farmers' priorities (Utting, 1993).

3.5.2 Financial Aid, Loans

Cernea (1995) maintains that governments can implement incentives such as contributions of free or subsidized seedlings, technical advice, tax mechanisms, and policies supporting markets for tree products. Small farmers can become more involved once tree products become a source of income. Due to the long gap of time between planting and harvesting trees, small farmers may not be able to wait several years for the

income generated from those trees. Other substitute income sources may need to be examined to foster small farmers' behavioural changes (ibid.).

Loans are another incentive that can be used to entice farmers to participate, allowing farmers to buy tools and agricultural inputs (National Research Council, 1993). It is important that credit mechanisms account for local conditions, in that farmers are able to repay the loans in the future. Access to loans is restricted for many farmers.

In summary, the literature suggests that social units are necessary to establish groups to select members that desire to participate in agroforestry projects. The formation of such units of social organization is crucial for tree growing because trees require structured support over extended periods (long production cycles). In this context, small farmers can enhance the productive capacity of their members. These groups increase the ability of individual small farmers to maximize their contributions to achieve objectives. Similarly, governmental institutions can play a crucial role organizing agricultural producers to become efficient partners in the design of agroforestry projects. Organizational design may be public or private, and organizations are crucial to foster contacts with outside agencies. A feasible concept of participation promotes community involvement in problem identification and solution implementation. Thus, in order for participation to be successful, there is a need for a dynamic process whereby the roles of agroforestry promoters and members change. A bottom up design can help foster the development, expansion and rehabilitation of small-scale community based systems.

The literature also identifies barriers to participation in agroforestry projects. For many rural families, agricultural-related activities are the main and only source of

income. It has been found that lack of land tenure security can result in on-farm investment reduction and a lower farm productivity. The success of farmers to practice and adopt agroforestry practices depends on the economic rewards involved, which is directly affected by their tenure over land and natural resources. Also, inadequate access to markets and raw materials are constraints that prevent small farmers from succeeding. The adoption of agroforestry innovations can lead to changes in labour patterns. The lack of adequate technical knowledge has previously been identified as a barrier in agroforestry. The flow of information between small farmers and agroforestry promoters is necessary for training in agroforestry technical knowledge. Education and training are crucial to promote new methods to change behaviour, norms skills and strategies. Small farmers and wealthy farmers have different access to resources and technology. Such access is based on unequal distribution whereby wealthy farmers enjoy greater access to land and who can afford to wait longer for benefits of agroforestry.

Socio-cultural barriers have also been identified in agroforestry projects. Government policies influence a specific economic path in a country. In the majority of cases, as is the case of El Salvador, governments support agricultural activities result in high capital costs and low returns for small farmers. In this context, governmental institutions need to foster their network with Non-governmental organizations to provide the training and education that is most needed in rural communities. Also, it has been found that women rarely benefit from agroforestry implementation. Women are crucial to identify forest products, plant properties and traditional methods of management. Issues such as local use and knowledge, land tenure, organization, landlessness, distance,

marketing and labour all have gender components. In El Salvador, it is important to consider gender issues because only 10 to 16% of women own plots.

Designing strategies around individual social actors, and building groups requires two fundamental factors: economic incentives, benefits to the social actors and an awareness of the existence of agroforestry projects. It has been argued that incentives are crucial and intertwined with participation. Trees, can work as incentives, when agroforestry promoters ask small farmers their wishes regarding tree species. Also, governmental institutions may implement incentives such as contributions of free or subsidized seedlings, technical advice, tax mechanisms, and policies supporting markets for tree products. Finally, loans may be necessary to entice small farmers to participate because they allow individuals to buy tools and agricultural inputs. It is important that credit mechanisms account for local conditions to enable farmers to repay loans in the future.

4.0 Methodology

This study compares the social barriers and incentives of small farmers' participation in agroforestry projects in El Salvador (See Map). Interviews were conducted with farmers from two rural communities: la Ciudadela Dr. Guillermo Manuel Ungo (community #1) and el Canton Los Melendez (community #2) and with agroforestry promoters from the capital city, San Salvador. A total of 48 participants were interviewed: 23 rural farmers were interviewed in the two rural sites: 15 farmers were from community # 1, and 8 farmers were from community # 2. Also, a total of 25 agroforestry promoters, 13 from non-governmental organizations and 12 from governmental organizations, were interviewed in the capital city.

4.1 Objectives of the Research:

This project identifies barriers and incentives to the participation of farmers in agroforestry projects on Salvadoran hillsides. A comparison is made between two communities with different levels of organization to understand how organizational levels of communities influence participation in agroforestry projects. The research therefore aimed to identify social and organizational characteristics needed for the design of agroforestry projects in both communities. This research will contribute to an academic and practical understanding of the features of participants and the socio-cultural surroundings that influence participation in agroforestry projects on degraded hillsides.

4.2 Methods

4.2.1 Study Sites

I conducted interviews with poor, rural farmers, from two communities that had different levels of organization. As previously stated, farmers from community # 2 in the

San Jose Guyabal area are less organized than farmers from community # 1 in the Suchitoto area. Community # 1 was greatly afflicted by civil war in the 1980's and the guerrilla movement had a strong base support from the farmers who resided in the area. These farmers eventually developed a high level of community organization and developed a local government (Valle, 1999). Although community # 2 was also afflicted by war, farmers' participation in organizing was almost non-existent. At the time the government was promoting community organization, all organizations had to be scrutinized by the government and the armed forces (FM1, 1999). The type of government allowed in community # 2 was dependent on the central government and any decision making had to be approved in advance by central government officials. Any other type of organizations promoting and supporting local self-reliance, initiatives and independence were considered a threat to the state. This study assesses whether these distinct histories and experiences have impacted differently the incentives and barriers to agroforestry participation.

4.3 Research Activities

4.3.1 Instrument

The interview guide was developed based on the literature review conducted in Canada prior to departing for the field. It was modified after more literature was accessed in El Salvador and after a few reconnaissance interviews. The interview guide was slightly shortened after the first interview because some questions were repetitive and because of the length of the original draft. Also, Miguel, my community liaison, pointed out that participants were not accustomed to lengthy interviews and that they might become bored and uncooperative. Originally, I had planned that a local literate

person from each rural site would conduct the informal interviews. However, such locals were not available at the time. The interviews were therefore conducted solely by myself. Interviews were informal, face-to-face, and were conducted in a quiet place. At times, Miguel was present during the interview process, but most of the time only myself and the participant were present. Notes were taken throughout the interview process. Tape recording was avoided due to participants' nervousness and unfamiliarity with the interview process. Participants were asked how they felt about using a tape recorder. They stated that they were uncomfortable because the information could be used against them. Farmers were afraid of information being divulged about their land or livelihoods and that the government would use it to restrict resources.

Data for this study were collected using informal, unstructured, face-to-face interviews with small rural farmers and agroforestry promoters from the government and non-profit sectors (see appendix A, B, and C). In general, the questions addressed specific incentives and barriers identified in the literature and the role of social organizing in their participation in the agroforestry project.

4.3.2 Selection of the District

The district was selected on the basis of its location: outside the capital, but close enough to be able to commute every day by bus or car. Because PAES provided the infrastructure (i.e., computers, agroforestry documents, transportation and access to the rural communities), PAES had to have a presence in the area. The San Martin municipality was selected because PAES has one of its two central offices there. This headquarter was close to the two rural communities where the research was carried out.

4.3.3 Selection of Rural Communities

Having selected the municipality where the research could be conducted, the next step was to select the two rural communities within the boundaries of this municipality. The main criteria when selecting the two communities were (a) to have different levels of organization, (i.e., a history of cooperation and cohesion in one community, and much less in another), and; (b) previous or current agroforestry project implementation, and; (c) availability of a contact, preferably a gatekeeper from PAES, to introduce my research to the locals. The two rural communities selected were la Ciudadela Dr. Guillermo Manuel Ungo (community # 1) and el Canton Los Melendez (community # 2). Community #2 had less history of cooperating in group organization than did community # 1. The distance between the two rural communities is approximately 25 kilometers. The distance between community # 1 and San Salvador is about 45 km whereas the distance between community # 2 and San Salvador is about 35 kilometers.

4.3.4 Preliminary Visits to Rural Sites with the Community Liaison

Prior to the data collection process, several visits were made to the research sites. During these visits, I had the opportunity to meet rural farmers and leaders of the community, and to become familiar with the agroforestry project, the area of the project, and the farmers' exposure to the project. These preliminary visits were made possible through my liaison who knew the communities and was acquainted with the farmers. Miguel Valle, the community liaison, was crucial in assisting with field interviews with farmers from the two rural communities. Miguel provided transportation, assisted in locating the farmers, and asked individual farmers if they were available for an interview.

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Miguel Valle also provided me with listings and information on the farmers participating in the agroforestry projects. He introduced me to the farmers, and talked to them about the reason for my presence and explained my intentions. Without him the interviews with farmers would not have taken place. These visits took approximately one month. Finally, I developed a sampling approach, which will be discussed further in the sampling section.

4.4 Research Design

According to Berg (1998) qualitative research aims at finding answers to questions by examining social settings and the individuals who reside in these settings. For Berg, qualitative researchers are deeply interested in how humans arrange themselves and their surroundings and how they make sense of their places through symbols, rituals, social structures, and social roles. This research is an exploratory inquiry of farmers participating in hillside agroforestry. Open-ended interviews were used to elicit an exhaustive set of responses. As suggested by Palys (1997), open-ended questions are excellent when the researcher is interested in including respondents' opinions in their own words. Palys (ibid.) holds that exploratory research may include a wide range of responses that are important. There are three reasons why qualitative research was helpful in this study. First, it is unclear why farmers on hillsides would not be particularly interested in agroforestry given the high erodability of hillsides and the reliance on hillside agriculture. Second, qualitative research is used to understand the varied reasons farmers do or do not participate. A set of closed-ended survey questions would prematurely force answers into categories. Third, the projects were new and thus not established long enough to use typical evaluation research methods. The main point

was to find out both individual reasons and contextual reasons (i.e., the influence of organizational features) that might influence farmers' adoption of hillside agroforestry practices. Small farmers' lives depend on subsistence agriculture, which has a biological meaning attached to the corn planting cycle, but it also has social roles and meanings. To understand small farmers' preferences for subsistence agriculture on hilly areas, we need to understand their social conditions and how farmers perceived opportunities and disincentives to participating in agroforestry.

