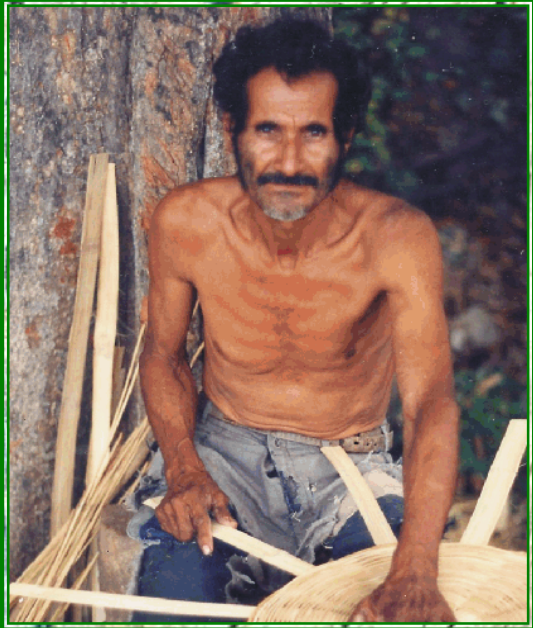
A DEMAND STUDY OF THE PRIORITY RESEARCHABLE CONSTRAINTS FOR FOUR GROUPS OF FOREST-DEPENDENT POOR PEOPLE IN THE MANAGEMENT OF FOREST AND TREE RESOURCES IN CENTRAL AMERICA

December 2000



Adrian Barrance
Independent Consultant

FRP Problem Surveys: No.3

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Project No. ZF 0143 – Researchable constraints to the use of forest and tree resources by the forest-dependent poor in Central America

Adrian Barrance

Independent consultant contracted by:
Natural Resources International Ltd
Pembroke, Chatham Maritime,
Chatham, Kent ME4 4NN, UK

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EXECUTIVE SUMMARY

A demand survey for forestry research in Honduras, El Salvador, Nicaragua and Guatemala, was carried out during October and November 2000, on behalf of DFID's Forest Research Programme (FRP). A total of 83 actors were interviewed in these four countries and in Costa Rica, from national NGOs, community based organisations, government and academic institutions, and from regional research and funding bodies. Semi-structured interviews, group discussions and literature review were used to identify the principal constraints on poverty reduction affecting 4 target groups of poor people, identified as priorities by FRP:

a) small-scale poor farmers
b) landless poor families
c) artisans, traders and small-scale entrepreneurs
d) urban and peri-urban poor families

These constraints were linked, through cause and effect relationships identified by the interviewees, to deficiencies in 17 sub-categories of sustainable livelihood capital. Those constraints addressable by FRP research were then identified and research themes proposed to address each of them. These research themes were prioritised according to their potential poverty impact (determined by the frequency of their mention by interviewees, the extent of their geographical relevance, the number of poverty groups potentially affected and the number of categories of sustainable livelihood capital to which they relate).

The potential of existing national/regional capacity to carry out the research (determined by interviews with research actors) was then assessed.

The researchable constraints and prioritised research themes are presented below. Most of the constraints and themes are regional in nature, with excellent opportunities for research based on diverse case studies in different parts of the region.

Researchable constraints	Research themes	Poverty impact
1. Ineffective civil society	1. Mechanisms for the development of pro-poor forest laws and policies	**High**
2. Excessive and exclusive regulation		
3. Ineffective regulation	2. Alternative regulatory models for the forestry sector	
4. Lack of organisation/grouping	3. Organisational models for forest-dependent communities	
5. Lack of effective technical support	4. Extension and technical support models for tree-based land use management systems	
6. Lack of payment for environmental services	5. Quantification, valuation and payment of environmental services	
7. Unfavourable marketing chains	6. Marketing chains for small scale producers and processors of forest products	Medium
8. Lack of workable incentive models	7. Forestry incentive schemes for small farmers	
9. Lack of market knowledge	8. Potential for market development of forest products from small operators	
10. Narrow market preferences		
11. Lack of workable credit models	9. Credit schemes for small scale forestry operators and processors	
12. Lack of workable certification schemes	10. Accessible forest product certification for rural income generation	Low
13. Scarcity of seed trees and regeneration	11. Germplasm resources for income-generating natural regeneration in agroecosystems	
14. Lack of workable reforestation models	12. Alternative on-farm tree establishment models for smallholders	

15. Lack of forest management knowledge	13. Single tree growth models for mixed-age conifer forest	
	14. Single tree growth models for lesser known species in mixed-age humid lowland forest	
	15. Management of young natural pine forest	
	16. Management requirements of NTFPs in humid lowland forest	
	17. Long term growth and management of small forestry plantations	
16. Lack of provenance information	18. Provenance variation within lesser-known plantation species for smallholders	
17. Lack of income from tourism	19. Pro-poor forest tourism in Central America	
18. Lack of integrated land management models	20. Integrated territorial land use planning	
19. Lack of workable territorial land use planning models		
20. Lack of knowledge of lesser known species' timber	21. Characteristics and working properties of lesser known species	

The quality of research carried out by in-region institutions is variable, but collectively there is significant research capacity. A small subset of institutions has considerable potential as regional research centres. Specific themes in which in-region capacity is lacking, and to which UK specialists could usefully contribute, are the sustainable livelihoods approach and environmental economics. In addition, FRP could play a significant role in providing regional and interdisciplinary overviews and research coordination in the other themes identified (most of which are regional in scope), thereby helping to overcome the geographic and sectoral compartmentalisation which handicaps research at present.

A considerable number of institutions provide funding for research, though only a limited subset provides particularly significant levels. The highest-priority themes for research identified by this study, referring to regulation, law formulation and organisation at a regional level, are not at present sufficiently covered by existing funding sources.

The limited impacts of research in the region to date, and its variable quality, result from a failure to disseminate results in an effective and action-oriented manner, to develop local capacity, or to foster genuine local ownership of research themes. These shortcomings could be resolved by a commitment, on the part of outside institutions, to research cooperation of a more fundamental nature with the most capable local institutions; and to more action-oriented research, linked directly to the activities of local development and conservation actors.

ACKNOWLEDGEMENTS

I am indebted to each of the 83 people interviewed in the course of this study for their contribution of time and knowledge. Special thanks go to David Kaimowitz for suggesting a range of useful contacts throughout the region; to Andrea Schlönvoigt at CATIE for coordinating my visit there; to Orlando Peralta of PROZACHI, Guatemala, for arranging the workshop there; and especially to Duncan Macqueen at FRP for suggestions on methodology and for revising the draft of this document.

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CONTENTS

Abbreviations

ACOFOP	Asociación de Comunidades Forestales del Petén
AFE-COHDEFOR	Administración Forestal del Estado-Corporación Hondureña de Desarrollo Forestal, Honduras
BOSCOM	Proyecto Bosques Comunitarios, INAB, Guatemala
CATIE	Centro Agronómico Técnico de Investigación y Enseñanza, Costa Rica
CENTA	Centro Nacional de Tecnología Agropecuaria y Forestal, El Salvador
CICAFOC	Coordinadora Indígena Campesina de Agroforestería Comunitaria
CONAP	Comisión Nacional de Areas Protegidas, Guatemala
CONSEFORH	Conservación y Silvicultura de Especies Forestales de Honduras
CUPROFOR	Centro de Uso y Promoción de Productos Forestales, Honduras
CURLA	Centro Universitario de la Región Litoral Atlántico, Honduras
EAP	Escuela Agrícola Panamericana, Honduras
ESNACIFOR	Escuela Nacional de Ciencias Forestales, Honduras
FHIA	Fundación Hondureña de Investigación Agrícola
FLACSO	Facultad Latinoamericana de Ciencias Sociales
FUNADES	Fundación Salvadoreña para el Desarrollo Económico y Social
HDI	Human Development Index
IDEADS	Instituto de Derecho Ambiental y Desarrollo Sostenible, Guatemala
INAB	Instituto Nacional de Bosques, Guatemala
INAFOR	Instituto Nacional Forestal, Nicaragua
LMDSA	Ley para la Modernización y el Desarrollo del Sector Agrícola (1992), Honduras
PDO	Private Development Organisation
PINFOR	Programa de Incentivos Forestales, Guatemala
PRISMA	Programa Salvadoreña de Investigación sobre Desarrollo y Medio Ambiente
PSP	Permanent Sample Plot
RAAN	Región Autónoma del Atlántico Norte, Nicaragua
SL	Sustainable livelihoods
UCA	Universidad Centroamericana, Nicaragua
UNAH	Universidad Nacional Autónoma, Honduras

1. INTRODUCTION: OBJECTIVES AND METHODOLOGY

1.1 OBJECTIVES

The objective of this report (see Appendix 1 for detailed Terms of Reference) is to identify and prioritise issues related to the management of forest and tree resources in Honduras, El Salvador, Guatemala and Nicaragua, research into which by the Forest Research Programme may contribute to combating poverty among 4 target groups:

a) Poor small-scale farmers
b) Poor landless families
c) Poor artisans, traders and small-scale entrepreneurs
d) The urban and peri-urban poor.

1.2 METHODOLOGY

The study methodology was based on that used by FRP in previous research demand surveys in southern Africa and Belize, Guyana and the Eastern Caribbean states (Macqueen, 2000).

1. Literature Review

Available literature was reviewed on the nature and causes of poverty, including trends and geographical patterns (see references list).

2. Interviews to Assess the Nature and Causes of Poverty

Semi-structured interviews were carried out with key informants (listed in Appendix 2 and summarised in Table 1) regarding the nature and causes of poverty among their constituency or beneficiary populations. The informants were selected from a wide range of NGOs, community-based organisations, producer organisations (representing cooperative and *campesino* forest-based enterprises) and government institutions, with experience of the principal socio-biological zones in each country (Appendix 3). Emphasis was placed on geographical zones with high concentrations of poverty. In addition to the capital cities where the head offices of most organisations are located, visits were made to regional offices in San Pedro Sula and La Ceiba, Honduras; San Andrés and Chalatenango, El Salvador; Petén and Quetzaltepeque, Guatemala.

Table 1: Summary of types and numbers of interviewees consulted

Country	Research Institutions	Government	NGOs/ PDOs	International Cooperation	Consultants	Producer organisations	Others
Honduras	5	5	7	2	1	0	2
El Salvador	3	3	6	2	0	0	0
Guatemala	3	2	15	0	0	1	0
Nicaragua	3	1	4	0	2	0	0
Regional	2	0	0	0	0	1	0
Total	16	11	32	4	3	2	2

Semi-structured interviews were based around the key questions “what are the principal characteristics of poverty among your target population?” and “what factors constrain different sectors of your target population from reducing their poverty level?”. Interviews were flexible in nature, in order to reflect the diverse natures and levels of the interviewees and to permit exploration of themes as they emerged.

3. Interviews to Assess Research Status and Capacity

Interviews were carried out with international agencies and research institutions (also listed in Appendix 2), to determine the current state of forest-related research, future plans, research capacity and availability of support for research.

4. Construction of problem trees

The factors mentioned by interviewees as causes of poverty are explained in text form, together with the immediate causes and effects of each, in Section 3. These causal factors were linked, through the cause and effect relationships described by the interviewees, into problem trees (based on the "mindmapping" approach proposed by Macqueen, 1999). Each of these problem trees ultimately leads to a "branch tip" each of which is a sub-category of the 5 principal categories of capital (financial, social, natural, human and physical) essential to the sustainable livelihoods approach (Table 2). 17 such sub-categories were identified from the interviews, resulting in 17 problem trees (presented in Appendix 4).

These same 5 categories (financial, social, natural, human and physical) are used in Section 3 to group the causal factors that constitute the roots of the problem tree.

Table 2: Sustainable livelihood (SL) capital categories and sub-categories used

SL capital category	SL capital sub-category
1. Physical	1a. Inadequate rural living conditions and services
	1b. Poor urban living conditions
	1c. Poor physical access
	1d. Disaster vulnerability
2. Natural	2a. Low basic grain production
	2b. Lack of secure land tenure
	2c. Lack of food security
	2d. Lack of access to forest resource
3. Financial	3a. Lack of robust rural incomes
	3b. Lack of robust urban incomes
	3c. Lack of affordable long-term credit
4. Human	4a. Lack of education
	4b. Lack of training
5. Social	5a. Lack of representation
	5b. Geographical dispersion of population
	5c. Lack of organisation/grouping
	5d. Ineffective civil society

Constraints addressable by FRP were identified among the causal factors included in the problem tree. These "researchable constraints" are not necessarily located at the very roots of the problem trees; indeed, in some cases they constitute branch tips. A "research theme" was then identified to address each of the researchable constraints (Section 4).

5. Prioritisation of Research Themes

The research themes were prioritised according to the following criteria:

1. ***Frequency of mention by interviewees***.
2. ***Geographical impact area of results***: in how many of the four countries would the research results have impact, and in which ecosystems within each.
3. ***Number of poverty groups potentially affected.***
4. ***Number of categories and sub-categories of sustainable livelihood capital:*** how many forms of sustainable livelihood capital are affected by the researchable constraint(s) that the research theme addresses.

On the basis of the above criteria, each research theme was assessed according to a) its potential poverty impact and b) its relevance to FRP's objectives and *modus operandi.* The bases on which research themes were categorised are set out in Table 4.

Table 3: Bases for categorisation of research themes according to potential poverty impact

Category	Criteria
HIGH	Affects all 4 countries **and** all 3 ecosystems **and** poverty group score is at least 2* **and** addresses at least 3 SL categories **and** problems addressed are mentioned by at least 25 people.
MEDIUM	Does not qualify for High, but affects at least 3 countries **and** at least 2 ecosystems **and** poverty group score is at least 1.5 **and** addresses at least 3 SL categories **and** problems addressed are mentioned by at least 25 people.
LOW	Affects less then 3 countries **or** less than 2 ecosystems **or** poverty group score is less than 1.5 **or** addresses less than 3 SL categories **or** problems addressed are mentioned by less than 25 people

*Note: sum of poverty groups affected (a = 1, b = 1, c = 0.5, d = 0.5). Lesser weightings assigned to c and d in reflection of the smaller size of these groups.

2. POVERTY IN THE STUDY COUNTRIES: AN OVERVIEW

2.1 TYPES OF POVERTY

Table 4 shows the four study countries to have high levels of poverty on a global and regional level, using a range of criteria covering health, education, income, access to services and income distribution.

Table 4: Summary of Poverty Indicators for the Study Countries (plus reference countries elsewhere in the region and worldwide)

Country, with World Ranking for HDI	Life expectancy at birth (years) 1998	Adult literacy rate (%) 1998	GDP per capita (US$)	Human Development Index[1] (1998)	No access to drinking water (%)	No access to health services (%)	Gini coefficient [2]
1. Canada	79.1	99.0	23,582	0.935	-	-	-
21. Spain	78.1	97.4	16,212	0.899	-	-	0.26
48. Costa Rica	76.2	95.3	5,987	0.797	4	3	0.46
55. Mexico	72.3	90.8	7,704	0.784	15	9	0.50
104. El Salvador	**69.4**	**77.8**	**4,036**	**0.696**	34	-	-
113. Honduras	**69.6**	**73.4**	**2,433**	**0.653**	22	38	0.54
116. Nicaragua	**68.1**	**67.9**	**2,142**	**0.631**	22	-	0.50
120. Guatemala	**64.4**	**67.3**	**3,505**	**0.619**	32	40	0.55
174. Sierra Leone	37.9	31.0	458	0.252	66	64	-

(source: UNDP, 2000b, 2000c)

2.2 GEOGRAPHICAL DISTRIBUTION

A common pattern in all of the study countries, in addition to low average levels of human development and correspondingly high poverty, is the grossly skewed distribution of the available wealth, as indicated by high Gini coefficients (Table 4). This disparity exists between both social classes and geographical regions.

Honduras

The principal area of chronic poverty in Honduras is the rural west, bordering on El Salvador and Guatemala, an area also characterised by relatively high densities of indigenous population (UNDP, 1998). On the basis of the number of households with unsatisfied basic needs, analysed at the municipality level, del Cid *et al.* (1999) identify an additional area of poverty concentration at the agricultural frontier in the north of Olancho and El Paraiso Departments. They contrast the chronic poverty in the west, characterised by highly entrenched patterns of land use and tenure, with the "transitional poverty" at the agricultural frontier, as small farmers (typically migrants from the areas of chronic poverty) push back the limits of the humid forest in advance of larger scale cattle ranchers and land speculators. At the other end of the scale is the central corridor, between the two main cities of Tegucigalpa and the industrial centre San Pedro Sula, which is the principal focus of economic development; especially in San Pedro Sula, this is characterised by the recent development of factories (*maquilas*), where typically Asian investors take advantage of low cost Honduran labour to produce clothing.

El Salvador

Poverty in El Salvador also shows a strong geographic polarisation: the 6 easternmost departments (out of the total of 14) are also the 6 with the highest proportions of families living in poverty and extreme poverty (Cox Edwards, 2000). This east-west division to some extent reflects climatic patterns, the east

[1] Based on a combination of life expectancy at birth, education (adult literacy and matriculation rates) and GDP (UNDP, 2000).

[2] Indicates the degree of inequality of distribution of income: high coefficients indicate high inequality.

being significantly drier than the west. The rural-urban divide mirrors that in Honduras: in 1996 64.8% of rural households were poor, compared to 42.3% of urban households (Jaramillo, 2000). The urban economic situation has local effects on rural conditions, La Libertad and San Salvador departments (where the San Salvador conurbation is located) have the lowest national levels of both urban and rural poverty.

Nicaragua

Geographical patterns of poverty in Nicaragua vary according to the indicator used. Extreme poverty, (defined on the basis of family incomes) is concentrated down the spine of country, in the band running from the Segovias in the north-west to the eastern shores of Lake Managua in the south-centre[1]. Conditions of health and nutrition are lowest in the north and north-east (between the Segovias and the RAAN); education is lowest in the north-centre and south-east (UNDP, 2000a). The area where the foci of these different measures of poverty most overlap is in north and centre. Again, in Nicaragua there is a strong rural-urban contrast in poverty levels: 69.5% of rural households live in poverty as compared to 31.5% in urban areas.

Guatemala

The polarisation of poverty (defined by income levels) is especially extreme in Guatemala. In addition to the rural-urban divide (75% of rural households live in poverty compared to 29% in urban areas), there is a strong polarisation according to ethnicity: 74% of indigenous households live in poverty as compared to 41% of non-indigenous households. This situation is reflected by geographical polarisations; the highest concentrations of poverty are found in the north, north-west and south-west, these being the areas where indigenous populations are concentrated (UNDP, 2000c).

2.3 TRENDS

All four countries show high rates of overall population growth, although these show signs of levelling off (Table 5). Urbanisation rates are also high, due largely to rural-urban migration (Table 5), though due to continuing high reproductive rates this has not as yet (with some local exceptions) led to an actual reduction of rural population levels. All four countries have shown moderate but variable increases in their levels of Human Development Index, despite disparate economic performance.

Table 5: Principal Demographic Characteristics of the Study Countries (source, UNDP 2000b).

Country	Annual population growth rate (%)		Population density/km^2 1998	Urban population as % of total		
	1975-1998	1998-2015		1975	1998	2015
El Salvador	1.7	1.7	285.2	40.4	45.9	53.6
Honduras	3.1	2.3	54.4	32.1	45.7	56.1
Nicaragua	2.9	2.5	32.0	50.3	63.7	71.3
Guatemala	2.6	2.5	99.2	36.7	39.7	48.3
Developing countries (average)	2.0	1.4	-	26.1	39.0	49.1

Table 6: Human Development Trends and Economic Growth in the Study Countries (source, UNDP 2000b)

Country	Change in HDI (1990-1998)				Average annual change in GDP
	1975-1980	1980-1985	1985-1990	1990-1998	(1975-1998)
El Salvador	0	+0.023	+0.037	+0.055	-0.2
Honduras	+0.049	+0.032	+0.022	+0.029	+0.7
Nicaragua	+0.011	+0.008	+0.008	+0.035	-3.4
Guatemala	+0.036	+0.012	+0.024	+0.042	+0.5

[3] source: http//:www.sdnnic.org.ni/documentos/mapa-pobreza

3. THE CAUSES AND CHARACTERISTICS OF POVERTY

This section presents an overview of the natural resource-related causes of poverty, as determined from the interviews carried out in the course of the study and a review of literature including previous poverty analyses (Appendix 10), supplemented and interpreted where necessary on the basis of the regional experience of the consultant.

The cause-and-effect relationships between these factors (set out in section 3.1) and their contribution to deficiencies in 17 sub-categories of sustainable livelihood capital are presented graphically as problem trees in Appendix 4. Section 3.2 summarises the characteristics of poverty among each of the four poverty groups identified.

Section 4 narrows down from the factors presented here, to focus in on FRP-researchable constraints.

3.1 THE CAUSES OF POVERTY

FINANCIAL

Small farmers receive little income from agriculture

In much of the region basic grain (maize, beans, sorghum) farming is either only marginally profitable or loss making, due to a combination of low production [N8][1] and variable prices; these factors also affect alternative crops such as market vegetables, though these tend generally to have more income-generation potential than basic grains.

Low agricultural production is due to:

i) **limited access to land**, due to entrenched **land tenure conditions**, **failure of agrarian reform programmes**, **lack of policy support** [H17, N5] and **demographic growth** [G11-18];
ii) **soil degradation**, due to **inappropriate land management practices** [H15], a function of the **ineffectiveness of technical support** programmes, **lack of credit** and **population impermanence** in agricultural frontier areas;
iii) **variable climate** (a problem compounded by **steep topography** and **lack of access to technical support** and **credit**, which limit opportunities for irrigation) [H12, G3, N4] and pests and diseases (Flores-Barahona, 1998).

Low prices are due to:

i) **lack of post-harvest care** (resulting in losses and reducing ability to wait for high prices before selling) ([G10], Flores-Barahona, 1998)
ii) **poor market access** (due to **isolation** and **lack of organisation**) [H15, N5]
iii) domination of markets by **intermediaries**
iv) **Lack of a policy support framework** for agriculture [N5]
v) unfavourable **macroeconomic policies** [H17] (Núñez Sandoval, 1999).

The profitability of agriculture is further affected by **high costs of chemical inputs** and by **high labour costs**, which is partly a result of **labour shortage** due to **migration** [E12].

[4] Codes in square brackets (see key in Appendix X) indicate the interviewee who referred to each cause. Given the non-random nature and small size of the sample, the numbers of citations per theme should not be used for quantitative comparisons of the geographical importance of each cause.

