

DISILLUSION AND HOPE OF SMALLHOLDERS IN CORDILLERA CENTRAL, DOMINICAN REPUBLIC: IS PROCARYN THE RIGHT WAY TO CHANGE THE TREND OF FOREST DETERIORATION?

Henning Peter

ABSTRACT

The upper watershed of the Yaque del Norte River in the Dominican Republic is one of the most important water sources of the country. Formerly, the area characterized by a mountainous topography was nearly entirely covered by endemic pine forests.

Nowadays, farmers have transformed over 50% of the watershed's natural forests into different agricultural uses triggering erosion, which affects the population downstream. PROCARYN, a Dominican-German cooperative project develops different mechanisms to reverse the trend of forest deterioration. Focusing mainly on smallholder farmers who own considerable extensions of natural forests and plantations, the project supports them directly by co-financing reforestation and forest management, technical support in forest management, training, commercialization support for forest products, fostering farmers' organisations and forest certification according to the FSC principles and criteria. Indirect support refers to establishing good relations with the forest administration, providing practical experience for the formulation and revision of forestry policies, and supporting key stakeholders. First results reveal that, despite not very favourable conditions for forest management on smallholders' properties, they are willing to invest in the sustainable management of their forest resources and can contribute significantly to reverse the trend of forest deterioration in the upper watershed of the Yaque del Norte River.

INTRODUCTION

All over Latin America, if not worldwide, considerable extensions of forest resources—particularly natural forests—are in the hands of smallholder farmers. As primary managers they decide on what happens with the resource. They determine if the resource will be managed as forest or transformed into other uses such as agriculture or pasture for livestock breeding.

Although this group of forest owners holds millions of hectares of forests, they are seldom considered as a clientele which should be given special attention. In consequence, conventional forestry politics and policies have not developed special strategies for smallholders in order to put them into the position to manage their forest resources in a sustainable manner. The contrary is the case and has led in many cases to forest degradation and deterioration on smallholders' properties (Homma and others 1993, FAO 2001).

In the Dominican Republic this trend has not been different, but even worse, causing smallholder farmers to become "tree-haters" (Geilfus 1997), meaning that they perceive trees as their

enemies. Owning forests permits the state to get access to their private properties and their management decisions.

In this paper, I will attempt to reveal how a concrete development intervention, the Project for Conservation and Sustainable Management of the Upper Watershed of the Yaque del Norte River (PROCARYN) undertakes to reverse the above described situation, and how sustainable management of the forests of smallholder farmers' is being fostered.

CAUSES FOR FOREST DETERIORATION IN THE DOMINICAN REPUBLIC

Although there are countless causes for forest deterioration in the Dominican Republic, I will concentrate on the most significant ones with respect to their relevance for smallholder forest management.

Forestry Policies Leading to Forest Deterioration

Forests originally covered 99% of the Dominican Republic's territory. For a long time timber exports were the country's main income source. First, the lowland forests with valuable mahogany (*Swietenia mahagoni*) timber were exploited and from the 1930s onwards pine forests (*Pinus occidentalis*) in remote mountainous areas were exploited as well (Dotzauer 1993, Luna 1984, Antonini and others 1975).

In the mid 20th century, deforestation reached such dimensions that, in 1967, the government enacted a forest law which led to the closure of all existing sawmills and prohibited all harvesting operations in forests. At the same time adjacent areas of the Cordillera Central were declared as national parks. The forest law was applied rigidly to smallholders. Stories about peasant farmers who were put into jail for having cut branches off trees on their own compounds (Kustudia 1998) are typical examples of the government's understanding of what should be done with the remaining natural forests. Total protection seemed to be the only response, even for private tenure.

At the same time, various efforts were undertaken to reforest degraded agricultural land, pastures and waste land (Geilfus 1997). Despite heavily subsidized attempts during the last three decades, reforested areas remain insignificant. The Ministry for Environment and Natural Resources reports a total amount of 36,000 ha for forest plantations (SEMARENA 2001). Nowadays, the Dominican Republic has to import wood products for a corresponding value of about US\$ 200 million.