4.5 Sampling

Researchers are sometimes interested in an interconnected network of people or organizations. The fundamental feature is that each person is linked with another through a direct or indirect linkage (Newman, 1997). This means that most people have direct or indirect links within an interconnected web of linkages. Snowball sampling is a procedure for identifying and sampling the various cases connected through a network. According to Palys (1997) snowball sampling involves starting with one or two people, and using their contacts to generate a larger sample. It is therefore a multistage technique, which begins with a few people and spreads out to new interviewees who are somehow all linked to the initial contacts.

4.5.1 Sampling of Agroforestry Promoters

I tried to use the phone directory to find listings of government and non-profit organizations. At first, an attempt was made to contact non-governmental agroforestry promoters by phone, but this was generally unsuccessful. In one case the interviewee did not show up for the interview and others never returned my phone calls to schedule a time to meet. People seemed skeptical about having a stranger asking for them over the

phone and requesting a face-to face interview, possibly because of the violence, absence of democracy and consequent lack of trust that has historically plagued El Salvador.

A snowball sampling approach was used with agroforestry promoters and other members of governmental organizations when the other method proved unsuccessful. Some of the first interviewees were contacted prior to my trip to El Salvador. Some of these contacts originated from my residence in El Salvador twelve years ago, others from CATIE contacts I had met at a meeting in Edmonton. Respondents provided me with other names of people, and the names of their organizations. When I called the next group of potential interviewees, I was able to provide the new respondents with references of the people who had initially given me their names. Potential participants felt more at ease with these references. The agroforestry promoters interviewed were not necessarily working with PAES. However, two agroforestry staff working with PAES were automatically selected to participate in the study.

More specifically, participants included engineers working with the government such as the National Parks of El Salvador, the Forestry Service, the Ministry of Agriculture, the Ministry of Renewable Resources, the Faculty of Agronomy/University of El Salvador, the Environmental Branch/Power, the Ministry of the Environment and the Environmental Program of El Salvador. Participants also included engineers and rural educators working with non-governmental organizations such as the Environmental Fund of El Salvador, the Environmental Management Program/Central American University, the Training Research Centre for the Environment, the Environmental Fund of El Salvador, the Salvadoran Research Program on the Environment and Development, Team Corn Association, the Salvadoran Ecological Unity, the Centre for Cooperation on

Information about Alternative Technology, the Salvadoran Foundation-Prodesse, and the Program for Sustainable Agriculture on Hillsides of Central America. The participants were selected under the assumption that agroforestry promoters working for different organizations would not necessarily have the same views and experiences as farmers who were participating in agroforestry projects.

4.5.2 Sampling of Rural Farmers

A convenience sample was used because farmers were busy during the time data were collected. Despite the fact that a convenience sample was used, I expect the participants approximate a representative sample given they did not disproportionately represent a group of farmers based on kinship, wealth, or political clout. Farmers were often cultivating their plots or were obtaining agricultural inputs in town. Farmers did not have time to book appointments with me. Rather, a convenience sample was ideal as it allowed me to ask farmers, wherever they were, if they were willing to participate. Miguel Valle provided me with two lists of farmers who were participating in the agroforestry project that was being implemented by PAES in community # 1 and in community # 2. These lists were used to locate potential interviewees. From this list, 15 farmers were selected and interviewed from community # 1, and 8 farmers were chosen and interviewed from community # 2.

Miguel was crucial in introducing me to the rural farmers and the community leaders. The interviewed farmers were all adults, approximately between 20 and 60 years of age. While an effort was made to interview both men and women equally, this was impossible because men are generally the heads of households and the key persons within families who participate in agroforestry projects. In many rural households, men occupy

themselves with more agricultural work than do rural women. Men are also generally the sole owners of the land in the family. In the cases where rural women volunteered to be interviewed (5 in total), it was because they were either a single mother, had previously been involved in some kind of conservation, reforestation or nursery project, had experience participating in community organizing and women's groups or simply because their husband was not at home.

4.6 Research Procedures

4.6.1 Interviews with Agroforestry Promoters

In San Salvador, I conducted the interviews with agroforestry promoters. Prior to conducting the interviews, they were provided with consent forms. Interviews were not taped and, instead, notes were taken. Two groups of interviewees were identified, (a) agroforestry promoters working for the government, and (b) agroforestry promoters working for non-profit organizations. Most of these participants were graduates with degrees in agronomic engineering. Only staff involved in agroforestry projects or rural development were considered for interviews as they were the ones expected to have had practical experience in rural communities.

Interviews conducted with agroforestry promoters working for non-governmental organizations lasted between one and two hours long. Agroforestry promoters from non-governmental organizations provided more detailed and in-depth information than those working for the government. The majority of respondents from governmental organizations required references from other respondents, including the person's name and the title of organization before they would schedule an interview. As previously indicated, agroforestry promoters from non-governmental organizations are cautious

about whom they speak to because they do not want to put themselves at risk. Non-governmental organizations were targets during the civil war. Most of these non-governmental organizations were characterized by having a small number of staff who worked in various rural environmental programs: agroforestry, soil conservation, rural development, women's programs, rural literacy, rural economic development and health.

Interviews held with agroforestry promoters working for the government were difficult to schedule. Thanks to his previous employment in government, Miguel Valle, my community liaison, once again played a crucial role in making four of the 12 interviews possible. The governmental organizations were characterized by a higher number of staff who provided several specialized programs: agroforestry, soil conservation, rural development, park management, reforestation and environmental education. Some participants working for governmental organizations seemed extremely busy and had little time to voice their opinions on agroforestry.

4.6.2 Interviews with Rural Farmers

Farmers were both interviewed in their fields and at their houses. The interviews were held at a time and place most convenient to each farmer. This flexibility allowed the farmers to share their agroforestry experiences in great detail. Prior to starting the interview process, a translated copy of the informed consent was read to each farmer. In cases where farmers were reluctant to sign the consent forms, they gave verbal consent. Audiotaping was avoided because farmers were extremely nervous and uncomfortable with this, thus I took notes during the interview. In one community, one participant refused to participate in the research on the basis that she had other duties to fulfill at home and needed to bring food to her son working in the cornfield.

To keep the flow of the interview process as informal as possible, I avoided reading directly from the interview sheets. I memorized most of the open-ended questions to maintain a natural flow. Because some rural farmers limited their answers to yes or no, probing was used to obtain more in-depth responses. For example, if the participant responded “yes” when asked if the existence of local organizations helped farmers to participate in the design of agroforestry projects, the farmer was asked why that was the case.

The individual interviews with rural farmers lasted on average approximately one hour. It should be noted that I am fluent in Spanish and conducted all the interviews with rural farmers solely myself. Therefore, note taking was the most acceptable approach to gathering farmer’s views and perceptions. The interviews and notes were taken in Spanish.

4.7 Data Analysis

Upon my return to Canada the interviews were translated, typed into English and reviewed to identify themes and patterns. Although this was a time consuming process, it was necessary to capture the participants’ views and perceptions in English. This was also crucial because it allowed me to retrieve and clean up what seemed to be unmanageable data. I reviewed the translation process twice to convey the proper meaning, avoided omitting any relevant information, and whenever possible added words to make full sentences.

4.7.1 Generating Categories

Patton (1998) describes inductive analysis as a strategy used to identify categories and themes. Indigenous typologies are included by participants and are generated

through the researcher's analysis of how language was used and what they expressed. Analyst constructed typologies can be generated by the researcher and do not necessarily correspond directly to the meaning used by the participants. This process involves describing patterns, themes, and categories that are found in the data and can be subject to the legitimate charge of imposing a world of meaning on the participants that reflects the observer's world.

The process of data analysis was characterized by identifying salient central categories of information about the phenomenon being studied. The process of category generation involved identifying patterns in the data: ideas, themes and perspectives that depict the social world I was studying: small farmers participation in agroforestry projects (Patton, 1998). Categories emerged around various topics for farmers in agroforestry such as rainy season, technical knowledge, land tenure, tree species, financial aid, incentives for women, and farmers' participation in local organization. For example, a farmer's need for more land featured in barriers to agroforestry involvement. Within the barrier category three properties were identified; (a) rainy season, (b) technical knowledge, and (c) land tenure. These properties were grouped under the central category, 1-Barriers to Rural Farmer Participation. Similarly, two more central categories were identified: 2- Incentives to Rural Farmer Participation and 3-Participation of Rural Farmers in Local Organization. Incentives to farmer involvement featured three properties: tree species, financial aid and loans, and incentives for women. Participation of small farmers in organization examined the level of farmer participation in agroforestry initiatives.

Hernes (1998) argues that explaining a social phenomenon implies identifying its causes. This explanation can take the form of a complicated set of casual statements. Hernes (1998) refers to this set as a “social mechanism” (SM) which is a well-articulated set of causes responsible for a given phenomenon. For example, social mechanism include markets, networks, even loan policies that enhance the conditions under which farmers believe agroforestry can be incorporated into their current livelihoods. Farmers’ responses explained the causes of their social reality. Statements provided insightful understanding to farmer’s participation in agroforestry projects. Farmers had the opportunity to articulate the reasons for their participation in agroforestry development.

4.8 Trustworthiness

Trustworthiness is a crucial characteristic of qualitative research. Rossman and Rallis (1998) argue that the trustworthiness of a qualitative research project is judged by two interrelated criteria: a) the research must meet standards for acceptable and competent practice, and b) the study must be ethically conducted with sensitivity to the politics of the setting and the topic. This research was submitted to the Human Ethics Review Committee of the Faculty of Agriculture, Forestry, and Home Economics at the University of Alberta. The Ethics Review Committee determined that the study met the required standards for acceptable practice.

There are different ways of establishing trustworthiness. Lincoln and Guba (1985) point out that researchers should seek applicability, consistency, and neutrality in their qualitative research. Applicability refers to how someone determines the extent to which the topic is applicable to other cases and different respondents. Consistency examines how someone determines whether the findings can be repeated if the study

were to be replicated with similar or different subjects and situations. Neutrality looks at how someone can establish the degree to which the findings are determined by the participants and the conditions of the study, and not by motivations or personal interest of the researcher.

An effort was made to ensure that the findings were applicable to other cases. Various studies have identified a range of individual and social conditions associated with barriers, incentives and participation to agroforestry and other rural development projects. I have made direct comparisons in this work. Agroforestry promoters were selected on the basis of their understanding of farmers' livelihoods in rural settings, agroforestry expertise, and their rural development experience. Again, the agroforestry promoters' interviews yield information applicable to understanding the constraints and opportunities in agroforestry across El Salvador, but particularly on hillsides.

