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Commercialization of non-timber forest products in Mexico and Bolivia: factors influencing success.

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EXECUTIVE SUMMARY

The preparation, implementation and outputs of a five year multidisciplinary research initiative involving partners drawn from the UK, Mexico and Bolivia are described in this report. The project team responded to the call for "Winners and Losers" by designing a work programme that contributed to the understanding of what factors influence success, and under conditions which NTFP commercialization can make a positive contribution to the livelihoods of the poor.

Project preparation was lengthy, initially focussing on establishing a strong collaborative approach to undertaking multidisciplinary research on the impacts of different market structures and NTFP commercialization on the resource base and poverty reduction. This included identifying and selecting suitable case study partners and products. Case studies were selected primarily on the basis of identifying products under existing trade, and also for socio-economic and biogeographical reasons. A variety of forest biomes were selected, from oak pine to tropical moist in Oaxaca and tropical dry in Guerrero, in southwest Mexico, where rural communities are most highly marginalised. In Bolivia, sites in the departments of La Paz, Beni, and Santa Cruz were selected, three in tropical rain forest, and one in montane forest.

The research team undertook socio-economic and market research to examine the impact of different NTFP commercialization networks (value chains) on poverty reduction, women's livelihoods, natural resources, and rights and access of the poor, in eight communities in Bolivia and ten communities in Mexico. The structure and function of 16 different NTFP value chains were analysed, enabling identification of the attributes that make a chain successful.

The components of the research can be subdivided as:

1) Formulation of six key research hypotheses;
2) Socio-economic surveys in each case study community;
3) Individual market based surveys along the value chain of all the NTFPs;
4) Supporting policy studies, integrated vertically from community to national level.

The main findings of the CEPFOR project include:

- Success cannot be summarized by a single variable, and community perceptions of success need to be assessed and incorporated in project planning and evaluation.
- NTFP activities provide an important opportunity for poverty reduction, contributing between 7% and 95% of a household's annual cash income.
- NTFP activities can provide women with a greater sense of self-confidence and improved status within the household and the community, and represent one of the few cash-generating opportunities for women in marginalized rural communities.
- Regardless of tenure, in the majority of cases, increased commercialization initially leads to overexploitation of the resource. Tenure influences the variety of strategies used by communities and individuals to ensure NTFP supply is sufficient to meet increased demands There is little policy or legislation specific to NTFPs in either Mexico or Bolivia, and improved cross-sectoral coordination would help ensure that poor producers, processors and traders are better placed to meet the legislative and institutional requirements for successful NTFP commercialization.
- NTFP value chains are highly dynamic, and producers, processors and traders show remarkable degrees of resilience to external shocks and a great ability to adapt to changing contexts.
- Lack of market information is the key barrier into NTFP trade, and information about markets, together with the capacity to act upon it, is an important prerequisite for entering, and maintaining a hold in, new markets.

1 BACKGROUND

1.1 Development of the project

A presentation of the participatory development of this project provides an important insight into the demand for the project by partners, the objectives developed, and the focus of the project outputs.

The project began in 1999 as a response to a call for proposals structured around "winners and losers" in forest product commercialization. The full research project was funded from 1st November 2000, and the inception projects held in Oaxaca, Mexico in March 2001, and Santa Cruz, Bolivia, two months later in May.

- The initial concept note focussed on the scope for commercialization of NTFPs from Mexican cloud forest in different locations under different use and marketing regimes, with a particular focus on the role of women in this process. The social and cultural factors influencing collection and sale of NTFPs, including constraints and opportunities, were to be analysed in different communities, along with the comparative impact of NTFP harvesting. A key output was a manual produced to provide guidance on harvesting methods, to ensure sustainable use of a declining resource. Previous research had highlighted that in some communities, NTFPs were the most important source of cash income for highly marginalised community members (Marshall and Newton, 2003). However in other areas, although the same NTFPs were available locally, these resources had not been developed commercially. This prompted the overall research question of why some communities were more successful at commercialising NTFPs than others.

- Following invitation to tender for full proposal, the project expanded to include Bolivia in its geographical focus. The research emphasis shifted towards an improved understanding of how different market chains are structured and function, and away from the biophysical impact on the resource.

- The project was provisionally approved in February 2000, with the agreement to fund a pre-project scoping phase, including a networking visit to Mexico and Bolivia, between April and July (ZF0173). The overall aim of this pre project phase was to establish working relationships with in-country project partners to support the preparation of the project initiation workshop, through in-depth consultation with a variety of stakeholders.