At the end of the 1990s, government allowed and even fostered forest management (Dirección General Forestal 1997). In 2000, the new government first closed all forestry operations. Since mid 2001, forest management has once again been allowed, but on a very limited scope and with bureaucratic barriers that continue to limit smallholders' forest management.

Such discontinuity and changing approaches of forestry policies, legal problems and bureaucratic procedures do not create a positive climate for investments in sustainable forest management.

In: Baumgartner, David M.; ed. Proceedings of Human Dimensions of Family, Farm, and Community Forestry International Symposium, March 29 – April 1, 2004. Washington State University, Pullman, WA, USA. Washington State University Extension MISC0526. ISBN Number 0-9721994-5-4

Landowners, and that does not just refer to smallholders, prefer investing in land-uses other than forest management, for instance, agriculture. In consequence they continue to transform forests into agricultural crops and pastures.

Economic Causes for Forest Deterioration

Smallholder farmers are farmers—agriculturists. When farmers moved from the lowlands to the mountainous areas of the Cordillera Central they encountered vast pine forests covering nearly all sites, also the sites suited for agriculture. Due to their knowledge, that does not involve forest management, and lack of adequate road infrastructure, they started clearing forests on the ground of the large valleys. With a growing population, demographic reasons urged them to clear forests on steep slopes with poor soils, sites that are definitely not suitable for agriculture. Slash-and-burn agriculture was the prevalent practice.

When forest management became totally prohibited, from the mid-1960s onwards, agriculture was the only way to make a living for farmers. Although illegal, once the forest was cleared and became agricultural land it could be “legally” managed. For farmers, there was and is no viable economic alternative to agriculture. This situation worsened through government policies, which subsidized inputs for agriculture such as fertilizers, pesticides, and seeds.

On the other hand, there have not been any incentives for forest management. As described above, forest management was totally banned for a long period of time, and nowadays, bureaucratic barriers do not allow smallholders in particular to manage their forest.

In addition, even a smallholder farmer who wants to manage 5 to 20 hectares, is required to have a management plan that is elaborated by a forestry professional and needs to contract another professional forester to accompany him after the plan’s approval during the management operations. These requirements are so costly that smallholders cannot afford them, and in consequence, do not practice forest management. Their only alternative is to continue transforming forest resources into agricultural uses.

In this situation, it is a wonder that forests still exist on private property.

Cultural and Social Causes for Forest Deterioration

When the Spaniards first settled on Hispaniola Island, they cultivated the lowlands, which had rich soils and were well suited for agriculture.

As stated above, demographic pressure urged poorer farmers from the lowlands and landless people to move to the mountains of the Cordillera Central. They first settled the big valleys and then migrated to the hillsides. These settlers of the Cordillera Central were and are farmers who do not have a tradition of managing forests, but are agriculturists. They do in the mountains what they did in the lowlands—cultivate the soil with agricultural crops. Therefore, it is no wonder that farmers transform forests into agricultural uses, as they are culturally shaped as farmers.

When farmers invaded the mountains, they came with their own family, but, in general, not in larger social entities. Coming from different regions of the country they followed the sawmills and settled where they found access or, later on, where they got, in the context of the agrarian reform, a piece of land assigned by the Agrarian Institute (Instituto Agrario Dominicano). In general the social cohesion between families is loose and all tenure is private and individual property. The right of a landowner to do on his or her property what he or she likes is an important social value. With regard to forest management, small plots of natural forests on privately owned land are difficult to manage under a

sustainable management scheme and a low organizational degree in rural communities does not foster collective management and commercialization activities.

Corruption, Bureaucracy and Power Structures that Hinder Sustainable Forest Management of Smallholders

As in most developing countries, corruption is one of the main causes hindering development. With respect to smallholders’ forest management, corruption prohibits smallholders from becoming involved in an economically interesting activity, as they cannot afford to bribe government officials in order to “accelerate” bureaucratic procedures or even to bypass them.