Consistency, as previously stated, depends on another researcher's ability to replicate a study. However, replicability can only be determined within a provided framework of reliability and validity (Lincoln and Guba, 1985). I made a concerted effort to maintain consistency in both data collection and analysis by making the interview questions both reliable and valid, and by carefully documenting my methods so someone could repeat them. Neuman (1997) argues that reliable and valid research questions are crucial in social research because constructs of social theory are ambiguous. He adds that reliability introduces certain indicators that provide information that remains unchanged. For example, in this agroforestry research, using the same set of questions for farmers, governmental and non-governmental agroforestry promoters provided the

researcher with answers addressing the same issues. These answers provided similar themes around barriers, incentives and participation.

Validity refers to the quality of the researcher's measures (i.e., Is the researcher accurately addressing the social concept of interest?) (Neuman, 1997). Wolcott (1994) argues that validity refers the degree to which observations measure what they intended to measure. However, validity is never absolute because constructs are abstract (Neuman, 1997). The effort to obtain valid information is part of a dynamic process that increases through the accumulation of evidence over time. Given the reality that small farmers' needs might change from one period of time to another, qualitative research has the strength of obtaining valid representations of a social phenomenon over time. Neuman (1997) concludes that while reliability might be necessary to obtain a valid measure of a concept, this does not guarantee that the measure will be valid. A study can be reliable and replicated, but the measure might not be invalid. Given my interview questions were peer reviewed by my gatekeeper and supervisor, were pre-tested in the field, and yielded information consistent with that found in the literature, the interview questions showed adequately addressing incentives, barriers and organizational influences on agroforestry participation.

Neutrality may be examined from the following perspectives. Lincoln and Guba (1985) report that neutrality refers to an honest attempt on the researcher's part to be objective. Objectivity exists when the phenomenon being studied is value-free – this is based on the fact that it is possible to allow “nature” to speak for itself without the impacts from the biases of the researcher. The influence of the subjectivity of the researcher was always considered when conducting this study. I was aware of my

potential biases, such as my middle class background and my upbringing in El Salvador, that could have influenced my understanding of the data. I consciously focused on the objectives of this study. Thus, when I made sense of the data, I tried to put my biases aside by allowing respondents to do the teaching and the talking about what they considered to be the social barriers and incentives to their participation in agroforestry projects.

4.9 Ethics

Whenever possible, prior to the implementation of the research, I made a conscious effort to tell the participants the purpose of my research visits. After the interview process, participants were thanked and reassured that the findings of the study will be used as explained at the beginning of the interview. I reassured participants by emphasizing the privacy and confidentiality of the interview. They were also assured that the findings of the study would not result in any physical or psychological harm to them.

My main interest in the study was to examine small farmers' participation in agroforestry projects. Neuman (1997) argues that the researcher's responsibility is to guide, protect and oversee the interest of the people in the study. For example, participants' permission was requested to conduct the research. I also adhered to the following codes of conduct: a) participants were informed as fully as possible about the study; b) they understood what participation entailed; c) they gave consent willingly and; d) they understood that they could withdraw from the study at any point without any prejudice (Rossman and Rallis, 1998).

Rossman and Rallis (1998) argue that a researcher makes decisions to follow a code of ethics and/or a standard for conduct that is based on moral principles. A proposal

was drafted at the beginning of 1999. This proposal was sent to the International Development Research Center (IDRC) to get approval for funding. A copy was also e-mailed to the Agronomic Center for Teaching and Research (CATIE) in Costa Rica and El Salvador. Additionally, this study was reviewed and approved by the Human Ethics Review Committee of the Faculty of Agriculture, Forestry, and Home Economics at the University of Alberta prior to my departure to the field. CATIE was then the main contact in El Salvador through the Salvadoran Environmental Program (PAES).

An important point of ethics is privacy and confidentiality of the participants (Rossman and Rallis, 1998). I was careful to protect their privacy (identity and names) and keep in confidence what they shared with me (not sharing it with others during the research process or using their names). Participants were informed that their words would be quoted or paraphrased in the written report of the study, and interpreted by me in the thesis.

Neuman (1997) argues that research can potentially harm participants physically and psychologically. In order to prevent this, I anticipated risks before beginning the interview process. I assured small farmers and agroforestry promoters from governmental and non-governmental organizations that the information was for my personal use only and no one else would have access to it in El Salvador or Canada. Due to the political and social unrest that has characterized El Salvador, participants were nervous about who they were seen with and about the information that was requested from them. Participants were afraid that if they said how they felt about their agricultural situation, the government and the armed forces might restrict resources in some way. Thus, I had to conduct the interviews under less than desirable conditions.

4.10 Limitations and Strengths

Although the rural communities where the interviews were conducted have been previously introduced to soil conservation practices and reforestation projects, they have only recently been exposed to agroforestry projects. My attempt to qualitatively assess farmers' participation at this point seemed premature. The agroforestry project that I was examining was implemented in January 1999. Thus, trying to determine whether the organizational level of the community has an impact on the farmers' participation was challenging. This study would have been strengthened given more time to assess the reasons for farmers' participation on this specific project in community # 1 and community # 2 throughout various stages of the projects' existence. Most projects are characterized by participants showing enthusiasm and commitment when the projects are first starting. Therefore, my timing was opportune because the assessment of the incentives and barriers to agroforestry project participation was conducted in the early stages of project implementation.

The period of time when the study was conducted was another constraint of the study. At the time of the research the majority of farmers were busy attending to their fields. This had a significant impact on the opportunities to interview as many farmers as I had hoped for. A three month period was also insufficient for developing good rapport with farmers in both of the communities.

In many cases farmers' gave short responses and were generally suspicious of the research. This suspicion could be due to their experiences during the civil war. Community # 1 and community # 2 were both war zones. While the first was more influenced by the guerrilla movement, the latter was heavily influenced by the central

government. During this time, farmers were killed or disappeared because of their support for the guerrillas or for the government. While a political democratic process is underway in El Salvador today, people are still uncomfortable answering questions related to their livelihoods. Ruesschemeyer, Stephens and Stephens (1992) argue that democracy, by any definition, is extremely rare in agrarian societies let alone one so recently militarized and terrorized. While the purpose here is not to argue whether there is a solid democracy in El Salvador today, the important point to remember is that Salvadoran farmers' experiences, livelihoods and openness are directly related to their past experiences and the lack of democratic institutions. This is worth mentioning because land tenure depends on stable democratic institutions. Thus, farmers sometimes appeared to feel threatened when I asked them questions related to their land, their sources of livelihood, and identity. Perhaps they were afraid that the collected information was going to be used to take their land away, a practice historically known in El Salvador.

Crime was also a serious hindrance to the research process. El Salvador is experiencing a staggering rise in crime rates, where kidnappings, murders, robberies, and break-and-enters are a normal daily occurrence. For this reason, I had to be extremely cautious. Naturally, agroforestry promoters were also suspicious of my plans whenever I called to schedule a meeting for an interview. One person was very suspicious about my call and asked many questions about who I was and what I was doing. Accordingly, interviews were scheduled during the day to reduce any concerns related to crime. In the rural areas, I made sure there was always someone I knew with me. If crime had not been so prevalent, I could have been more opportunistic in obtaining interviews.

A strength of this research was my Salvadoran heritage. By speaking Spanish I was able to speak to participants more freely and I was able accurately translate the data. My Spanish language proficiency minimized data loss during the translation of interview data and increased my interpretation accuracy of farmers' responses. I have also lived in El Salvador, and my background provided me with some solid knowledge about the social and economic conditions of the country, particularly some knowledge about rural farmers' livelihoods and management of natural resources. I read Spanish documents related to agroforestry in the country. These attributes allowed me to make connections with farmers and agroforestry promoters despite the difficult circumstances of doing social research in these areas.

Another important strength of the research was the support I received to conduct this research by the Environmental Program of El Salvador (PAES) and the Agronomic Tropical Center for Research and Teaching (CATIE). My choice of community # 1 and community # 2 was the result of these important contacts. This particular research project filled a gap in their research program on social factors influencing hillside agroforestry in El Salvador and its prospects for future participation by small farmers. Finally, this research was important because it allowed respondents to reveal some of the most intimate details of their lives around agriculture in El Salvador. Farmers' openness made this study possible as they expressed what was in their hearts and provided me with rich data (Perry, 2000).

5.0 Findings and Discussion

The purpose of this chapter is to identify themes that emerged from each group of interviews. Findings are drawn from a set of 48 interviews with small farmers and agroforestry promoters (from governmental and non-governmental institutions), and field notes from non-participant observation. As previously mentioned in the methodology chapter, community # 1 was more organized than community # 2. Some participants in community # 2 were reluctant to participate. In community #1, farmers were pro-active and participated more in environmental projects. Also, in community # 1, a non-governmental organization worked with farmers and encouraged them to participate in soil conservation and agroforestry projects. Furthermore, farmers from community # 1 cultivate corn and beans, vegetables, and fruit trees in the coffee cultivated area. Seventy four percent of farmers own their fields; the remaining 26 percent are landless. Farmers practice animal husbandry by raising pigs, chickens and cattle (Valle, 1999). Farmers from community # 2 cultivate corn, beans, sorghum, and some vegetables. In community # 2, approximately 60 percent of farmers lease land from landowners to cultivate their crops, while the other 40 percent own their fields. They also raise pigs, chicken and cattle (Valle, 1999). Although it was impossible to obtain an estimate of farmers' annual income, most farmers expressed that they survive on a daily basis and have no extra savings to rely on when they are unable to work or when they are sick.

The findings are presented in detail under two broad categories: a) barriers to rural farmer participation in agroforestry, and b) incentives to rural farmer participation in agroforestry. I will also compare the participation of rural farmers from the two communities. An overview of agroforestry promoters' perspectives, (both non-

governmental and governmental), on the social barriers and incentives of farmers to participate in agroforestry practices is presented. Quotations from the interview notes will be used, whenever possible, throughout this chapter. Whenever possible, findings in this chapter will be further examined and expanded with a discussion section. Thus, this chapter briefly summarizes the main findings of barriers and incentives to rural participation in agroforestry projects and relates the main findings to the agroforestry literature. Finally, I summarize my original intentions and the limitations of conducting research in El Salvador.

5.1. Barriers to Rural Farmer Participation

5.1.1 Rainy Season

Small farmers argued that they face a number of barriers to participate in agroforestry projects. The rainy season, May through August, during which agroforestry projects are implemented, seemed to be a problem because it interferes with the time spent in their cornfields. For example, some farmers expressed concerns that as subsistence farmers they only have enough time and energy to plant their corn. They reported that they had little extra time to care for trees. Even though they would like to participate in agroforestry, they will not because planting corn is their highest priority, and planting trees does not have an immediate benefit for their subsistence agriculture. Farmers also expressed how important it is for them to supplement their earnings with seasonal labour in other fields or plantations.