- The implementation of this pre project phase coincided with a re-orientation of donor priorities, specifically that Mexico had just ceased to be on the bilateral priority list. The project team responded by strengthening links to Central America, through the involvement of Fauna and Flora (FFI) in Nigaragua.

- Upon the successful completion of this phase, and the necessary provision of research partner details and case study selection, the PMF was approved and the CEPFOR project officially began in November 2000.

- A few weeks prior to the approval of the PMF, Dr Adrian Newton of the Institute of Ecology and Resource Management, University of Edinburgh, who had provided management support to the Project Coordinator, relocated to Head of Forest Programme at UNEP-WCMC. The project was moved in its approved format to Cambridge, from where it was implemented. The administrative and financial implications of relocating a project to a different organisation (and Institutional type), presented a variety of challenges to its implementation, throughout the life of the project.

- The four target groups of FRP are: small-scale poor farmers; landless poor families; small-scale traders and entrepreneurs; urban and peri-urban poor families. The CEPFOR project focused on the first three of these groups.

- The CEPFOR project aimed to analyse the opportunities and constraints to commercialization of NTFPs at the household and community level, through comparative analysis of case studies in Mexico and Bolivia (both FRP priority countries[1]). Market structure was analysed for selected NTFPs, to identify interventions necessary for successful commercialization. Gender issues and community perceptions of success received particular attention

Staff changes

Although perhaps inevitable, staff changes can have important implications for projects. In this particular project, all key staff were fortunately maintained during the full five years of the project.

- The involvement of Kate Schreckenberg was limited in the initial PMF, to a few days a year, overseeing the work of Charlotte Boyd. Charlotte left ODI in late 2000, and Kate was able to use the total time allocated to Charlotte to increase her input.
- Then, during the first year of the project, Dirk Willem te Velde, ODI, joined the team to provide an input on project design, with the intention to undertake the econometric analysis of the quantitative data.
- Diana Pritchard, FFI Nicaragua, was involved with the design of the initial inception workshops, and the intermediary data analysis workshop. She also undertook an information needs assessment in Central America, during the 3rd year of the project, before she left FFI.
- During the 1st year of the project, the team hired Alan Bojanic to help design the market analysis methodologies, and help provide training to in-country researchers. Increasing commitments and other work pressures meant that he was unable to see this phase through, and unable to undertake the analysis of the value chains. The project was fortunate to have identified Jonathan Rushton and his small dedicated team of people, and Alan was able to hand over responsibility for the qualitative and quantitative analysis of the 10 project value chains.
- The project chose to work with local NGOs in Mexico and CARE Bolivia, for the main reason that the project partners had established close working relationships with communities who had insipient experiences in NTFP commercialization. All the project case studies were selected on the back of ongoing projects within each NGO partner organisation, which had various advantages, including that the CEPFOR project was able to piggy back onto ongoing initiatives, sharing costs of project implementation, staff etc. In return, all the NGO partners had a strong interest in undertaking commercialization work, but needed the capacity and guidance to do so. The downside of this was that project funding dictated availability of personnel. Many of the smaller NGOs lived a hand-to-mouth existence, in terms of cash flow, and were not always able to have continuity of staff. This was also a challenge for CARE Bolivia. Despite almost 2 years having passed, between the end of the field phase and the launch of final outputs, the presence of all the key field staff at the final in-country launches, was testament to their dedication to this work.

1.2 Key development constraints addressed by the project

The key developmental problems addressed by the project were:

1. In much of Latin America, harvesting and management of NTFPs is undertaken by highly marginalised indigenous populations, and often by women, who often face a specific set of opportunities and constraints in relation to the commercialization of NTFPs.

[1] During the course of the research, Mexico was dropped from FRP's priority list. However, work in Oaxaca and Guerrero, two of the country's most impoverished states, was still considered to be of relevance by FRP for neighbouring countries.

Information is much needed on identifying factors that support successful commercialization.
2. Marketing processes and structures are one of the most significant constraints to successful development of NTFP activities as part of livelihood strategies, however, there is a lack of capacity of many local NGOs to support community based commercialization and the lack of available decision-making tools - appropriate to local conditions – for NTFP commercialization.
3. At a methodological level, there is a lack of an integrated methodological approach to undertake market based and socio-economic research at community level, and along the value chain.