Rural populations lack employment opportunities

Limitations on the economic use of available natural resources (see below) and **lack of local processing** restrict opportunities for employment through small enterprises. Employment in the agricultural sector is limited by the **agronomic problems** and **price fluctuations** which typically affect commercial crops (*e.g.* cattle, melons, coffee and shrimps) [E7, E12] on which much of the rural population has become dependent for income (Flores-Barahona, 1999); and by the **low profitability of basic grain farming**.

Limitations on employment opportunities may disproportionately affect certain sectors of society. The landless are more vulnerable to non-availability of employment, as, **lacking access to natural resources**, the sale of their labour may represent their only opportunity for income generation. Women tend to have limited access to forestry-related employment, due to a combination of the heavy **nature of the work** and **cultural restrictions** on men and women working together [H19].

Urban population lack access to quality employment

Despite greater employment opportunities in urban centres, poor migrants tend to be excluded from well-paying jobs due to their **low levels of education**. The *maquilas*, which are of particular importance in attracting population in search of employment, in many cases offer poor working conditions with long working days and low salaries [G4]. Urban unemployment has been exacerbated in Nicaragua by the **structural readjustment** programme implemented following the election defeat of the Sandinistas, involving massive downsizing of the state apparatus [N8].

Small operators lack access to credit and incentives

Access to credit is limited by:

- poor people's **lack of collateral** in the form of secure land title [H7, H9, H11, H12, E4, E6, G8, G11-18];
- high transaction costs on the part of credit providers in dealing with **widely dispersed small producers** [H9];
- the **risky nature of the rural economy** [G8];
- **inappropriately designed rural finance programmes** [H5].

When credit is available, it is generally short-term in nature and subject to high interest rates [G11-18]; Alternative credit mechanisms such as *cajas rurales* can go some way to overcoming these problems [H5].

Small landowners, and those lacking secure title, **lack access to environmental subsidies and incentive programmes** (such as PINFOR in Guatemala), and thereby have limited opportunity to participate in forestry as an income-generating activity [G3, G11-G18, G20, R1].

Lack of finance limits the ability of small players in the forest industry to technify, as a means of increasing efficiency and valued added, or capturing new markets; to increase scale and thereby market influence and ability to meet supply commitments to clients consistently; to survive cash flow problems to which they may be exposed on entering new markets (for example as a result of payment defaults by clients) [H19]; and to purchase raw materials [H7].

The poor receive little indirect benefit from industrial forestry activities

The potential for the forest industry, with its technical capacity and economies of scale, to benefit the poor significantly through "trickle-down" effects at local and national levels [H22], has as yet failed to materialise, due to a combination of corruption and lax control; instead forest resources have suffered severe degradation and the benefits have largely remained in the hands of the timber companies [H7].

Available forest resources are under-utilised

In much of the region, the problem is less a scarcity of forest resources than the fact that they are not used by, or for, poor people, as a means of income and employment generation [R2]. This is partly due to a failure, on a number of levels, to recognise the potential for forests to be sustainably managed. In Guatemala, some indigenous communities are resistant to the concept of timber harvesting for **cultural reasons**, although this has in some cases been overcome by exposure to successful examples [G2]. In El Salvador, **excessive and over-restrictive environmentalism** is blamed [E6]. In Nicaragua, the forest sector was described as having a pariah status in **public opinion** [N6].

Under-utilisation of the resource is also due to **lack of knowledge of management requirements** and **narrow market preferences** for certain types of products. The extensive areas of young (secondary) natural pine forest in Honduras, for example, are currently unutilised and unmanaged, despite being seriously overstocked, due to a combination of a lack of experience of how to manage them [H3, H9, H21] and limited markets for small diameter thinning products [H19]. A **lack of markets for small diameter material** also limits the economic potential of small Teak plantations in El Salvador [E1]. In broad-leaved forests, meanwhile, **narrow species preferences** (the "Caoba-Cedro culture") lead to many potentially useable species remaining untouched [H1, G6, G7]. This situation is partly due to **traditional consumer preferences** and partly due to **lack of knowledge of the timber characteristics and processing requirements** of lesser-known species, within the timber industry [H1].

Lack of local processing has the additional effect of reducing opportunities for the local use of processing waste products, in small scale industry, for the generation of employment and income [G6].

Rural communities receive low prices for forest products and services

Low timber prices significantly limit the opportunities for the rural population to live from forestry activities. In addition to limiting small operators' levels of consumable income, they limit their ability to capitalise, by increasing either their scale of operation (in order to achieve increased market influence) or their level of technification (in order to increase quality and therefore value added, or access new markets) [H7, G11-18].

Low prices are due to a combination of the following factors:

i) Legally produced timber is not price competitive

Small producers operating within the law find it difficult to compete with the illegal timber which dominates the market (a result of an **absence of effective regulation**) [H1, H9, H10, H16] or with low priced timber which AFE-COHDEFOR periodically markets as a means of generating revenue (a reflection of a **lack of policy support** for small producers [H1]).

ii) Producers, processors and consumers are not favourably linked by marketing chains

Rural producers lack knowledge of, and access to, markets (processors and consumers) offering reasonable prices for their products; while largely urban processors lack access to sources of reasonably-priced raw material of appropriate specifications [H16, N6, R2, R8, R3-5, R15]. Currently, sale prices for producers are depressed, and purchase prices for producers and consumers inflated, by the **domination of the trade in forest products by intermediaries** [G4]. Inadequate operation of the marketing chain, linking producers to processors and consumers, is a function of **limited access and communication, low levels of education** [G3] and a **lack of producer grouping** ("*redes empresariales*") (Díaz Arrivillaga and Falck, 1999). However poor market knowledge is not limited to small producers; projects that have promoted handicraft production, for example, have at times **failed to carry out market research** on behalf of their beneficiaries.

iii) Small rural producers lack access to price information

In the absence of up-to-date, reliable information prices (also a function of **limited access and communication, low levels of education** and a **lack of producer grouping**), it is difficult for small producers to negotiate fair prices for their timber with the intermediaries who link them to processors and consumers.

iv) Small rural producers lack access to credit

Lack of credit for working capital obliges small producers to depend on advances from buyers, which reduces their capacity to negotiate favourable prices [G6].

v) Rural producers fail to add value to forest products

Opportunities for adding value locally are limited [R1] by:

- **steep topography** (e.g. in Honduran humid forest [H16, H19]) and **poor access** (Nicaraguan humid forest [N4]), which make it an unattractive proposition to transport processing equipment, such as mobile sawmills, to the tree [H1];
- **excessive regulation**, which in Honduras makes it difficult to obtain permission to operate small-scale rural sawmills [H10, H19];
- **poor quality production**, due to a combination of **equipment limitations** and **lack of training** [H1, H19, N6];
- **lack of infrastructure**, in the form of electricity to power machinery [H1].

vi) Niche markets and certification are not fully developed

Speciality niche markets paying price premia for certified timber and timber products have, to date, largely failed to confer benefits to small producers [H10, G6, N4]. Opportunities are **limited by low levels of production** which are inadequate to satisfy markets reliably; this is due in part to a **lack of producer grouping** and partly to producers **lacking sufficient confidence** in the markets, or their benefits, to increase production [H4, H10]. Access to certification is limited by the fact that much rural land **lacks secure title**. **Lack of education** and **business skills** also limit small rural producers' ability to deal with the administrative procedures associated with exporting wood to niche markets and to participate in certification schemes [H10].

In addition, the **mechanics of the certification process** are not fully resolved; for example in northern Honduras the Proyecto para el Desarrollo del Bosque Latifoliado (PDBL) has to date been paying affiliation fees due to the certifying body, but it is not clear who will meet this cost following project closure; a similar situation is reported in the Guatemalan Petén [G6]. **Costs** of certification are still considered to be excessively high, partly due to the **number of requirements** of the process [G6]. Information on locally-specific management requirements of forests is *not* considered to be an obstacle to the development of local standards for certification [N7].

vii) Small operators produce low quality products

Due to **lack of technical skills** and **machinery**, small furniture workshops typically produce sub-standard products, which fail to command attractive prices [H19].

viii) Lack of product diversification

Small rural producers typically produce a **narrow range of products**, leading to high levels of competition and therefore low prices [H19, G4].

Urban processors receive low prices for products

Small furniture and handicraft businesses in urban areas are faced by similar problems to rural producers. Despite their physical proximity, access to markets is again often through **intermediaries**, limiting the

price received by the producer [H13]. **Market research and innovation is limited**; there is **little product diversification** [E7], numerous producers offering the same, in many cases unattractive, product, resulting in low prices. Project support tends to focus more on technical quality than on finding out what consumers actually prefer.

The rural poor lack diverse income sources

Given the **low prices** and **variable productivity** of basic grains, the **variable prices and "boom-and-bust" nature of traditional and non-traditional commercial crops** and the associated **scarcity of employment opportunities** [G11-18], there is a need for alternative income sources for rural communities [E4, G4, G6, G10], which contribute directly to household economies, reduce the motivation for emigration (with its associated livelihoods implications), and protect or provide environmental services to vulnerable populations elsewhere [E6]. The opportunities for the poor to benefit from such alternatives face various limitations:

i) The poor do not participate in the benefits of tourism

Tourism is now a very significant source of income in several parts of the region; in both Guatemala and Nicaragua it is now reported to be the second most important source of foreign exchange [G6, N7]. However the benefits of this sector are very unequally distributed [R2], due to a **lack of policy support** [N7], **infrastructure**, **local experience** and **education** [G6]; **poor management and control** also leads to negative social and environmental impacts [E7]. The potential for growth of this sector is limited by consumers' **perceptions of political instability** in the region [R2].

ii) The poor do not receive payment for environmental services

The environmental services most often referred to are the protection of water catchments and carbon capture. The former is of greater local interest, given that the beneficiary populations are located exclusively within the region, and the highlighting of upstream-downstream relationships by Hurricane Mitch. In El Salvador, for example, the growing conurbation of San Salvador depends strongly on surrounding shade coffee areas and the Río Lempa catchment for water supply (Cuéllar and Rosa, 1999). The case for a local trade in environmental services is less clear cut in the Petén, where the benefits of forest conservation are predominantly international, in terms of biodiversity conservation and carbon capture.

However there are as yet few conclusive demonstrations of effective mechanisms for the payment for environmental services in the region; experiences in Costa Rica are not generalised [R17]. There are significant, but researchable, limitations in all stages of the process: **lack of quantification of the services provided**; **lack of economic valuation** of the services; and **lack of models for payment mechanisms** to service providers [H10]. Research into this area is at an early and largely discursive stage (*e.g.* Cuéllar and Rosa, 1999; Rosa *et al.* 1999a and 1999b). Given their **limited land ownership**, it is important to recognise that poor people have limited capacity to produce, and thereby receive individual payment for, environmental services [R12-14].

The poor are marginalised from economic activities

Poverty is a self-perpetuating condition; there is a tendency towards a **polarisation in levels of participation in economic development** activities in rural communities, a few dynamic actors (typically not the poorest) rapidly becoming dominant in the areas of production and commerce, and thereby receiving a disproportionate share of the benefits [E7].

SOCIAL

Poor people lack organisation and grouping

Lack of organisation (in its simplest sense of joining together to achieve a critical mass) limits small producers' access to, and influence over, markets for both forest products and environmental services [H7, G11-18, N6, N7] and their capacity to invest in infrastructure (such as roads) for their collective benefit [N7]. Lack of effective local decision-making organisations results in decisions failing to represent the interests and needs of poor people. Weak social structures make it difficult for extension or development institutions to establish community-based management initiatives [G11-18].

Rural populations lack organisation due to:

- **geographic dispersion;**
- **low levels of education** [H11, H12];
- **cultural preference** for working as individuals [H1, H12, G2, R12];
- a **lack of resource support** to municipalities [H18];
- community dislocation due to **emigration**, especially in El Salvador;
- **cultural erosion** of indigenous organisation, dating back to colonial times [G4];
- **paternalism** by development agencies, which have caused internal divisions and failed to promote local capacity [G6, N4];
- **cultural heterogeneity**, for example in the Petén where many communities are recently formed by people from many different areas of Guatemala and therefore lack a common cultural and organisational history [G6, G8].

The dominant model for organisation among the rural poor has, for several decades, been that of formally organised groups or co-operatives. Examples are the *"grupos del sector reformado"*, who were the beneficiaries of the Honduran agricultural reform, and the groups of ex-combatants, at whom the post-war Programa de Transferencia de Tierras was aimed in El Salvador [E7]. These traditional models have tended to lack permanence, with groups fragmenting due to **insufficient technical and credit support**, and a **lack of genuine commitment** of members to working collectively (some groups having been formed with the sole purpose of benefiting from the agrarian reform or participating in projects [R2, R12-14]). The new organisational model proposed by *e.g.* FUSADES en El Salvador is that of "associativity" based on association of producers principally for economic ends [E12]. However in general there are few examples of community organisations providing alternatives to co-operatives.

Patronatos are the predominant form of organisation at the community level, but in both rural areas and urban *barrios* [G9] they are typically **limited to infrastructural issues**. Community-level committees, set up by NGOs and projects, tend to lack a broad constituency and credibility outside of the direct beneficiaries of the sponsoring institutions, and in some cases are dependent upon incentives and therefore unsustainable.

At the level of local government, municipal authorities tend to suffer from **corruption** and **political favouritism** [H10, G20], a situation that is yet to be addressed by effective social auditing by civil society [H10]. They also typically receive **inadequate funds or legal support** from central government [G20, N9], which is a reflection of a **lack of genuine political will** for decentralisation (though paradoxically in the case of Estelí, Nicaragua, lack of central government support, due to party political differences, was considered to be a reason for that municipal authority's current strength). They tend to **lack technical capacity** [G20, N9], although there is great variability between municipalities in this respect; while there are moves to redress this situation through the establishment of, for example, Unidades de Manejo Ambiental (UMAs) in a number of municipalities in Honduras, these tend again to be heavily politicised and to have a **predominantly urban focus** [H10]. In Guatemala, promising results are reported with

municipal forestry offices established through the BOSCOM project of INAB [G2], despite problems such as conflicts arising from pay differentials between forestry staff and existing municipal employees. In Nicaragua, the potential of municipal governments to assume a more significant role in natural resource control is limited by their **excessive fragmentation**; while some larger municipalities such as Estelí have significant capacity, there are many smaller ones with very low staffing and educational levels [N5].

Policies, laws and plans act against the interests of poor people

The domination of policies by the neo-liberal agenda has increased price instability for basic grains and cash crops, on which poor people depend for income and employment; and, with its focus on the development of agricultural export crops, continues to reinforce the polarisation of land distribution [E6] and neglect the productive potential of forestry resources [N7]. There is a general tendency for the rural sector to be marginalised in central government policies [N2], with greater emphasis being placed on the development of the urban *maquila* sector, using cheap local labour to produce export goods [E10, E12].

Forestry laws and policies in Central America have tended to be excessively **top-down, exclusive** [R2], **bureaucratic** [G6], **complex** [R2] and **poorly designed** [G11-18], and to **generalise across forest types and socio-economic and cultural conditions** ([H9], Segura *et al.*, 1997).

An additional problem, especially in Guatemala at present, is **instability and uncertainty** regarding laws and policies in the forest sector [G20]. The successive dramatic changes in forestry laws in Honduras (the 1974 *Ley de COHDEFOR* and the 1992 *LMDSA*) have left significant uncertainty in rural communities as to their rights regarding trees. This situation is compounded by a **lack of effective communication of the provisions of forestry laws** (Barrance *et al.*, 2000; [G11-18], [R2]). Even when policies and laws are pro-poor, they are on occasion glossed over and thereby made inoperative by interested parties. The *Ley para la Modernización y el Desarrollo del Sector Agrícola* (1992) in Honduras, for example, in theory grants equal rights to forestry groups operating in accordance with Management Plans, as to private landowners, though this fact is not generally recognised [H10].

Inappropriate laws, policies and plans also affect the urban poor. Opportunities for urban forestry are limited by **lack of guarantee of long term access** to the resource and an unclear **land tenure** situation there; while initiatives to establish forested "green lungs" within urban areas at times **fail to take into account the needs of informally-settled poor people** on such areas [G9].

Lack of clarity in forestry laws is also a disincentive to the establishment of income-generating forestry plantations by small farmers [E2]; **overlap in institutional responsibilities**, meanwhile, leads to inefficiency and ineffectiveness with detrimental implications for the defence of the interests of the poorest sectors [G6].

Examples of inappropriate or excessive regulations and policies include:

- moratoria on forestry activities: in Honduras, the felling of a number of species was prohibited by decree of the Director General of AFE-COHDEFOR, with little objective foundation (Barrance *et al.*, 2000); while a 6-month complete moratorium is proposed in Guatemala on forest harvesting, frustrating communities involved in the sustainable management of forests and threatening to lead to increased contraband and corruption [G6, G20];
- the application of norms and management plan requirements developed for coniferous forest to broad-leaved forests and dispersed tree situations in agroecosystems, limiting opportunities for them to be well and sustainably used for income generation (Barrance *et al.*, 2000);
- the difficulty in Honduras in obtaining permits to operate small-scale rural sawmills to add value locally to forest products (an especially important consideration for operators using machinery obtained on credit) [H10, H19]

- excessive dominance of management plans in the Guatemalan Petén by technical considerations, with little attention given to social issues (legal bureaucracy there is a disincentive to timber salvage from the clearance of agricultural areas) [G6];
- levels of allowable annual cut in Honduran humid forest which are considered to be set too low [H10];
- the policy of auctioning timber on Honduran national land to the highest bidder, which is a disincentive to long-term stewardship by any one actor such as forestry co-operatives [H10]

The increased voice of civil society in law formulation in Honduras and Nicaragua offers the potential for legislation to become more pro-poor. In El Salvador, however, the process of formulation of the new forestry law has effectively stalled; the consultation process there has merely resulted in different sectors attempting to introduce clauses favouring their particular **interests** [E1] and the result is likely to be law of the traditional model [E10]. In Guatemala, moves afoot to modify the existing forestry law are largely **politically motivated** [G6, G20].

Development and extension programmes have limited effects

Despite massive investment in rural extension programmes, impacts have been limited, due to a combination of the **characteristics of the target communities**, the **nature of the technologies promoted** and the **extension strategies applied**. The net effect was considered by one interviewee to be the promotion of "sustainable poverty" [N5] rather than true development.

The poorest sectors of society tend to be bypassed by extension programmes; this situation is openly recognised as a policy by a number of agencies, which consider that it is **difficult to work with the very poor** due to their lack of **dynamism, education or stable land tenure** [H11, H15, E4], and that they can only be impacted indirectly through economic and employment trickle-down effects from more dynamic and accessible strata [H11, H15, N5, N6]. Exclusion of the land-poor from direct participation and benefits is particularly a problem with projects concerned with the management of natural forests [R8].

Programmes also find it difficult to work in communities with high levels of **emigration**, due to the difficulty of building a resource of trained human capital [E6]. The degree to which programmes focus on high poverty areas is limited by the low cost-effectiveness of investment in **very isolated communities** [N5] (see below); **continuism** (for example project attention continues to focus principally on the west of Guatemala to which it was initially attracted by the earthquake of the 1970s [G4]); and **insecurity** [N2].

For **cultural reasons**, in some communities it is difficult to involve women in participatory approaches to development [E4]. Members of communities which have historically been affected by **violence and repression** are at times be reluctant to participate in diagnostic and planning exercises which require the free expression of opinions [E7, E8, G2].

There has been significant progress in developing appropriate technologies for hillside land use [H15, G4]; however there is a **lack of information flow** between extension agencies, resulting in the promotion of outdated and flawed technologies [H15]. There is a **lack of integrated technology models** applicable at the whole farm or whole watershed levels [H11]. The **fluid nature of some rural communities** can also make rigid models rapidly obsolete [R12-14].

Adoption of technologies is limited by a **failure of extension agencies to connect** with the needs, aspirations and decision-making processes of farmers. Many of the agroforestry systems promoted are only applicable to larger farms [G10]. Some research institutions still apply a **predominantly technical and financial approach** to technology development and evaluation (e.g. FHIA [H2]), with little attention to more livelihood-oriented considerations [H10]. **Training of agroforestry extension agents** is also considered to be too sectoral in nature, with excessive emphasis on technical issues (although there are also deficiencies in that area). In general, there is more of a **need for further validation** of technologies

in different socio-economic and cultural conditions [H10], than for the development of new technologies. At a more fundamental level, there is a **failure to understand and take into account the psychological implications** for their decision-making processes of the pressures faced by poor people [N9].

Extension activities are excessively influenced by the **administrative considerations and timescales of projects** and the donor agencies that fund them [H4, H5, N4] (Flores-Barahona, 1998), with **little continuity** between successive extension projects [H5]. The need to meet donor and project goals has led to the widespread use of **incentives**, with negative implications for the sustainability of technology adoption and for community coherence [H12]. The **large number of NGOs** in existence (especially in Nicaragua, where government downsizing in the 1990s has led many former civil servants to establish NGOs as a survival strategy) leads to a **fragmentation and inconsistency of effort** [E7, G2], resulting in low impact and contributing to divisions within communities [N4]. Despite NGOs being considered in general to be more effective than government agencies, they **lack resources** due to the tendency among donors to channel funding principally to government [E8].

Government agencies such as AFE-COHDEFOR are considered to have **difficulties in relating to *campesinos*** in general, tending to deal only with industry representatives and technical foresters [H20]. Despite some successful examples on the part of INAB, in promoting community forestry management, elsewhere that institution has suffered **rejection** by community members for cultural and historical reasons [G2].

There is a lack of stable, locally owned and interdisciplinary institutionality

In-country institutions have failed to undergo incremental advances in their capacity to provide solutions for the problems of the poor, as development agendas have largely been **defined by international funding/lending agencies** rather than the target countries themselves [R17, N8, N9]. Research has tended to be carried out by institutions with only temporary presence in the region, little investment having been made in building permanent local research capacity [R16].

Decisions are based on inadequate information

Decisions relating to poor people continue to be taken on the basis of inadequate information, either due to the **non-existence of such information** due to a lack of research of or to poorly focused research [N9] or to the **lack of information flows** between researchers and information centres and implementing institutions [G20, R7-10]. This is due to downsizing associated with **economic restructuring policies** and to **changes in donor priorities**.