The above mentioned bureaucratic barriers (see also de Moya 2002: 16) that make no difference between a landowner who wants to manage 1,000 ha of natural forests and a smallholder, who wants to manage 20 ha, make it impossible for small-scale forest owners to make use of their forests. In general, smallholders are not in the position to understand the very complex procedures, even for a professional forester. If they want to manage their forest resources they have to contract with a costly professional.

As already pointed out, each year the Dominican Republic imports wood products for an estimated 200 million US Dollars. Six companies dominate this sector. The importers obviously did not have any interest in the development of a national forestry industry. These powerful stakeholders protect their own interests through political connections, dependencies, and where necessary, corruption. Obviously, this does not only affect smallholder forest owners, but all forest owners and national sawmills as well. But, undoubtedly, smallholders are the most affected group as they know less about how to get their rights.

WHAT DOES PROCARYN DO TO REVERSE THE TREND OF FOREST DETERIORATION?

The upper watershed of the Yaque del Norte River is one of the most important water sources in the Dominican Republic. The Yaque del Norte River provides drinking water for Santiago (the second largest city of the country with more than 500,000 inhabitants) water for irrigation in the Cibao valley (the country’s main agricultural area) and alimentes two hydro-power plants.

In the face of continuing degradation of the upper watershed’s natural resources and increasing erosion, in 1998 the Dominican and German governments agreed upon its protection and sustainable management so that the basic ecological functions could be further fulfilled. In 2001, PROCARYN started in operational terms on behalf of the Dominican Ministry for Environment and Natural Resources and counts on support from three German agencies—the German Agency for Technical Cooperation (GTZ), the German Bank for Reconstruction (KfW) and the German Development Service (ded). Since then the project focuses on integrated watershed management. Forests are the most important natural resource in the region and contribute significantly to avoid erosion. Therefore forest management and reforestation are core activities of the project.

With regard to the above mentioned causes for forest deterioration, in the following section I will explore the pathways PROCARYN takes in order to reverse this trend. Obviously, the project on its own cannot generate a significant impact to reverse the trend in all the Cordillera Central, but, notwithstanding, will demonstrate in practice how forest deterioration could be reversed.

PROCARYN focuses on the following issues in order to reverse the trend:

- Co-financing Sustainable Forest Management
- Applying Sustainable Forest Management Techniques
- Investing in Smallholders Knowledge
- Certifying Forest Management
- Organizing Smallholder Forest Owners
- Orienting Government Forest Administration and generating inputs for Forestry Sector Policy
- Supporting Key Stakeholders

Co-financing Sustainable Forest Management

As smallholders do not have sufficient economic resources to initialize forest management, PROCARYN co-finances forest management activities such as the elaboration of management plans and managerial support in the implementation phase (provision of information, facilitating bureaucratic procedures, establish linkages with forestry companies and markets, etc.) and reforestation of degraded land.

As many other projects have revealed, support for smallholders' management through gift-like donations is not recommended (Giger 1999). Hence, the project co-finances a certain part of an investment in forest management measures; for instance 60% of all costs of reforestation up to a total period of 5 years. The other part farmers have to finance themselves, often by investing their own and their family's working force and tools.

This policy fosters farmer's ownership since they invest significant resources in a certain productive activity and have an intrinsic interest in positive results.

With regard to the management plans this means that farmers are interested in managing their own forest resources well for their own benefits and for not giving government officials any reason to close the operations. With respect to reforested areas, they maintain the plantations so that these one-day will generate economic benefits and contribute to farmers' livelihood income.

Applying Sustainable Forest Management Techniques

In the Cordillera Central, forest management is a delicate issue. Due to a very critical society, the fact that a unique forest resource, the endemic *Pinus occidentalis* forests, is the subject of forest management with its steep topography and susceptible slopes demands very conservative management techniques, forest management must pay attention to all these circumstances.

