

RURAL DEVELOPMENT FORESTRY NETWORK

RESPONDING TO PRACTICE AND AFFECTING
POLICY: THE EXPERIENCE OF THE MADELEÑA-3
PROJECT IN CENTRAL AMERICA

Elvira Belaunde and Carlos Rivas

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INTRODUCTION

The history of the Madeleña Project — the broadest-based forestry project in the region — illustrates how lessons learned from implementation in particular countries have been fed back into project goals, reorienting objectives and creating a particular project ethos. But even more interesting is the way in which this local national experience has been used to benefit the region as a whole through the Madeleña headquarters in Costa Rica.

The Madeleña project is based at CATIE (Centro Agronómico Tropical de Investigación y de Enseñanza) in Costa Rica and works throughout the Central American region, covering Honduras, Guatemala, El Salvador, Nicaragua, Costa Rica and Panama. In each country the project works in partnership with national forestry institutions. Since CATIE is a research and teaching institution, Madeleña's main activities are research and dissemination, through postgraduate training, publications and the provision of technical assistance to other development projects in the region. Because of the Madeleña project's complex institutional links, the changes which it has undergone over the last 13 years have affected the attitude and operation of other forestry projects and institutions in Central America.

The project started in 1981 as the Fuelwood and Alternative Energy Sources or Leña (fuelwood) Project. In 1985, a second phase began; renamed the Multi-purpose Tree Cultivation or Madeleña (timber and fuelwood) Project. The third phase, Madeleña-3 (1991-95) is a project devoted to a broader extension of multi-purpose tree cultivation¹.

This paper examines the evolution of Madeleña-3 and how changes within the project have encouraged new thinking and policy in the Central American forestry sector, at all levels. The first section describes the general evolution of the Madeleña-3 project. The second section analyzes the project's history and influence in Costa Rica and El Salvador. Finally, the constraints and challenges facing the project in the future are examined.

THE EVOLUTION OF THE MADELEÑA-3 PROJECT

Outline of Deforestation in Central America

Deforestation is a serious problem throughout Central America. It is estimated that in the last 30 years, two thirds of the forest existing in 1950 has been destroyed. The reasons for this destruction of forest are complex and are subject to local historical and economic variation. However, a general picture of deforestation processes in Central America suggests the following main causes:—

¹ Throughout its existence the project has received financial support from USAID. It is currently financed by both USAID and FINNIDA, in the case of USAID under a wider project RENARM (Proyecto Manejo Regional de Recursos Naturales y Ambientales) covering Central America.

- 1 The prioritization by Central American States of a model of economic development stressing agricultural exports, which has dictated the clearance of large areas of forest for agricultural production.
- 2 A policy of internal colonization of 'virgin', 'wasted' forest land and the population movements which have accompanied implementation of this development policy.
- 3 Population growth.
- 4 Expansion of the area under cultivation to meet food requirements.
- 5 Land redistribution.
- 6 A dependency on fuelwood as a source of energy.
- 7 The deeply engrained extractive character of forest industry, mainly logging, which gives little consideration to the management and renewal of forest resources.
- 8 Inconsistent forest policies which rarely correspond to the true needs and practices of the population. (Rivas, 1992; Utting, 1991).

The shrinking of forest resources has serious environmental and social consequences, especially for the rural poor. On the one hand, deforestation is seen as a device for dealing with poverty by 'exporting' it to forest areas. Deforestation takes place to create new farms and sources of income and subsistence. On the other hand, this move brings only temporary relief from poverty, because excessive utilization of land and trees leads to a rapid exhaustion of land resources and productivity.

The consequences of deforestation also affect urban areas and national economies in general. For example, in Costa Rica, it is estimated that commercial timber resources could be exhausted in five years. In countries with high fuelwood consumption, such as El Salvador and Nicaragua, the elevated price of this basic resource places a heavy burden on the already weakened economy of households and small industries (Current and Juárez 1992).

Not everything in this analysis is negative. During the last decade considerable effort has been made by government, NGOs and private organizations to control deforestation and undertake large scale reforestation programmes. However, there is still much to be done, with a deforestation rate in the region of approximately 416,000 ha/year and reforestation rate of less than 30,000 ha/year.

The Madeleña project has made a determined effort over the last 13 years to counteract the loss of tree resources. It has now become part of the Forestry Action Plan for Central America (PAFCA), under which a set of complementary projects are being implemented in each Central American country. The stress on the interconnection between projects ensures that deforestation is not seen purely technically, but that it encompasses wider considerations of land management and institutional strengthening.