Limited access to information for decision-making is also a result of **the way that research is carried out** and of the **institutional context** within which it occurs [R16]. Social research is made difficult by institutional influences in communities, which lead interviewees to give biased answers. Some research is "token" in nature and thereby fails to yield meaningful or useful results; with a lack of differentiation between the perceptions of different groups, or of different actors within communities [N9]. There is a strong tendency towards **sectoral compartmentalisation**, with a lack of interdisciplinary research and a lack of information flow between sectors (for example forestry research tends to be circulated exclusively within forestry spheres despite its broader relevance) [R17]; a **failure to share information** [N4, R2]; and a **failure to convert research findings into action**, for example in universities [N7].

Ill-informed decision-making is also explained by the **failure to question the reliability of data** that are repeatedly used in project justifications. An important case in point is the question of peri-urban firewood supply and consumption.

Poor people lack a voice in decisions affecting them

The formulation of policies and regulations has traditionally been heavily **top-down and politicised** in the region, failing to take into account the opinions of the poor This situation has to some extent been redressed by the recently greatly increased role of civil society in Honduras and Nicaragua, manifested in the consultation processes associated with the drafting of the *Ley para la Modernización y Desarrollo del Sector Agrícola* (1992) in Honduras and, much more significantly, the forthcoming forestry laws in both countries. Most significant have been the pressures from civil society for social auditing of relief efforts, following Hurricane Mitch in 1998.

However this has yet to result in social auditing being truly institutionalised and having any day to day influence on Government decision-making and operations. Many of the civil society organisations involved in the processes described above **do not truly represent grassroots interests**; NGOs in particular **lack power as pressure groups**, given that they do not have a popular base in the same way that *campesino* organisations do [H5]. In El Salvador, **civil society is considered to be seriously divided** [E6]. There is also doubt as to the degree to which some of the "civil society" institutions, which participated in the various fora which formed following Mitch, are genuinely committed to association and to what degree this has **simply been used as a strategy** for accessing international funds [H17].

Rural populations are subject to violence

Rural populations in Guatemala, El Salvador and Nicaragua have been subject to severe violence, in particular the civil war and political repression of the 1980s. Although politically-motivated violence is largely a thing of the past, there continue to be significant levels of banditry and other forms of insecurity in some areas, such as the RAAN area of eastern Nicaragua.

Violence increases poverty in a number of ways, both immediate and longer term, including: the destruction of infrastructure; the disruption of organisational structures; the creation of lasting mistrust, which is an obstacle to future development initiatives [E7, E8, G2]); the deterrence of development organisations from insecure areas [N2]; the disruption of traditional livelihood support systems due to migration to unfamiliar areas; and the reduction of family income generating capacity due to the loss of breadwinners.

The poor are particularly vulnerable to violence for a number of reasons, including their **lack of access to resources** with which to protect themselves; their **limited ability to move** to safe areas; their **lack of fallback economic support systems** when forced to move; and their **lack of information access and organisation**, which makes them subject to political manipulation

Resource management conflicts and decisions are not resolved collaboratively

Despite growing attention to the area of collaborative decision making and conflict resolution in the natural resources sphere, methodologies developed for this purpose have yet to be widely implemented [H8, G2, G6]. As a result, conflicts continue to result in a reduction of net benefit to the parties involved, and/or to an increase in polarisation of wealth and poverty [G20].

Regulatory institutions are weak

Limited regulatory capacity on the part of institutions such as AFE-COHDEFOR in Honduras and CONAP in the Maya Biosphere Reserve in the Guatemalan Petén make it difficult for small operators or groups, working within the law, to have guaranteed access to resources or to compete on the open market with illegally-felled timber [H1, G6].

NATURAL

Poor people lack securely titled land

Despite successive agrarian reform and land titling programmes, this is still a major problem in all four target countries. In general, women tend to have less access to land than men. In the absence of secure title, farmers are unable to obtain credit necessary for intensification or carrying out local value-adding activities. Insecurity over permanence is also a direct disincentive to investing in intensification (for increased production), soil conservation (with implications for the disaster vulnerability of populations downstream) [H7, H9, H11, G8] or tree planting [H2, E2]. Usufruct rights (*dominio útil*) and locally recognised informal tenure may provide sufficient security for some farmers to invest in their land, but not sufficient to give them access to credit. Small farm size (*minifundismo*) increases the opportunity cost to landowners of having trees on their land, given the negative impacts of their shade on agricultural crops [E8].

In Honduras, a **lack of technical and credit support** has led many of the co-operatives, formed to receive land under the agrarian reform programmes of the 1960s and 1970s, to sell their land (Ruben and Fúnez, 1993). In Nicaragua, the Sandinista government failed, before losing power, to complete the process of legally formalising tenure on land expropriated following the 1979 Revolution [N4, N5, N7], with the result that much land has returned to *latifundistas* (described by one source as a process of "*contra-reforma agraria*" [N7]). In the autonomous regions of the Caribbean coast of Nicaragua, meanwhile, insecurity of tenure is due to a **lack of policy support for the formalisation of indigenous peoples' traditional land rights** (though a law is currently in the pipeline [N7]). In Honduras, significant recent land titling efforts have had limited impacts on the rural poor living on hillsides [H12]. In the Guatemalan Petén, the situation has been exacerbated by large **speculative land grabs**, especially by members of the military in the 1980s, and the **influx of settlers** from elsewhere in the country [G6]; while in the Guatemalan highlands, indigenous communities have lost their communal lands to **coffee farms** [G10]. Landholding size is further being reduced by the successive subdivision of plots by farmers among their heirs [G10].

Poor people lack access to the forest resource

Scarcity of forest resource is only considered to be a limiting factor in a few areas, such as the east of Guatemala [G4]. Elsewhere, the problem is that the poor participate little in the use and management of the forest resources which surround them [H9, H15, G4, R1]; in Honduras this is the case despite the 1992 *Ley de Modernización y Desarrollo del Sector Agrícola* which returned rights of tenure and use of trees (vested in the state by the 1974 "*Ley de COHDEFOR"*) to landowners, and the Social Forestry System which promoted forestry activities by "agroforestry" co-operatives.

The reasons for poor people's continuing lack of access to the forest resource include:

- a **lack of genuine policy commitment** on broad social participation in the forestry sector;
- a **lack of support to community-based forestry management organisations** [H10];
- an unsatisfactory and **over-restrictive regulatory model** at odds with the realities of the countryside;
- with certain non-timber forest products, their **restricted range** which leads to them being concentrated in the land of a few individuals [G4];
- **loss of land tenure** due to expropriation [G6].

There is a failure to create a forestry resource accessible to poor people

Reforestation programmes in the region have been largely ineffectual at creating a resource available to poor people [R1], due to a **failure to identify socially and economically attractive models** appropriate to

diverse conditions. Opportunities for developing an accessible tree resource through management of natural regeneration in agroecosystems are possibly limited by a **scarcity of seed trees** [R7-10].

Although plantation species selection and silviculture has received significant attention to date in both implementation and research (*e.g.* Ugalde Arias, 1997), there are still areas of research outstanding; for example **provenance information is lacking** on a number of plantation species, limiting their productive potential [R10].

Inappropriate land management degrades poor people's productive resources

Inadequate or inappropriate technology transfer, which fails to correspond to local cultural and biophysical conditions, limits the adoption of appropriate land management practices [E2] (see above). This results in low productivity of agricultural crops, resulting in food insecurity and limited financial income, the degradation of the natural capital of the soil [G3, G11-18] and (debatably; Kaimowitz, 2000) disaster vulnerability among downstream populations.

Causal factors include excessively **narrow criteria for technology evaluation**, with limited attention given to broader livelihood factors [H2] such as the need to ensure food security during the process of changing technologies [N4]; **lack of culturally appropriate and effective extension methods** such as *campesino-a-campesino* (farmer to farmer) approaches [N4]; a lack of **participatory research** [N4]; a lack of **land use planning** (*ordenamiento territorial*) [H10]; and *minifundismo* which concentrates land-use pressure on restricted areas [G10].

The availability of suitable technologies is a less serious limitation; many of the outstanding obstacles to technology attractiveness have been overcome in recent years [H15]. There is, however, a **lack of "mixed models"** integrating the different components of the farm and applicable at the water catchment level [H11].

Forest resources of potential benefit to poor people are poorly managed

Poor management limits the degree to which forests are successfully managed for the sustainable generation of local income and employment. This is to a large extent due to a lack of information and management knowledge, including:

- **single-tree growth models** for mixed-aged natural stands of both conifers and broadleaves [H10, H17];
- **growth curves for lesser-known species** [G2];
- **rotation lengths in humid forests** [G6];
- **acceptable minimum diameters in humid broad-leaved forests** [H10];
- **the management of small areas of coniferous forest** [G11-18];
- **management of some NTFPs**, leading to their **unsustainable extraction** in the Guatemalan Petén, with long term implications for local economic welfare [G7];
- **the management of secondary forest**, which is a constraint to the productive management of the large tracts of formerly agricultural land left abandoned since the civil war in El Salvador [E2, R7-10];
- **the management of trees in agricultural systems**, due to a lack of awareness of traditional management practices [E2];
- **the long term growth and management of small forestry plantations** in El Salvador [E5].

Cultural resistance to felling in forests protected by local communities is, in cases such as Totonicapán in Guatemala, an obstacle to promoting a normal age structure through natural regeneration and thereby maximising the forest's productive potential [G2].

HUMAN

Rural populations are widely dispersed

The widely dispersed nature of the population in many rural areas makes it expensive to provide basic services (e.g. health, education and water supply) and technical or organisational support, discouraging even pro-rural agencies from investing in remote and dispersed populations. CARE Nicaragua, for example, has decided for cost-efficiency reasons not operate in the autonomous regions of Nicaragua, despite a 1997 strategy paper which identified this as a high poverty area [N6]. In areas where projects do work, population dispersion limits the multiplier effect, on which most extension agencies depend, through which farmers communicate technologies to neighbours [H5].

Population dispersion also makes it difficult for populations to organise among themselves, either with or without external support [H11]; and to form producer groups of sufficient scale to compete in the market [H9].

Rural people migrate to the cities or abroad

Lack of infrastructure, **services**, **income opportunities** and **employment** are leading large numbers of rural people to leave the countryside [E7, G4]; these factors are associated with policies of **marginalisation of the agricultural sector** in favour of urban industrialisation. Additional factors that have exacerbated migration rates in the past have been **political violence** in El Salvador and Guatemala, the insecurity resulting from which was principally felt in the countryside, and natural disasters such as the Guatemalan **earthquake**.

Migration is of various different types and has complex implications. Seasonal migration (for example from southern Honduras to the highlands, to participate in the coffee harvest) is an important source of rural cash income and has limited implications for the condition of social and human capital in the source communities. More significant is permanent, progressive internal migration. Del Cid *et al.* (1999) point out that the predominant form of permanent migration in Honduras is actually rural-rural rather than rural-urban, as people tend to arrive at the larger cities in a step-by-step fashion, migrating first from the countryside to nearby small towns from the countryside to the cities. However the net effect of this migration is an exodus from rural communities (though, due to high reproductive growth this does not necessarily imply a population decrease, but rather a reduction in growth); and the growth of severely marginalised and disaster-prone settlements in and around towns and cities.

External migration (in El Salvador, mostly to the USA; in Nicaragua, largely to Costa Rica) has similar demographic implications for source communities. The large quantities of money (*remesas*) sent back by émigrés have positive effects on incomes; US$350 million enter Nicaragua annually this way and *remesas* are now the largest source of foreign exchange earnings in El Salvador; they also reduce peoples' dependence on natural resources [H18, N9], with positive implications for the conservation of natural capital. However, the poverty impacts of *remesas* are limited; most income from this source is received by non-poor households with sufficient financial capital to enable family members to travel to the USA (Jaramillo, 2000). Dependence on income from *remesas* also reduces manpower availability and increases labour costs [E7]; this discourages agricultural investment and therefore narrows the base of the economy, thereby reducing individuals' livelihood robustness.

Agricultural extension programmes, meanwhile, suffer from the periodic loss of participating farmers from the community, making it difficult to build a base of trained leader farmers to act as the nuclei of technology multiplication.

Migration also has impacts on those who migrate. Those who attempt to enter the USA illegally are exposed to significant danger. Separation from their home community may also weaken their cultural values [E6]. Although the temporary exile of many indigenous peoples in Guatemala, due to political violence, has had significant negative livelihood, psychological and cultural impacts, it has had the positive effect of increasing their ability to deal with outside actors and to analyse their situations [G3].

Rural and urban populations are experiencing rapid demographic growth

Despite high levels of emigration, in general rural populations are continuing to grow in many parts of the region, as a result of **high fecundity levels**; a situation resulting from a combination of **cultural considerations**, **limited access to education and information**, and **limited availability of primary health care**. This situation exacerbates the existing scarcity of land as properties are repeatedly divided among heirs (to some extent counterbalanced by the farms of those who leave agriculture being purchased and reincorporated into existing properties) and places additional pressure on the available natural capital [G11-18].

The poor lack access to education and training

Rural communities typically suffer from woefully inadequate education provision, which in most cases does not go beyond primary level. The quality of the education provided is typically poor, teacher absenteeism being high due to **community dispersion** and **lack of access and transport infrastructure**, which obliges staff to travel significant distances to reach school. Pupil absenteeism is also high, due in large part to **low family incomes**. Education levels are significantly lower in rural than in urban populations (UNDP 1999, 2000a, 2000b, 2000c). Low levels of education limit people's ability to adopt new technologies, to participate in and influence markets, to organise effectively and to represent themselves [H12].

Due to **inadequate primary education**, **low resource availability** and **population dispersion**, training is deficient in technical aspects of production, processing and marketing, and in small business management [G6]. This results in low quality and inefficient production, lack of market access, low prices, poor management of finance and lack of business development. Poor education also affects access to quality employment, ability to organise and plan, and ability to control reproductive rates. The participation of indigenous communities in Guatemala in markets and their access to information and technologies is made even more difficult by the inability of many people to speak Spanish.

Rural populations are losing their identification with forest resources

Due to deforestation in some areas, young people lack a forestry culture and therefore an interest in training and participation in tree-related activities [G4]. This is exacerbated by external cultural influences and high rates of emigration from rural areas.

Urban forest products processors lack business expertise

Despite generally higher levels of education in urban areas, urban operators such as small furniture workshops typically **lack training and experience in small business management** [H13], which limits their ability to increase their technical level, to manage finance successfully and to market their products.

Female-headed households lack time for income generating activities

Single (female) parent families make up a significant sector of society in much of Central America, especially in areas historically affected by political violence. The ability of this sector to participate in income generating activities tends to be limited by women's burden of household chores, which limits the availability of their labour.

PHYSICAL

Rural populations lack access infrastructure

Widely dispersed populations in rural areas tend to lack road infrastructure. Even with road access, the poorer sectors tend to lack access to transport [H12, G10, G11-18, N5, N6]. This limits their access to markets [H14] and makes them dependent on intermediaries, with the result that the producers receive low prices for their products [H9, N7]; or it increases their transport costs and thereby erodes their profit margins. Low value products such as firewood are particularly subject to this problem [E8]. Lack of access also limits their chances of becoming beneficiaries of development programmes [G12].

The rural poor tend to be confined to areas of steep topography

The **traditional dominance of fertile lowlands by *latifundios*** (starting with cattle ranching in colonial times and, in the second half of the 20th century export-oriented "non-traditionals") has marginalised small farmers to steeplands, where production is constrained by poor access, difficulties of irrigation and mechanisation, and the susceptibility of soils to erosion. The **establishment of large reservoirs** (for example on the Río Lempa in El Salvador) has also led to population expulsion from lowlands [E9].

The rural poor lack basic services

Due to a combination of **population dispersion** (which increases the cost of service provision) and **exclusive policies**, many rural areas have low levels of coverage by electricity, piped water supply and sanitation (UNDP 1999, 2000a, 2000c).

Poor people live in disaster-prone areas

This theme was thrown to the fore by the experience of Hurricane Mitch in 1998. The impacts of flooding and landslides were felt most severely by the poorest sectors of society, especially in urban areas, as a result of the establishment of marginal *barrios* in high risk areas such as valley bottoms and unstable slopes [G9]. The existence of these *barrios* was to large extent due to the process of **rural-urban and urban-urban migration**, as a result of **rural poverty**; while the magnitude of the flooding and landslides has been widely blamed on the **upstream degradation of catchments** as a result of **inappropriate land use**, itself in many (but by no means all) cases linked to poverty as both a symptom and a cause. It should be noted that the widely made connection between upstream land-use and downstream disaster vulnerability [*e.g.* H11, G4] has been the subject of very little objective investigation, despite its importance as a justification for huge resource investment in watershed management (Kaimowitz, 2000).

The impact of natural disasters on poor people is exacerbated by difficulties and inefficiency in resettlement programmes (many people are still living in shelters in Tegucigalpa, for example, more than two years after losing their houses in Hurricane Mitch); and by a lack of commitment on the part of governments to provide housing of an acceptable standard [G9].

The urban poor lack access to reliable water supplies

Many towns and cities of the region have severely erratic water supplies, a situation by which the poorest sectors of society are most affected [R12-R14]. Poor people with **limited financial resources** tend to lack adequate water storage facilities to enable them to weather periods of interruption of supply; and the marginal areas in and around towns and cities, in which poverty is concentrated, tend to be poorly served by piped water supply, due to their rapid and unplanned expansion as a result of **rural-urban migration**.

The root cause of the erratic water supply to urban areas is widely attributed to **poor watershed management**, principally **deforestation**; though this is a matter for some debate (Kaimowitz, 2000), the hydrological implications of different land use practices being poorly understood [E10]. Investment in watershed management (for example by the PAES project in El Salvador) is not necessarily focused on

the areas most subject to degradation, prioritisation being based instead on potential for financial return [E10].

Repeated migration prevents the establishment of infrastructure
The repeated uprooting typically experienced by families at the agricultural frontier limits their ability to improve their living conditions (*e.g.* housing and water supply) and infrastructure (e.g. roads), and their access to services (*e.g.* schools and health centres). This is the "transient poverty", referred to in Honduras by del Cid *et al* (1999).

Urban timber processors lack access to raw materials
Small scale furniture workshops in urban areas suffer from limited access to reasonably priced timber of the required specifications and quality, due to the **poor functioning of the marketing chain** linking them to rural producers and primary processors [H7, H13, R8, N4], and **limited capital** for purchase of raw materials [H7].

Illegal settlers on protected areas are inadequately relocated
Both in the Maya Biosphere Reserve in the Guatemalan Petén, and the Río Plátano Biosphere Reserve in Honduras, there have been initiatives on the part of the institutions responsible (CONAP in the Petén and AFE-COHDEFOR, through the GTZ-funded Río Plátano project, in Honduras) to relocate illegal settlers. **Inadequate selection of resettlement sites**, **provision of basic services** (*e.g.* access, education) and **follow-up technical assistance** threaten significant social impacts on the relocated population [G6, H8].

3.2 THE CHARACTERISTICS OF POVERTY, DISAGGREGATED BY FOCUS GROUP

a. Small-scale poor farmers

By definition, small-scale poor farmers face limited access to land. Since colonial times, they have been marginalised to hill lands by the cattle ranching and export agriculture practised by large landowners on the fertile flat lands. Successive agrarian reform programmes have failed to redress this situation. Despite high emigration rates in some areas, high reproductive rates result in continuing population growth in much of the region; as a result, farm size continues to reduce. Agricultural extension programmes aimed at improving grain yields and reducing soil erosion have had very limited impact, having largely failed to take into account small farmers' labour limitations, to understand their priorities and perceptions or to create genuine commitment to land husbandry. Basic grain yields are therefore typically low, resulting in malnutrition and limited cash generation through the sale of surpluses. This situation is exacerbated by severe instability in both prices for basic grains and in climatic conditions, and by poor access to markets which places farmers at a price disadvantage. Much land tenure is informal in nature; as a result, without access to secure collateral, small farmers tend to lack access to credit, which in turn limits their ability to invest in the land in order to improve and stabilise production.

Off-farm income is of great importance for many small farmers; sources include *remesas* sent by relatives overseas (especially in El Salvador) and employment, either on the farms of other community members or in agro-industrial farms (*e.g.* melons, sugar cane, shrimps). Off-farm employment is highly vulnerable to the boom-bust nature of export-oriented agriculture. Employment in the forestry sector is limited by the legal and institutional environment, which fails to promote community-based forestry enterprises.

Small farmers typically have narrow income bases, centred on the production of a narrow range of basic grains (maize, beans and in some areas millet) and unreliable off-farm employment. Their use of tree resources is mostly of a subsistence nature. Opportunities for obtaining cash income from tree resources are largely limited by unfavourable legal environments and lack of access to markets.

Marginal conditions in areas such as the dry south of Honduras, the west and centre of Nicaragua, and the highlands of Guatemala, have led many small farmers to migrate to agricultural frontier regions. The type of agriculture which they adopt here is typically transient in nature, as they clear forest areas, cultivate for a few years and then move on to new areas, the areas cleared being taken over by low intensity cattle ranchers and land speculators. This impermanence deprives small farmers of opportunities to develop infrastructure and services, such as drinking water, electricity, access and education.

b. Landless poor families

Landless families typically rent land to cultivate, for limited periods, from other farmers and as a result have neither the incentive nor the means to invest in the land in order to improve production. Their limited agricultural production makes them more dependent on alternative income sources than the landed and, consequently, more vulnerable than the landed to instabilities in these income sources. In addition to off-farm employment, non-agricultural income sources of importance to the landless include the sale of fruit and flowers from the *solar* (the area immediately around the house, over which many otherwise landless families enjoy *de facto* tenure); the collection of non-timber forest products, such as bromeliads and lichens around Christmas time; and the fabrication and sale of handicrafts such as brooms and hammocks. Income from these sources is highly dependent on market access and is also, in the case of NTFPs, subject to arbitrary restrictions. Lack of land marginalises the landless poor from direct participation in diverse income generating activities such as forest management and tourism; indirect benefits from these activities are limited due to the restricted scale of these activities and the limited economic "trickle-down" through employment and service provision.

The landless poor tend to suffer exclusion from economic and development activities, these tending to be dominated by better-off sectors of the community. Rural extension agencies prefer to work with sectors of the community who have land and therefore the capacity to implement improved land management practices; as a result, the landless are also excluded from participation in the committees established by such agencies to promote community development and environmental protection. Instead, they tend to be beneficiaries of social support programmes such as the Family Support Programme (PRAF) in Honduras, and family adoption schemes such as Plan Internacional.

c. Artisans, traders and small-scale entrepreneurs

There is considerable overlap between this focus group and the other three, as many small farmers, landless rural poor and urban and peri-urban poor participate to some degree in handicraft production, trade and small enterprises.