1.3 Summary of significant previous research

Forests and Poverty Reduction:

The potential contribution of forests to poverty reduction is the subject of some debate (Mayers and Vermeulen 2002, Oksanen et al. 2003, Bird and Dickson 2005). At one level, industrial forest operations can contribute to poverty reduction through national economic growth and, more directly, by providing employment for poor people. At another level, forests can be an important source of subsistence support for low-income households living in and adjacent to forests. Many studies document the fact that forest-dependent people often have few options except to gather and hunt NTFPs for their food, medicines and cash income (FAO 1995, Falconer 1996, Ros-Tonen 1999). Nevertheless, our understanding of the role of forests in rural development remains limited and it is not clear whether a high level of current forest dependence necessarily corresponds with a high potential of using forests to reduce poverty in the future (Angelsen and Wunder 2003).

What is certain is that there are many emerging opportunities for pro-poor forest activities to complement and strengthen key components of livelihoods and poverty reduction. These are not without their challenges. There is a pressing need to facilitate specific interventions that enable forest resources to play a greater role in livelihoods through improved local forest governance. Forests can only contribute to poverty reduction when poor people have secure long-term rights to their resources, coupled with the capability to defend them against more powerful actors (Mayers and Vermeulen 2002). In addition, the dynamics of poverty suggest that multiple agencies need to be effectively engaged, and insufficient coordination between different sectors, coupled with unnecessary duplication of support initiatives, continues to result in inefficient action.

NTFPs and poverty reduction:

There has been a great deal of research on the role that NTFPs play in rural development, but much of it consists of detailed investigations of individual case studies with relatively little attention given to synthesis or comparison between cases (Ruiz Peréz et al. 2004). The development of generalizations has been hampered by the lack of an analytical framework to integrate and compare the results from case studies with highly diverse ecological and socio-economic characteristics (Arnold and Ruiz Peréz 1996). As a result, there is no easy way to identify NTFPs with high potential for commercialization success or failure at an early stage to facilitate more effective government and donor investment. The CEPFOR project addressed this gap by developing a methodology (see Chapter 2) that was used to carry out a comparative analysis of case studies, enabling general principles to be recognized. Although the case studies were diverse, they had sufficient contextual similarities, for example being from marginalized areas in Latin America and involving trade outside the community, to allow for the identification of more specific and targeted findings about which factors are important in determining successful NTFP commercialization in particular situations.

Arnold (2004) argues that while much is known about the characteristics of individual NTFPs, less is known about their commercial performance and developmental linkages. NTFP contributions to household livelihoods, and trade and market issues, have also been identified as priority areas for future research by Angelsen and Wunder (2003), who suggest

that studies to date may have been unduly optimistic about the potential contribution NTFPs can make to poverty alleviation. Until now, NTFPs have tended to be researched in isolation, but there is growing recognition that they need to be set within the context of other rural activities (Ros-Tonen and Wiersum 2005). Vosti et al. (1997) argue that the general level of market development in areas where NTFPs are promoted is the most important factor determining NTFP market potential. This is supported by a CIFOR project, working over the same period as the CEPFOR project, which has defined three categories of NTFP activity: coping, diversified, and specialized, based roughly on the level of integration into the cash economy and the proportion of household income contributed by the NTFP (Ruiz Peréz et al. 2004). NTFPs as raw materials can be considered part of the agricultural economy, and Vosti et al. (1997) suggest that, other than the fact that they are often collected from the wild, NTFP markets are not very different from those for non-essential agricultural products. Those NTFPs that require processing, however, are considered part of the rural non-farm economy (Haggblade et al. 2002), which, while linked to the agricultural economy, has its own constraints and opportunities. In addition to these socio-economic issues, there is still concern about how best to promote sustainable forest management, which is widely accepted as an important policy goal at both national and international levels.

1.4 Identification of demand for the project

Demand for the project was based initially on the previous experience of Elaine Marshall and Adrian Newton, in Mexico. Strong collaboration with ODI, and in particular Kathrin Schreckenberg, was developed, building on previous FRP funded work, both in the region and West Africa. Demand for the combined project was confirmed during the project preparation visit in 2000 during which meetings were held with government agencies, international and local NGOs, community representatives, academic institutions, independent consultants and bilateral project staff where possible.

In addition, the pre-project scoping phase, including a networking visit to Mexico and Bolivia, between April and July 2000, had the overall aim of establishing demand with potential project partners. Numerous meetings were held with government bodies, NGOs, research organisations, community representatives and the private sector, to ensure that this research addressed a real demand.

Once the research partner organisations had been confirmed, the project held annual meetings with the partners, bringing them together on two occasions to develop methods for data collection and analysis, agree coverage of case study communities, and iteratively discuss the findings and policy implications. The project leader visited each country for a minimum of 10 weeks a year, during the first three and a half years of the project (the data collection and analysis phase).