In consequence, PROCARYN applies low negative impact management techniques which maintain permanent forest cover and, in its practical application, are easily understood by farmers. Forest management demonstrates the following characteristics:

- Through selective cuttings the original structure of the forest is maintained and its quality improved by and by.
- Skidding with oxen does not harm the soil and remaining trees significantly.
- Areas totally unsuited for the extraction of wood are under permanent conservation.
- The timber volumes harvested are low, but high prices for forest products make this form of forest management profitable.

Management objectives focus on producing high quality timber because in the long run smallholders cannot compete with big landowners with respect to quantity, but only by offering the market place excellent products such as sawlogs, veneer logs and certified forest products. To prepare smallholders for these markets, the forest management measures put into practice with support of PROCARYN fulfil the requirements of the Forest Stewardship Council (FSC) as well (see below).

Investing in Smallholders Knowledge

Forest owners are the primary managers of the forests. They ultimately decide how the forest resources are managed. Their knowledge or ignorance shapes this valuable resource. If outsiders, and PROCARYN's technical staff are outsiders, want to change forest management practices so that they become more sustainable, they have to focus on people. In a situation where farmers do not have a forest management tradition, it has to be developed by and by.

Although the Dominican government demands a technical forest management plan, elaborated by a professional forester, we involve the forest owners from the very beginning in all planning and implementation activities as:

- Forest owners are involved actively in the forest inventory.
- On the basis of the inventory's results, technicians and the forest owners discuss and decide on where to do what and which parts of the forest are totally protected.
- Regarding the marking of trees to be felled, the forest owners first accompany technicians and later mark by themselves.
- Technicians train forest owners in directional felling techniques, calculating the volume of logs and commercialization of forest products.

All these activities contribute to improving forest owners' knowledge about sustainable forest management and to develop a forest management culture. It is a long-lasting process, but indispensable, if profound changes in the way rural people see forests and understand how to manage them are sought. Improving forest owners' knowledge contributes as well to developing a long-term commitment for sustainable forest management.

Certifying Forest Management

The forest certification system of the FSC is internationally recognized for pronouncing a trustworthy judgement on the quality of a forest management operation, in ecological as well as social and economical terms.

As of now, there are no certified forest management operations in the Dominican Republic. PROCARYN, jointly with the World Wildlife Foundation (WWF), the GTZ, the Dominican Forestry Chamber (CFD) and a NGO called Plan Sierra will develop an initiative to prepare smallholders for forest certification. The so-called "step-wise-approach to forest certification" supports two groups of smallholders in adjusting their management operations to the Principles & Criteria of the FSC.

Once the certification of a group of smallholders is achieved, it will be a very strong incentive for sustainable forest management in the country, since it demonstrates that it is possible to manage the highly susceptible endemic pine forests according to an internationally accepted standard.

On the other hand, the simple fact that somebody is working on forest certification generated a strong push to the national debate on sustainable forest management.

The advantages of the FSC system over other certification schemes are its credibility, inclusiveness, democratic procedures, transparency, global impact, and independence.

The certification of smallholders' management operations will:

- protect them against hostile actions of the general public or government officials' arbitrary acts
- improve the image the general public have with respect to forest management
- open access to new markets (e. g. certified timber, environmental services)
- improve their management operations and make them more efficient.

Another focus of the initiative is to generate practical experience in order to improve FSC's principles and criteria with regard to small-scale and low intensity forest operations. Smallholders in developing countries are a very particular clientele, which up to date are almost excluded from forest certification because they are mainly not in the position to fulfil FSC requirements.

Organizing Smallholder Forest Owners

Farmers in the upper watershed of the Yaque del Norte River are in general weakly organized. Weak organizations lead to weak political representation of rural people's interests and economic losses resulting from poor prices which farmers obtain for individually selling their produce. At the community level, poor local organization causes under-development in terms of basic infrastructure, housing quality, education and natural resource management.