Artisanal woodworking tends to be concentrated in urban centres, from small towns to the region's capital cities. These enterprises vary widely in scale, ranging from the backyard production of basic furniture items, to small workshops with some woodworking equipment such as a benchsaw and a lathe, to small business employing non family members. These businesses in some cases constitute significant local sources of employment. In general, workshops lack equipment and offer poor working conditions. Enterprises tend to be grouped around local tourist markets or centres of woodworking tradition (such as El Triunfo in southern Honduras). Urban woodworking shops suffer from shortages of accessibly priced raw materials and depend heavily on the purchase of timber from intermediaries such as sawmills, rather than directly from producers. Income is also limited by limited market outlets for handicrafts and by a lack of information on the types of products required by the tourist market.

Firewood production and sale is an important economic activity in many peri-urban areas. The dynamics of this trade are not well understood. In areas surrounding Choluteca, in southern Honduras and Managua, Nicaragua, fuelwood is collected illegally from resprouting shrubby species in abandoned cattle pastures. Some collectors squat in scattered shanty settlements set up in these areas. The fuelwood collected is split and bundled on site, then sold at the roadside to trucks or pickups, which transport it to the urban centres.

The trade in forest (and agricultural) products is dominated by intermediaries or "*coyotes*" with small pickup trucks, who purchase fruit and other products such as firewood directly from the farmer and then transport the products to markets in the urban centres for sale. In addition to these reasonably well-off intermediaries who are often based in urban centres, some members of the rural communities themselves, even among the poorest sectors, specialise in trade, for example in fruit which they purchase from other community members and transport to market by bus.

For the purposes of this report, within the focus group of small scale entrepreneurs are included small scale forestry operators. There is some local sale of forest products, such as houseposts of durable species, between small farmers within communities. However, outside of large industrial enterprises, commercial forestry activity is largely limited to organised groups and cooperatives rather than individuals. The principal areas in the region where such groups exist are the humid forest of northern Honduras, where cooperatives have been formed under the Social Forestry System to extract resin and selectively harvest timber; the Guatemalan Petén, where large areas of the Maya Biosphere Reserve are managed by community-based cooperatives; and the Guatemalan highlands, where activity is based around indigenous community organisation.

d. Urban and peri-urban poor families

The urban centres of Central America are characterised by gross polarisation in living conditions; the poor tend to be concentrated in marginal shanty towns or *barrios*, typically of very poor construction, with poor access and limited availability of electricity, piped water and sanitation. These *barrios* are in a process of rapid expansion, due to the process of migration from depressed rural areas to the cities (often *via* minor urban centres). They are typically established by squatting illegally on unoccupied land. The provision of services comes later as municipal authorities come to recognise these settlements; although for public health reasons they settlements have been the subject of massive programmes of latrine building under the auspices of social compensation funds such as FHIS in Honduras. Water supply is a particularly significant problem in many *barrios*, especially in Guatemala City where in many areas it has to be purchased by the barrel from tanker trucks. The gradual installation of services is matched by the gradual improvement in housing standards due to investment by early arrivals.

The pattern of shanty town development varies from city to city. In Tegucigalpa and Guatemala City, they tend to be located on the steepest hills, making them highly vulnerable to landslips, as was graphically demonstrated by Hurricane Mitch in 1998. Low lying settlements near to rivers were also heavily affected by Mitch through flooding, although this form of vulnerability had a broader impact across the socio-economic spectrum. In addition to storm vulnerability, shanty towns are subject to high fire risk and to high crime levels.

Hurricane Mitch has left lasting social impacts among the poorer sectors in urban areas; due to delays in establishing replacement housing, more than two years after the event many families are still living in emergency shelters in Tegucigalpa, with significant levels of social problems such as crime, promiscuity and drug abuse. These problems also characterise some of the replacement housing projects that are now established and inhabited.

The urban and peri-urban poor are heavily dependent on the "informal" sector of the economy. This sector is extremely diverse, ranging for example from selling products at traffic lights and in unlicensed markets to small unlicensed businesses. The *maquila* sector, consisting of factories in industrial free zones, is of growing importance and has been a significant population draw to urban centres, especially attracting women to work in the Asian clothing factories which dominate this sector. As with the agro-industries, which dominate the rural employment market, the *maquila* sector is vulnerable to macroeconomic fluctuations.

4. RESEARCHABLE CONSTRAINTS AND RESEARCH THEMES

This section focuses in from the causes of poverty presented in Section 3, to concentrate on those which are forestry-related (*i.e.* related to the management of, or access to, trees) and researchable. For each researchable constraint, one or more research themes are proposed (Table 7). The frequency of reference among the interviewees to the researchable constraints listed is summarised in Appendix 5, disaggregated by country; the relation between each researchable constraint and sub-categories of sustainable livelihood capital is summarised in Appendix 6; and the rankings of each research theme for each of six criteria relating to its potential poverty impact and its relevance to FRP are presented in Appendix 7. Summaries of other research prioritisation exercises consulted are presented in Appendix 10.

Table 7: Research themes related to researchable constraints

Researchable constraints	Research themes
1. Ineffective civil society	1. Mechanisms for the development of pro-poor forest laws and policies
2. Excessive and exclusive regulation	
3. Ineffective regulation	2. Alternative regulatory models for the forestry sector
4. Lack of organisation/grouping	3. Organisational models for forest-dependent communities
5. Lack of effective technical support	4. Extension and technical support models for tree-based land use management systems
6. Lack of payment for environmental services	5. Quantification, valuation and payment of environmental services
7. Unfavourable marketing chains	6. Marketing chains for small scale producers and processors of forest products
8. Lack of workable incentive models	7. Forestry incentive schemes for small farmers
9. Lack of market knowledge	8. Potential for market development of forest products from small operators
10. Narrow market preferences	
11. Lack of workable credit models	9. Credit schemes for small scale forestry operators and processors
12. Lack of workable certification schemes	10. Accessible forest product certification for rural income generation
13. Scarcity of seed trees and regeneration	11. Germplasm resources for income-generating natural regeneration in agroecosystems
14. Lack of workable reforestation models	12. Alternative on-farm tree establishment models for smallholders
15. Lack of forest management knowledge	13. Single tree growth models for mixed-age conifer forest
	14. Single tree growth models for lesser known species in mixed-age humid lowland forest
	15. Management of young natural pine forest
	16. Management requirements of NTFPs in humid lowland forest
	17. Long term growth and management of small forestry plantations
16. Lack of provenance information	18. Provenance variation within lesser-known plantation species for smallholders
17. Lack of income from tourism	19. Pro-poor forest tourism in Central America
18. Lack of integrated land management models	20. Integrated territorial land use planning
19. Lack of workable territorial land use planning models	
20. Lack of knowledge of lesser known species' timber	21. Characteristics and working properties of lesser known species

1. Ineffective civil society

Lack of representation fundamentally limits the ability of the poor to influence their situations. In the absence of an effective civil society genuinely and accurately representing the poor, legislation and policies will continue to act against their interests, limiting their capacity to increase their income and employment opportunities through the optimal use of forest resources

2. Excessive and exclusive regulation

The poor are unable to use the abundant forest resources that surround them in much of Central America, due to unnecessarily prohibitive legislation which actively discriminates against them; this has significant implications for rural income levels, both directly and indirectly, through limited rural employment. This situation stems from a combination of inadequate information on the extent and growth characteristics of forest resources, and entrenched social discrimination against the poorer sectors of society.

POVERTY IMPACT: HIGH

Research theme 1 (addresses Constraints 1 and 2):
Mechanisms for the development of pro-poor forest laws and policies

The questions to be answered:

- How (and by whom) can diverse groups of poor people be accurately represented in decision-making processes relating to laws and policies that affect them?
- Through what processes can laws and policies be discussed and drafted, in order equitably to further the interests of diverse groups of poor people?
- What features of existing legislation and policies act against the interests of poor people and what in them requires changing in order to further their interests?

Approach to research: Review of experiences of civil society organisations in Honduras and Nicaragua, and law formulation processes currently underway in Honduras, El Salvador and Nicaragua.
Possible in-region collaborators: IDEADS (Guatemala); FUSADES (El Salvador).

Potential poverty impact: high

Although of indirect and medium-long term impact, potentially affects a wide range of poverty characteristics of rural and peri-urban poverty groups dependent on tree resources, over the whole of the target region.

3. Ineffective regulation

Enterprises formed to help the poor to obtain benefits from forest resources, such as forestry co-operatives, depend on technical assistance and access to niche markets, both of which require that they conform to legal requirements. As a result they are at a severe competitive disadvantage in a timber market which, due to ineffective regulation, is flooded by cheap, illegally harvested and transported timber. This situation limits rural income and employment levels.

The Government forestry authorities of the region are seriously under-resourced and over-stretched, due to inadequate policy support and the geographical scale and access difficulty of their areas of responsibility. An additional compounding factor is the entrenched corruption that characterises the forest sector. Despite the inadequacy of centralised state regulation of forestry activities, there has to date been little serious exploration of alternatives. This is in part due to a lack of genuine policy commitment to decentralisation, and in part to concerns over corruption at municipal level.

POVERTY IMPACT: HIGH

Research theme 2 (addresses constraint 3):
Alternative regulatory models for the forestry sector

The question to be answered:
- What is the potential of existing alternative institutions to carry out effective and equitable regulation of the forest sector?
- What types of institutions may need to be formulated to perform this role?
- What procedures are needed to ensure against corruption in such existing or proposed institutions?
- What types of inter-institutional relationships are necessary to carry out cost-efficient, effective and equitable regulation?

Approach to research: review of case studies (state forest authorities, municipalities, local environmental committees, indigenous groupings.
Possible in-region collaborators: IDEADS (Guatemala), PRISMA (El Salvador)

Potential poverty impact: high
Although of indirect impact, potentially affects a wide range of poverty characteristics of all rural and peri-urban poverty groups dependent on tree resources, over the whole of the target region.

4. Lack of organisation/grouping

Lack of organisation or grouping is a fundamental constraint to achieving representation and the "critical mass" necessary for attracting infrastructure and technical support, and for becoming a force in the marketplace.

POVERTY IMPACT: HIGH

Research theme 3 (addresses constraint 4):
Organisational models for forest-dependent communities

The question to be answered:
- What forms of organisation, sustainable in the long term, have the potential equitably to represent the interests of the poor and to allow them access to technology, markets and infrastructure?

Approach to research: review of case studies
Possible in-region collaborators: FLACSO (Guatemala), PRISMA (El Salvador), EAP Zamorano (Honduras), universities

Potential poverty impact: high
Although of indirect and medium-long term impact, potentially affects a wide range of poverty characteristics of all poverty groups (rural, peri-urban and urban) over the whole of the target region).

5. Lack of effective technical support

Despite massive investment, extension programmes aimed at improving land management have been largely ineffective, failing to achieve sustainable adoption of technologies which would permit small farmers to settle permanently and thereby invest in the improvement of living conditions, basic services and infrastructure; or which would (debatably) reduce the risk of disasters, associated with extreme weather events, and their effect on vulnerable, largely urban, populations downstream. This problem is largely agriculture-related; its relevance to FRP stems from the essential tree component in agricultural stabilisation and watershed protection technologies.

POVERTY IMPACT: HIGH

Research theme 4 (addresses constraint 5):
Extension and technical support models for tree-based land use management systems

The questions to be answered:
- What are the reasons for the low levels of impact of extension and technical support to date?
- What extension and technical support models are required to achieve improved uptake?
- What are the implications of cultural diversity for the required forms of extension and technical support?

Approach to research: review of experiences, action research in case studies
Possible in-region collaborators: FLACSO (Guatemala), CATIE, universities

Potential poverty impact: high
Affects all ecosystems in all target countries and all target groups, though likely to have greater impact on the landed than the landless and the benefits for downstream urban poor are not conclusively proven.

6. Lack of payment for environmental services

Payment for environmental services is another frequently mentioned theme, proposed as a means of diversifying rural incomes and ensuring the continuous supply of services, thereby reducing disaster vulnerability and improving living conditions for populations downstream. However, significant questions remain in all stages of the process and in most of the region this theme has got little past the stage of discourse (Appendix 8).

POVERTY IMPACT: HIGH

Research theme 5 (addresses constraint 6)
Quantification, valuation and payment of environmental services

The questions to be answered:
- In quantitative terms, what environmental services are, or could be provided by different land use practices?
- What is the economic value to the beneficiary population of the environmental services provided?
- How can producers of environmental services be adequately and equitably (pro-poor) compensated in way that motivates their continuing provision of the services?
- What are the institutional requirements for the sustainable long-term adoption of systems of payment for environmental services?

Approach to research: hydrological and carbon-sequestration studies of different land-uses, economic studies, workshops, review of experiences
Possible in-region collaborators: CATIE, PRISMA (El Salvador), EAP Zamorano

Potential poverty impact: high
Applies to all ecosystems in all countries, and a range of groups of poor people.

7. Unfavourable marketing chains

The product markets and prices available to small scale producers, and the supply and costs of the raw materials used by small scale processors, are negatively affected by the lack of favourable marketing chains; much of the price differential between producer and processor currently ends up in the hands of intermediaries.

POVERTY IMPACT: MEDIUM

Research theme 6 (addresses constraint 7):
Marketing chains for small scale producers and processors of forest products

The questions to be answered:
- How can links between producers, processors and consumers of tree or forest products be improved in order to maximise benefits for small-scale producers and processors?

Approach to research: characterisation of existing market chains, workshops and action research in case studies.
Possible in-region collaborators: Nitlapán-UCA, PRISMA, CATIE

Potential poverty impact: medium
Affects a wide range of poverty characteristics in all ecosystems and all target countries, but has little potential impact on the landless or on the urban and peri-urban poor who are not artisans, traders or entrepreneurs.

8. Lack of workable incentive models

Current incentive schemes are not accessible to small farmers without formal land tenure, or applicable to the protection and management of naturally regenerated trees. As a result, small scale actors are unable to take advantage of the income-generating potential of tree planting and management, with possible (debatable) negative implications for watershed conservation and downstream disaster vulnerability.

POVERTY IMPACT: MEDIUM

Research theme 7 (addresses constraint 8):
Forestry incentive schemes for small farmers

The question to be answered:
- How can incentive schemes for tree protection, planting and management be made accessible to small farmers or those without secure land title, in a way that sustainably enables them to obtain benefits from trees?

Approach to research: review of experiences, workshops, action research in case studies
Possible in-region collaborators: PRISMA, universities

Potential poverty impact: medium
Affects all target countries and ecosystems, but likely mostly to benefit small farmers in agroecosystems with limited forest cover.

9. Lack of market knowledge

Small forestry operators and processors are unable to take full advantage of marketing opportunities for their products, and thereby realise their full income generating potential, due to lack of knowledge of the available markets.

10. Narrow market preferences

The restrictive "Caoba-Cedro-Pino" domination of the timber market, which limits small producers' capacity to generate income from their available forest resource, is due in part to limited industry experience of other timbers and partly to narrow buyer preferences based on familiarity with these timbers.

POVERTY IMPACT: MEDIUM

Research theme 8 (addresses constraints 9 and 10):
Potential for market development of forest products from small operators

The questions to be answered:
- What additional potential markets exist for the types of forest products produced by small-scale entrepreneurs and artisans?
- How potentially receptive is the national timber market to alternative timbers?
- What are the timber characteristics sought by the national timber market?

Approach to research: national and international market surveys
Possible in-region collaborators: CUPROFOR, Nitlapán-UCA

Potential poverty impact: medium
Affects all ecosystems in all target countries, benefits are of immediate-medium term, but limited to small forestry producers and artisans

12. Lack of workable credit schemes

Limited access to credit remains a significant stumbling block to small operators making the "quantum leap" from shoestring family or group businesses to being significant market actors consistently producing high quality goods. The main obstacle to obtaining credit is the lack of collateral in the form of land tenure. However even those producers who can overcome this problem are faced by high interest rates, which are unfavourable to operations yielding returns in the medium to long term, as is typically the case with forestry activities.

POVERTY IMPACT: HIGH

Research theme 9 (addresses constraint 12):
Credit schemes for small scale forestry operators and processors

The question to be answered:
- How can credit be made more accessible to those without land collateral or those expecting medium-long term return periods on investments?

Approach to research: review of experiences, workshops, action research in case studies
Possible in-region collaborators: PRISMA, EAP Zamorano, universities, Nitlapán-UCA

Potential poverty impact: medium
All ecosystems in all target countries; principally limited to those directly involved in commercial forest-related activity.

12. Lack of workable certification schemes

Forest product certification has achieved little uptake in the region, with the exception of the forestry concessions of the Petén, Guatemala; even there, benefits received by participating groups are limited due to a combination of poor market access, high costs and the complexity of certification requirements. This situation has direct implications for income and employment levels in both rural and urban areas.

POVERTY IMPACT: LOW

Research theme 10 (addresses constraint 12):
Accessible forest product certification for rural income generation

The question to be answered:
- What are the principal obstacles to realising the income-generating potential of certification?
- How can certification be made simpler and less costly without sacrificing credibility in niche

markets?
Approach to research: review of experiences, workshops, action research in case studies
Possible in-region collaborators: CATIE, FSC, CUPROFOR (Honduras), PRISMA (El Salvador)

Poverty impact: low
Affects all ecosystems in all target countries, but a limited range of poverty characteristics, is largely limited to small-scale forestry operators and co-operatives, and was little mentioned.

13. Scarcity of seed trees and regeneration

The potential for the management of naturally regenerated tree germplasm to provide a low cost and socially and biologically appropriate alternative to reforestation using planted stock, as a means of creating a tree resource with potential for the generation of rural incomes, is partly dependent on the existence of sufficient seed trees of the desired species. Given the extensively degraded nature of many Central American ecosystems, it is possibly that scarcity of seed trees constitutes a significant limiting factor.

POVERTY IMPACT: LOW

Research theme 11 (addresses constraint 13):
Germplasm resources for income-generating natural regeneration in agroecosystems

The questions to be answered:
- How adequate is the resource of seed trees, seed banks and vegetative material to allow natural regeneration to be used as a means of establishing a tree resource for income generation in agroecosystems?
- How can the germplasm resources be increased, where necessary?

Approach to research: temporary sample plots, tree seed dispersal studies
Possible in-region collaborators: CATIE, CONSEFORH

Potential poverty impact: moderate
Principally small farmers in agroecosystems with limited forestry cover, affecting a limited range of forms of livelihood capital, with medium-long term impacts; very infrequently mentioned.

14. Lack of workable reforestation models

Despite large scale investment over recent years, tree planting is yet to be spontaneously adopted by small farmers on any scale. The principal reason for this is a technician-dominated approach to technology development, which has failed to take into account the significant socio-economic constraints to small farmers' willingness to establish conventional forestry plantations. This failing, in addition to representing an inefficient use of significant quantities of development funds, implies a lost opportunity for the improvement of rural incomes through the sale of tree products.

POVERTY IMPACT: LOW

Research theme 12 (addresses constraint 14):
Alternative on-farm tree establishment models for smallholders

The question to be answered:
- What are the principal obstacles to the adoption of tree establishment models by farmers?
- Identification of acceptable tree establishment models

Approach to research: review of experiences, workshops, action research in case studies
Possible in-region collaborators: CATIE, CONSEFORH (Honduras)

Potential poverty impact: low

Principally small farmers in agroecosystems with limited forestry cover, affecting a limited range of forms of livelihood capital, with medium-long term impacts.

15. Lack of forest management knowledge

The lack of some basic information on forest growth and management limits poor people's capacity to obtain economic benefits from the forest resources available to them.

POVERTY IMPACT: LOW

Research theme 13: (addresses constraint 15):
Single tree growth models for mixed-age conifer forest

The questions to be answered:
- Single tree growth models to be developed and made accessible to operators

Approach to research: forest mensuration
Possible in-region collaborators: universities, CONSEFORH (Honduras), CATIE

Potential poverty impact: low
Limited to medium-scale forestry operators and co-operatives in coniferous forests; likely to affect limited range of forms of sustainable livelihood capital.

POVERTY IMPACT: LOW

Research theme 14: (addresses constraint 15):
Single tree growth models for lesser known species in mixed-age humid lowland forest

The question to be answered:
- Single tree growth models to be developed and made accessible to operators

Approach to research: forest mensuration
Possible in-region collaborators: CATIE

Potential poverty impact: low
Limited to medium-scale forestry operators and co-operatives in humid forests (excludes El Salvador).

POVERTY IMPACT: LOW

Research theme 15: (addresses constraint 15):
Management of young natural pine forest

The question to be answered:
- How can young (secondary) natural pine forest be managed in order to provide income for local communities and to maximise long-term productivity?

Approach to research: Thinning trials with Permanent Sample Plots (PSPs)
Possible in-region collaborators: CATIE, CONSEFORH (Honduras).

Potential poverty impact: low
Areas opened up likely to be large; but benefits largely limited to medium-scale forestry operators and co-operatives in coniferous forests.

POVERTY IMPACT: LOW

Research theme 16 (addresses constraint 15):
Management requirements of NTFPs in humid lowland forest

The question to be answered:
- What is the long-term extraction carrying capacity for different NTFPs?
- What are the propagation and management requirements of different NTFPs?

Approach to research: PSPs and on-station propagation trials
Possible in-region collaborators: Conservation International (Guatemala), ACOFOP (Guatemala), CATIE, universities.

Potential poverty impact: low
Limited to small scale forestry operators and co-operatives in humid lowland forest (excludes El Salvador), affects limited range of forms of sustainable livelihood capital, delayed benefits.

POVERTY IMPACT: LOW

Research theme 17 (addresses constraint 15):
Long term growth and management of small forestry plantations

The question to be answered:
- How do small plantations behave and how can they be managed over several rotations in order to maximise economic benefits?

Approach to research: long term silvicultural trials and PSPs
Possible in-region collaborators: CATIE, CONSEFORH (Honduras).

Potential poverty impact: low
Limited to small farmers in agroecosystem areas with limited natural forest resources, delayed benefits.

16. Lack of provenance information

Despite significant research in a number of key species in the past, there remain a large number of plantation species which fail to achieve full their potential for growth, quality production and thereby income generation, due to insufficient information on provenance variation.

POVERTY IMPACT: LOW

Research theme 18 (addresses constraint 16):
Provenance variation within lesser-known plantation species for smallholders

The question to be answered:
- Characterisation of patterns of provenance variation within lesser-known plantation species
- Identification of promising provenances for smallholder needs

Approach to research: provenance collections and on-station provenance trials
Possible in-region collaborators: CATIE, CONSEFORH (Honduras)

Potential poverty impact: low
Affects all target countries, but mostly limited to small farmers in areas with limited natural forest cover, and likely to have delayed impacts.