A method for dealing with this problem would be to promote working in groups to care for the trees, as discussed by Cernea (1995). Cernea suggests that groups can more efficiently manage the tree-production cycle. In doing this, the burden of caring for

trees is shared and therefore reduced on an individual basis. Neighbours can cooperate to ensure that their trees survive. Agroforestry projects should therefore strongly promote group formation in any type that satisfies the needs of the farmers. There needs to be a willingness and ability to cooperate and work together, as well as willingness to work voluntarily for the common good (Bunch, 1997).

Farmers could also be compensated for their labour in the agroforestry project through a *food-for-work* program. The *food-for-work* approach employs the farmer in return for his/her labour for the agroforestry project (Utting, 1993; Ghai and Vivian, 1995). Utting (1993) observed that while *food-for-work* proved useful as a means of attracting people's interest early in an agroforestry project, it became a hindrance as the farmer became a wage-worker employed by the project. This experience showed that farmers relied on wages as an incentive to work. Therefore, it might also be argued that *food-for-work* can result in dependency. Foreign aid, food and medication relief to rural areas during the Salvadoran civil war is a good example of how small farmers became dependent on aid for their survival. After the war ended, farmers continued to rely on the government for food and medication, and were not eager to return to subsistence crop cultivation. However, in this particular study, it appears necessary to provide employment or a collective framework to share work burdens in order to overcome the obstacle of a "labor squeeze" during the corn planting season.

5.1.2 Technical Knowledge

A lack of adequate technical knowledge in agroforestry was identified as a barrier. Small farmers emphasized the need for more training and workshops. They suggested that some farmers are more knowledgeable than others. Farmers reported that

even though they might not have adequate training to participate in agroforestry projects, they do have the desire and capacity to learn about agroforestry. Some non-governmental agroforestry promoters also suggested that farmers lack adequate training in agroforestry. In other words, farmers possess knowledge about planting crops, but lack training and information on specific sustainable agroforestry practices. Other promoters further suggested that farmers need more information to gain an interest in and to participate in agroforestry projects.

Governmental agroforestry promoters shared similar views. One argument is that farmers need more training because although they know about cultivating crops such as corn and beans, they often lack agroforestry technical knowledge. Another promoter suggested that farmers lack information rather than training, such as the definition and purpose of agroforestry. While information involves basic knowledge of agroforestry, training refers to the technical expertise for agroforestry practices. Farmers have learned through trial and error, and the passing down of traditional knowledge from their parents; learning through agricultural extension is unusual for these farmers.

Utting (1993) argues that farmers not only need more training but personal, intensive services with frequent follow-up visits from extensionists. This will ensure that farmers are on the right path, which will increase the chances of success. Visible success is crucial to the survival of agroforestry projects. If no successes are witnessed by farmers, they may quickly lose interest in the project (Bunch, 1997).

The exchange of information between farmer and agroforestry promoter appears inadequate in my two case studies, suggesting the need for efforts that go beyond sporadic extension contacts with farmers. It was found that agroforestry promoters in

Honduras unsuccessfully relied solely on verbal explanations to obtain producers' collaboration, without any demonstration opportunity for farmers. Research on farmers' participation in agroforestry has shown that without hands-on training on demonstrative plots, farmers are unlikely to become interested by verbal invitation alone. Technical knowledge therefore needs to be taught using different methods that are accessible to the farmer. First, using dialogue to convey information is important because it allows for exchange and discussion, thus valuing the farmers' knowledge and experiences. Second, extension agents should use language that is accessible to farmers and ensure the message is properly conveyed. Third, the extension approach must be practical. Visual teaching may be more useful in this context. Talks, audio-visual presentations, field days and visits to demonstration plots and farms can prepare farmers for the tasks that would ultimately be added to their current work load (Oseguera, 1999). In this study I found that many agroforestry promoters rely primarily on talks, and assemblies, and do not use any audio-visual presentations and demonstration plots to convince farmers from both communities of the benefits of agroforestry projects. The use of audio-visual presentations and demonstration plots may have enabled the small farmers to appreciate how trees can be incorporated into their plots. Finally, hands-on demonstrations are very valuable teaching tools (Bunch, 1997). Farmers have learned what they know through experimentation and hands-on learning that has been passed down through generations. Replication of learning situations that farmers are comfortable with could enhance the success of technical transfer. Farmers must want to grow trees for a project to be successful and must know how to carry out the necessary activities. Farmers in both

communities stated that they did have the desire to learn, yet no such hands on training was made available to them.

5.1.3 Land Tenure

Another troubling issue for small farmers was land tenure. Farmers, from community # 1 argued that the farmers who are leasing land from landlords find it more difficult to participate in the design and implementation of agroforestry projects than do farmers who own their land. On average small farmers reported owning an equivalent of 1 m² (approximately .8 acres of land), which is inadequate for their subsistence. Farmers thus view leasing as a barrier to agroforestry participation because the renter may not reap the benefits of his or her investment. Farmers from community # 2 had similar views. Lack of land was viewed as a barrier to their involvement in agroforestry projects. They argued that planting trees on land that does not belong to them is unrealistic and that it would not be worth their time and energy. When tenants make improvements to the land, owners can claim the land back and lease it to other tenants. Many small farmers lease lands from landlords on a short-term basis. For example, along the basin of the Lempa river, small farmers had cut down trees to expand cashcrops, and had no interest in tree planting strategies.

Utting (1993) argues that many of the barriers of small farmers are structural and characteristic of farmer production and the nature of the land tenure system. While lack of land tenure may be an obstacle to tree planting and management, it cannot be argued that simply granting land titles will result in significant positive changes in agroforestry adoption and management practices. Planting and management depend on whether or not the small farmer has access to various resources such as financing, agricultural inputs,

technical assistance, and market outlets for tree products. Some institutions such as the World Bank maintain that land titling can help farmers access credit. However, farmers know that accessing credit depends on several factors such as the type of land, the availability of land, and who they know. In the end, farmers may be unwilling to use their land as collateral because a bad harvest could result in losing their sole livelihood. The incentives provided and the availability of labour for tree planting and management activities are also important. In this particular study, ownership or increased control over land may be necessary, but not sufficient, to lead to increased participation in agroforestry. Concurring with Utting (1993), given the additional costs of participating and access to other resources, it would be necessary to appreciably increase agroforestry incentives to increase participation.

5.2 Incentives to Rural Farmer Participation

The majority of the respondents reported that the use of incentives is necessary for farmers to participate in agroforestry projects. Because farmers' rural life requires hard work to meet their basic needs, and because the planting of grains has not generated enough income for farmers' survival, incentives are necessary to encourage farmers' participation in agroforestry. Incentives have become a crucial component of agroforestry projects in El Salvador.

5.2.1 Tree Species

A common theme among farmers was the need to introduce fruit trees and trees that farmers could plant to obtain some immediate earnings instead of just teak and cocoa trees. Farmers suggested that they would like to plant native local trees such as cedar, olive, cocoa, citrics (orange and lemon), banana, cashew, avocado and other native trees

such as pepeto, jocote and pito. Few farmers mentioned their willingness to experiment with trees non-native to the area such as eucalyptus and teak trees¹⁹. However, some agroforestry promoters supported planting eucalyptus and teak trees because they provide fast growth and multiple use and their wood products could be sold to obtain extra earnings. The farmers' general sense was that they would like to see more fruit trees on their plots because the fruit could be eaten or could be sold. Farmers also argued that farmers could plant fruit trees in their family gardens.

Utting (1993) argues that some agroforestry and social forestry projects have mistakenly relied on inappropriate incentives. Small farmers often have their own priorities regarding tree species selection and land management practices (Oseguera, 1999). In past agroforestry project implementation, farmers have preferred fruit trees that were not part of the original project. The cultural attractiveness of tree species and crops may vary from region to region. My findings demonstrated similar priorities in communities # 1 and # 2. Farmers wanted fruit trees to plant in their family gardens so that they could eat, or sell the fruit to other people in the community or a nearby market. In previous agroforestry projects, it has been found that imposing rigid formulas regarding species selection has often marginalized the rural farmers.

Agroforestry promoters emphasize technical factors such as adaptability of the tree species, ease of establishment, fast growth rate, and high resistance to pest and diseases (Tamale, Jones & Pswarayi-Riddihough, 1995). My interview data suggested that few farmers realized that tree growth could be obtained in a short time in some

¹⁹ Eucalyptus and teak are fast growing trees and can make a significant contribution for small farmers in terms of cash and production (Nair, 1989). Teak trees can also regenerate the soil in shifting cultivation and have proved efficient in forest production (Nair, 1993).

species, nor did they see the soil conservation benefits associated with planting trees.

Agroforestry promoters and farmers had little dialogue about their needs and priorities.

5.2.2 Financial Aid, and Loans

Farmers agreed that economic assistance, especially soft loans, were important incentives for agroforestry participation. They expressed interest in credit schemes for incentives to participate in agroforestry. Farmers reported that accessing credit depends on several factors, such as the type of land, the availability of land, and who they know. Farmers reported their unwillingness to use their land as collateral to access credit because they could not afford putting at risk their only source of income. Farmers also added that incentives, such as tools and agricultural inputs, are useful to them because many poor farmers cannot afford to buy agricultural inputs such as fertilizer and seedlings.

Utting (1993) argues that incentives are crucial to initially attract farmers' participation in agroforestry and to encourage long-term involvement. Farmers in community # 2 were more interested in these individual level incentives for participating in agroforestry than were farmers in community # 1. This suggests that different incentives may be appropriate in communities that are close together and biophysically similar, but that have different histories of successfully working together toward common goals.

Oseguera (1999) argues that awareness and education are actions that appeal to the consciousness and creativity of the people. For instance, education and agroforestry training could provide small farmers with the necessary tools to find creative solutions to their land management problems. For the most part, small farmers in communities # 1

and # 2 have not been exposed to agroforestry education except when assemblies are held to inform farmers of the implementation of agroforestry projects in their communities. Furthermore, small farmers could combine agroforestry practices with some type of non-agricultural work. Agroforestry promoters can play an important role, with other community actors, to create non-agricultural employment that may alleviate some of the pressure to have simply enough cash to survive.