2. PROJECT PURPOSE

The project's purpose was to "identify factors which influence successful NTFP commercialization". Specifically, the project sought to define under what conditions NTFP commercialization may contribute to sustainable rural development in highly marginalised communities, in Mexico and Bolivia.

The identification of factors that support successful commercialization was achieved through the assessment and joint analysis of socio-economic, biological, and market data rigorously collected across the 19 case studies. The qualitative and quantitative information was integrated and analysed, using a probabilistic model (Bayesian Belief Network). From this an analytical framework was developed enabling different case studies to be compared, and key factors influencing success to be identified.

The project aimed to develop tools to support research of and decision-making around NTFP commercialization, for a wide range of stakeholders. This was addressed through the

development of research and analysis methodologies that involved training local NGOs partners, working with them to implement the methods, evaluating the tools, and presenting the results to the wider team. The research findings were used to develop practical tools for evaluating the potential for commercialization of NTFPs, both for use by local communities and NGOs, in the form of a manual, and for use by other decision-makers, from NGO to donor, in the form of an Decision-Support Tool.

The project's aim of developing a multidisciplinary methodology to investigate successful NTFP commercialization addressed the final development constraint, namely the previous lack of an integrated methodology for NTFP value chain research.

2.1 Recommendation domains

Broadly speaking there are two types of recommendation domain for the conclusions resulting from this project. Some of the data collection focuses on specific NTFPs, examining their whole market chain from the various source communities to the final consumer (or a clearly defined intermediary point in the case of internationally traded products). Conclusions and recommendations relating to products and how successfully they are traded relative to other products are potentially relevant to the whole area in which that particular product is being produced and marketed. Actual relevance depends on how homogeneous the marketing experience (supply, demand, marketing strategies, etc.) is across this area, which varies from case to case.

The second body of data collection is concentrated within source communities, looking at the relative success of different types of people involved in the NTFP commercialization chain. The recommendation domains are limited, therefore, to other communities (or people within them) who share key characteristics with those in which the data were collected.

Maps were produced for each case study product to show the distribution of the species (i.e. maximum potential recommendation domain), the main production sites in the country, the case study communities (minimum recommendation domain), and the principal marketing routes (all presented in Marshall *et al.*, 2006a).

2.2 Project research hypotheses

The research builds upon previous research undertaken by CIFOR (Ruiz Perez and Byron, 1999), which concluded that development potential of NTFPs is associated with:

(i) positive state-sponsored regulations that offer clear rights to people
(ii) a harvesting intensity / technique that does not put excessive pressure on the resource
(iii) a transparent market
(iv) well-organized gatherers
(v) existence of external support groups

The links between these conditions was unclear, and their relative importance had not been evaluated. These were issues that the CEPFOR project intended to address.

The project also drew on the work of IFPRI and NRI in Brazil and Cameroon (Vosti and Witcover, 1997), which investigated the domestic potential for tree products from farms and rural communities. The IFPRI/NRI report made suggestions for future research including an emphasis on understanding the potential impact of increased commercialization. The CEPFOR project therefore investigated not only the factors that underlie successful commercialization but also the impacts that changes in commercialization can have upon communities and the natural resource base.

CEPFOR was implemented by a large international research team, including researchers from a range of disciplines – social science, forestry, agriculture, economics and ecology – and development NGOs. To ensure that everybody was working towards the same research aims, six key hypotheses were identified at an early stage.

1. Changes in trade in NTFPs have a greater impact on the poorest producers, processors and traders.
2. Changes in trade in NTFPs have a greater impact on women's livelihoods.
3. Increase in the volume of NTFP trade leads to forest overexploitation and/or domestication.
4. Changes in the volume of NTFP trade lead to reduced rights/access to the resource for the poorest producers.
5. The successful commercialization of an NTFP depends critically on the existence of an accessible market, potential demand, and the access by producers, processors and traders to market information.
6. The number of demanders and suppliers, the exertion of market power, barriers to entry, and the degree of vertical and horizontal integration determine how competitively poor producers, processors and traders can participate in NTFP commercialization.

The first four are predominantly concerned with the impact of NTFP commercialization on different groups of participants in the commercialization process (both within communities and along the market chain) as well as on the environment. The latter two are focused on understanding the different types of market structure that exist for NTFPs and, in conjunction with the earlier hypotheses, their relative impact on participants. The hypotheses were developed at the start of the project during a one-day workshop of the core research team plus external experts on the basis of extensive knowledge of the literature and own experience. Each of the hypotheses contains within it a number of sub-questions (see section 4) on which the project hoped to throw some light. Both the questions and the hypotheses were a guide and their wording changed over the course of the project as understanding of the issues increased and became more complex.