The Phases of the Madeleña Project

Phase 1: fuelwood and the farmer

The first phase of the Madeleña project (1981-85) aimed to develop and demonstrate improved silvicultural practices with trees for fuel production, and to transfer this technology to forestry institutions and technical staff in the Central American region. The goal was to improve the welfare of low-income rural groups by increasing the supply of low-cost energy. The project identified 150 forestry species, both exotic and native, with good potential for widespread cultivation in the region. It implemented an on-farm research methodology and offered training to technical staff belonging to the different forestry institutions of the region.

Farmers contributed to the research with their land and labour, and with silvicultural initiatives of their own. Through their contact with farmers, technical staff learnt to identify farmers' production priorities, including their perception of the role of trees within farming systems. It became clear that fuelwood, although a crucial and often scarce resource, was not the only priority of the rural poor. As a result, multi-purpose, fast-growing tree species began to be included in project research and demonstration sites.

Phase 2: focusing on farmers' priorities and building the technical knowledge to help them

Farmers' needs and perceptions of tree growing led to a change of objectives in the second phase (1986-91) of the project. From the previously selected 150 fuelwood species, 24 well known species were chosen for their multi-purpose potential and faster growth rates. The benefits to be derived by farmers from multi-purpose tree production included fuelwood, green manure, and wood for construction and fence posts. In-depth on-farm research was carried out for these species in close collaboration with farmers on the demonstration sites. The new research included both silvicultural and socioeconomic studies, crucial for understanding how tree planting could be an economic complement to their system of production.

Training

In this phase, the project trained a large number of Central American foresters, at different levels. It also published silvicultural and socio-economic research findings and produced training materials aimed at a wide audience. During this phase the forestry extension component was also being consolidated, providing technical assistance and materials to tree planting schemes in Central American countries. The project played a crucial role in supporting several nursery and plantation programmes in the region.

With these outreach activities, the project successfully influenced the thinking of many foresters who benefited from training and assistance. They took this knowledge back to their place of work so that, both directly and indirectly, the project was able to promote the importance of local initiatives with trees, and strengthen the relationship between farmers and foresters at different levels. Through its socioeconomic research it also provided persuasive arguments in favour of the economic advantages of multi-purpose trees for small farmers; arguments which a generation of foresters trained by the project then used to convince high-ranking decision-makers at the national level.

The MIRA database

Another project activity during the second phase was the creation of the MIRA (Tree Resource Information Management) information system, which includes a database with tree, silviculture,

socioeconomic and forestry extension components. It contains the results of a large number of silvicultural experiments, permanent plots and demonstration farms, as well as information concerning seeds, climate, soils and models of tree growth and yield. This data was made available to forestry programmes, projects and students in the region. Finally (in this phase) the project developed a regional strategy for forestry extension. In addition to working in partnership with national forestry agencies, the project established links with 21 forestry institutions, NGOs, private firms and universities, as a first step towards the creation of a network for the dissemination of the information produced by the project.

Phase 3: from more effective extension to better regional dissemination and collaboration

The third phase of the project, Madeleña-3 (1991-95) aims principally at the development of this strategy of dissemination through a strengthening of inter-institutional collaboration. Another objective is the continuation of relevant silvicultural, socioeconomic and extension research. The dissemination strategy operates at different levels, both vertically and horizontally.

Building in-country networks with links to CATIE

In each country, the project coordinates its actions with a network of national institutions, NGOs and private firms. Each institution has a representative who liaises with the project and is an active participant in the national network. Through their representatives, these institutions have access to information produced by the project and at the same time supply the project centre at CATIE with the results of their activities. This ensures a flow of information from the project centre to the national networks and vice-versa. The information produced by the project is available as a resource to be utilized by these network institutions.

Building country-to-country links which bypass CATIE

The project also fosters bilateral collaboration between the institutions belonging to the networks within each country and regionally. To aid this collaboration the project has instituted regular national and regional meetings between network representatives. At these meetings there is an exchange of information both through the project's formal channels and through informal encounters. Such exchanges are not just a means of conveying information, but are also used to organize activities, plan training courses and events, arrange joint publications, and even exchange seed.

Supporting the entire regional network with information and training opportunities

Through this network, the project also formally organizes and carries out a variety of activities in support of its members. It provides training courses in both silviculture and socioeconomics; technical and material assistance (such as poly-bags and high quality seeds); educational materials (such as silvicultural guides, extension manuals, leaflets, calendars and videos); it also facilitates the production and publication of extension materials suggested by members and helps them monitor their extension activities.