5.2.2.1 Support Given by NGO's

Non-governmental promoters held that their organizations played a crucial role in providing economic incentives for farmers to participate in agroforestry projects. It was argued that farmers could be provided with seedlings to plant subsistence grains in combination with trees. Non-governmental agroforestry promoters reported that farmers face poverty and lack of opportunities which forces them to cut down trees to expand cash crop production. In Perkin, a poor area in eastern El Salvador afflicted by the civil war in the 1980's, agroforestry promoters have provided farmers with stoves and water pumps to encourage them to participate in agroforestry projects.

5.2.3 Incentives for Women

5.2.3.1 Inputs/Species to Plant

Many of the respondents, all of whom were male, reported that there is a need to include incentives to increase women's participation. It was noted that women could be provided with nurseries, seedbeds, rootbags, fruit trees such as mangoes and lemon, and vegetables, such as *guisquil* and *chipilin* to plant in their mixed home gardens.

Surprisingly, male farmers were supportive of women's participation in agroforestry projects. It was not clear to me if this is due to the acceptance that women

can work and participate in agroforestry projects as much as male farmers do, or if this is due to the critical poor reality of small farmers who need different ways to survive. Obviously, when examining male farmers responses to what women could do in agroforestry projects, a majority of male farmers supported women's participation, in addition to the maintenance of women's household roles. In other words, men were in favor of women's participation in home gardens. Certainly, based on my personal observations, because women do not own land, women participated less in agroforestry than male farmers in the communities.

5.2.3.2 Training, Education and Employment For Women

Men reported that women enjoy attending workshops, and could benefit by participating in agroforestry training. Farmers reported that women are good supervisors and pay attention to detail when taking care of trees. It was mentioned that in order for women to take advantage of incentives in agroforestry, they need to become literate and have access to educational resources. Wages for women were also seen as possible incentives for their participation because men perceived greater benefits for the family unit.

5.2.3.3 Other Incentives

Farmers reported that women should be given agroforestry participation incentives such as pigs and hens to raise. They added that there is a need to provide women with incentives such as daycares, communal banks, sewing machines and computers for their children.

5.2.3.4 Increase Involvement Through Participatory Mechanisms

Male farmers also reported that women could participate in the design of agroforestry projects to identify their needs and the most appropriate incentives for project implementation. It is important to note that the gendered incentives suggested here came from a majority of male respondents on what they thought would be best for their partners.

5.3 Participation of Rural Farmers in Local Organization

Farmers argued that in order to participate in agroforestry projects, they need to become organized to determine the needs of the community and how they want to implement agroforestry practices. Farmers from community # 1 provided a broad spectrum of responses around the organization theme. They suggested that farmers need to be informed through assemblies to make participation more effective. These assemblies can facilitate farmers' involvement in the initial stages of the project so that they may understand the benefits of agroforestry to their subsistence agriculture practices. Some farmers argued that local organizations could more easily communicate their intentions to outside institutions. Farmers from community # 1 suggested that a strong organization is crucial to respond to the needs of the community and added how important it had been to be organized in order to participate in projects with local non-governmental organizations. Farmers from community # 2 on the other hand, did not directly address the need for improved organization. Although they spoke of the importance of cooperatives, which are a form of organization, they never directly discussed organization as a theme in and of itself. Farmers in community #1 reported a greater range and depth of responses on the importance of organization.

The findings showed that farmers are not adequately organized to participate in agroforestry projects. Although small farmers from community # 1 appeared more organized than those of community # 2, they argued that they could be much better organized. Even though I cannot say for sure to what level of organization the farmers were referring, farmers might have been comparing their organization level to the one that was reached during the insurgency in the rural areas during the 1980's. Other respondents implied that they had few opportunities to participate in agroforestry practices. Women, for example, had less access to agroforestry projects due to male ownership of land.

Governmental promoters argued that farmers are well organized for projects in health and education, but they are not well organized for environmental projects. They suggested that farmers' organizational level depends on the location of the projects. Previous rural development experiences have shown that a certain level of organization is required in order to make environmentally sustainable projects successful. Farmers are more organized in some areas of the country than in others. For example, in Las Pilas Chalatenango, in North Eastern El Salvador, farmers managed to create a market for their vegetables because they were well organized. The Pilas Chalatenango project worked efficiently because farmers had common interests, and had made sure that the project included marketing plans and organization in the design and implementation processes. Governmental agroforestry promoters also added that more needs to be done to cover new rural areas that do not have any agroforestry projects.

Non-governmental agroforestry promoters shared similar views about farmers' organization levels. They argued that farmers were more organized in some areas, but

lacked organization in other regions of the country. Non-governmental agroforestry promoters reported that El Salvador had been divided up by a series of military regimes, which has resulted in the development of individualism in community culture and fears about local organization. For example, during the civil war, local governments and the armed forces had equated organization with communism. In spite of this, former guerrilla combatants in the North East of El Salvador had managed to use their militia organizational skills to examine their needs, apply for funding and successfully implement projects that addressed their needs in the post-war period.

Oseguera (1999) maintains that participative approaches, such as the ability to analyze the problem, consciousness of the situation, collective action and decision-making do not provide a quick solution to the complex problems that rural communities face. In other words, there are no short-cuts to success. Oseguera (ibid.) adds that a sustained participative process is a crucial factor in the longevity and success of development projects. In my assessment of the two communities, members from community # 1 were aware of their agricultural limitations and the need for collective action to change hillside land conditions. However, this awareness and willingness to organize is not enough to assure agroforestry project success, because they have not yet organized around collective goals and shared decision-making. Community # 1 also needed the individual incentives to sustain organizational commitment. The interview data suggest that farmers in community # 2 did not recognize the potential for agroforestry or the need for a strong organization to promote the adoption of agroforestry practices as did farmers in community # 1, and thus may need more front-end incentives to take an interest in, and eventually become committed to, agroforestry practices.

Participative approaches have many advantages, such as encouraging situation analysis, constructive criticism, and the strengthening or capacity to mobilize those resources that are essential components of agroforestry projects. The use of participative approaches promotes the use of new methods that influence attitudes, behaviours, norms, and skills. The successful use of participative methods require skills, the facilitation of dynamic participative techniques and negotiations around conflict. For example, in community # 1, facilitators from a non-governmental organization have successfully assisted in changing farmers' attitudes and behaviours by promoting sustainable land use practices, such as organic composting.

In the community with greater prior organization through guerrilla activity, farmers were more likely to report organization and community leaders as key initiators for agroforestry participation. Farmers in community # 1 were also exposed to successful agricultural cooperatives, which also appeared to increase their confidence in organization. In the community that had low prior organization, where there was high state military presence and "local development initiatives" were discouraged, farmers did not report the presence of an organization to initiate agroforestry participation to be as important. Non-governmental agroforestry promoters were more likely to emphasize the needs for stronger organization than governmental agroforestry promoters.

Some farmers mentioned the need for cooperatives to raise their awareness. One type of cooperative that may work well in this setting is one in which farmers involved benefit by experimenting collectively with demonstrative plots. Benefits from these new sustainable practices require social organization to meet the overall ecological goals of replanting trees on vast stretches of degraded hillsides. Small farmers have a better

chance of surviving rural poverty when they are organized so as to minimize personal risk and tap into labour and expertise to which they would otherwise not have access. The challenge is to have a coherent group of farmers who generate enough synergy to make organizations more effective (Cernea, 1985). Small farmer organizations, may be in a position to obtain external funding for projects that suit their self-identified needs. The findings of this study suggest that small farmers are not adequately organized to participate in agroforestry projects. Farmers lack a strong coherent group that can sustain the project once the funding institution leaves.

5.4 Summary of Findings and Discussion

A number of barriers can prevent farmers' participation in agroforestry projects. Farmers from communities # 1 and # 2 made it clear that the season of agroforestry implementation interferes with the planting of subsistence crops. Agroforestry promoters need to consider the timing of project labor when launching an agroforestry project. One way of overcoming this barrier is by combining agroforestry and the planting of subsistence crops. The delivery of agroforestry inputs may win the trust of the farmer, and result in greater participation. Although farmers lack training in agroforestry, they are willing to learn. Agroforestry developers and promoters must consider training farmers in various agroforestry areas such as home gardens, trees scattered over crops, and trees planted as hedges or in alleys. Such training should consider the farmer's tree preferences as more important than the type originally envisioned by the donor agency. Agroforestry promoters could provide advice in those areas, but in the end the farmers should decide what type of agroforestry practices they want to practice. Farmers have been planting subsistence crops for centuries. Increasing the adoption of agroforestry

practices may be a slow process, thus project donors should make long term commitments to promote agroforestry organizations.

In El Salvador, land tenure has been unsettled and contested and this has affected agroforestry projects. While agroforestry promoters should promote agroforestry practices among farmers who own their plots, new ways need to be examined to include rural people who do not own any land. Home gardens may be an alternative way of including people who are landless.

Respondents indicated that incentives are crucial for agroforestry participation. Farmers argued that they require fruit trees so that they can obtain immediate earnings. The farmers' general sense was that they would like to see more fruit trees on their fields because the fruit can be eaten or sold. Second, farmers argued that economic assistance such as soft loans were important incentives in agroforestry design. For them, access to credit depends on several things: land, the availability of land, and who they know. Non-governmental agroforestry promoters indicated that farmers could be provided with seedlings to plant subsistence grains in combination with trees.

Small farmers further argued that women also need incentives, such as nurseries, seedbeds, rootbags and fruit trees to increase their participation in agroforestry projects. It was indicated that women could attend workshops as they are good supervisors who pay attention to detail. Small farmers added that women could be provided with pigs and hens to raise.

The experiences of farmers from the two studied communities are different from one another even though both communities are experiencing severe land degradation and soil erosion. Farmers from community # 1 were supporters of the guerrilla movement in

the 1980's. They added that they had prior participation in sustainable projects in their community through a non-governmental organization. Farmers from community # 2 on the other hand, appeared to be influenced by the government's and the armed forces' discouragement of organization. Farmers from community # 2 added that they lacked organization and that most leaders, including the leader of the community, did not participate in sustainable development projects.

Farmers argued that in order to participate in agroforestry projects, they need to become organized. Overall, the findings showed that farmers are not adequately organized to participate in agroforestry projects. Farmers, from community # 1 identified organization as crucial to respond to the needs of the community. Farmers, from community # 2 did not consider the need for improved organization. Both, governmental and non-governmental organizations, shared similar views that the communities lack organization. Some non-governmental promoters argued that small farmers had been divided up by a series of military regimes, that had promoted the development of individualism in community culture and fears about local organization.