2.3 Planned outputs

The project intended to produce two main outputs:

- *An Expert System* for use by decision-makers to evaluate the potential for successful NTFP commercialization. The CEPFOR Decision Support Tool (CDST) is available on the CEPFOR CD-ROM.
- *A manual* developed and tested with rural communities, to provide tools for successfully developing NTFP resources. The final manual (Marshall *et al.*, 2006b) was produced in electronic format only and is available on the CEPFOR CD-ROM. In addition to supporting people helping communities to improve their NTFP commercialization activities, it also guides users of the CDST through methods required to obtain the data for the CDST.

In addition to these two outputs, the project produced a book (Marshall *et al.*, 2006a) outlining the results of the research.

3. RESEARCH ACTIVITIES; METHODOLOGICAL APPROACH, SAMPLING, DATA COLLECTION AND ANALYSIS

The following sections on methodological approaches, sampling, analysis, synthesis and integration of results draw heavily on the internal project publication 'Methodological Procedures' (Schreckenberg *et al.,* 2005). This documents the approach to project implementation, specifically in relation to methodological design to ensure biometric vigour in design, data collection and analytical approaches. The approach was closely monitored and evaluated by Reading Stastical Services Centre (SSC), who provided FRP with consultancy capacity in this area. Dr Savitri Abeyasekera participated in two project meetings, at data collection and analysis design stage, and reviewed and provided feedback on numerous iterations of the internal procedural publication.

3.1 Combining a variety of methods

As indicated above, the project was interested both in identifying the factors that contribute to successful commercialization and in looking at the impact of (different types of) commercialization on communities.

Research was broadly divided into two areas – community-level work investigating the impact of NTFP commercialization, and market chain research on selected traded NTFPs. Field data to evaluate the research hypotheses was collected in two different areas each of Mexico and Bolivia.

The project collected *a mixture* of quantitative and qualitative information. At this point it is useful to note the distinction between the *methods* of data collection and the *type* of data that is collected (Booth *et al.*, 1998; Hentschel, 1999). Data can be qualitative or quantitative but this should not be confused with the methods used to obtain them. Thus methods typically considered to be 'quantitative', such as surveys, can also produce qualitative data (e.g. why children aren't going to school), while more 'qualitative' methods can equally well produce quantitative data. Hentschel (2001) argues that it is better to think of methods lying on a spectrum of being more or less 'contextual' – with those at the most contextual end attempting to understand human behaviour within the social, cultural, economic and political environment of a locality. Participatory methods are a sub-class of those at the more contextual end of the spectrum (Booth 2001).

The combined approach is a difficult but essential one for a project which is both aiming to produce evidence-based and academically acceptable research results of broader relevance as well as working with local NGOs and communities to improve the information base upon which they develop their activities (Schreckenberg *et al.*, 2005).

The 'conventional academic' approach (for want of a better term) required the project to use fairly standardized methods, the results of which could be compared across communities and the relevance of which could be extrapolated with a specified degree of certainty to other communities/products. This approach is associated with the logical positivism school of thought which considers that there exists a single, external reality which the analyst should capture as closely as possible (Christiaensen, 2001). Our 'community' approach is more closely associated with the interpretivist and the constructivist traditions. Christiaensen (2001) describes these as starting from the recognition of a multitude of realities and the belief that objectivity and value-free science are simply impossible. "To fully understand the topic of interest within its context, the inquiry methods used seek to involve many stakeholders and to obtain multiple perspectives on the subject of research and the meaning of concepts, through semi- or unstructured, exploratory data collection methods. In the constructivist tradition, the analyst does not only aim to provide and facilitate an understanding of the subject, but also seeks to bring about change and empowerment of the stakeholders in the process" (Christiaensen 2001). While FRP did not explicitly require the project team to empower stakeholders, it did expect communities involved in the research to be compensated for and, ideally, to benefit from the research.

As Uphoff (2001) points out "Decimal points are no guarantee of precision, any more than words give us assurance of validity". Qualitative and quantitative data must therefore go hand-in-hand. In this project, we saw the value of quantitative and qualitative data as being as follows:

Quantitative information

- Includes qualitative data that can be quantified;
- Collection can be standardized more easily;
- Helpful for statistical analysis;
- Useful for any kind of economic analysis;
- Valuable for baseline monitoring (e.g. of impact of a project);

- Can be easier to compare across communities and or products;
- Numerical results can be easier to communicate to non-participants and may carry more weight with decision-makers.