Although the project implements and finances some of these activities or parts of them, it prefers to use its institutional network to identify the appropriate persons and institutions to manage and finance the activities in question. In this way, the financial autonomy and resourcefulness of the system — and the institutions within it — is fostered. Dependency on CATIE, the central organization, is reduced, which increases the network's chances of survival after the conclusion

of the project.

Of course, this is not always without problems, as it can be difficult to encourage collaboration between institutions of different kinds such as national agencies, NGOs and private firms. However, the project sees the different working practices and extension methods of the institutions as an advantage rather than a limitation, because in this way there is greater impact in the field and in the separate network institutions. One year after entering its third phase, the project regards the very positive response to the creation of the network as an indicator of success.

Via the network, and the different network organizations, the project is investigating the effectiveness of different extension techniques and strategies. Each member of the network gathers data from its own extensionists after their visits to the field. The information thus gathered is input, analyzed and compared with the information gathered by other organizations using extension techniques of their own. Each network organization has access to the computer sub-program MIRA-EX via a microcomputer installed by Madeleña-3.

In this way, the project hopes to offer network organizations reliable information on adoption rates of silvicultural techniques depending on the extension method used. The data will also enable network organizations to monitor and report on the achievement of their extension objectives. This approach, one of the first of its kind to be implemented in Central America, should provide key information in an area where little has been available to date.

MADELEÑA IN EL SALVADOR AND COSTA RICA

The Interface Between the Project's Regional and National Levels

Madeleña's regional centre is based at CATIE, but in each country, the project's activities are supervised by a basic team composed of a national coordinator hired by the project and a national director hired by the national partner forestry agency. National teams keep in close contact with the project's regional administration based at CATIE, but are also independent decision makers. The flexible relationship between the regional centre and national teams is the key to the success of the project.

Although forestry problems and institutions of Central America share common features, each country has different natural and social research characteristics, and in each the project has developed a different background and character. Indeed, the relative independence of national teams from the regional centre has allowed initiatives to be taken at a local or national level that were sometimes beyond project expectations. These initiatives have fed back into the project centre at CATIE and helped to broaden the impact of the project on foresters and Forestry institutions in Central America as a whole.

MADELEÑA IN EL SALVADOR

Environmental Problems

This century, the population of El Salvador has increased sixfold, giving the country the highest population density in Central America (248 inhabitants/km²). By the 1960s the country had no 'virgin' land left for agrarian expansion. In consequence, farmers who previously relied on slash-and-burn agriculture for their subsistence had to intensify the use of their small plots. Under the 1984 agrarian reforms (FINITA), land was acquired from large farmers, and sold back to those who had been occupying the land so that they could form production cooperatives. However, the majority of farmers still work on individual plots of 3 ha in size. The extreme fragmentation of land combined with the hardship endured by the Salvadorean people through a decade of war have accelerated land degradation to an alarming degree.

One of the critical problems associated with environmental deterioration in El Salvador is the lack of trees for fuelwood. Both the rural sector and small industries are largely dependent upon fuelwood as a source of energy. Forty per cent of the supply comes from coffee plantation prunings and the rest from natural forests and trees on farms. As the supply does not meet the demand, fuelwood has to be imported illegally from neighbouring countries (Heckadon-Moreno, 1989, p.11).

Early attempts to address these problems

Over the last twenty years, the Salvadorean State has launched several large scale initiatives to counteract environmental degradation, for example, the Watershed Reforestation Programme (1970-80) and the employment-generating ORE-MAG (Office of Special Resources — Ministry of Agriculture) Reforestation Project (1981-86). Neither of these had much success with either technicians or the public, and both had administrative and technical weaknesses (Reiche, 1993, p.5). The lack of a professional forestry tradition has contributed to poor forestry programmes, as well. Most technicians have an agricultural background and began with little knowledge of tree species and silvicultural practices adapted to local conditions. Another handicap to reforestation is the law prohibiting the cutting of any tree without a permit, which gives State forestry activities a strong regulatory and policing character, resented by farmers. The difficulty of obtaining forestry permits has discouraged farmers from planting trees on their land since they fear that they may not be allowed to cut the trees at maturity and will lose access to their land for agricultural production.

Madeleña's Approach

In the last decade, the Madeleña project and an FAO agroforestry project have been the major contributors to increasing forestry and agroforestry knowledge in the country. Madeleña has been operating continuously in El Salvador since 1983, with CENREN (the National Centre for Natural Resources) acting as its national counterpart, coordinating on-farm research experiments and demonstrations with fuelwood and multi-purpose species; and ensuring the monitoring and measurement of plots even through the most difficult war years.