In the long run agroforestry promoters should address organizational issues prior to implementing agroforestry projects. This organizational component could be incorporated in the extension process at the beginning of the agroforestry project. This organizational process could include all actors within the community including cooperatives, women groups, youth, and the municipality. When all these groups work together, they can identify the needs of the community and find the most appropriate ways to find solutions to their problems. Unexpected supporters and collaborators for agroforestry projects may come forward.

Agroforestry projects can not afford to overlook the social reality of rural El Salvador. If Salvadorans have suggested that crime is on the rise, agroforestry promoters need to take this into account when designing agroforestry projects. Rural crime can undermine agroforestry participation because farmers are less willing to take risks in such a context and there is a concomitant weakness in trust toward institutions that purport to protect collective interests. Although small farmers are aware that their agricultural contribution is crucial for the long lasting social, political and economic recovery of rural El Salvador, they need to hear that their contribution is crucial to the recovery of soil in their fields. Past agricultural policies have undermined farmers' knowledge, and often they have been portrayed as part of the problem, but little has been done to make them part of the solution.

5.4.1 The Socio-Political Context

Based on the literature reviewed and on my personal observations, it becomes then necessary to discuss the socio-political context in which agroforestry projects are implemented. In order to win small farmers' trust, there is a need for access to land to implement these agroforestry projects (See Figure A). Small farmers need to know that they would be protected from losses of land and access to it. In this context, rural women need to have access to land to participate in agroforestry projects. In the case of garden-based agroforestry, as suggested by some small farmers, this could generate a greater value than the successional systems landholders have introduced (Schroeder and Suryanata, 1996). For example, women could generate a greater absolute income than a monocrop mango system. This could result in a more continuous seasonal income stream, one that can enable women to face the financial challenges for their rural

families. Also, the successful and clear inclusion of women in agroforestry projects could start removing the rural gender gap that has isolated women from accessing natural resources and consequently from participation in sustainable projects (Redclift, 1995). Agroforestry promoters need to become conscious that there would be limits of farmers' labor as they are required to attend to their fields.

Cerne's discussion on social units could be implemented to create agroforestry groups that can take care of various tasks, including the growing of trees and subsistence crops. Small farmers need to have security and have access to loans and soft loans that facilitates their adoption of agroforestry practices. Also, there is a history of war and terror that has spread generalized mistrust to promoting development projects in the rural areas. Agroforestry promoters need to be conscious of this to understand the reasoning of farmers' mistrust. It is in this context that some small farmers have been drawn to crime because this is the only way of life they know to overcome extreme poverty. This lifestyle, which offers quick economic returns, will compete with any agroforestry project that fails to offer quicker returns to farmers.

All the above issues are inherently intertwined with farmers' daily routines and organizing as they are part of their rural reality. Through organizing, small farmers could be able to understand their issues and find solutions to improve their lives.

Rueschemeyer, Stephens and Stephens (1992) argue that organizations are relevant as they empower subordinate groups and protect them from the dominant groups. This results in the balancing of power of state and civil society. A dense civil society could facilitate the development of democracy because it creates favorable conditions for the excluded groups, from the political arena, to organize for collective action to overcome

the free-rider problem (ibid.). In this view, social mobilization and organization and pluralization of society can be compatible with the democratic process. Thus, the empowerment of previously excluded small farmers improves the chances of democratization. Rueschemeyer et al., (1992) add that a dense civil society facilitates the political inclusion of the middle classes, and small farmers, and in some situations this may result in a democratic breakthrough, especially in the rural areas.

Small farmers' knowledge, skills and interactions can be reflected on the technical factors of agroforestry projects. Based on surveys of traditional farming in southern Mexico and Central America, it was found that traditional techniques in energy supply, soil classification, and the management of soil, water, slope, and space require understanding local conditions and ways of managing local energy and materials (Yapa, 1996). Finally, once agroforestry promoters understand the farmers' socio-political context, it would be easier to understand farmers' realities and work cooperatively to find solutions. This would then facilitate small farmers' adoption of agroforestry projects. The strengths of agroforestry systems would not lie in the ways they can enhance productivity or reverse degradation, but would rest in the opportunities farmers create and maintain in the socio-political context that they live. Thus, agroforestry systems would be strongest when small farmers can manage their own resources independently, beyond the scope of powerful interests (Schroeder and Suryanata, 1996). As Redclift (1995) puts it, participation does not ensure the efficacy of farmers' development (such as the creation of employment). Rather, participation is a means for farmers to ensure their sustainability through the active protection of their rights.

5.4.2 Time of Agroforestry Projects

I was hoping to see trees growing in the fields, which would have clearly indicated the level of farmers' acceptance or rejection of agroforestry projects. I had been under the impression that the agroforestry projects had been implemented for at least a year before my arrival. If this had been the case, it would have been easier to determine the barriers, incentives and the level of farmer participation in the agroforestry projects. I was surprised, however, to find that the project was actually only about four months old. Thus, the short life of the project presented a barrier and required a reevaluation of my original intentions.

5.4.3 Interview Process

Initially, I wanted to conduct a minimum of 60 interviews: 40 interviews from community # 1 and # 2 and 20 from agroforestry promoters. I thought that this would give more voice to farmers' needs and goals in agroforestry projects. The reality is that I conducted my study at farmers' busiest time of the year, which reduced my opportunity to interview as many farmers as I had intended to. Also, farmers' responses were very limited and dry. They appeared not to want to reveal very much about their livelihoods. This lack of farmer collaboration impacted the original intention of presenting farmers' views in my findings. Some non-governmental workers suggested that even though my study was well intended, three months was barely enough time to gain acceptance in the communities. I found farmers cautious and conservative about the kind of information they shared with me. Three months were not sufficient for farmers to get to know me before the intended 40 interviews were conducted. Despite my Salvadoran heritage and

fluency in Spanish, I was expected to establish trust over time with farmers before I asked them for information.

5.4.4 Crime and Violence

Kidnappings, murders, robberies, and break-and-enters are common in urban and rural El Salvador. Crime has increased and continues to threaten political and democratic stability in the country. All the participants were suspicious of my study. One cannot undermine the reality that over 70,000 people died during the twelve years of civil war. Every participant was careful about how they shared their views and about how much information they shared with me. Again, it takes more than Salvadoran heritage and Spanish ability to become an “insider” in these communities.

During my three months stay in El Salvador, I was on guard at all times and felt afraid everywhere I went. Having lived in Canada for over a decade, I have become accustomed to living without fear and persecution. It has been reported that El Salvador has become the most violent country in Latin America, even more than Colombia. It was difficult to conduct research knowing that anything could happen to me in the field. In one of the communities I visited, I was told that there were daily robberies and kidnappings. I felt overwhelmed and at times discouraged to see such levels of violence. Post-war violence appears to have crippled El Salvador’s ability to function and to establish solid long term social and economic development. People I met there have suggested that before and during the war, they knew who could harm them, but that today they feel anyone is capable of committing a crime. It has been suggested that organized crime is perpetrated by both former army personnel and former guerrilla members.

Agroforestry projects need to take rural crime and violence into account.

Agroforestry participation may be limited and undermined by the many social problems that continue to plague El Salvador. If an individual has the opportunity to participate in kidnappings, and make five to ten times more money than by cultivating subsistence crops and trees, that individual might opt to participate in such a crime. Thus agroforestry promoters need to go beyond the basic provision of incentives such as trees and agricultural inputs. Agroforestry projects need to incorporate incentives at the social and economic levels. Agroforestry promoters need to realize the difficulties of establishing trust and cooperation in regions where people have been traumatized by perceived betrayals and failures of institutions to protect them.

6.0 Conclusion

6.1 Sociological Implications

Sociological literature on rural development for farmers tends to assume that farmers want to remain farmers, and that given an opportunity to improve their farming operations and make more money, they will change their behaviour. My research suggests that many of these farmers do not want to remain farmers. They have resorted to farming hillsides because they have to in order to survive. Given the opportunity to have an alternative livelihood, many of them would take it, because farming is hard, and has unpredictable returns. Accumulating material possessions, such as refrigerators, television sets, VCR's, and modern homes, are unreachable on a farmer's income. According to my observations, given the choice of either protecting their soils by planting trees, or working extra hours as a general laborer on a plantation or in the city, many farmers would opt for the extra income. Thus, immediate supplemental income in the rural areas appears to be a likely key incentive for agroforestry project success. In fact, I observed that some farmers who received remittances from families in Western countries sometimes abandoned agricultural work because they had enough income to fulfill their basic needs for food, shelter, education, health, and farming labor simply provided too little economic gain to bother with it.

This all suggests that sociologists studying rural development should not romanticize farming, or assume that farmers are tied to the land, even if farming has been practiced in their families for generations. Generally speaking, Salvadorans look down on farming practices. In a society where social and economic status is very important, farmers are considered the lowest occupational position. Small farmers are conscious of

this and feel unappreciated and marginalized. Small farmers need to feel that they are also contributors to the development and well-being of Salvadoran society. Governmental and non-governmental institutions need to provide farmers with material rewards to increase participation in agroforestry. Rewards for small farmers can be materialized by creating a market for the cultivation of trees, and promoting the establishment of non-agriculture employment. This would increase projects' potential for success, and empower farmers with choices.

Also, the sociological features of successful organization around agricultural improvements may be misleading if the sociologist gives primacy to the organization alone. My research suggests that agroforestry organizations may in part experience success because farmers who are earning extra income through other means have the luxury of participating in agroforestry projects. These farmers will have a higher social and economic status and will therefore be considered as contributors.

6.2 Suggestions for Future Research

Further research is needed on the creative ways in which farmers can earn a livelihood over the annual cycle, and how they might combine agroforestry activities with other income-earning activities. Agriculture offers few, and limited returns that are not cost effective for small farmers. For small farmers to continue cultivating, sustainable agricultural practices must be combined with other non-agricultural work. Lopez (1997) found that the chances of finding non-agricultural jobs increases with higher levels of education. Future research could examine the impact of education on small farmers' livelihoods. This is important because uneducated small farmers with few, limited employment opportunities are most likely to practice hillside agriculture

(Lopez, 1997). The Salvadoran government has recently legalized the U.S. dollar as the other national currency in El Salvador. Macroeconomic policy supporters maintain that this would stabilize inflation and lower interest rates, would allow a more competitive economy and could result in the promotion of greater foreign investment. Such argument argues that the benefits of this economic policy would trickle down to the poor, including rural farmers. Future research could examine whether the benefits of this macroeconomic policy has reached small farmers and has promoted agroforestry (Stein, 2000).