Qualitative information
- Good to provide an in-depth understanding of the context in each case-study community;
- Important for understanding why a particular situation is as it is;
- Contextual information allows for clearer specification of quantitative data needs;
- If well analysed, it can be easy to communicate to non-participants.

Three key data collection tools were employed in the project.

Community report: One was written for each community. Their aim was to collate all the information relating to NTFP commercialization in a particular community, including a preliminary assessment of the local relevance of the research hypotheses. Although predominantly qualitative, some of the data included in the report was of a quantitative nature and could be codified for entry into a database. A secondary aim of the community reports was to provide sufficient contextual background to allow for the development of a precise and locally acceptable survey tool. As pointed out by Barrett (2001), "'ethnography' precedes 'sampling' in the dictionary and ought to in the field, as well." In addition to the outline structure, NGO partners were provided with suggestions and detailed activity guidelines (for everything from the use of secondary data to how to implement a range of participatory research techniques) on how to obtain the necessary information (Schreckenberg and Marshall, 2001). A late addition to the reports was a discussion by the authors of how representative these communities were in relation to other communities in our target population.

Market report: One was written for each product. The focus was on the overall marketing chain for the product, concentrating in particular on elements outside the study communities. The market report, in effect, started at the point where the community report ended. As with the community report, it was mostly qualitative but also included some quantitative data, which could be extracted into the database.

Questionnaires: Four questionnaires were developed all with the same basic structure. The first was directed at community members involved in any aspect of NTFP production to sale with a second directed at a control group of community members not involved with NTFPs. A separate form of the questionnaire targeted people outside the community who were involved with the case study NTFP (e.g. processors, traders), and a final version targeted a control group of non-community members. Together, the four forms of the questionnaire aimed to interview households in and outside the case study communities involved in NTFP activities at different stages (Production (cultivation), Collection, Processing, Storage, Transport, Sale). Questions related to individual characteristics (education, access to assets, gender, past experience, etc.), quantitative information about costs and benefits of typical transactions by households at each stage of the marketing chain, quantitative and qualitative information about importance and success of NTFP commercialization to households, access to information and qualitative barriers to entry to NTFP or other trade, etc. Given the emphasis of the research hypotheses on determining the impacts of changes in commercialization, particular attention was paid to obtaining information on any changes that had occurred in the last 10 years. The questionnaires were developed together with the NGO partners in an iterative manner including interaction at two workshops (Bojanic *et al.*, 2001; Guadarrama *et al.*, 2002). The resulting questionnaires were then field-tested for several communities/products (around 60 interviews in all) during April/May 2002, leading to a final revision in June 2002.

In addition to these three principal data collection tools, the project commissioned a policy paper for Bolivia (Bojanic, 2002) and Mexico (García-Peña Valenzuela, 2002). These outlined the legal and policy context within which NTFP commercialization was taking place.

They also highlighted questions that needed to be explored at community level (and incorporated in the community and market reports as appropriate) to determine the degree to which existing regulations were being enforced.

Finally, with a view to informing the content and format of the project's final outputs, an information-needs assessment was carried out by project partners in Bolivia and Mexico and by a consultant in Central America. This involved interviewing representatives from a range of government and non-government development and research organizations, which both finance and implement projects to determine:

- The key questions they were asked by communities about NTFP commercialization;
- The main queries they themselves had about NTFP commercialization;
- The format in which they would most like to receive any information resulting from the CEPFOR project.

3.2 Sampling procedures

Uphoff (2001) makes a plea for qualitative data to be put into enough of a quantitative framework so that they can be meaningfully interpreted. In the case of this project, sampling decisions were required at various stages from the choice of products to be included in the research, to the selection of the study communities and the focus groups and households within the communities. Instructions on how to go about sampling were provided to the NGO partners in Schreckenberg and Marshall (2001). Due to the importance of a rigorous sampling methodology, the SSC of Reading University was drawn heabily upon, during the key earlier design phases of this project.

3.2.1 Selection of the products

Product selection was the first step in the research process. The following criteria determined the selection:

- The total number of products per country had to be manageable, i.e. 4-6.
- Products had to be commercialized, defined as being sold for money (rather than exchanged for other goods), and had to leave the community of origin. In Bolivia it was specifically decided to exclude brazil nuts and palm heart, both of which had been the subject of extensive research.
- Each product potentially had to illustrate some of the factors we felt were important for ensuring successful commercialization: e.g. length of time product had been commercialized; form in which the product was being commercialized (local, national or international markets; different degrees of value-added; different degrees of vertical and horizontal market integration; etc); involvement of different groups in society (e.g. men and women; poor and rich); source of product (e.g. forest, farm, varying types of land tenure).
- Overall, the range of products selected in the two countries had to illustrate a range of these key issues.
- For each product, it had to be possible to identify two case-study communities in which the product was commercialized.