Through a joint learning approach to extension called "Extensión como Proceso de Aprendizaje Mutuo (EPAM)" or Extension as Mutual Learning Process in English, PROCARYN together with seven other organizations from government, NGOs and farmer federations facilitate farmers and their families in developing capacities to better organize themselves and tackle their genuine challenges.

Through linking this innovative extension approach with the initiative to forest certification, PROCARYN promotes and supports the formation of a smallholder forest owners group. The group is a must to make forest certification viable for smallholders, since no single farmer could afford the costs of forest certification on his or her own. The second objective of the group is to commercialize forest products jointly in order to obtain higher income. Thirdly, this group will develop the capacity to negotiate with other outsiders as the forest administration and other government service providers, forestry companies, local and regional NGO in order to support the group to better fulfil its objectives.

Orienting Government Forest Administration and Generating Inputs for Forestry Sector Policy

The advantage of PROCARYN is its parastatal status. On the one hand, the project has the possibilities of a NGO, but on the other hand it is strongly related with the government. PROCARYN is also part of the GTZ programme "Management of the Natural Resources" in the Dominican Republic. The programme owns a policy component and takes the practical experiences made in PROCARYN into account while supporting the formulation of government sector policies.

The practical experiences with smallholder's forest management demonstrate that they are able to manage forest resources without destroying them and that sustainable forest management in general is possible and viable. Such experiences will lay the foundations

for the government to formulate forest management—friendly and stable sector policies which foster investments in the forestry sector and contribute significantly to the sustainable management of the country's natural resources.

Good relations with government officials, mostly forestry officers of the forestry administration Sub-Secretaría de Recursos Forestales, are used to support officers in understanding smallholders' specific situation and to establish exchange between farmers and government officials.

Supporting Key Stakeholders

In order to foster the national discussion with respect to sustainable forest management, in particular related to smallholders' forest resources, PROCARYN supports and develops strategic partnerships with other important stakeholders. There are linkages and cooperation with several local and regional NGOs, in particular, with the Dominican Forestry Chamber (CFD).

The CFD represents forest owners' interests at the national level and has good connections to the government and civil society. Local NGOs as the Obra Social Salesiana or the Plan Cordillera have a high credibility with the rural people and local civil society in the watershed's urban centre Jarabacoa. The NGO Plan Sierra, situated in the neighbouring watershed, has a nation-wide reputation for excellent forest management.

Strategic partnerships are very important to establish power structures and to form alliances on thematic and interest issues.

FIRST RESULTS

Although, after 2.5 years of implementation, it is very early to evaluate if PROCARYN's strategies chosen to reverse the trend of forest degradation do work or not, the first results are promising.

Considerable Interest of Smallholders in Reforestation

Albeit, the initial situation the project team found in summer 2001 was anything but promising. Up to date, 188 land owners have reforested about 1,021 ha. Considering that in 2001, in the face of forest management being prohibited, very few farmers were motivated to reforest, the demand on reforesting degraded land increases continuously.

Actually, forest management is permitted and the first management plans elaborated by PROCARYN are approved by the forestry administration. Vis-à-vis to sustainably managed natural forests and older forest plantations which generate tangible economic benefits for its owners, many landowners take the opportunity and reforest parts of their compounds that are unsuitable for agriculture and/or degraded. Interestingly the motivation to reforest is in those high areas where there already exists a relatively dense coverage of forests and not where it is most necessary considering, for instance, aspects of soil conservation.

Although there are some losses of forest plantations co-financed by PROCARYN, this occurs due to natural phenomena (extended dry season) and not because land owners abandoned or did not maintain the reforested areas. It seems that the concept of obliging farmers to co-invest in the measures the project supports creates ownership and that most owners of reforestations assume the responsibility to maintain and protect plantations on their own property. Another indicator for farmers assuming responsibility is that only 1 ha of the forest plantations supported by the project since 2001 was destroyed by fire.