There are fundamental questions surrounding gender. Given the evidence that women are more likely to perform household duties that supplement subsistence, perhaps women would be better targets for agroforestry promoters. Further research in the importance of including women in agroforestry is needed. This research should also address the impact of women's participation on sustainable farming practices.

6.3 Concluding Remarks

The ultimate goal of any agroforestry project is the conservation of the ecosystem while meeting the needs of small farmers (Matyas, 1999). It would be unrealistic to promote agroforestry projects without the active participation of small farmers. As previously indicated, small farmers are aware of the benefits that trees can play in soil protection. Projects that promote soil conservation and agroforestry should be more accessible to farmers. Accessibility includes more than physical accessibility but also socio-cultural, economic and technical accessibility.

To overcome these barriers agroforestry projects need to address these issues. This can be accomplished by informing farmers of the projects, sharing success stories

with them and providing them with concrete evidence of the potential of agroforestry in language that is easily understood. One method of doing this is to promote the *campesino-a-campesino* as discussed by Utting (1993). This method allows farmers to teach other farmers about agroforestry practices. This allows for exchange of information among people who are experiencing many of the same challenges and barriers. It can also give credibility to projects, as farmers can see and hear that other farmers have experienced successes. It can provide an incentive to farmers who are still hesitant about participating. As farmers become involved, they may themselves become promoters of more sustainable practices in agriculture, thus perpetuating the information through their networks.

More favorable conditions would also improve agroforestry participation, but it is unlikely that it is enough. In addition to ownership, farmers need specific economic incentives to take time to plant trees when they would rather use that time to earn money in other ways. Farmers also need agricultural inputs such as native trees or fruit trees to encourage participation.

There are also clear post-war effects on a community's capacity to participate in collective action in rural regions. Post-war impacts are still felt, given the differential support for guerrilla collective action and state discouragement of collective action, varying even within a similar geographic location in El Salvador. A different level of front end organizational support for beginning an agroforestry project may be necessary. Rural communities need organizing to reap the benefits of agroforestry. This means that expectations of projects must also be in line with what is realistically possible given the time it takes to rebuild trust in organizations.

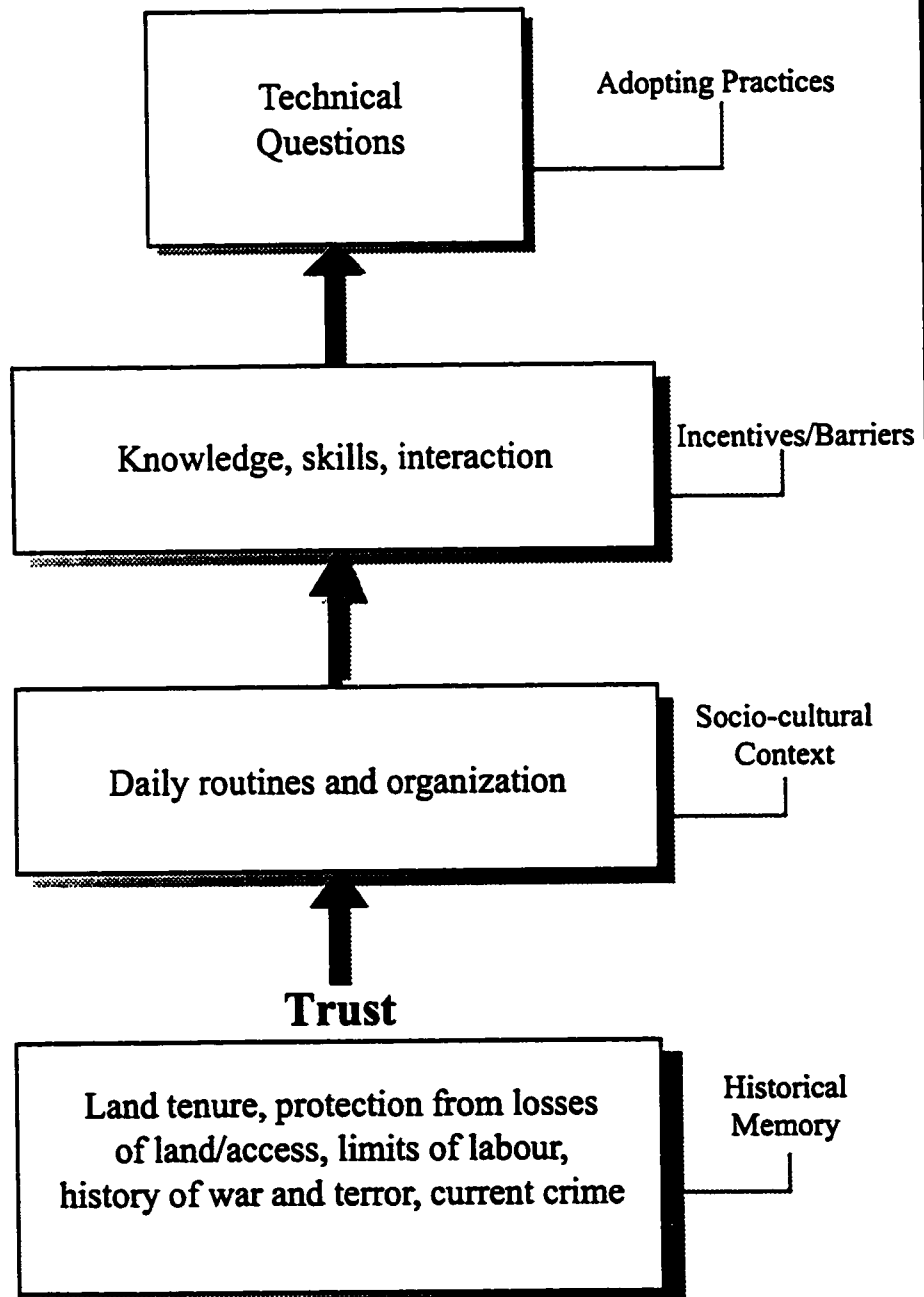
Socio-economic reform could be a start to improve small farmers' livelihoods. As far as agriculture reform goes, it has been found that progress towards democracy in Latin America was prevented when labor intensive agriculture predominated, and where agriculture was the crucial export sector. Under such conditions, there is a dominant group of wealthy landowners who oppose any reform that does not reflect their agro-export model (Rueschemeyer, Stephens and Stephens, 1992). Socio-economic reforms officials could begin to change this pattern by promoting the cultivation of subsistence grains with agroforestry systems to supply the local markets. Also, local grains, such as corn and beans, vegetables and fruits, are often imported from other countries such as Guatemala. The promotion of subsistence grains, fruits and vegetables among small farmers along with agroforestry systems could begin to diffuse to other Central American regions. In this context, small farmers require incentives such as access to credit in terms of soft loans, and economic protection in case of loss. Also, when promoting socio-economic reform, small farmers could be given opportunities to attend school. Small farmers could be given scholarships to study agriculture or other careers such as law, medicine etc. in return for them growing subsistence grains and promoting agroforestry. The idea of this education incentive would be to give small farmers options that they can rely on to survive and work their way out of the poverty cycle.

Other socio-economic reform could promote the industrialization of rural areas for farmers to have non-agricultural employment. Such trend is common with multinational companies in rural El Salvador. New reforms could promote the establishment of locally owned companies whose main mandate would be to employ the

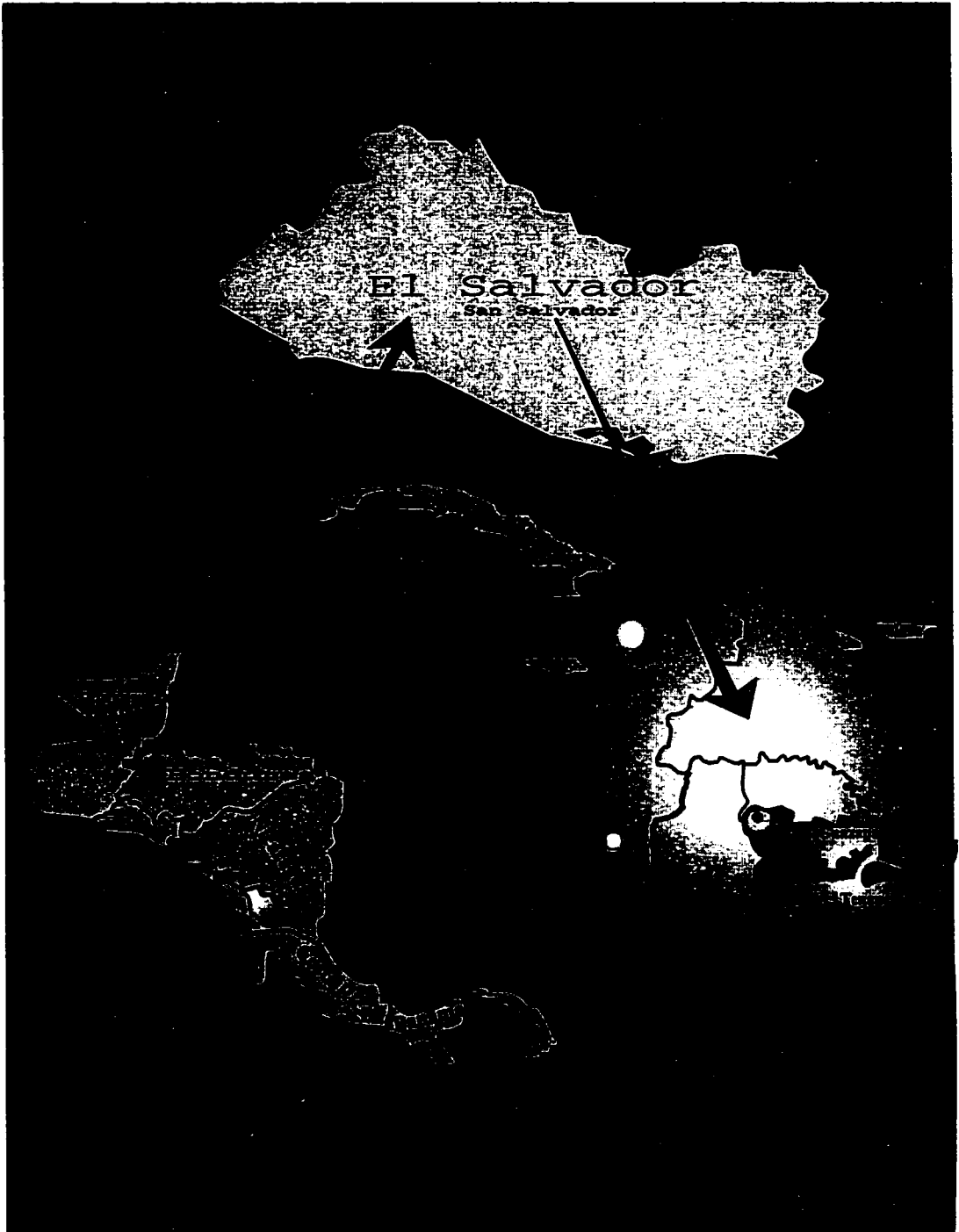
rural population. All of the above suggestions for reform policies require political will by politicians because they would promote long-term reform policies that address rural poverty. Salvadoran politicians could work together with local and international non-governmental organizations to consolidate these reforms. Organizations such as CIDA are currently promoting market enterprises that promote the independence of small farmers in many rural areas of the world. Only then small farmers could continue growing subsistence grains in combination with agroforestry systems. Finally, such socio-economic policies could work as disincentives for violence and organized crime in the country, especially in the rural areas.