17. Lack of income from tourism

Tourism activity is currently concentrated to a few well-known hotspots; even within which these areas, the poor receive very little economic benefit due to inadequate distribution mechanisms.

POVERTY IMPACT: LOW

Research theme 19 (addresses constraint 17):
Pro-poor forest tourism in Central America

The question to be answered:
- What is the market potential of community/farm tourism?
- How can the participation of the poorer sectors of society in tourism be increased?
- How can the benefits of tourism be equitably distributed to benefit the poorer sectors of society?

Approach to research: review of experiences, action research in case study areas
Possible in-region collaborators: FLACSO (Guatemala), EAP Zamorano, universities

Potential poverty impact: low
Potentially affects all countries and ecosystems, though principally the rural rather than the urban poor; in practice benefits are likely to be geographically limited to more attractive areas. Little mentioned by interviewees.

18. Lack of integrated land management models
Lack of farm- or watershed-level models, as opposed to field-level technologies, is limiting the uptake and effectiveness of land management in watersheds vulnerable to degradation; with implications for agricultural productivity within the farms affected, non-agricultural resources within the communities affected and downstream disaster vulnerability for principally poor urban populations.

19. Lack of workable territorial land use planning models
Much mentioned as a prerequisite for optimal resource management, territorial land use planning (*ordenamiento territorial*) is still largely confined to theory and pilot studies. Few advances have been made regarding large-scale practical application or the conversion of planning into practice.

POVERTY IMPACT: LOW

Research theme 20 (addresses constraints 18 and 19):
Integrated territorial land use planning

The questions to be answered:
- What models of territorial land use planning are required to optimise land use and maximise adoption and implementation?
- What are the institutional requirements to ensure the long-term adoption of territorial land use planning?

Approach to research: workshops, review of experiences, action research based on case studies
Possible in-region collaborators: CATIE, PRISMA (El Salvador)

Potential poverty reduction impact: low
Requires implementation in all target countries and ecosystems, but beneficiaries are principally limited to high disaster-risk populations, mostly in urban areas. Likely benefits are indirect and are not well proven.

20. Lack of knowledge of lesser known species' timber
The currently dominant "Caoba-Cedro-Pino" culture in the marketplace is severely limiting the economic benefit which small timber operators and co-operatives are receiving from the areas under their control,

with implications for rural income and employment. This situation is partly due to processors' lack of experience with, or knowledge of the characteristics of, other species. This problem is principally recognised in humid lowland forest, but also limits the potential for productive tree management in dry forest agroecosystems, with potential benefits for both rural incomes and watershed protection.

POVERTY IMPACT: LOW

Research theme 21 (addresses constraint 20):
Characteristics and working properties of lesser known species

The question to be answered:
- What are the physical characteristics and working properties of lesser known timber species in humid and dry tropical forests?

Approach to research: physical trials in timber testing laboratories
Possible in-region collaborators: CUPROFOR (Honduras)

Although this research theme is related to theme 14 and there is potential for them to be covered by a combined research project under the auspices of one institution (such as CUPROFOR), they are sufficiently different in their objectives and research approaches (market research and physical timber testing trials respectively) for them to warrant consideration as separate research themes.

Potential poverty impact: low
Principally limited to landed farmers and medium-scale timber co-operatives, in the humid forest and potentially the dry forest agroecosystem.

5. CAPACITY AND FUNDING SOURCES

5.1 PRINCIPAL INSTITUTIONS INVOLVED IN RESEARCH

1. CATIE (Tropical Agronomic Research and Teaching Centre), Turrialba, Costa Rica

The foremost natural resources research centre in the region. Despite being perceived by some actors as being excessively Costa Rica focused, CATIE has significant decentralised activity, such as TRANSFORMA (managed by the Natural Forest Management Unit), the Olafo Project (Conservation for Sustainable Development in Central America) and PAES in El Salvador.

CATIE has defined the following research lines:

- Germplasm improvement and conservation for selected agricultural crops and forest species
- Integrated pest management for agroforestry and forestry activities
- Agroforestry systems
- Development of technologies for the sustainable management of forests and their biodiversity
- Socio-economic analysis of environmental policies and management systems in tropical ecosystems

The list of CATIE research projects currently approved or in the pipeline, presented in Appendix 9, gives an indication of the institution's thematic capabilities, its geographical and biological areas of activity, and the extent of its links with regional collaborators and funding agencies.

Both the Natural Forest Management Unit (UMBN) and the Olafo Project focus on humid lowland tropical forest. The UMBN has contributed to the establishment and monitoring of research sites in Guatemala, Honduras, Nicaragua, Costa Rica and Panama and to the development of field methodologies and software for data organisation and analysis (CATIE, 2000). The UMBN collaborates with partners of regional humid forest networks to research:

- Natural regeneration and dynamics of forests
- Effects of disturbances on natural regeneration and species growth
- Mechanisms of pollination and seed dispersal
- Biodiversity, carbon fixation and other environmental services.

Research and validation areas covered by the Olafo Project (CATIE, 1998) include:

- Non-timber forest resource management (ecology/production through domestication in natural conditions)
- Diversified forest management (both timber and non-timber)
- Agroforestry and sustainable agriculture
- Economic evaluation of goods and environmental services
- Evaluation of family production system sustainability
- Participatory land use planning at a regional level.

Agroforestry and watershed management are areas of particular emphasis at CATIE, both through training and research. Although the institution does have social expertise (Appendix 2), staff members interviewed identified environmental economics as an area of weakness.

2. CENTA (National Centre for Agricultural and Forestry Technology), El Salvador

CENTA is the main government agricultural research centre in El Salvador; in addition to its on-station research component, it has a nation-wide sustainable agriculture extension programme, funded by the

Dutch Government and FAO. It aspires to a coordinating role among development agencies and NGOs in the communities in which it works. Its main emphases are on agriculture and agroforestry, with a catchment-level focus; it has limited forestry activity.

3. CONSEFORH (Conservation and Silviculture of Forestry Species), Comayagua, Honduras

CONSEFORH was established with DFID funding in the late 1980s with a focus on the genetic improvement of industrial tree species; over the years it has undergone changes of emphasis, addressing respectively the *ex situ* conservation of native tree species in combined Breeding Seedling Orchards and subsequently, in reflection of DFID priorities, the needs of poor communities. The quality of its on-station silvicultural and tree improvement work has been generally excellent, though hampered by attempting to meet multiple objectives. Its social research has been of variable quality (a reflection of the fact that this was not the original objective of the project); although it has carried out sound studies such as Colindres *et al.* (1995), other studies have tended to focus excessively on strictly financial evaluations of tree management options, with scarce assessment of broader livelihood factors or opportunity costs.

In common with CUPROFOR, CONSEFORH has suffered from its institutional dependence on AFE-COHDEFOR; following the withdrawal of DFID support, it has suffered a drastic resource crisis which has led to a protracted period of inactivity and the loss of some good quality technicians. Unlike CUPROFOR, this situation shows no immediate signs of being resolved, though (due to the tenacity of its core staff) it has managed to retain and maintain its two showcase research stations and is now embarking on new research activities, through AFE-COHDEFOR (management and markets for small diameter *Pinus oocarpa*) and in conjunction with CATIE (*Hypsipila grandella* control in *Swietenia humilis*).

4. CUPROFOR (Centre for the Use and Promotion of Forest Products), San Pedro Sula, Honduras

Established with DFID support in 1990, CUPROFOR's purpose is to "promote increased uptake of non-traditional species and more efficient timber processing affecting the flow of traditional and non-traditional hardwood species from forest areas to industry, to incorporate the needs of *campesino* groups while collaborating with international projects working within hardwood areas in Central America" (Brett and Everest-Phillips, 2000).

CUPROFOR has significant infrastructure in the form of buildings, wood processing equipment (sawmill, solar and conventional kiln drying facilities, a saw doctor shop and woodworking shop) and timber testing laboratories. Its principal areas of work to date have been the testing of non-traditional humid-zone species and technical support and training to *campesino* forestry groups and small-scale timber processing enterprises. It offers the following research services (CUPROFOR, n.d.):

- studies of the physical and mechanical characteristics of wood, including the level of hardness;
- studies determining the characteristics of wood for sawing, drying, working and preserving;
- potential uses of wood species;
- certification of wood products and the preparation of samples;
- use of laboratory equipment.

CUPROFOR has been hampered to date by the lack of inclusion of localisation plans in the original project proposal, and by its links with AFE-COHDEFOR. It is at a crucial stage at present with the withdrawal of DFID support (the current TCO is due to leave in March 2001). A DFID-funded consultancy, undertaken by ESA Consultores, is currently underway to oversee the transition of CUPROFOR to a foundation equivalent. The aim is for it to become a financially self-supporting regional resource centre offering research, technical assistance and training, technical services to industry and information. As such it has considerable potential as a partner in the areas of timber technologies and properties. It currently has limited capability in the area of research into marketing chains and producer

organisation; however this is an obvious area for expansion if it is to achieve its vision as a research foundation.

5. ESA Consultores

Perhaps the most capable consulting firm in Honduras, and one of the most capable in the region, in the areas of economics and social sciences. Its particular areas of speciality are demography, social surveys, and the economics of water supply. The environmental section is currently weak, though it does have access to a wide range of local consultants in this area. Its consultant pool is of generally good, though variable, quality. Despite its capability in its areas of speciality and its past alliances with bodies such as PRISMA and FUMANITAS for specific studies (*e.g.* del Cid *et al.*, 1999), the fact that it is a consultancy company, whose activities are largely dominated by commercial concerns, does not make it a suitable candidate for fostering as a local research resource centre.

6. Escuela Agrícola Panamericana, Zamorano, Honduras

Zamorano is an internationally-renowned agricultural school (it actually describes itself as a university, but has no post-graduate component) accepting students from all of Latin America. It has considerable infrastructure in the form of land, vehicles, laboratory and teaching facilities, plus good GIS capacity and a herbarium, which has been used by previous FRP projects (e.g. R6913).

Most of its research (around 60%) is carried out through student theses; the significant remainder is through projects supported by donors, such as the USAID/COSUDE research into coconut lethal yellowing and bean research supported by CIAT/CGIAR. Student research tends to be grouped around themes, to facilitate supervision. In the forestry area, the principal areas of research are:

- watershed management (accounting for more than half of student theses in natural resources)
- community development, focusing on local government
- rural finance
- rural tourism (incipient)
- environmental services (incipient).

Opportunities for student involvement in FRP research are constrained by their limited time availability, due to class timetables; however there are good opportunities for working with individual staff members.

7. FHIA (Honduran Foundation for Agricultural Research), La Lima, Honduras

The main areas of research of FHIA are agriculture and agroforestry. It has a steepland site (CADETH) for research and validation of technologies on the north coast, near La Ceiba, and has recently begun two USAID-financed projects: a watershed protection project "Agroforestry Systems Transferral for the Protection and Sustainable Management of Steeplands in the Río Aguán Catchment" and "Agricultural Sector Renovation Project based on Technology". Among its facilities are a large library; a communication centre; plant tissue, pesticide residue and biotechnology laboratories and a nursery. It also provides market research studies and price information. FHIA is receptive to opportunities for collaboration; to date these have taken the form of allowing researchers (for example from Laval University, Quebec) to use its experimental sites and participation in joint research programmes.

FHIA is the principal agricultural research institution in the country; however it has a rather traditional and technology-driven approach to research and extension. The social component of its technology validation uses a set of manuals produced by the PDBL, which focus principally on quantitative economic valuation and give limited attention to broader livelihood considerations.

8. FLACSO (Latin American Faculty of Social Sciences), Guatemala City

FLACSO is basically an educational institution for social sciences, with branches in 11 Latin American countries including, in Central America, Guatemala, El Salvador and Costa Rica. Its principal objectives are (FLACSO, n.d., a):

- Promotion of scientific research into social problems in Latin America, with the objective of analysis of social processes;
- Training of specialists in social sciences, through postgraduate-level courses;
- Dissemination of knowledge in the area of social sciences, especially those derived from FLACSO's own research;
- Provision of scientific advice to governments, research institutions and teaching centres in the region.

The principal areas of activity of FLACSO Guatemala are:

- Political and security studies;
- Urban studies;
- Ethnic studies;
- Environment, natural resources and development;
- Women and gender relations studies
- The State and governability studies;
- Economic studies.

FLACSO Guatemala operates approximately 60% in Guatemala and 40% in the rest of Central America. Principal publications to date in the area of natural resources are listed in Box 1:

Box 1: Research projects carried out by FLACSO (Guatemala) to date (FLACSO, n.d., b):

Completed:

- **Community participation in forestry development projects** (2 case studies)
- **Community management of natural resources** (case study of Totonicapán)
- **Forestry institutions** (Sierra de las Minas – with University of Indiana, Defensores de la Naturaleza and Forest Trees and People)
- **Peasant economy and environment** (case study of survival strategies in Ch'orti communities in the east)
- **Economy and environment** (economic valuation of pollution in Lake Amatitlán)
- **Rural communities and protected areas** (case studies from the Petén)
- **The situation of environmental education in Central American universities**
- **Strengthening perspectives for sustainable development: the case of Guatemala** (with WWF)
- **Case studies of social pressure and sustainability in the Guatemalan highlands**
- **Case study of natural resource degradation and sustainability in the Petén** (with WWF and PRISMA)
- **Social actors and forestry policies in the Petén** (with CIFOR and PRISMA)
- **Economic valuation of Bahía de Amatique**
- **The situation of the Arbol Verde community forestry concession** (in 9 communities in the Petén – with FTPP/FAO and Programa Frontera Agrícola)
- **Mitch and its social, economic and environmental impacts in Guatemala** (with OXFAM)
- **Disaster risk in daily life. The implications of Mitch in the Ch'orti area of Guatemala** (with IDRC Canada)
- **Communities and *cacicazgos*** (study of local control of forests and territory in Totonicapán)

In progress:

- **Regional research programme for the sustainable development of frontier zones**
- **Regional study: indigenous women and traditional biodiversity management**

- **Environmental economic valuation**
- **Local management of natural resources**
- **Regional study of risks and vulnerability to natural disasters**

FLACSO Guatemala has a community forestry programme, including research and training aimed at community leaders. They are developing agreements with national universities in order for students to participate in this programme as part of their social service. FLACSO is generally well regarded and considered to have much potential as a within-region research actor, although past research has been somewhat variable and the community forestry programmes is regarded as having a heavily technical emphasis.

9. FUSADES (Salvadoran Foundation for Economic and Social Development), San Salvador

FUSADES describes itself as a private, non-partisan, non-profit think-tank and research centre, promoting economic and social progress through sustainable development and democracy. It works as a study and research centre, and as a development facilitator in the economic and social spheres, channelling business and social promotion services through its programmes. It is financed by contributions from founding members and sponsors, agreements with national and international organisations, and its own endowment (FUSADES, 1999).

FUSADES has the following departments:

- *Department of Economic and Social Studies*: produces 5 yearly national strategies for economic and social development; analysis and proposals related to labour, financial and land markets and poverty alleviation in the rural area (USAID-funded, in coordination with Ohio State University);
- *Department of Legal Studies:* systematisation and analysis of legislation, promotion of debate, revision of law initiatives;
- *Department of International Relations;*
- *Investment Promotion Programme (PRIMEX);*
- *Programme for the Promotion of Small and Micro Enterprises (PROPEMI):* integral support services including loans, administrative training and entrepreneurial support.
- *Agricultural Diversification Programme (DIVAGRO)*: centred on an agricultural research farm; research, development, promotion and demonstration of non-traditional agricultural crops;
- *Integral Quality Laboratory:* technical services to agricultural, industrial and commercial sectors, and to social areas (education, health and environment);
- Programme for Social Strengthening (FORTAS)

FUSADES is clearly a highly influential and well-resourced institution, with diverse areas of operation related to the key themes of relevance to poverty alleviation. Its interests are, with the exception of its Department for International Relations, exclusively El Salvador oriented. It is an initiative of private industry; the 27 sponsoring members listed in its 1999 Annual Report include are mostly banks and manufacturing companies.

10. IDEADS (Environmental Law and Sustainable Development Institute), Guatemala City

The mission of IDEADS is to improve environmental legislation, and its efficiency of implementation, in order to bring about social change leading to sustainability. Its objectives are:

- Promotion of research into environmental law and sustainable development in Guatemala;
- Design and plan programmes, projects and activities in environmental law and sustainable development;

- Dissemination of knowledge related to environmental law and sustainable development;
- Carry out programmes, projects and activities in the area of environmental law and sustainable development; through cooperation, contracts and subcontracts;
- Promote environmental protection through all legal means.

Its programme areas are: Judicial Environmental Research (PROINJA), Technical Legal Support (PRATEL), Training (PROCAP), Information Diffusion (PRODII), Institutional Coordination (PROCI), Alternative Conflict Resolution and Environmental Mediation (PRACMA) and Economy and Environment (PEMA).

IDEADS forms part of RODA, a regional network of environmental law organisations, which is supported by the Ford and MacArthur Foundations.

11. INAB (National Forest Institute) Guatemala

Although INAB has a forestry research section, it has no in-house research capacity; in order to reduce overheads and bureaucracy research activities are contracted to outside institutions such as national universities. University students are involved in research activities wherever possible. Funds for research are managed by CATIE. Research in the past is described as having been poorly focused, coordinated and disseminated, with most emphasis on silviculture and forest management.

12. INAFOR (National Forestry Institute) Nicaragua

As with INAB, INAFOR has almost no in-house research capacity; in the case of INAFOR, this is a result of the downsizing of the state apparatus as part of the post-Sandinista structural adjustment programme. Unlike INAB, in Nicaragua out-sourcing does not compensate for this lack of in-house capacity; there just is very little or no state-supported forestry research.

13. Nitlapán-UCA, Managua, Nicaragua

Instituto Nitlapán is an institution within the University of Central America in Nicaragua; it is well regarded by the Ford Foundation as a within-region research actor, and has collaborated successfully with CIFOR in a number of studies. Areas of research of relevance to forestry-related poverty alleviation include studies of marketing chains in Nicaraguan pine forests; municipal-level resource management; agricultural frontier dynamics; and poverty and development. Research papers produced to date are listed in Box 2.

Box 2: Principal research areas of Nitlapán-UCA as indicated by research papers

- Coffee processing in Nicaragua
- Impacts of financial liberalisation
- The timber marketing chain: in search of links
- Rural credit availability in Nicaragua 1997
- Local institutionality and credit
- The timber sub-sector in the Segovias
- Silviculture of native timber species
- Rural finance markets
- Crisis, arborization and conservationism
- Guidelines for a rural development strategy
- The farmer peasant (*campesino finquero*)
- Social policy agenda
- Poverty reduction
- The role of municipal governments in the management of local resources (for 10 municipalities)
- The national market for furniture: case studies
- Reactivating marketing chains in pine forests in the Segovias
- Potential and limiting factors for agricultural development in Somotillo

14. PRISMA, San Salvador

PRISMA is widely considered to be the best research institute in El Salvador, and one of the best in the region; it is influential at the policy level, while managing to maintain political neutrality. It focuses on the social/environmental interface, principally, but not exclusively, in El Salvador. Important themes that it has covered include environmental services, the role of civil society and environmental management.

Box 3: Principal research areas of PRISMA as indicated by published bulletins

8. Environmental degradation and the management of development in El Salvador
9. Crisis in the rural economy and environment in El Salvador
11. Population, territory and environment in El Salvador
16. Restrictions for forestry development and revegetation in El Salvador
20. Management of urban land in El Salvador
21. Transformation of the Salvadoran agricultural sector and the effectiveness of sectoral policies
23. State, social actors and urban environment in El Salvador
25. Economic transformation, crisis in the agricultural sector and rural poverty in El Salvador
26. The Salvadoran rural sector and environmental services: towards a strategy for revegetation
28. Global climatic change and national revegetation: challenges and opportunities
30. Towards strategy environmental management in El Salvador
31. Local experiences of environmental management in El Salvador
32. Women's property rights and access to land in El Salvador
33. The Salvadoran agricultural sector and its potential as a producer of environmental services
34. Environmental services of the agricultural sector: the case of shade coffee in El Salvador
35. Valuation and payment for environmental services: the experiences of Costa Rica and El Salvador
36. After Mitch: themes and actors in the transformation agenda in Central America
37. El Salvador: civil society in the face of the reconstruction and transformation post-Mitch
39. Gender, development and environment: principal approaches and initiatives in El Salvador
40. Towards an alternative management of socio-environmental conflicts in El Salvador: the case of "El Cimarrón"

15. PROLEÑA

PROLEÑA, whose main role is the promotion of dendro-energy, has carried out a number of studies on patterns of firewood consumption and use. However the research capacity and quality of this institution is not great; the studies carried out to date (in common with those carried out by other institutions) have largely failed to arrive at the depth of understanding of where firewood comes from and the social and environmental implications of its collection, necessary for informed decision-making and policy formulation.

16. Universities

Research activity and capacities in universities within the region are variable. A number of Guatemalan universities are involved in forestry research, covering themes including GIS and dendrology (Universidad del Valle), plant production (Universidad Rafael Andivar) and biotechnology, soils, water and genetic improvement (Universidad de San Carlos). Of the Honduran universities, only CURLA in La Ceiba has a forestry component, although UNAH will in the future be introducing an agroforestry programme. CURLA has no significant history of research, although it is proposed that students will participate, with CATIE coordination, in the validation of forestry extension materials as part of FRP project R7588 (Mesoamerican Tree Species: a *Source Book* for Farm Planting and Ecological Restoration). In the principal forestry school in the region, ESNACIFOR in Siguatepeque, Honduras, research is limited to thesis projects, chosen from a menu of themes produced by academic staff and with strict time limitations. In Nicaragua the two main universities with forestry components are the Universidad Centroamericana

(where Instituto Nitlapán is located, see above) and the Natural Resources Faculty at the Universidad Nacional Agraria.

In general, the region's universities suffer from a lack of connection with implementing agencies, with the result that research findings tend not to be converted into actions. In addition, research capacity is limited by shortages of personnel at postgraduate level and out-dated equipment.

5.2 COVERAGE OF RESEARCH THEMES

As may be seen from the preceding section, the research themes highlighted in section 4 have been unevenly covered by within-region institutions to date.