Economically Viable and Technically Sound Forest Management

Even though it is a stony road through the government's bureaucracy, PROCARYN has put together 26 forest owners management plans for 1,045 ha of natural forests and plantations. In 2003 management operations started with 11 farmers who harvested about 600 cubic meters of timber, posts and other forest products.

For most of them, it was the first time in their life that they were allowed to legally make use of their forest resources. We, as technical staff of PROCARYN, hoped that smallholders would manage their forests according to the management plan indications and in order to not give government officials a chance to intervene and to stop the operations. Surprisingly, farmers were very keen, even with sub-contracted personnel for tree felling and skidding, to fulfil all requirements of the management plan that is not to fell more trees than indicated, to avoid damages to the remaining stand and to realise low-impact logging with oxen.

High prices for forest products are peculiar for the Dominican Republic. Due to the large amount of imported timber with relatively high taxes, the national market pays well for timber produced in the country. The price for timber logs is about USD 40 per cubic meter in the forest at a place reachable by small trucks. Considering the purchasing power of the money in the country, it is even more.

For the above mentioned 11 cases, the net-income, not considering the costs for the management plan and supervision by PROCARYN's technical staff, varied between USD 10 and 30 per cubic meter. Taking into account that it was the first intervention in unmanaged 30-year-old forest plantations and natural forests and, consequently, mainly the "garbage" was harvested in order to improve the stands' quality, the income levels are surprising. For farmers with low monetary income, the first regular operations showed that forest management is economically viable and can contribute significantly to improve household monetary income. In all cases farmers expressed their satisfaction with the results of forest management and some are even so enthusiastic that they want to reforest more degraded land on their compounds.

Positive Results of the First Forest Certification Audit and Organising Farmers

In correlation with the joint initiative for forest certification under a group scheme, the first audit of the step-wise approach took place in November 2003. The auditors and the representative of WWF Central America expressed their surprise and satisfaction with the impacts of the forest management measures in practice and about the farmers' conscience with respect to the different functions a forest fulfils. In particular the extremely low impact of management interventions on steep slopes over soils and remaining vegetation and the degree to which farmers make use of felled trees, so that very little cullwood remains in the forest, convinced the auditors of the worth of this form of forest management. They stated that, regarding the technical and economic aspects of forest management, the management plans supported by PROCARYN fulfil almost all principles and criteria of the FSC certification system.

Whilst a first meeting with forest owners, these manifested their interest in obtaining a group certification and already undertook first steps to organise themselves.

On the basis of the auditors' evaluation report first steps are undertaken to improve, in particular, social aspects of forest management and to strengthen the formation of a forest owner group for certification under a group scheme, as well as for

obtaining even higher prices for forest products through joint commercialization.

Improving Relations with Government Officials and First Inputs for Forestry Policy

Since the first management plans, PROCARYN's technical staff worked together with farmers, we looked for the practical participation of forestry officers of the Sub-Secretaría de Recursos Forestales in all steps of the process. This practice generated very positive results, as the officers became trained in this kind of low impact forest management, which is really innovative in the country, and with regard to understanding better farmers' situation and specific problems. The practice avoided as well insurmountable problems relating to the plans' approval.

Currently, the rules and norms regulating forest management are being revised. During this process PROCARYN has been involved in contributing the practical experiences we made with forest management. Several aspects are considered for re-designing the legal basis for forest management, as, in particular, technical instructions on the design of the forest management plans.

Strong Cooperation with the Forestry Chamber

Apart from cooperation and exchanges with other stakeholders, a very good relationship and cooperation with the Dominican Forestry Chamber (CFD) are worth emphasizing.

The CFD does not just co-ordinate the initiative of forest certification where PROCARYN plays also an important role, but permanent exchange at formal as well as informal level is sound day-to-day practice. So did PROCARYN, for example, contract a professional forester of the CFD to accompany forest owners during the post-approval phase of the management plans? The CFD-forester's tasks embrace working out the annual operational plans, marking trees to be felled together with the forest owners, organise the administrative procedures for transport of the forest products, facilitate market information, train smallholders in volume calculation, etc.