It is my hope, as it is many I interviewed, that small farmers' participation in these projects would lead to their empowerment and the transformation of their current situations. As an organized group farmers can articulate their needs and interests more effectively and mobilize as a group to address the barriers they face. Empowerment and environmental protection are the ultimate goals of agroforestry projects and only when these two result, has the project been successful. A sign of this success is the continued organizing of people after projects have ended to continue improving their situation. Finally, in order for agroforestry projects to succeed, it requires a multi-sectoral approach that would rely on the funding, expertise, facilitation and commitment of several actors.

Figure A The Importance of the Socio-political Context



Map of Central America, El Salvador and the Department of Cuscatlán



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INTERVIEW GUIDES:
Appendix-A

Interview Guide for Rural Farmers

1. Has there been any agroforestry projects in your community in the past?
2. Do you think that farmers in your community are aware of these projects?
3. Did you participate in any of the projects?
4. How many members of your family participated in agroforestry projects?
5. How many members are there in your family?
6. Were you involved in the planning and design of the agroforestry projects in your community?
7. How should farmers be involved in the design process?
8. What type of relationships should be established between agroforestry promoters and community members?
9. Do partnerships between agroforestry projects and local/rural community groups or associations improve the implementation of agroforestry projects?
10. What do you think the role is of local organizations in attracting farmers to participate?
11. Do you think that already having organizations present in your community helps you to participate in agroforestry projects?
12. Do you think that farmers are organized enough to participate effectively in agroforestry?
13. What personal benefits have you observed from participating in these agroforestry projects?
Economic benefits?
14. Are there any barriers that prevent you from participating in agroforestry projects?
15. Are there any particular seasons in which participation in agroforestry is difficult?
16. Do you think agroforestry project practices complement or compete with other subsistence crop activities?

17. How does your involvement with agroforestry fit into the other activities in your day?
18. Do you have enough time to participate in agroforestry projects?
19. Do you think that farmers have adequate staff in agroforestry projects?
20. Do you feel that farmers have enough training in agroforestry?
21. Do you think that farmers have adequate financial resources?
22. What do you consider the most efficient ways to enhance rural poor farmers participation in agroforestry programs?
 - Educating rural poor farmers?
 - Training rural poor farmers?
 - Securing long term funding for agroforestry projects?
 - Ensuring other forms of rural employability?
 - Economic incentives?
23. Do you think that tenure relationships are a barrier to the design and implementation of agroforestry projects?
24. What do you think the role of land tenure is in attracting particular participants to the agroforestry project?
25. Do you think gender differences are addressed in the design of agroforestry projects?
26. Do women participate in these agroforestry projects?
27. [If female participation is low].
Why do you think that women participate less in the projects?
Are women less inclined than men to participate?
If so, why do you think women are less inclined than men to participate in this agroforestry project?
28. What incentives in the project might increase women's participation?
29. Do you think that agroforestry projects narrow or increase gender inequalities?
30. What changes in the agroforestry project's division of labor could encourage women's greater participation?
31. Do you think that agroforestry policy makers can learn from small farmers?
32. What kind of advice would you give to agroforestry policy makers?

33. What recommendations can you make that would improve this agroforestry project's ability to serve farmers' needs?

Appendix-B

Interview Guide for Government support Staff

1. Do you think that the staff in your department (agency) is aware of agroforestry projects and the importance of agroforestry projects?
2. Are there any benefits to agroforestry projects for your department?
2. How do you feel about the Environmental Program of El Salvador's (PAES) involvement in agroforestry projects?
4. What do you think PAES' priorities should be?
5. Are there any procedures that PAES should examine better, to involve your department's in agroforestry projects?
6. Are there any other organizations that PAES needs to create partnerships with to achieve their objectives?
7. Do you think that your department has committed adequate staff and funding to support agroforestry projects?
8. Do you think that social and cultural patterns are considered in the design of agroforestry projects?
9. Do you think that farmers should be directly involved in the planning and formation of agroforestry projects?
10. How do you think farmers should be involved in the design of agroforestry projects?
11. What type of relationships should be established between the agroforestry promoter and community members?
12. Do partnerships between agroforestry projects and local/rural community groups or associations improve the implementation of agroforestry projects?
13. What do you think the role is of local organizations in attracting farmers to participate?
14. Do you think that already having organizations present in the community helps farmers to participate in agroforestry projects?
15. Do you think that farmers are organized enough to participate effectively in agroforestry?

16. Are there any barriers that prevent farmers from participating in agroforestry projects?
17. Are there any particular seasons in which participation in agroforestry is difficult?
18. Do you think agroforestry practices complement or compete with other subsistence crop activities?
19. How does farmer involvement with agroforestry fit into the other activities in their day?
20. Do you feel that rural farmers have enough time to dedicate to agroforestry projects?
21. Do you think that rural farmers have adequate staff to support agroforestry projects?
22. Do you feel that rural farmers have enough training to support agroforestry projects?
23. Do you think that rural farmers have adequate financial resources to support agroforestry projects?
24. What do you consider the most efficient ways to enhance rural poor farmers participation in agroforestry programs?
 - Educating rural poor farmers?
 - Training rural poor farmers?
 - Securing long term funding for agroforestry projects?
 - Ensuring other forms of rural employability?
 - Economic incentives?
25. Does your department offer any incentives associated with agroforestry projects?
26. In your opinion, do these incentives increased farmer's participation in agroforestry practices?
27. Do you think that tenure relationships, are a barrier to the design and implementation of agroforestry projects?
28. What do you think the role of land tenure is in attracting particular participants to the agroforestry project?
29. Do you think gender differences are addressed in the design of agroforestry projects?
30. Do women participate in these agroforestry projects?
31. [If female participation is low].
Why do you think that women participate less in the projects?

Are women less inclined than men to participate?

If so, why do you think women are less inclined than men to participate in this agroforestry project?

- 32. What incentives in the project might increase women's participation?**
- 33. Do you think that agroforestry projects narrow or increase gender inequalities?**
- 34. What changes in the agroforestry project's division of labor could encourage women's greater participation?**
- 35. What mechanisms can be used to get input in agroforestry projects from other staff in your department?**
- 36. Do you think your department has a crucial involvement in the planning behind agroforestry project decisions?**
- 37. How is policy decision-making over agroforestry projects handled in your department?**
- 38. Does your department take into account learning from the community?**

Appendix-C

Interview Guide for NGO's (Non-governmental Organizations)

1. Do you think staff in your organization is aware of the importance of agroforestry projects?
2. What do you see as the benefits of agroforestry projects for rural farmers?
3. What do you think the project's immediate priorities should be?
4. Does your organization have a formal commitment to provide staff and funding to support agroforestry projects in rural areas?
5. Do you think that your organization has committed adequate staff and funding to support agroforestry projects?
6. Do you think that social and cultural patterns are considered in the design of agroforestry projects?
7. Do you think that farmers should be involved in the planning and formation of agroforestry projects in order to increase participation?
8. How do you think farmers should be involved?
9. Has your organization cooperated with local farmers to implement these agroforestry projects?
10. Do partnerships between agroforestry projects and local/rural community groups or associations improve the implementation of agroforestry projects?
11. What type of relationships should be established between the agroforestry promoter and community members?
12. What do you think the role is of local organizations in attracting farmers to participate?
13. Do you think that already having organizations present in the community helps farmers to participate in agroforestry projects?
14. Are there any government or non-governmental programs that the agroforestry project should be examining to secure farmer's participation?
15. Do you think that farmers are organized enough to participate effectively in agroforestry projects?

16. Are there any barriers that prevent farmers from participating in agroforestry projects?
17. Are there any particular seasons in which participation in agroforestry is difficult?
18. Do you think that agroforestry practices complement or compete with other subsistence crop activities?
19. How does farmer involvement with agroforestry fit into the other activities in their day?
20. Do you feel that rural farmers have enough time to dedicate to agroforestry projects?
21. Do you think that rural farmers have adequate staff to support agroforestry projects?
22. Do you feel that rural farmers have enough training to support agroforestry projects?
23. Do you think that rural farmers have adequate financial resources to support agroforestry projects?
24. What do you consider the most efficient ways to enhance rural poor farmers participation in agroforestry programs?
 - Educating rural poor farmers?
 - Training rural poor farmers?
 - Securing long term funding for agroforestry projects?
 - Ensuring other forms of rural employability?
 - Economic incentives?
25. Does your organization offer any incentives associated with agroforestry projects?
26. In your opinion, do these incentives increased farmer's participation in agroforestry practices?
27. Do you think that tenure relationships, are a barrier to the design and implementation of agroforestry projects?
28. What do you think the role of land tenure is in attracting particular participants to the agroforestry project?
29. Do you think gender differences are addressed in the design of agroforestry projects?
30. Do women participate in these agroforestry projects?
31. [If female participation is low].
Why do you think that women participate less in the projects?

**Are women less inclined than men to participate?
If so, why do you think women are less inclined than men to participate in this agroforestry project?**

- 32. What incentives in the project might increase women's participation?**
- 33. Do you think that agroforestry projects narrow or increase gender inequalities?**
- 34. What changes in the agroforestry project's division of labor could encourage women's greater participation?**
- 35. What mechanisms can be used to get input in agroforestry projects from other staff in your organization to increase farmer participation?**
- 36. Do you think your organization has a crucial involvement in the planning behind agroforestry project decisions?**
- 37. How is policy decision-making over agroforestry projects handled in your department?**
- 38. Does your department take into account learning from the community?**
- 39. Can you think of any other challenges an agroforestry project might face in increasing farmers' participation in the projects?**
- 40. What mechanisms should be used to keep your staff informed of agroforestry projects?**