- **Policy, legal and organisational models** (Themes 1, 2 and 3) have received significant attention from, *inter alia*, FLACSO, IDEADS and PRISMA; however all of these organisations recognise the need for additional work.
- The **quantification, valuation and payment of environmental services** (Theme 5) have been areas of research of CATIE/Olafo, FLACSO and PRISMA; EAP Zamorano is also beginning research in this area.
- A number of studies have been carried out on **marketing chains** (Theme 6) by Nitlapán-UCA, but principally with reference to Nicaragua.
- CONSEFORH is one of a number of institutions which have carried out research into **tree establishment models** (Theme 12), but with a largely technical focus which has not adequately addressed the complexity of the constraints facing farmers.
- CONSEFORH has also recently started research into the **management of young natural pine forest** (Theme 15), but on a limited scale.
- The **management requirements of NTFPs** (Theme 16) have received some attention from CATIE/Olafo.
- Both CATIE and CONSEFORH have carried out, or are planning, trials looking at the **growth of forestry plantations** (Theme 17).
- CONSEFORH has largely focused on species trials and within family variation, but has also carried out **provenance trials** (theme 18) of a number of species, though not necessarily with smallholders in mind.
- Little work has been done on **pro-poor tourism** (theme 19) in the region, although the EAP Zamorano is interested in working in this area.
- CATIE/Olafo have worked to some extent on **land use planning** (theme 20).
- CUPROFOR has carried out research on the **timbers of lesser known species** (theme 21) but only on a limited number to date, and exclusively from the Honduran humid forest.

The following themes were not mentioned as being covered by any of the within region institutions visited:

- **Extension and technical support models for tree-based land use management systems** (Theme 4)
- **Forestry incentive schemes for small farmers** (Theme 7)
- **Potential for market development of forest products from small operators** (Theme 8)
- **Accessible forest product certification for rural income generation** (Theme 10)
- **Germplasm resources for income-generating natural regeneration in agroecosystems** (Theme 11)
- **Single tree growth models for mixed-age conifer forest** (Theme 13)
- **Single tree growth models for lesser known species in mixed-age humid lowland forest** (Theme 14)

It should be noted that the listing of the themes mentioned above, as having received research attention, does not pretend to be exhaustive; neither does it imply that the research efforts to date have been sufficient in any case. Interviewees described a need for additional research into all of the themes mentioned.

5.3 SOURCES OF SUPPORT FOR RESEARCH

The diversity of research funding sources active in the region is demonstrated by the list of research projects, approved or in the pipeline, at CATIE, presented in Appendix 9. The list presented in Appendix 9 also indicates the main areas of interest of each donor. Although, in parallel with DFID in Honduras, DANIDA has previously supported research aimed at genetic conservation and tree improvement in Nicaragua, donor countries such as Denmark, Germany and the Scandinavians now have limited interest in funding research; this situation was confirmed through interviews with national representatives of DANIDA in Nicaragua and GTZ in Honduras. CATIE confirm that most research funds come from INCOD (EU) and private foundations.

A number of sources provide funds for research scholarships, for example: POSAF in Managua; WWF with BMZ, which offers $5000 scholarships for research in support of Mesoamerican Biological Corridor; ECOFOREST in Panama (through CATIE), PROMSA, into tropical agroforestry in the Ecuadorian Amazon (through CATIE); USAID, into watershed management (through CATIE). In addition FLACSO Guatemala provide opportunities for university students to participate in their research programmes; PAGS in Honduras invites students from Canadian Universities to carry out research on themes defined in-country; and FHIA in Honduras provides space at its experimental stations for field trials by thesis students. CUPROFOR in Honduras similarly envisage entering into agreements with regional educational institutions allowing thesis students to carry out research on their facilities.

5.4 THE NEED FOR RESEARCH SUPPORT

The list of principal research institutions presented in Section 5.1 demonstrates that, among these and other institutions, there is considerable research capacity in Central America in a wide diversity of areas related to poverty alleviation. The few areas in which interviewees mentioned within-region capacity as being seriously deficient, and justifying external specialist support, were:

- ***the sustainable livelihoods approach:*** the livelihoods focus of DFID has generated significant interest within the region; it is recognised that this is a cross-cutting theme in which DFID in particular has much to contribute;
- ***environmental economics***: this is an area relevant to many of the researchable constraints and research themes set out in section 4, in which local capacity is lacking and in which DFID is recognised as having capacity.

In general, FRP has the potential to act as a catalyst for within-region institutions to carry out research, and to provide seriously-lacking regional overviews and coordination, linking disparate national institutions in research into themes which, for the most part, are of regional relevance.

The failure, despite the undeniable in-region capacity for research, for the principal research questions in the region adequately to be addressed or resolved, has a number of explanations which should be taken into account in future research cooperation:

i) ***Failure actively to foster institutional research capacity***; this is largely to a function of the design of externally supported research programmes and projects. Research cooperation with local institutions has typically been of project-by-project nature, with little attention to developing long-term

relationships, aimed at institutional capacity building (apart from the on-the-job training of individual national researchers) and the local ownership of research themes.

ii) ***Lack of effective action-oriented information flow***: many researchers and development or conservation actors in the region seriously lag behind in their knowledge of the current status of research, and as a result repeat research or implement projects based on inaccurate information. This problem results not only from a failure to disseminate results locally, a situation which has received increased attention by researchers in recent years; but from a failure to integrate research and implementation activities, through action research.

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Appendix 1: Terms of Reference

Country focus: Central America regionally, and specifically El Salvador, Guatemala, Honduras and Nicaragua (with a visit to regional institutions in Costa Rica).

Duration: seven weeks total (two weeks preparation and contact building, four weeks field visit and one week analysis and report writing). Start date 1/10/00 – Finish date 19/11/00.

Activities:

1. Assemble a balanced list of contacts from five categories (favouring if necessary category 5):
   (1) Government institutions and forestry departments
   (2) University Forestry/Environment/Social Development Departments
   (3) Development or Research Institutions (e.g. DFID, CG centres)
   (4) Private forest based enterprises
   (5) NGOs and CBOs.

2. Prepare a semi-structured interview protocol to identify poor people's problems relating to the management of forest and tree resources, disaggregated by FRP's four focus groups of poor people:
   (1) Poor small-scale farmers
   (2) Poor landless families (e.g. employees of forest industry etc.)
   (3) Poor artisans, traders and small-scale entrepreneurs
   (4) The urban and peri-urban poor.

3. Conduct a demand survey visit to interview key informants in the four DFID Forestry Partner Countries within the region (and if necessary regional centres based outside those four countries).

4. Identify and report on priority national/regional problems in the management of forest and tree resources for the four FRP focus groups, cross referenced to national strategies, action plans or priority setting documents and participatory poverty analyses (all such documents should be collected and submitted to FRP).

5. Identify and display the logical chain between key problems and their underlying problems (both researchable and non-researchable).

6. Identify and report on the national capability to solve these problems effectively (including the compilation of full addresses for all key contacts) and where capability is inadequate.

7. For those priority problems for which the national capability is inadequate, whether other donors or international agencies are covering the gaps.

8. Catalogue information on alternative sources of funds (doctoral scholarships, project funding etc.).

9. Prioritise the remaining problems for which the national capability is inadequate and for which other donors are not filling the gaps and for which there is UK capability.

10. Provide a report to FRP on the results of the demand survey visit and problem analysis.

Appendix 2: List of persons interviewed, with contact details

1. Honduras

Contact Person		Institution	Postal Address	Telephone/fax	Email
Research Institutions:					
H1	Ramón Arístides Jiménez (Director), Christopher Brett (Principal Technical Advisor)	Centro de Utilización y Promoción de Productos Forestales (**CUPROFOR**)	Colonia Luisiana, 27 y 28 Calle, 20 Ave. SE, Apdo Postal 2410, San Pedro Sula.	Tel: 559 3148 Fax: 559 3160	ger@cuprofor.hn
H2	Adolfo Martínez (Director General), Dale Kringsvold (Director of Research)	Fundación Hondureña de Investigación Agrícola (**FHIA**)	Apartado Postal 2067, San Pedro Sula.	Tel: 668 2078 Fax: 668 2313	fhia@hn2.com www.cuprofor.hn
H3	Ernesto Ponce (Director)	Proyecto Conservación y Silvicultura de Especies Forestales (**CONSEFORH**)	Estación Experimental La Soledad, Comayagua	Tel: 772 1786	conseforh@globalnet.hn
H4	Michael Hands	Dept. of Geography, University of Cambridge; **Proyecto Guama**, La Ceiba	-	-	michaelh@gbm.hn mrh13@cam.ac.uk
H5	Peter Doyle (Head of Natural Resources and Environment), Mayra Falk	**Escuela Agrícola Panamericana**	Apartado Postal 93, Tegucigalpa	Tel: 776 6140	
Government:					
H6	Denis Buteau (Principal Technical Adviser)	Proyecto de Apoyo a la Gestión Sostenible de los Recursos Naturales (**PAGS**)	Edificio Secretaría de Agricultura y Ganadería, 1er Piso, Apdo Postal 15086, Col. Kennedy, Tegucigalpa	Tel: 232 1654 Fax: 232 6102	sostenib@david.intertel.hn
H7	Efraín Díaz Arrivillaga (Director PRONADERS; President CDH)	Programa Nacional de Desarrollo Rural Sostenible (**PRONADERS**); Centro de Desarrollo Humano (**CDH**)	Colonia Miramontes, Tegucigalpa	Tel: 235 7585	cdh@sdnhon.org.hn
H8	Jacqueline Chenier (Head of Planning and Policy Department, PRONADERS; Coordinator, Red Colabora)	Programa Nacional de Desarrollo Rural Sostenible (**PRONADERS**); Red Colabora.	Colonia Miramontes, Tegucigalpa	Tel: 235 7585	politica@pronaders.hn
H9	Carlos Sandoval (Head of Department)	Unidad de Cuencas Hidrográficas **AFE-COHDEFOR**	Colonia El Carrizal No. 1, Tegucigalpa	Tel: 223 0426	
H10	Richard Trudel (Co-Director), Julio Torres (National Director)	**Proyecto de Desarrollo del Bosque Latifoliado**	Apdo Postal 427, La Ceiba	Tel: 441 1832 Fax: 441 1833	pdbl@lacaiba.com

NGOs					
H11	Raúl Zelaya (Area Representative, Central America)	**Vecinos Mundiales**	Colonia Miraflores Norte, Casa #1840, Bloque 60, 3a. Avenida, Tegucigalpa	Tel: 230 2003 Fax: 233 1615	cnvm@sdnhon.org.hn
H12	Miguel Sánchez (Post-Mitch recuperation)	**Visión Mundial**	Colonia Montecarlo, Boulevard Morazán, atrás de canchas Bigos, Tegucigalpa. Apdo Postal 3204	Tel: 236 7024 Fax: 236 7108	
H13	Darrell Cáceres (Asesor Región Central)	**Visión Mundial**	Colonia Montecarlo, Boulevard Morazán, atrás de canchas Bigos, Tegucigalpa. Apdo Postal 3204	Tel: 236 7024 Fax: 236 7108	darrell_caceres@wvi.org
H14	Soheil Dooki (Ejecutive Director)	**Bayan** (Asociación de Desarrollo Socioeconómico Indígena)	Ave. San Isidro, Comercial La Ideal, 2o. Piso, Apdo Postal 320, La Ceiba	Tel: 442-2570 Fax: 443 2713	bayan@laceiba.com
H15	Roland Bunch and Gabino López	**COSECHA**	El Naranjal, Valle de Angeles	Tel: 766 2580	gabino@cosecha.sdnhon.org.hn
H16	Filippo del Gatto	**COSPE** (Cooperación para el Desarrollo de Países Emergentes)	Colonia El Sauce, Casa E14, La Ceiba	Tel: 440 1501	fdelgatto@hotmail.com
H17	Gilberto Ríos	**CARITAS**	Barrio Buenos Aires, Tegucigalpa	Tel: 237 2719	
International Cooperation					
H18	Gunter Simon (Team Leader)	**GTZ (Social Forestry Programme)**	Apartado Postal 3739, Tegucigalpa	Tel: 239 2906 Fax: 235 6219	profor@hondutel.hn
H19	Konrad Uebelhör	**GTZ (PROFOR, Gualaco)**	Apartado Postal 3739, Tegucigalpa	Tel: 239 2906 Fax: 235 6219	profor@hondutel.hn
Others					
H20	Juan Blas Zapata (Coordinator)	**Agenda Forestal Hondureña**	Colonia Palmira, Ave. República de Perú No. 402 Frente a Redondel Benito Juárez, Tegucigalpa	Tel: 232 9322 Fax: 239 0530	afh@sdnhon.org.hn
H21	Rigoberto Sandoval Corea	ex Gerente General COHDEFOR, ex Director Instituto Nacional Agrario			
Consultants					
H22	Ian Walker (Director)	**ESA Consultores**	Edificio San Miguel, Barrio la Plazuela, Tegucigalpa	Tel: 238 8570	iwalker@esa.hn

2. El Salvador

Contact Person		Institution	Postal Address	Telephone/fax	Email
Government					
E1	Hector Díaz, Delmy de Rodríguez	Servicio Forestal, Dirección General de Recursos Naturales Renovables (**DGRNR**)	Cantón el Matazano, Soyapango, San Salvador	Tel: 294 0574 (Dirección)	
E2	Jan van Wambeke (Principal Technical Adviser)	Proyecto FAO "Agricultura Sostenible en Zonas de Ladera", Centro Nacional de Tecnología Agropecuaria y Forestal (**CENTA**)	Km. 33½ Carretera a Santa Ana, San Andrés, La Libertad.	Tel: 338 4503 Fax: 338 4278	agrisost@es.com.sv
E3	Lauro Alarcón (Coordinator), Adonis Moreida Rivas, Carlos García	División de Recursos Naturales, Centro Nacional de Tecnología Agropecuaria y Forestal (**CENTA**)	Km. 33½ Carretera a Santa Ana, San Andrés, La Libertad.	Tel: 338 4824	lauroalarcón@usa.net
NGOs/Projects					
E4	Walter Sánchez Andoiza (Director)	**Proyecto PAES/CARE**	Col. Lomas de San Francisco, Calle 3 Casa #20, Apdo 01-462 San Salvador.	Tel: 273 4100 Fax: 273 0939	wsanchez@care.org.sv
E5	Modesto Juárez (Head of agroforestry)	CATIE (**Consorcio PAES – IICA/CATIE/UCA/CRS**)	1 Calle Poniente y 61 Avenida Norte, Edificio Bukele, 1 planta	Tel: 261 2036	
E6	Raúl Elías Araíz de León, Gilberto Vaquerano, Marcos Antonio López, Ricardo Quintanilla, Mario Edgardo	Programa de Agricultura Sostenible, Secretariado Social-Caritas de la **Arquidiócesis de San Salvador**	Calle San José y Avenida América, San Salvador	Tel: 226 1943	
E7	Montano Ruíz (Head of Operations)	Proyecto de Desarrollo Rural de Chalatenango (**PROCHALATE**)	Final Calle Morazán, Bo. El Calvario, Chalatenango.	Tel: 301 1241	prochalatech@sal.gbm.net
E8	Ricardo Vásquez (Director)	Fundación Río Lempa (**FUNDALEMPA**)	Residencial Santa Ana, Casa 10, Chalatenango	Tel: 301 0618	
E9	Wilfredo Morán	Comité Ambiental de Chalatenango (**CACH**)	Calle Morazán, Bo. El Calvario, Chalatenango.	Tel: 335 2783	cach995@saltel.nt
Research Institutions					
E10	Herman Rosa (Director), Susan Kandel	Programa Salvadoreña de Investigación sobre Desarrollo y Medio Ambiente (**PRISMA**)	3a C. Pte. No. 3760, Col. Escalón, San Salvador. Apartado 01-440. International mailing address: VIP No. 992, PO Box 52-5364, Miami 31152	Tel: 298 6852 Fax: 223 7209	prisma@es.com.sv hrhr@es.com.sv
E11	Cristobal Escobar Betancourt (Research Director)	Area de Investigación, Centro Nacional de Tecnología Agropecuaria y Forestal (**CENTA**)	Km. 33½ Carretera a Santa Ana, San Andrés, La Libertad.	Tel: 338 4503 Fax: 338 4278	agrisost@es.com.sv

E12	Guillermo Pérez (Senior Analyst)	Sector Agropecuario, Departamento de Estudios Económicos y Sociales, Fundación Salvadoreña para el Desarrollo Económico y Social (**FUSADES**)	Edificio FUSADES, Boulevard y Urbanización Santa Elena, Antiguo Cuscatlán, La Libertad. Apdo. Postal 01-278.	Tel: 278 3666 Ext. 307 Fax: 278 3356	gperez@fusades.com.sv
International Organisations/Agencies					
E13	Roberto Rodríguez Rojas (Advisor)	Dirección General del Medio Ambiente, Secretaría Ejecutiva de la Comisión Centroamericana de Ambiente y Desarrollo (**CCAD**)	Sistema de Integración Centroamericana (SICA) Blvd. Orden de Malta No. 470, Urb. Santa Elena, Antiguo Cuscutlán, San Salvador.	Tel: 289 6131 Fax: 289 6127	rrodriguez@sicanet.org.sv otrebor@es.com.sv
E14	Leif K. Pedersen (Programme Officer)	**UNDP**	3a. Calle Poniente No. 4048 entre 77 y 78 Avenida Norte, San Salvador	Tel: 263 3504 Fax: 263 3501	leif.Pedersen@undp.org

3. Guatemala

Contact Person		Institution	Postal Address	Telephone/fax	Email
Government					
G1	Leonel Miranda, Efraín Díaz Mazaviegos	**INAB** Región Nor-Oriente			
G2	Mynor René Barillas Muñoz (National Coordinator)	Proyecto de Fortalecimiento Forestal Comunal y Municipal (**BOSCOM**), Instituto Nacional de Bosques (**INAB**)	7a. Ave. 6-80, Zona 13, Guatemala City	Tel: 473 5212	boscom@concyt.gob.gt
NGOs/Projects/Programmes					
G3	José Us Vicente (National Coordinator)	**Plan de Acción Forestal Maya**	38 Ave. A, Casa 0-63, Zona 7, Colonia Villas del Pedregal, Guatemala City	Tel: 591 4809	
G4	Domingo Chalí	Conferencia de Iglesias Evangélicas de Guatemela (**CIEDEG**)	7a. Ave. 1-11, Zona 2, Guatemala City	Tel: 220 8579	ciedeg@guate.net
G5	Carlos Soza	Director, **Conservation International Guatemala**	Ciudad Flores, Petén	Tel: 926 1370 Fax: 926 0495	csoza@conservation.org.gt
G7	Reginaldo Reyes Rodas	Proyecto Conservación y Desarrollo en Centroamérica (**OLAFO/CATIE**)	Ciudad Flores, Petén	Tel: 926 0427	
G8	Teresita Chinchilla (Sub-Region Director)	**CARE Petén**	0 Ave. 0-56, Zona 2, Santa Elena, Petén	Tel: 926 0708	peten@care.org.gt
G9	Elvira Sánchez (Director)	Instituto para la Superación de la Miseria Urbana (**ISMU**)	10 Ave. A, 4 Calle 10-30, Zona 2, Guatemala City	Tel: 254 2303	
G10	Oscar Castañeda Samayoa (Director)	**Vecinos Mundiales Guatemala**	7a. Ave. 13-01 Zona 9, Edificio La Cúpula, 2o. nivel, Guatemala City	Telefax: 332 5045	vecinosm@guate.net
G11	Carlos Roberto Paíz García, Manuel Alberto Torres, Walter Felipe Espinoza, Otto R. Marroquín, Jeovani Rosa Pérez	Proyecto de Desarrollo Rural de Zonas de Fragilidad Ecológica en la Región del Trifinio (**PRODERT**)	6a. Ave. 2-43 Zona 1, Esquipulas	Tel: 943 0931	
G12	Orlando Peralta (International Director) Santos Ruíz, Carlos R. García	Proyecto de Desarrollo Rural para Pequeños Agricultores en Zacapa y Chiquimula (**PROZACHI**)	Km. 196 Quetzaltepeque, Chiquimula	Tel: 944 0122 Fax: 941 3809 Cel: 709 9224	operaltar@guate.net
G13	Carlos López Tejada	**ASORECH**		Tel: 709 9302	
G14	Gregorio Marcos Pérez	**ADISJA**	San Jacinto, Quetzaltepeque		

G15	Octavio Villeda Sosa	Proyecto de Alivio a los Desastres Ocasionados por la Tormenta Tropical Mitch (**Post-Mitch**)		Tel: 944 0122	
G16	Nidio Otoniel de León, Carlos León Aceituno	Proyecto Miniduc/UNESCO/Países Bajos Educación Básica en Zacapa y Chiquimula (**BEZACHI**)		Tel: 942 0136	
G17	Elío Barrera R., Manuel Padilla González	Proyecto Manejo Sostenible de los Recursos Naturales Renovables en el Departamento de Chiquimula (**Jupilingo las Cebollas**)		Tel: 944 0093	
G18	Nelida Pazos Machorro	**SACODEVI**		Tel: 944 0093	
Producer Organisations					
G6	Marcedonia Cortavé (Director), Ileana Valenzuela (Executive Assistant)	Asociación de Comunidades Forestales de Petén (**ACOFOP**)	4 Ave. 11 Calle, Zona 1, San Benito, Petén	Tel: 926 3572 Fax: 926 3571	acofop@gua.net
Research Institutions					
G19	Luís C. Donado (Head of Research)	Instituto Nacional de Bosques (**INAB**)	7a. Ave. 6-80, Zona 13, Guatemala City	Tel: 475 3460	investigacion.forestal @concyt.gob.gt
G20	Edmundo Vásquez Paz, Mara Bocaletti Florián, Nicolás Belicó	Instituto de Derecho Ambiental y Desarrollo Sustentable (**IDEADS**)	3a. Ave 4-68, Zona 1, Segundo Nivel, CP 01001, Guatemala City	Tel: 253 2061 Fax: 253 1987	ideads@intelnet.net.gt ideads@pronet.net.gt
G21	Silvel Elías (Coordinator of Environmental Department)	Facultad Latinoamericana de Ciencias Sociales (**FLACSO**)	5a. Ave. 6-23, Zona 9, Guatemala City	Tel: 362 1431 Fax: 332 6729	flacso@quik.guate.com