CENREN has continued to be the national counterpart for the research components of Madeleña, but since 1991, closer collaboration has been established with CENTA (National Centre for

Agriculture, Livestock and Forestry Technology) who are now responsible for agriculture and forestry extension throughout the country.

During the first two phases of Madeleña/CENREN it became clear that farmers would not plant trees for fuelwood alone although it is in short supply and used on a daily basis. By contrast, trees for timber and fence posts were highly valued as essential building materials. *Eucalyptus camaldulensis* emerged as a favourite, and farmers rapidly introduced their own taungya combinations, intercropping with maize, beans and other vegetables. Although the project's technicians were cautious about this, their attitude was to accept farmers' initiatives and treat them as new research elements. They continued measurements and collected important information on the effect of trees on crop yields, demonstrating that in many cases yields did not diminish in a significant way. At the same time, some farmers started benefitting from tree products within three years. The project's economic records and analysis present a clear picture of the general improvements produced by trees in farming systems.

Community nurseries

The close collaboration between the project and CENREN was particularly fruitful in the case of community nurseries. The main role of the Madeleña project was to provide technical assistance and materials to the community nursery programme, but the project's support was also instrumental in persuading Salvadorean institutions that community nurseries were a viable idea. The history of the first steps of the programme reveals the interplay between local and national issues.

The example of Natividad in the region of Santa Ana

Farmers in the village wanted posts to fence plots given to them under agrarian reform, and contacted local extensionists from the Ministry of Agriculture. Since there was no budget to buy fence posts, the extensionists suggested setting up a nursery to produce them.

At first, both farmers and officials from MAG and CENREN opposed the concept. Farmers were afraid that legal restrictions would mean that they could not harvest the trees they planted; officials, on the other hand, did not believe the farmers were capable of carrying out the project. Madeleña brought both sides together, and suggested *Eucalyptus camaldulensis* as a trial species. The World Bank offered food for work, and farmers were given appropriate training and reassured that participation in the nursery programme was voluntary.

The farmers of Natividad were a cohesive group after having won the battle over land ownership during the agrarian reform process. Its leaders were well respected. Though some refused to get involved because they had no spare time for nursery activities, or were uncertain about the political implications of the programme, a small group of enthusiasts went ahead. Eighty per cent of seedlings were planted along fences and water-courses. The rest were planted in small blocks in extremely degraded land. Over the next two years they produced 10,000 plants each year, including fruit trees.

As their success became obvious, farmers from other communities became interested, and in this informal way, the news was spread around and the activity taken up voluntarily throughout the

country. Between 1984 and 1990, the number of community nurseries rose from one to 300. Over a similar period, nearly 80,000 farmers took part in community nurseries.

Learning from farmer responses

The process was also a learning process for Madeleña's extensionists and technicians. They had to learn to cooperate with farmers rather than give them orders; adapt to farmers' timetables, and respect their forms of organization, such as involving women in the nurseries.

They also learnt to identify potential local leaders who could express the common feeling of a community and be trusted. Extensionists learnt to respect farmers' preferred tree species and economic expectations of them. For example, fruit trees were central to the success of the programmes: multi-purpose trees alone — even with the food for work incentive — were not enough. The realization that farmers understood their technical advice and implemented it of their own free will was a great source of satisfaction for the extensionists.

In time, extensionists and technicians could readily point out the social and institutional strong and weak points in the programme (Current, 1991, p.18-19). Strong points were:–

- ! An appropriate technical package with obvious benefits;
- ! good participation and training of the local population;
- ! flexible project design and multipurpose nature of trees planted;
- ! equitable distribution of project benefits among members of the communities involved;
- ! simple bureaucratic procedures.

The Madeleña project helped by providing subsidies in kind to farmers (polybags and seedlings); by training and supporting the CENREN extensionists; by having the freedom, with its relatively unbureaucratic structure, to respond promptly to needs emerging from the field. Lastly, the presence of Madeleña project technicians ensured the continuity of the programme in the extremely difficult and unstable context of war.