See Table 1 for the products selected.

3.2.2 Selection of the communities

Community selection was the second step in the research process. The selection was carried out as follows:

- Once the products were finalized, each NGO suggested a number of communities in which the product was commercialized, and which might be interested in participating in the research (based on the NGO's own knowledge of the constraints faced by the community). NGOs were asked to pay special attention to selecting communities that were representative (in terms of social homogeneity, resource tenure and market access) of the wider set of communities commercializing each product.
- At least two communities were pre-selected (by NGO and UK-team) for each product. The two (or more) communities per product differed in a key attribute (e.g. length of time

they had been commercializing the product, manner in which they commercialized the product, access to the resource and/or the market, etc).
- Overall, the number of communities per NGO could not exceed their capacity to carry out the research (i.e. 2 per staff member involved in the project).
- Consultation meetings were then arranged in all the pre-selected communities to discuss their information needs and how the project might help meet them.
- Final decisions were taken by NGO partners and the UK-team on the basis of the community meeting reports.

Table 1 shows the selected case study products and communities in Bolivia and Mexico, and the key reasons they were selected. In the case of incense a second community was originally selected but research was not able to proceed due to complicated local politics (not directly to do with the project). In La Esperanza and Topiltepec (Mexico), both the products (maguey and Soyate palm) were studied. This gave a total of 18 communities.

Table 1. Case study products and communities

NTFP English	**NTFP Spanish**	**Scientific name**	**Community**	**Key reasons selected**
Bolivia				
Organic Cocoa	Cacao	*Theobroma cacao*	• Carmen del Emero • San Silvestre	Comparison between production of cocoa beans and paste
Natural Rubber	Goma	*Hevea brasiliensis*	• Santa Rosa de Challana • Tomachi	Comparison between local sale of rubber products and sale of latex to La Paz
Incense and copal	Incienso /copal	*Clusia and Protium* spp.	• Pucasucho	Complementarity of two products (incense and copal), providing sole cash income
Jipi Japa palm	Palma jipi japa	*Carludovica palmata*	• El Carmen Surutu • Candelaria • San Rafael	Product of particular interest to women, very different marketing strategies (direct to local market or to tourist market via small company)
Mexico				
Soyate palm	Palma soyate	Brahea dulcis	• La Esperanza • Topiltepec	Important source of income for local people but inequitable distribution of benefits along the chain.
Maguey	Maguey papalote	Agave *cupreata*	• La Esperanza • Topiltepec	Differences in resource management and distribution of benefits
Mushrooms	Hongos	*Boletus edulis, Tricholoma magnivelare Amanita caesarea, Cantharellus cibarius*	• Cuajimoloyas • Latuvi	Very different products and markets (local sale of fresh mushrooms, national sale of dried mushrooms or export of fresh mushrooms)
Pita	Pita	*Aechmea magdalenae*	• Agua Pescadito • Arroyo Blanco	Comparison of trade of traditional unbleached

				fibre and recent introduction of bleaching; and different marketing via intermediaries or a cooperative
Camedora palm	Palma camedora	*Chamaedorea elegans, etc.*	• Monte Tinta • Nueva Santa Flor	International trade of leaves, failed in one community
Tepejilote palm	Tepejilote	*Chamaedorea tepejilote*	• San Miguel Tiltepec • Santa Cruz Yagavila	Different sourcing of resource (mainly wild or mainly cultivated) and marketing

3.2.3 Selection of the **'barrio'** *or part of the community*

In all but two of the case-study communities the total size of the community was either less than 100 or the number of people involved in the selected NTFP activity was small enough that the whole community could be involved in the study. In the two exceptions (Topiltepec and La Esperanza in Mexico) the majority of the 350-400 people in the communities were involved in the NTFP activity so some selection was necessary.

Local authorities and key informants were consulted to help select an administratively or physically defined *barrio* in which to work, ideally with 20-50 households. Criteria considered when selecting the *barrio* included:

- Whether the people engaged in NTFP commercialization activities;
- Homogeneity of the population (e.g. in terms of ethnic group and shared general history);
- How representative the people were of the whole community (i.e. they should not all be the richest or the poorest, but represent a reasonable mix of wealth groups);
- Availability of secondary data (e.g. household lists, well-being ranking, seasonal calendars, etc.);
- Possibility of obtaining a list of all the households in order to carry out a well-being ranking.