4. Nicaragua

Contact Person		Institution	Postal Address	Telephone/fax	Email
Government					
N1	Sandra Tijerino M. (Executive Director)	Instituto Nacional Forestal (**INAFOR**)	Km. 12½ Carretera Norte, Managua	Tel: 233 0013 Fax: 263 2827	inafor@sdnnic.org.ni
NGOs/projects/programmes					
N2	Francisco Rodríguez (Executive Director)	Programa Socioambiental y Desarrollo Forestal (**POSAF**)	Km. 12½ Carretera Norte, Apartado 1369, Managua	Tel: 233 1309 Fax: 233 1952	posaf@sdnnic.org.ni
N3	María Engracia de Trinidad Prado (Executive Director), Serafín Filomeno (Consultant)	Asociación para el Fomento Dendroenergético (**PROLEÑA**)	Ave. Central, Altamira de Este, de SINSA media cuadra abajo, Casa 454.	Tel: 270 5448	prolena@sdnnic.org.ni
N4	Abelardo Rías	**Programa Campesino a Campesino**	Unión Nacional de Agricultores y Ganaderos, de Tica Bus, una cuadra abajo, media cuadra al Lago, frente a Delicias del Mar, Managua.	Tel: 222 2235	pcac@munditel.com.ni
N5	John Veerkamp (Sub-Director)	**CARE Nicaragua**	Sandy's Carretera a Masaya, 1c. abajo ½ c. al lago, PO Box 3084, Managua	Tel: 278 0018 Fax: 267 0386	jveerkamp@care.org.ni www.care.org.ni
Research Institutions					
N6	Ruben Pasos	Servicios de Informacion Mesoamericana de Agricultura Sostenible (**SIMAS**)		Tel: 277 3556	infantil@munditel.com.ni
N7	Mario Davide Parrilli	Instituto de Investigación y Desarrollo **Nitlapán-UCA**	Universidad Centroamericana, Apartado Postal A-242 C.C.M., Managua	Tel: 278 0627 Fax: 267 0436	ner@ns.uca.edu.ni
N8	Jaime Guillén	Sociedad para la Conservación de la Naturaleza y la Restauración Ambiental (**Nicambiental**)	De Plaza del Café 2 cuadras al Norte y 1 al Este, Casa 751. Apartado Postal 3772, Managua.	Tel: 270 5528 Fax: 270 6077 Cel: 088 65049	ceiba@sdnnic.org.ni
Consultants					
N9	Eduardo Buameister			Cel: 088 44853	ebaumeis@tmx.com.ni
N10	Desirée Elizondo		De Rotonda Gueguense 1c. abajo 2c. al lago, 20vrs. abajo, Managua.	Tel: 266 1185 Cel: 088 79771	dec@ibw.com.ni

5. Regional

Contact Person		Institution	Postal Address	Telephone/fax	Email
Producer organisations					
R2	Alberto Chinchilla (Facilitador Regional)	Coordinadora Indígena y Campesina de Agroforestería Comunitaria (**CICAFOC**)	Barrio Francisco Peralta, 150 sur de Casa Italia, casa 1056, San José, Costa Rica	Tel: 225 2567	cicafoc@sol.racsa.co.cr
Research Institutions					
R1	David Kaimowitz	**RUTA-CIFOR**	San José, Costa Rica		dkaimowitz@cgiar.org
R3	John Beer (Head of Watershed and Agroforestry Systems Area)	Centro Agronómico Tropical de Investigación y Enseñanza (**CATIE**)	CATIE 7170, Turrialba, Costa Rica	Tel: 556 7830 Fax: 556 1576	jbeer@catie.ac.cr
R4	Andrea Schlönvoigt (Watershed and Agroforestry Systems Area)			Tel. 556 6418 Fax. 556 9620	aschlonv@catie.ac.cr homepage: http://www.catie.ac.cr
R5	Eduardo Somarriba (Agroforestry Specialist)			Tel: 556 6418 Fax: 556 1576	esomarri@catie.ac.cr
R6	Markku Kanninen (Director, Research Programme)			Tel: 556 1754 Fax: 556 6255	kanninen@catie.ac.cr
R7	Florencia Montagnini (Head of Area of Management and Conservation of Forests and Biodiversity)			Tel: 556 6440 Fax: 556 0169	montagni@catie.ac.cr
R8	Bryan Finegan (Applied Forest Ecology)			Tel: 556 0401 Fax: 556 2430	bfinegan@catie.ac.cr
R9	Glenn Galloway (Leader TRANSFORMA project)			Tel: 556 2703 Fax: 556 7730	galloway@catie.ac.cr
R10	Jonathan Cornelius			Tel: 558 2528 Fax: 556 1533	jcorneli@catie.ac.cr
R11	Tania Ammour (Director of Strategic Planning, Head of Monitoring and Impact Evaluation)			Tel: 556 0782	tammour@catie.ac.cr
R12	Mario Piedra (Associate Research Professor)			Tel: 556 8514 Fax: 558 2218	mpiedra@catie.ac.cr
R13	Robert Hearne (Assistant Research Professor, Environmental Economics)			Tel: 556 8514 Fax: 556 1533	rhearne@catie.ac.cr
R14	Kees Prins				
R15	Guillermo Detlefsen (Agroforestry)				gdetlef@catie.ac.cr
International organisations/agencies					
R16	Deborah Barry	**Ford Foundation**	Mexico City	(525) 280-3047	d.barry@fordfound.org

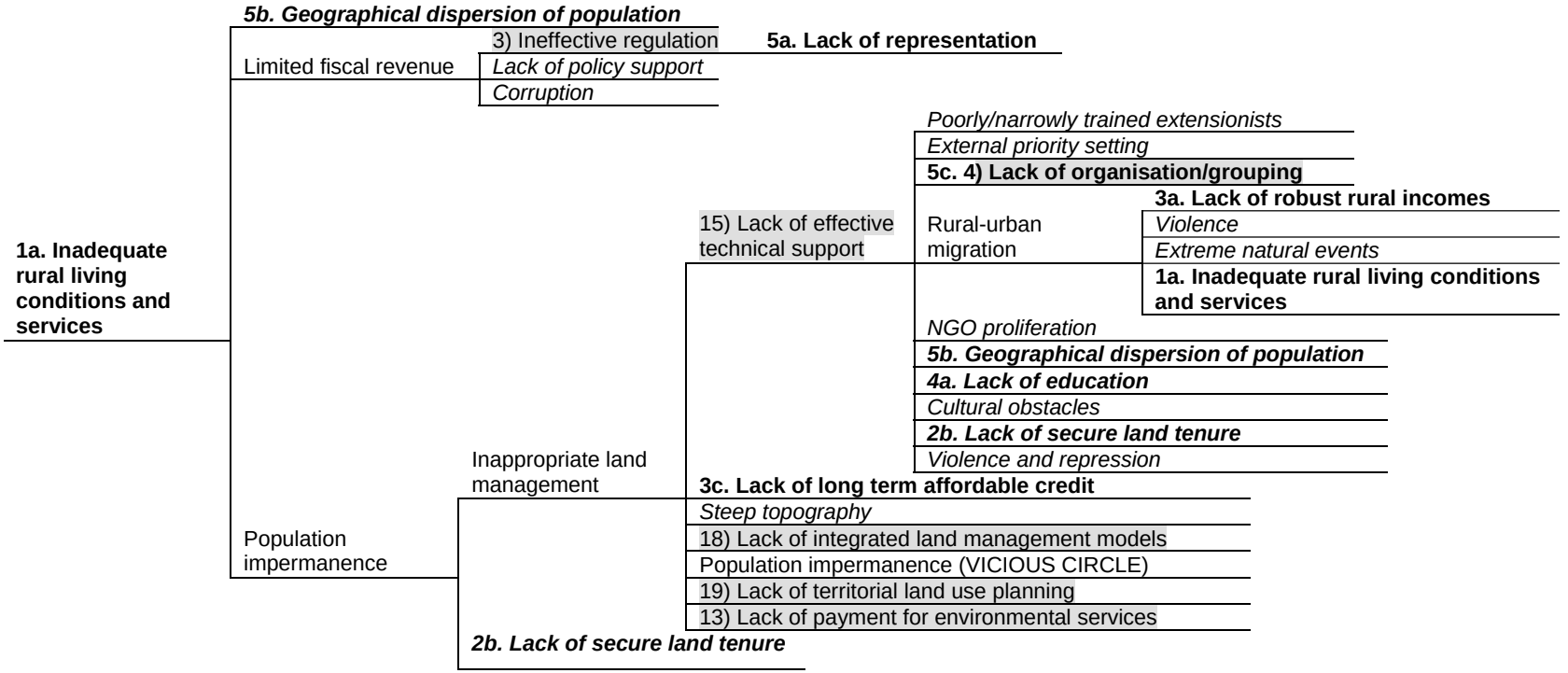
Appendix 3: Principal socio-biological zones in the study countries (approximate equivalents between countries grouped by rows)

Honduras	El Salvador	Guatemala	Nicaragua
Central development corridor (Tegucigalpa and San Pedro Sula)	Growing San Salvador conurbation	Guatemala City – extensive marginal barrios divided by *barrancas* (gullies)	Managua – until recently the principal pole of urban migration
Southern (Pacific slope) dry forest/ basic grain agroecosystem	Eastern dry zone, dominated by basic grain farming	Eastern dry zone, dominated by ranching and marginal basic grain production	Western (Pacific slope) dry zone, dominated by basic grain farming
Coastal plains on both coasts dominated by export "dessert" crops	Coastal plains dominated by export agriculture	South coast dominated by commercial agriculture	Pacific plains dominated by export crops
Western "poverty belt"; pines, cloud forest and dry forest, coffee		Central poverty belt, with pines in the north and ranching in the south, and coffee	
	Central coffee belt, important for firewood, under urban pressure		
Runaway agricultural frontier in the humid north and east		Lowland humid zone; "release valve" for pressures elsewhere; high international conservation value	Runaway agricultural frontier heading eastwards into humid lowlands
	Northern highlands, population expulsion zone, principal water catchment for San Salvador and reservoirs	Highly populated *altiplano*, with much indigenous culture; expulsion zone due to political violence	
Stable indigenous groups in the far east; humid forest, *Pinus caribaea* and savannah			Autonomous Atlantic coast humid zone – much indigenous presence

Appendix 4: Problem trees linking the causes of poverty to shortages of livelihood capital

Key:
Bold indicates links to other sub-categories of sustainable livelihood capital
Italic indicates non FRP-researchable constraints
Shaded and numbered indicates FRP researchable constraints

1. PHYSICAL CAPITAL



	Lack of policy support		
	3a. Lack of robust rural incomes		
	Poorly executed resettlement		
1b. Poor urban living conditions	*Extreme natural events*		
	1d. Disaster vulnerability		
	3b. Lack of robust urban incomes		
	Erratic water supply	Catchment degradation	Inappropriate land management (see 1a)
			19) Lack of territorial land use planning
	Rural-urban migration (See 1a)		
	Poorly-executed resettlement		

1c. Poor physical access	*Lack of policy support*	
	Isolation	
	Steep topography	

1d. Disaster vulnerability	*Extreme natural events*	
	Rural-urban migration (See 1a)	
	Catchment degradation (See 1b)	

2. NATURAL CAPITAL

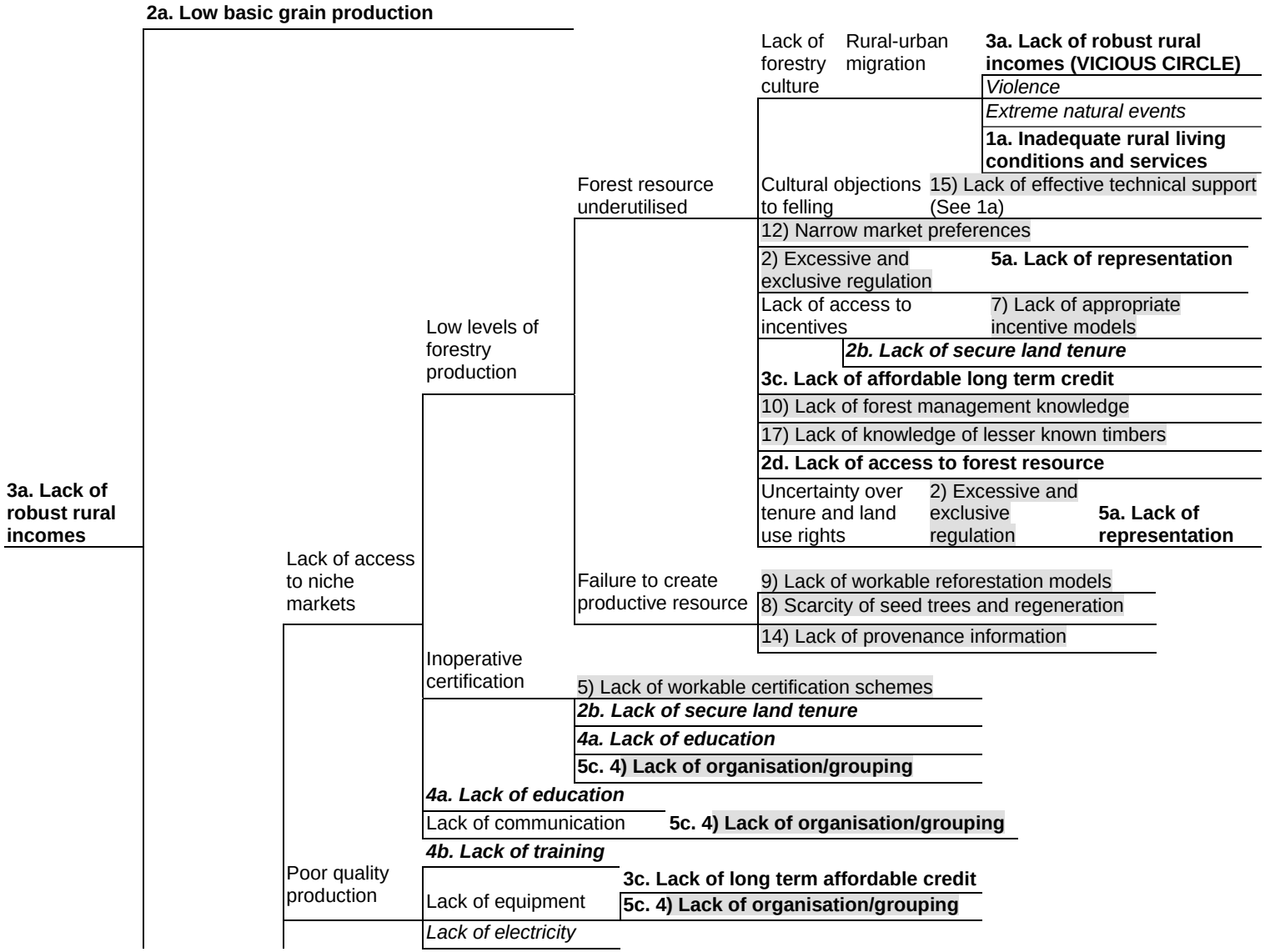
	2d. Limited access to land	
	Soil degradation	Inappropriate land management (See 1a)
2a. Low basic grain production	*Variable climate*	
	Pests and diseases	
	High agricultural input costs	*Macroeconomic policies*
	Lack of post-harvest care	

2b. Lack of secure land tenure

2c. Lack of food security	**2a. Low basic grain production**	
	3a. Lack of robust rural incomes	

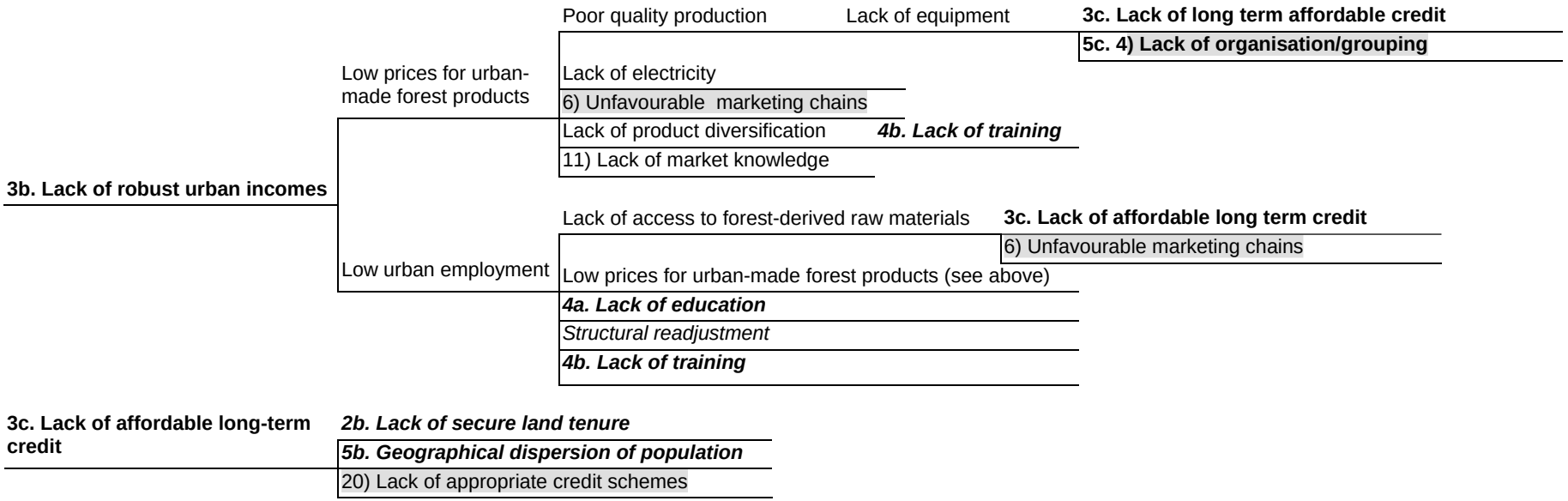
2d. Lack of access to forest resource	*Lack of policy support*	
	2b. Lack of secure land tenure	
	2) Excessive and exclusive regulation	**5a. Lack of representation**

3. FINANCIAL CAPITAL



3a. Lack of robust rural incomes

- Low forest product prices
  - Limited local processing
    - 2) Excessive and exclusive regulation — **5a. Lack of representation**
    - **3c. Lack of affordable long term credit**
    - *Isolation*
    - *Steep topography*
    - ***1c. Poor physical access***
  - **3c. Lack of affordable long term credit**
  - **5c. 4) Lack of organisation/grouping**
  - Unfair price competition
    - 3) Ineffective regulation
    - *Lack of policy support*
  - Lack of price information
    - *Corruption*
    - Lack of communication — **5c. 4) Lack of organisation/grouping**
    - **5c. 4) Lack of organisation/grouping**
    - ***4a. Lack of education***
  - 6) Unfavourable marketing chains
  - Lack of product diversification — ***4b. Lack of training***
- *Scarcity of family labour*
- 16) Lack of income from tourism
- 13) Lack of payment for environmental services
- Variable prices of basic grains
  - **1c. Poor physical access**
  - *Lack of post-harvest care*
  - 6) Unfavourable marketing chains
- Lack of reliable rural employment
  - *Macroeconomic policies*
  - **2a. Low basic grain production**
  - *Variable prices of basic grains*
  - *Boom and bust nature of commercial crops*
  - *Low export crop profitability*
  - Limited local processing (see above)
  - *Cultural restrictions*
  - Low levels of forestry production (see above)
  - Low forest product prices (see above)
  - 16) Lack of income from tourism (see above)



4. HUMAN CAPITAL

4a. Lack of education

4b. Lack of training

5. SOCIAL CAPITAL

5a. Lack of representation

5c. 4) Lack of organisation/grouping

5d. 1) Ineffective civil society

5b. Geographical dispersion of population

5c. 4) Lack of organisation/grouping

5d. 1) Ineffective civil society

Appendix 5: Frequency of reference to researchable constraints by interviewees

Researchable constraints	Hond.	ES	Guat.	Nic.	Regional	Total
1. Ineffective civil society	3	5	1	3	5	**17**
2. Excessive and exclusive regulation	8	3	3	2	11	**27**
3. Ineffective regulation	8	4	11	2	3	**28**
4. Lack of organisation/grouping	13	5	16	6	4	**44**
5. Lack of effective technical support	14	7	16	5	13	**55**
6. Lack of payment for environmental services	6	3	2	2	14	**27**
7. Unfavourable marketing chains	11	3	14	4	12	**44**
8. Lack of workable incentive models	1	3	12	2	8	**26**
9. Lack of market knowledge	5	5	11	2	4	**27**
10. Narrow market preferences	2	0	1	0	0	**3**
11. Lack of workable credit models	10	3	12	2	1	**28**
12. Lack of workable certification schemes	3	2	3	2	9	**19**
13. Scarcity of seed trees and regeneration	0	0	0	0	4	**4**
14. Lack of workable reforestation models	1	4	1	1	9	**16**
15. Lack of forest management knowledge	8	4	11	5	9	**37**
16. Lack of provenance information	0	1	0	0	4	**5**
17. Lack of income from tourism	0	1	2	1	1	**5**
18. Lack of integrated land management models	3	0	2	0	0	**5**
19. Lack of territorial land use planning models	2	4	12	2	0	**20**
20. Lack of knowledge of lesser known timbers	1	0	3	0	0	**4**

Appendix 6: Sustainable livelihood capital sub-categories affected by researchable constraints

Researchable constraint	Sustainable livelihood capital categories																		
	Physical				Natural				Financial			Human		Social				Total categories	Total sub-categories
	1a	1b	1c	1d	2a	2b	2c	2d	3a	3b	3c	4a	4b	5a	5b	5c	5d		
1. Ineffective civil society	X	X			X		X	X	X					X				**4**	**7**
2. Excessive and exclusive regulation	X	X			X		X	X	X									**3**	**6**
3. Ineffective regulation	X	X			X		X		X									**3**	**5**
4. Lack of organisation/grouping	X	X			X		X		X	X				X				**4**	**7**
5. Lack of effective technical support	X	X			X				X									**3**	**4**
6. Lack of payment for environmental services	X	X			X				X									**3**	**4**
7. Unfavourable marketing chains	X	X			X				X	X								**3**	**5**
8. Lack of workable incentive models	X	X			X				X									**3**	**4**
9. Lack of market knowledge										X								**1**	**1**
10. Narrow market preferences	X	X			X				X									**3**	**4**
11. Lack of workable credit models	X	X			X				X		X							**3**	**5**
12. Lack of workable certification schemes	X	X			X				X									**3**	**4**
13. Scarcity of seed trees and regeneration	X	X			X													**2**	**3**
14. Lack of workable reforestation models	X	X			X													**2**	**3**
15. Lack of forest management knowledge	X	X			X													**2**	**3**
16. Lack of provenance information	X	X			X				X									**3**	**4**
17. Lack of income from tourism	X	X			X				X									**3**	**4**
18. Lack of integrated land management models	X																	**1**	**1**
19. Lack of workable territorial land use planning models	X	X																**1**	**2**
20. Lack of knowledge of lesser known species' timber	X	X																**1**	**2**