The community nursery programme's problems were in fact mainly caused by external factors which impinged on the project:–

- ! The atmosphere of insecurity that prevailed as a consequence of the armed conflict. In some cases, it is difficult to document the experience of community nurseries because farmers were afraid to even mention any communal activity, in case it was regarded as politically threatening by government or guerilla forces.
- ! The insecurity of land tenure, which was often exacerbated by the movement of people as a result of the war. More than 25% of the population were displaced within the country (Heckadon-Moreno, 1989, p.55).
- ! Legal obstacles to the use and commercialization of planted trees. Permits were often difficult to obtain and the market for multi-purpose trees is limited. Although in much demand within the local communities, they are not commonly used by the industrial

sector.

- ! Untimely provision of seedlings and materials.
- ! A dependency on Food For Work which engendered a degree of passivity among some communities.
- ! The use of some unsuitable species.

Despite all these problems, the community nursery programme supported by the Madeleña project achieved important institutional changes at different levels: among local farmers' organizations, extensionists and national institutions. In the words of a technician:

"Community nurseries have aroused farmers' interest in tree planting. If Madeleña were to finish tomorrow, the state could use the open door of farmer enthusiasm. This was the seed planted by the project". (Heckadon-Moreno, 1989, p.67).

Collaboration Between Madeleña and CENTA (The National Centre for Agriculture, Livestock and Forestry Technology)

The creation of a wider collaborative network during the current third phase of the Madeleña project has coincided with the fact that, in the last two years, El Salvador, advised by the World Bank, has been restructuring its major institutions. Part of this reorganization entails the execution by CENTA of a nationwide extension programme. The programme began simply with agriculture, but expanded to encompass forestry and agroforestry when CENTA linked with Madeleña, and as a result of the personal tenacity of Madeleña's national team. In particular, CENTA combines information from Madeleña's experience with community nurseries, and the technical findings from FAO's agroforestry project, to organize local extension groups.

Working through the pre-existing agricultural extension agencies of MAG, and building up extensionist numbers, the CENTA extension programme aims to plant and manage 56,000,000 multiple use trees in the next five years, the equivalent of devoting 22,400 ha to forestry and agroforestry activities. (Juárez & Portillo, 1993).

Information management

Meanwhile, the major official tasks of Madeleña remain to provide information (publications, leaflets, access to the MIRA data base, etc) on silvicultural, socioeconomic and extension matters; to organize training activities for technicians and extensionists; and to promote seed collection and distribution.

CENTA feeds records about extension activities and progress into the MIRA information system. The data recorded is not only of comparative interest, it also plays a crucial role when the time comes to cut trees, as forestry permits are usually easier to obtain when it can be proved that the trees were actually planted by a particular farmer. Since the Madeleña project will be able to provide such evidence, this is an added incentive to farmers to join the programme. Given current forestry policies, Madeleña's services are therefore crucial to widespread adoption of the

programme.

The training of extension staff

One of the major remaining challenges faced by Madeleña with regard to the CENTA programme is the training of extensionists. The project will emphasize the need to coordinate silvicultural and tree management possibilities with local perceptions and systems of production. For this purpose, Madeleña's existing demonstration farms will play a crucial role in training technicians and persuading farmers of the usefulness of tree plantations and the conditions required for success.

The national team of the Madeleña project in El Salvador is aware that many problems still exist, above all the present chaos due to institutional restructuring. Here, the inter-institutional collaboration network of the project has proved most useful. Rather than having to await orders from top officials, often busy trying to secure their position, medium ranking staff in CENTA and CENREN are using the horizontal collaboration possible through Madeleña, both at a national and a regional level, to get things done in a timely way.

MADELEÑA IN COSTA RICA

In the last forty years Costa Rica, unlike El Salvador, has lived through a period of peace and economic prosperity. The country has developed an advanced welfare state, achieving a high standard of living compared to other countries in the region, and has been a pioneer in forest conservation initiatives, earning an international reputation in the process. Several international environmental conservation organizations have set up their headquarters in Costa Rica, as a result, attracted by the country's political stability. These include CATIE, located in the city of Turrialba. Deforestation is also a very serious problem in the country, yet its implications differ from other parts of Central America. For instance, lack of fuelwood is not perceived as a priority, as most farmers have access to electricity. The issues are mostly linked with the general deterioration of natural resources and its impact on crops and on cattle productivity.

Madeleña and the Cantonal Agricultural Centre of Hojanca (CACH)

The Madeleña project in Costa Rica is so intimately linked to the evolution of the Cantonal Agricultural Centre of Hojanca (CACH), in Guanacaste, that it is worth telling CACH's story. The centre was created in 1978 through local initiative, as a means of coping with the rapid destruction of local forest and its conversion into pastures.