There is an intensive professional exchange at several levels and many events and meetings are organised and put into practice together.

OUTLOOK TO THE FUTURE

As stated above, PROCARYN is a baby undertaking its first steps. Therefore, there is still a lot to do. Albeit the project focuses on sustainable and integrated watershed management in all its dimensions, forest management plays a key role in this context due to its importance for halting erosion and offering new economic opportunities for the watershed's inhabitants. Embedded in a sound social, legal and political framework, forest management has the potential to change greatly the degrading trends in the watershed and enable, in particular, farmers to earn their living whilst protecting the environment and the natural resources.

Even though nobody wants to drastically change locally developed culture and farming practices, nevertheless conventional agriculture is in crisis and obliges farmers to look for viable alternatives. Forest management is such a viable option, offering short-, medium- and long-term benefits to forest owners and producing valuable environmental services for society.

REFERENCES

- Antonini, G., K.C. Ewel and H.M. Tupper 1975. Population and Energy: A systems analysis of resources utilization in the Dominican Republic. University of Florida, University Press of Florida, Gainesville, United States of America. 21 p.
- Darrow, K. W. 1990. Hispaniolan Pine (*Pinus occidentalis* Swartz) a little known sub-tropical pine of economic potential. Commonwealth Forestry Review, 69 (3). as quoted in Dotzauer, H. 1993. The political and socio-economic factors causing forest degradation in the Dominican Republic. RDFN Network Paper, ODI, United Kingdom
- Dirección General Forestal. 1997. Estrategia forestal para lograr la conciliación entre el desarrollo y la conservación. Santo Domingo. República Dominicana. 35 p.
- Dotzauer, H. 1993. The political and socio-economic factors causing forest degradation in the Dominican Republic. RDFN Network Paper 16d, ODI, United Kingdom
- FAO. 2001. Situación de los Bosques del Mundo. Roma. 175 p.
- Homma, A.K.O., R.T. Walker, F.N. Scatena, A.J de Conto, R. de Amorim Carvalho, A.C.P. Neves da Rocha, C.A. Pálheta Ferreira and I. M. dos Santos. 1993. Dynamics of Deforestation and Burning in Amazonia: A Microeconomic Analysis. Rural Development Forestry Network. Network Paper 16c. 16 p.
- Geilfus, F. 1997. From 'Tree-haters' to Tree-farmers: Promoting farm forestry in the Dominican Republic. RDFN Network Paper 22d, ODI, United Kingdom. 20 p
- Giger, M. 1999. Avoiding the Shortcut: Moving beyond the Use of Direct Incentives - A review of experience with the use of incentives in projects for sustainable soil management. Centre for Development and Environment, Institute of Geography, University of Berne, Switzerland. 61 p.
- Kustudia, M. 1998. Conucos, Campesinos and the contested Cordillera - Grassroots perspectives in a Dominican watershed. FTTP Newsletter No. 36/37, Uppsala, Sweden: 26-33
- Luna, J. 1984. Informes y recomendaciones para la conservación de nuestros bosques y ríos. orig. 1945, Reed, Plan Sierra/ed, San José de las Matas, Dominican Republic
- de Moya, J. 2002. Consultoría: Productos Forestales. Internal Project Report, PROCARYN. 44 p.
- Russo, I. 1987. Evolución de la situación Forestal 1844 - 1987. Document No. 7, FAO, Santo Domingo, Dominican Republic
- Secretaría de Medio Ambiente y Recursos Forestales 2001. Inventario de cobertura Forestal. Santo Domingo, Dominican Republic. 33 p.

AUTHOR

Henning Peter
Forestry Adviser
German Development Service (ded)
PROCARYN
Estela Geraldino No. 7
Jarabacoa
Dominican Republic
Ph.: 011-809-574-6727
Fax.: 011-809-574-6994
wald.meister@web.de