Appendix 7: Summary table of categorisations of research themes

Researchable constraint	Frequency of mention of addressed constraints	Countries (ecosystems) addressed	Poverty groups addressed	SL categories (sub-categories) addressed	Potential poverty impact
1. Mechanisms for the development of pro-poor forest laws and policies	17,27	4(3)	a,b,c	4(7),4(7)	**HIGH**
2. Alternative regulatory models for the forestry sector	28	4(3)	a,b,c	3(5)	**HIGH**
3. Organisational models for forest-dependent communities	44	4(3)	a,b,c,d	4(7)	**HIGH**
4. Extension and technical support models for tree-based land use management systems	55	4(3)	a,b,c,d	3(4)	**HIGH**
5. Quantification, valuation and payment of environmental services	27	4(3)	a,b,d	3(4)	**HIGH**
6. Marketing chains for small scale producers and processors of forest products	44	4(3)	a,c	3(5)	MEDIUM
7. Forestry incentive schemes for small farmers	26	4(3)	a,c	3(4)	MEDIUM
8. Potential for market development of forest products from small operators	27,3	4(3)	a,c	3(4)	MEDIUM
9. Credit schemes for small scale forestry operators and processors	28	4(3)	a,c	3(5)	MEDIUM
10. Accessible forest product certification for rural income generation	19	4(3)	a,c	3(4)	LOW
11. Germplasm resources for income-generating natural regeneration in agroecosystems	4	4(1)	a	2(3)	LOW
12. Alternative on-farm tree establishment models for smallholders	16	4(1)	a	2(3)	LOW
13. Single tree growth models for mixed-age conifer forest	37	4(1)	c	2(3)	LOW
14. Single tree growth models for lesser known species in mixed-age humid lowland forest	37	3(1)	c	2(3)	LOW
15. Management of young natural pine forest	37	4(1)	c	2(3)	LOW
16. Management requirements of NTFPs in humid lowland forest	37	3(1)	c	2(3)	LOW
17. Long term growth and management of small forestry plantations	37	4(1)	a	2(3)	LOW
18. Provenance variation within lesser-known plantation species for smallholders	5	4(1)	a	3(4)	LOW
19. Pro-poor forest tourism in Central America	5	4(3)	a,b	3(4)	LOW
20. Integrated territorial land use planning	5,20	4(3)	d	1(1)	LOW
21. Characteristics and working properties of lesser known species	4	4(2)	a,c	1(2)	LOW

Appendix 8: Forest economic valuation exercises to date in Central America (source: Colindres, 2000)

Study	Geographical location	Institutions involved
Valuation of forest environmental services (biodiversity, carbon capture, water production, hydroelectric productivity, flood control, water quality protection, landscape values and ecotourism	Costa Rica (various ecosystems)	ODA/MINAE
Storage and fixing of carbon by *Quercus costarricense* in high altitude forest	Cordillera Talamanca, Costa Rica	Forest Management Unit, CATIE
Capacity and risks of forestry activities for carbon storage and biodiversity conservation in private farms	Central Costa Rica	Forest Management Unit, CATIE
Valuation of broadleaved forest	Petén, Guatemala	Forest management and biodiversity conservation area, CATIE
Economic valuation of carbon sink service in different forest ecosystems and plantations	Costa Rica, Bolivia, Chile	Research Programme, CATIE
Economic valuation of watershed hydrological resources	Río Tarcoles, Costa Rica	CATIE
Economic valuation of drinking water	Guanacaste, Costa Rica	
Partial economic valuation of mangroves	Región II, Nicaragua	CATIE

Appendix 9: CATIE projects currently (as of November 2000) approved or in the pipeline, and funding sources (source: internal list lent by CATIE staff)

Donor	Theme	Status
AVINA	Private enterprise - research centre research cooperation	In pipeline
	Multi-stakeholder approach to developing sustainable landuses for dry forests in Guanacaste and Central America	
Central American Mitigation Initiative	Vulnerability reduction (Guatemala and El Salvador)	
CCAD	Watershed map (Central America)	
CCAD/DANIDA	Watershed project	
CONAP	Monitoring and evaluation system for biological indicators in protected areas (Guatemala)	
Conservation, Food and Health Foundation	Strategies for the recovery of biodiversity in degraded ecosystems: natural regeneration in mixed and pure plantations of native species	
Corredor Biológico	Sustainable management of secondary forests by rural communities (Nicaragua)	
COSUDE	Execution of second phase of TRANSFORMA project	Signed
DANIDA	Watershed planning and management (Bolivia)	
DFID	Growth, productivity and socioeconomic feasability of mixed and pure plantations of native species in humid tropics (with 10 private foundations)	In pipeline
	Strategies for the recovery of biodiversity in degraded ecosystems: natural regeneration in mixed and pure plantations of native species (with 10 private foundations)	
Dutch committee of IUFRO members	Improvement of technical capacity and information exchange in Mesoamerican and Caribbean herbaria	
Dutch Government/ World Bank	Supply and demand study for certified products and services (Central America)	Signed
ECOFOREST (Panamá)	Masters scholarships	
EU/European Commission/INCO	Strengthening of environmental economics capacity (Central America)	
	Sustainability of coffee agroforestry systems: coffee quality and environmental services	In pipeline
	Sustainable management of neotropical tree genetic resources: structure and dynamics of gene diversity	
	Smallholder planting systems for IPM of *Hypsipyla grandella*	
	Methods and models for assessing impacts of trees on farm productivity and regional biodiversity in fragmented landscapes	
	Decision support system for sustainable ecosystem management	
	Modelling carbon sequestration in forested landscapes	
FAO	Support to Programa de Asesoría Forestal	Signed
	Establishment and maintenance of Spanish-speaking satellite of Virtual Research and Development Centre	
	Extension of Tree Resources Outside Forest project	
	Management of *Swietenia macrophylla* and associated species in natural tropical forest (Central America)	In pipeline
FAO/GEF/BM	Livestock resource management at rainforest/pasture interface (Costa Rica, Nicaragua, Colombia	
FIDA	Improving technical capacity of local organisations to support rural investment projects (Central America)	
FINNIDA	Carbon capture in silvopastoral systems in Nicaragua	
FONTAGRO	Rescue, propagation, conservation and use of highly threatened species and populations of forest trees (Central America/Caribbean)	
Fundación Andrew W. Mellon	Conservation and development for sustainable management of natural resources and diversity (Panama)	

GEF	Biodiversity conservation through organic cocoa agroecosystems (Costa Rica)	
German Research Council	Coffee-environment interactions for sustainable production systems under mono-culture and agroforestry	
GTZ	Agroforestry course (Colombia)	Signed
	Evaluation and improvement of fallow systems (Panama)	In pipeline
IADB	Watershed management feasability study (Nicaragua)	Signed
	Technical publication of manual on grafting of Zapote	
	Management of priority watersheds – with MAGA (Guatemala)	In pipeline
	Environmental education	
ICAFE	Coffee GIS inventory (Costa Rica)	
IPGRI	American regional training workshop	Signed
	International training course on cryopreservation techniques	
IRD	Map-based cloning of root knot nematode resistance gene in coffee	In pipeline
Italian Government	Influence of development patterns on mangrove conservation in Central America	
	Collaboration to aid indigenous communities in the management and conservation of tropical forests in the Mosquitia (Honduras)	
IUFRO	Publication of book "Ecología de bosques lluviosos tropicales"	
MAG-FOR	Rehabilitation of farms and prevention of impacts from natural disasters through agroforestry technology	
NORAD/DANIDA/ BMZ-GTZ	Rehabilitation of degraded pastures in humid Central America	
OPS/OMS	Publication of "Agromedicina"	Signed
PROARCA/CAPAS	Park Guards course	In pipeline
PROFOR	Secondary forest (with UCA Nicaragua/PROCAFOR)	Signed
	Monitoring, evaluation, training and technical support unit to support sustainable forestry (Nicaragua)	In pipeline
PROMSA	Postgraduate scholarships in tropical agroforestry aimed at ecodevelopment in the Ecuadorian Amazon	
	Agroforestry for humid tropics with emphasis on sustainable development (Ecuador)	
Rainforest Alliance Kleinhans Fellowship	Evaluation of substances extracted from tropical trees as repellents or deterrents of insect pests	
SIDA	Support to "*strengthening local capacity to deal with watershed management and natural disaster prevention*" project	Signed
	Capacity building in environmental economics (Central America)	In pipeline
	Economic valuation of environmental services in priority micro-catchments (El Salvador)	
UNEP	Reducing the impact of environmental emergencies through early warning and preparedness – the case of El Niño	
UNESCO	Protected Areas Management course	Signed
USAID	Technical and administrative strengthening of community forestry concessions (Guatemala)	
	Environmental monitoring of watershed management activities (Guatemala)	
	Masters scholarships in watershed management	
	Recovery of rural economy from effects of Hurricane Mitch and reduction of disaster vulnerability	
	Training of municipalities affected by natural disasters in planning and management of natural resources (Honduras)	In pipeline
	Strengthening of Municipal Environmental Units (Honduras)	
	Strengthening of community concessions (Guatemala)	

USDA	Collection of *Swietenia macrophylla* germplasm in South America	Signed
	Working capital fund for diverse research and extension projects	
	Collaborative research, extension and teaching activities	
	Collection of *Swietenia macrophylla* germplasm (South America)	In pipeline
	Genetic characterisation of USDA forest service mahogany germplasm collection from Puerto Rico using RADPS markers	
	Biointensive approaches to managing *Hypsipyla grandella*	
	Evaluation of substances extracted from tropical trees as repellents or deterrents of *Bemesia tabaci*	
USDA/USAID	GIS mapping and watershed management, Río Lempa (Honduras)	
World Bank	Vegetation map of Panama	
	Feasability study for sustainable watershed management (Costa Rica)	
World Bank/GEF/ Fundecooperación	Diversified organic cocoa farms for biodiversity and improved living standards (Costa Rica)	
WWF	International course on Rural Development based on Management of Natural Tropical Ecosystems	Signed

Appendix 10: Other analyses of poverty-related constraints and socio-environmental problems

Poverty-related constraints in Honduran dry forest agroecosystem, identified through R6913 (Source: Barrance *et al.*, 2000).

FRP project R6913 (Conservation through use of tree species diversity in fragmented Mesoamerican dry forest) identified and described farmer-developed agroforestry systems, based on the protection and management of naturally-regenerated native tree species, which have significant potential to contribute to small farmers' livelihoods. Factors limiting their contribution at present include:

i) Lack of recognition by existing forestry legislation of the characteristics and social/biological dynamics of the dry forest agroecosystem;
ii) Lack of recognition of the value of, and support for, the protection and management of natural regeneration, both in official laws and policies and among development agencies and NGOs;
iii) Controls on the use of naturally-regenerated trees in agroecosystems are excessively restrictive, centralised, bureaucratic and in certain cases lack scientific objectivity;
iv) Lack of clarity among the rural poor about their legal rights regarding tree management and use;
v) Lack of extension of "dispersed tree" systems based on natural regeneration, in communities where they are not currently practised (e.g. due to historical dominance of land-use by *latifundista* cattle ranching).

Principal environmental problems in Chalatenango (CACH/PROCHALATE, 2000)

Biophysical problems:

- massive deforestation due to expansion of cropping area, timber and fuelwood extraction and fire
- soil deterioration due to landuse not appropriate to vocation
- generalised erosion and mass movement related to land use change
- reduction in dry season river flow and wet season flashiness
- water contamination by domestic and agricultural waste and erosion
- loss of biodiversity
- increases in soil temperatures due to lack of vegetation

Social problems:

- marginalisation of women
- lack of options for young people leading to emigration
- inadequate coverage of basic services (education, health, housing)
- lack of long term paid employment
- cultural separation from the land
- geographical dispersion of population making service provision difficult

Economic problems:

- inflexibility of the economic structure making change to sustainable land uses difficult
- failure to recognise the provision of environmental services
- lack of access to land for production
- lack of suitability of land for profitable agriculture
- household economies based on survival
- dominance of the informal economy
- lack of vision, business initiatives and credit
- unsustainability of small businesses
- lack of access to technologies, technical assistance and training due to inability to pay
- inefficiency of current market structure for most of the population
- profits passing into the hands of intermediaries
- lack of roads and productive infrastructure
- lack of added value to agricultural and forestry production

Institutional problems:

- loss of functions and capacity of the State
- limited involvement of the civil society in strategic environmental and economic decision making

- lack of strategies for i) land use planning, ii) laws and controls, iii) economic transformation of the agricultural sector, iv) diversification of energy sources, v) decentralisation and modernisation at municipality level, vi) urban settlements.

Principal problems identified by Department in El Salvador (Plan de Nación, El Salvador)

	AH	SO	SA	LL	CH	SS	CU	LP	CA	SV	US	SM	MO	LU
Concentration of power and recources						x								
Deforestation					x									
Delincuency			x				x					x		
Departamental marginalization					x								x	x
Deterioration of road network				x										
Insecurity				x				x				x		
Lack of education			x			x								
Lack of social and economic investment														x
Lack of support to agriculture							x							
Limited citizen participation	x											x		
Limited economic activity														
Loss of natural resources									x					
Low agricultural production												x		
Poor access			x											x
Poverty								x	x		x		x	
Precarious social and economic situation	x	x					x							
Unemployment				x	x	x		x	x	x	x		x	

AH=Ahauchapán, SO=Sonsonate, SA=Santa Ana, LL=La Libertad, CH=Chalatenango, SS=San Salvador, CU=Cuscatlán, LP=La Paz, CA=Cabañas, SV=San Vicente, US=Usulután, SM=San Miguel, MO=Morazán, LU=La Unión.

Results of regional participatory forestry meetings January-November 1992 (Perfil del Plan de Desarrollo Forestal y Medio Ambiental del Pueblo Maya: Plan de Acción Forestal Maya, 1994)

Problems	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**
Access to resources							
Scarcity of land (small holding size - *minifundios*)	x	x	x	x	x	x	x
Land tenure insecurity	x	x			x		
Shortage of water and forest resources due to deforestation	x		x	x	x	x	x
Lack of working capital	x	x	x	x	x		
Lack of access to credit appropriate to local conditions				x			x
Limited road access and communication		x				x	
Lack of basic services						x	
Low crop yields due to soil degradation and topography		x	x	x		x	
Loss of forest due to agricultural expansion	x	x		x			x
Uncontrolled felling by ranching and timber interests					x		
Damage to planted trees by grazing			x			x	
Pollution by industry and agrochemicals			x	x	x	x	x
Loss of forest due to fires and illegal felling		x	x	x			
Loss of fauna due to deforestation and hunting	x			x		x	
Lack of investment in land due to tenure security	x						
Timber wastage in agricultural activities (slash and burn)	x						

High cost of agricultural inputs						x	
Access to fair market prices prevented by intermediaries							x
Access to technologies							
Inappropiate technologies lead to resource damage				x	x		x
Lack of crop diversification		x		x			
Lack of knowledge of forest management			x		x	x	x
Lack of experience of industrial harvesting	x		x		x		x
Lack of knowledge of timber processing		x	x		x		x
Lack of technical assistance	x		x	x	x		x
Limited knowledge of markets	x						
Laws and policies							
Policies alien to local sociocultural conditions	x						
Lack of local knowledge and respect of laws			x				
Population and culture marginalised in management plans	x						
Private companies flout forestry laws and management plans	x	x					
Uneven application of laws					x		x
Timber theft by outsiders or neighbours without forest	x						
Institutions							
NGOs and institutions divorced from communities					x		
Corruption in forestry institutions		x	x				
Limited institutional support for reforestation					x		
Lack of interinstitutional coordination				x			
Ineffectual institutions							x
Indigenous people marginalised from developlment process				x			x
Social capital							
Little communication between communities						x	
Lack of communal organisation	x	x	x		x	x	x
Communities have no say in conservation in *latifundios*		x					
Population growth						x	
Neglect of indigenous environmental tradition	x		x		x		x
Lack of knowledge of social/environmental values of forests	x		x		x	x	
High illiteracy rates				x	x		x
Lack of attention to environment in education	x						x
Loss or denial of culture				x		x	
Neglect of indigenous culture in national education programs		x		x		x	

I: Poptum, Petén. II: Cobán, Alta Verapaz. III: Santa Eulalia, Huehuetenango. IV: San Cristobal, Totonicapán. V: Uspantán, Quiche. VI: San Marcos. VII: Tecpán, Chimaltenango.

Appendix 11: Other Research Prioritisation Exercises

Research areas identified by actors (Government, projects and community organisations) in Quetzaltenango workshop, Guatemala 27/10/00

1. Reasons for undervaluation of forest resources
2. Alternatives for forest management
3. Reasons for non-functioning of local organization and community-based management
4. Reasons for non-inclusion of environmental aspects in education curricula
5. Production systems for local agroclimatic conditions
6. Markets at local/regional level
7. Alternative forms of forestry incentives accessible to small farmers with informal land tenure
8. Mechanisms for land use zoning
9. Silviculture of humid-zone tropical broadleaved forest
10. Methodologies for communication and technology transfer appropriate to local cultural conditions
11. Options for diversification of production
12. Funding bodies which provide technical assistance
13. Social considerations affecting opportunities for strengthening of communities' organisation
14. Means of dietary improvement based on locally-available products
15. Needs and suitable locations for infrastructure development

Priority research areas identified for CONSEFORH (Source: Hobley and Henderson, 1998).

Research topic	Priority	Reasons/Observations
1. Study of natural regeneration and silvicultural techniques for management of dry forest	**High**	- **Community and institutional interest** - **No other projects involved**
2. Supply and consumption of fuelwoods and other timber for small business	**High**	- **Follows on from existing work** - **High demand**
3. Artisan and non-wood products	**High**	- **Some documentation started**
4. Most profitable systems	**High**	
5. Innovative methods for financing plantations and tree management	**High**	
6. Innovative community participation methods for conservation	**High**	- **Some work carried out on this**
7. Models of agroforestry plantations, coppice regrowth in dry forest	Medium	- Rural development agencies interest - Ongoing CONSEFORH work - Too large area of research
8. PSP establishment in dry forest	Medium	
9. Inventory of natural dry woodlands	Low	- Interest from other FRP projects - Lack of resources
10. Models for remnant forest management on coffee and cattle farms in dry forest	Low	- Doesn't affect small farmers
11. Management of degraded dry areas	Low	- Unclear of aims of research topic
12. Phenology/reproductive biology of fuelwood species	Low	
13. Studies about methods of recuperating endangered populations	Low	
14. Categorisation of remnant woodlands (hotspots)	Low	
15. Conservation strategy	Low	- Others involved
16. Leguminous species for soil conservation	Low	- Others involved
17. Population dynamics of flora and fauna and ecological linkages	Low	- Lack of ecological skills
18. Study of economic and environmental value of water	Low	- Others involved - Protected Areas Dept. doing research

19. Prioritising water catchments	Low	- Not a CONSEFORH strength
20. Silvopastoral systems	Low	- Information available from Costa Rica
21. Inventory and performance of plantations and farmers' perceptions	Low	- Unclear researchable constraint

Tree-related research priorities identified by Barber (1995) for the promotion of steepland basic grain farming systems in El Salvador:

- ***Identification of multipurpose trees suitable for live fences in different soils and agroecological zones:*** to allow cattle to be managed within the farm by fences in order to prevent overgrazing
- ***Investigate the aptitude of native and exotic forage trees, improved grasses and legumes for different soils and agroecological zones, with potential for providing dry zone cattle feed:*** in order to reduce the use of crop residues for cattle feed and allow them to be used for mulch.

Priorities for applied research identified in INAB Guatemala Strategic Plan 1998-2015

a) ***Support for forest management***. Including site indices, extent and composition of forests, site quality, increment rates, volume tables, product distribution tables, national and regional forest inventories, silvicultural techniques.
b) ***Tree improvement.*** Orientated towards productivity improvement on productive sites, to obtain competitive products.
c) ***Forest product industrialization.*** Alternative processing methods for processing secondary species, efficiency improvement, product and sub-product diversification, preservation etc.
d) ***Support to forest production.*** Including methods for regeneration and/or enrichment, propagation methods, planting distances, resination methods, production costs, site evaluation etc.
e) ***Forest conservation and restoration.*** Inventories of endangered forestry species and ecosystems, identification of seed stands, studies of pests and diseases, fire, species for site restoration, processes and patterns of natural regeneration in degraded areas.
f) ***Forest product transformation.*** Options for more integrated use of trees.
g) ***Valuation of environmental services.*** Methodologies and procedures which allow the internalisation of the externalities of forest production and conservation systems.

Process for definition of a strategy for revegetation based on the payment of environmental services (Barry and Cuéllar, 1997)

Theme	Sub-theme
1. Criteria for definition of priority areas	• Environmental
	• Economic
	• Social
	• Institutional
2. Revegetation technologies	• State of the art in national knowledge of techologies
	• Access to technologies
	• Consideration of environmental, social and productive dimensions
3. Determination of needs for technology diffusion and transfer	• Identification of strategic needs for technology diffusion and transfer
	• Institutionality required for diffusion and transfer
	• Methods and modalities for diffusion and transfer
4. Identification of options for micro-level incentives to promote technology adoption	• Identification of incentive types for different user/beneficiary groups
	• Determination of magnitude of different incentives
	• Timescale of incentives
5. Putting scheme for payment of environmental services into practice	• Need to advance in economic valuation of environmental services
	• Mechanisms and institutions for payment

CATIE Research Lines (source: CATIE, 1997)

Research Line	Beneficiaries
Germplasm improvement and conservation for selected agricultural crops and forest species	• Smallholder forest owners of planted and natural forest • Through impact on biodiversity conservation, population of member countries as a whole
Integrated pest management for agroforestry and forestry activities	*Direct*: • National institutions involved in research, extension and application of IPM and/or agroforestry *Indirect*: • Producers of crops and trees in target systems • Consumers • Rural communities due to employment, incomes, health and reduced pollution • Scientific community • Society due to reduced migration and encroachment on forests
Agroforestry systems	• Rural families • Vegetable consumers in cities • Policy and decision makers • Students and technical staff in government and NGOs • Private forestry companies • Global scientific and technical community
Development of technologies for the sustainable management of forests and their biodiversity	
Socioeconomic analysis of environmental policies and management systems in tropical ecosystems	• Support to CATIE's technical development efforts • Farmers and natural resource users potentially adopting CATIE technologies