Until the 1920s, Hojanca was inhabited mainly by indigenous and mixed populations who practised slash-and-burn agriculture in the lowlands. From the 1920s onwards, the area was opened to colonization and a wave of people from the Central Valle came to Guanacaste to seek their fortune. These people were mainly of mixed and Spanish extraction and they practised agroforestry and coffee growing. Most of them settled in the highlands of Guanacaste, and proceeded to transform the forest into family plots of coffee, sugar cane and subsistence grains. The levels of production were good, but marketing was a major problem as the region lacked basic infrastructure.

In response, the population created the first cooperatives in the country, based on the Catholic popular tradition of mutual assistance. Since the area had no local government institutions, the cooperatives soon fulfilled many of the roles of a municipality. They helped to plan the further colonization of the area, took care of road construction, and built schools and health centres. The one problem the cooperatives failed to solve was that of coffee marketing.

As an alternative, farmers began to introduce cattle to their plots. As cattle ranching spread and proved highly profitable, old cooperative attitudes languished and people adopted typical cattle rancher attitudes and lifestyles. During the 1960s, when the 'hamburger connection' with the United State was at its peak, farmers received State incentives to establish ever more pastures, leading to yet further destruction of the remaining forests.

By the time the international meat market collapsed around 1970, more or less everyone in the area had abandoned coffee in favour of cattle ranching. Then, in 1973, a severe drought devastated the region, killing most of the cattle. Well over half the population of the area emigrated south, and those who remained decided to rebuild both their environment and their economy.

In 1976 an integrated development project was started with the help of an American NGO. The aim was to 'de-pasture' the area, by turning old pastures back into forests. As an institutional base, the local people created the Cantonal Agricultural Centre of Hojancha (CACH) in 1978. From the start, the centre shared the same participatory spirit as the earlier coffee cooperative, and this played a crucial role in setting the tone and dynamism of its work.

In 1981, Madeleña arrived in the area. Madeleña staff shared CACH's offices and were introduced to the farmers associated with CACH, greatly facilitating the development of mutual trust between project technicians and local people. Madeleña provided experimental and demonstration sites with species required by the local population. It also provided seeds, technical assistance and materials in support of other local reforestation activities promoted by CACH.

From technical forestry to forestry in rural development

More and more farmers became interested in benefitting from Madeleña's activities, either directly by lending them a plot for research and demonstration, or indirectly by taking part in projects. Adoption grew far beyond the expectations of Madeleña, until it became clear that the project had a complete rural development programme on its hands. At the same time, it served as a training ground for young foresters who came to learn how to strengthen forestry development among small farmers through the strengthening of farmers' organizations.

In 1986, Madeleña's national team, backed by many other national foresters, realized that the moment was right to extend their model of rural development to other parts of the country. The idea was to encourage the National Forestry Institution (the DGF) to create a special department for rural development. As a result, in 1987, the Costa Rican Forestry Service created the Department of Small Farmer Forestry Development, DECAFOR. The department was conceived of as bridge of communication between local agricultural organizations and State institutions. From this moment onwards, Madeleña in Costa Rica stopped being a technical project and became a 'national movement'.

Many of the young foresters associated with Madeleña and CACH joined the new department. In 1988, the government authorized DECAFOR to manage a financial incentive programme for reforestation by small farmers, financed as part of a debt-for-nature swap first by the Dutch, and later also the Swedish and Finnish governments.

The programme was designed to strengthen local farmer organizations throughout the country. The money was channelled through these organizations, and they were responsible for contacting farmers, distributing payments, supervising work and giving them technical assistance with nurseries, plantations and with plantation management. The scheme was intended to help farmer organizations by enabling them to hire administrative staff, and technicians.

Although many farmer organizations managed to implement the scheme successfully, there were some problems. Plantations have not always been sufficiently well looked after, for instance. Another problem (external to the organizations themselves) is the fact that forest industry in Costa Rica has not yet developed appropriate techniques for processing narrow diameter, farm-grown trees.

However, despite the limitations, reforestation has effectively contributed to the revival of both farmer organizations and local economies. For example, tree seed orchards have become a major source of income and private nurseries have been established. By the end of 1990, the production of seed alone had generated an income of \$US 169,107 and 4,899 man-days of employment. A total of 826,000 plants were produced in 1987 from 20 nurseries; by 1990 this had grown to 4,380,500 plants from 49 nurseries, ranging from large commercial nurseries down to small family nurseries.

Madeleña and regional—national tensions

The Madeleña project in Costa Rica has had to be careful to balance its local national, and broader regional role. The regional team of the Madeleña project based at CATIE have mainly been interested in technical matters, while the national Costa Rican team became committed to local rural development. Foresters working at the regional level in CATIE have tried to avoid being drawn too deeply into debate about forestry within Costa Rica. However, the regional level did give its support to national activities at critical moments and this support was essential for achieving changes in national forest policy.

MADELEÑA'S OVERALL IMPACT

Over 12 years the Madeleña project has generated and gathered together a huge amount of technical information. For instance, its research on multi-purpose species constitutes an invaluable source of information for forestry students, projects and institutions in Central America. Above all, it has generated a unique regional model for information sharing in a particular sector, among a set of small adjacent countries.

Many of its supporters also feel that it has made a key contribution to the transformation of forestry institutions and policies. Madeleña has shown its ability to adapt rapidly both at field and at institutional level. The informal relationship between the regional centre at CATIE and the

national teams has been at the core of the dynamism of the project as a whole.

Above all, as we have seen in the case of Costa Rica and El Salvador, Madeleña has been more than just a project for many people. It has caught the imagination of many of the technicians, extension workers and farmers who have worked with it, because it has actively encouraged foresters to democratize forestry activities and understand local and institutional processes. The effects have been similar in other Central American countries.

Madeleña has also contributed to the institutional strengthening of CATIE itself, as one of its major and longest-lasting projects. It has been able to offer assistance to some of the other projects based there, and has played a major role in shaping the current Master's programmes offered by CATIE. These courses are taken by large numbers of foresters from all over Latin America and other countries as well, especially by medium and high ranking decision makers. Through these students, Madeleña's experience is thus disseminated to new institutions.

Challenges for the Future

The Madeleña-3 project has set itself several goals over the next three years. One of the main needs is to strengthen forestry socioeconomics and give technical assistance in the management of already established plantations. This has been the weak point of many reforestation projects which have concentrated on nurseries and establishment, but have disregarded the growth of trees in the long term.

Firstly, the project must train the trainers in plantation management techniques and teach them how important it is for the future viability of reforestation. Secondly, the project must find ways of enhancing the care of plantations. The first step is to support the development of a market for smaller diameter trees, since the best way of ensuring the better management of forestry products is to make them economically more attractive. Another possibility being considered currently in Costa Rica is the introduction of monetary incentives for the management of plantations. This option has all the usual disadvantages, but it could be used to foster the expansion of a forest industry based on plantation products, as well as natural forest.

Another challenge is to strengthen and further extend the cross-nation collaboration between forestry institutions in the region.

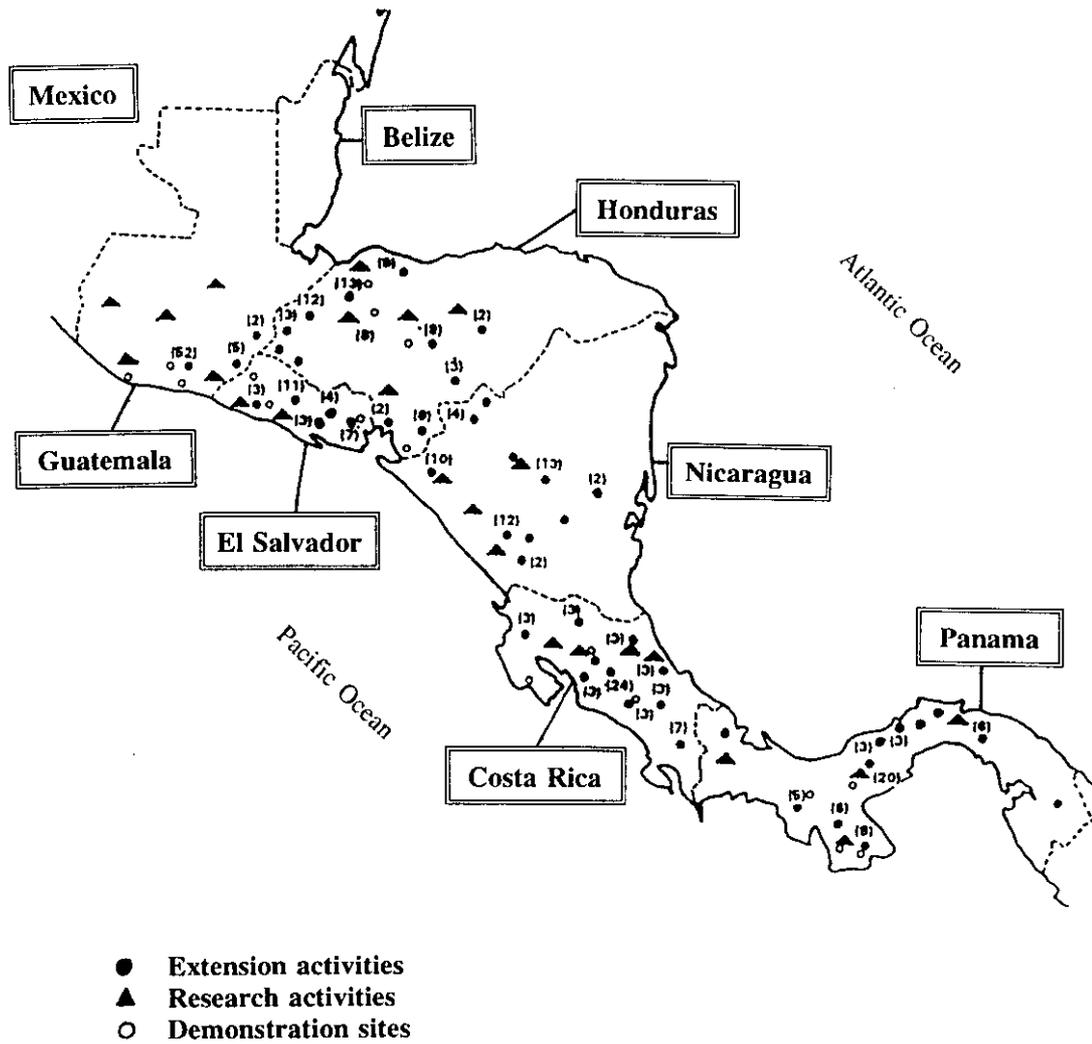
The range of contacts that have been possible through Madeleña have led some to ask where the limit to networking should be. With the technician who trains extensionists in the network institutions? With the extensionist in the field? With the farmer? Some members of the project consider that the only way to obtain reliable information and effectively assist network institutions is to maintain close contact at field level. Other members, principally at the regional centre, consider that the project should work with trainers and leave the execution and monitoring of field activities in the hands of the network institutions.

Over the next few years the debate will no doubt generate new approaches and ideas, as previous debates have done, to such good effect, in the past.

**REGIONAL MAP SHOWING THE MADELEÑA PROJECT'S RESEARCH AND
EXTENSION SITES**



REGIONAL MAP SHOWING THE MADELEÑA PROJECT'S RESEARCH AND EXTENSION SITES



ACRONYMS

CACH	Centro Agrícola Cantonal de Hojancha.
CENREN	Centro Nacional de Recursos Naturales (Subsequently known as DGRNR — Dirección General de Recursos Naturales Renovables).
CENTA	Centro Nacional de Tecnología Agropecuaria y Forestal.
DECAFOR	Departamento de Desarrollo Forestal Campesino
DGF	Dirección General Forestal.
FINITA	Financiera Nacional de Tierras, decreto ley No 207.
MIRA	Sistema de Manejo de Información sobre Recursos Arbóreos.
MIRA-EX	Extension sub-program of MIRA
ORE-MAG	Oficina de Recursos Especiales y Ministerio de Agricultura del Salvador.
PAFCA	Plan de Acción Forestal para la América Central
RENARM	Proyecto Manejo Regional de Recursos Naturales y Ambientales.

BIBLIOGRAPHY

- CURRENT, D**, (1991), 'Forestry for Sustainable Development: Experiences from Central America and Panama', internal document, CATIE.
- CURRENT, D & JUAREZ, M**, (1992), 'El estado presente y futuro de la producción y consumo de leña en el Salvador', internal document, CATIE.
- HECKADON-MORENO, S**, (1989), *Madera y Leña de las Milpas: los viveros comunales una alternativa para el desarrollo forestal en el Salvador*, CATIE Press.
- JUAREZ, M & PORTILLO, F**, (1993), 'Incorporación del Componente forestal en las Fincas de Agricultores Beneficiarios del Sistema de Extensión Dirigida a Objetivos del CENTA', internal document.
- REICHE, C**, (1993), 'Análisis económico e institucional de Proyectos agroforestales en El Salvador', internal document, CATIE.
- RIVAS, C**, (1992), 'El Componente Forestal en el Contexto del deterioro de los recursos naturales en america central', internal document, CATIE.
- UTTING, P**, (1991), *The Social Origins and Impact of Deforestation in Central America*, Discussion Paper No 24, United Nations Research Institute for Social Development, Geneva.

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