In addition to household-level work in the selected barrio, researchers also spoke to people from elsewhere in the community as key informants on particular aspects of NTFP collection, processing or trade.

3.2.4 Selection of focal groups for participatory research

All partners were required to hold a community-level meeting to inform the population about the research and obtain their written consent. In addition partners were provided with guidelines (Schreckenberg and Marshall, 2001) suggesting how they should obtain community-level data through a combination of secondary data and primary research with groups (using participatory techniques) and individual key informants. Given the different levels of experience the NGO partners already had in 'their' communities, we did not insist on a certain set of methods. Some NGOs had, for example, already carried out well-being ranking exercises and some had also carried out mapping, seasonal calendars, etc. It was up to the NGO to determine whether they could complete the community reports based on existing (mostly participatory) research or whether they needed to carry out supplementary group work. For further group work, we suggested that:

- Group size be restricted to 4-8 people to facilitate interaction;
- Women should be fairly represented or, if appropriate, separate women-only sessions should be organized;

- The same people did not need to be involved in all the exercises, but all participants should understand the overall process they are part of (i.e. be invited to the introductory and feedback meetings);
- An effort should be made to ensure that the groups were fairly randomly selected from the whole *barrio* or community. Names of participants in group exercises should be recorded;
- If, during the process of the research, certain people had still not been involved in group exercises, an attempt should be made to meet them or invite them specifically to take part in a particular activity.

3.2.5 Selection of interviewees for household questionnaires within the community
From a descriptive point of view, we were interested in understanding how the 'average' person acts and why. However, we were also interested in finding out why some people were doing better than others. For this we needed to include 'extremes'. From an analytical point of view, the more variation the better. For instance, if one trader was monopolizing trade in an NTFP, we would certainly want to interview this person.

While we wanted to have a reasonable number of households in order to have confidence in the research results, our main concern was to avoid sample selection bias, i.e. interviewing only the poorer (or female) traders, or those closest to a forest. Where we had a choice of people to interview, therefore, we were more concerned with who we interviewed than the final number. Ideally we wanted as many households as possible with as many different characteristics (e.g. poor and rich, with and without access to credit and transport, etc.) as possible.

A well-being ranking exercise was carried out in each community. In addition to providing the means for exploring the concepts of well-being and how these might be related to NTFP trade, the resultant grouping of households into 4 or 5 well-being categories enabled us to ensure that interviewees were selected across the well-being spectrum (as described by Booth, 2001). It is important to note, however, that "findings from well-being rankings conducted in different communities do not facilitate interpersonal comparisons because there is no common well-being referent across the domain of the comparison. As a consequence, aggregating results from well-being rankings to arrive at an average across communities of 'poor' or 'worse-off' persons is misleading, …" (Shaffer 2001). To get around the problem of not being able to compare well-being groups from different communities, we included some questions in the questionnaire relating to a household's perception of its relative success.

In addition to well-being groups, community members could be differentiated according to which aspects of NTFP commercialization they were involved in (i.e. collectors from the wild, producers of the cultivated plant, processors, traders).

For the 'NTFP' group, we wanted the sample to be as representative of both NTFP activities and well-being groups as possible, i.e. we had a 2-way matrix of well-being and type of NTFP involvement. This could be slightly complicated where people were involved in more than one aspect of the NTFP, leading to a sampling frame as shown in Table 2

Table 2. Possible sampling frame for selection of NTFP and control groups in communities

		People not involved in any NTFP activity	People involved in NTFP activity				
			Wild collection and sale	Wild collection, production and sale	Production and sale	Wild collection, processing and sale	*Etc, columns added for all existing combinations*
Well-being category	1 Highest						
	2						
	3						
	4						
	5 Lowest						

To increase the confidence in our conclusions, we aimed to interview 2-5 households in each relevant 'cell' of the matrix. Where there were just a few specialists in one particular aspect of the trade, we aimed to talk to all of them. Overall, our aim was to interview around 25 NTFP households in each community.

For the control group, we had to decide between spreading the sample across all classes in order to determine whether NTFP households were more or less poor than the average. However, as this information was already available through the well-being ranking and we also wanted to look at behavioural issues, it was more important to have a matching control in all aspects except the NTFP activity (i.e. if NTFP people were all clustered in the 2nd well-being group, then the control should be similarly clustered). We also made a special effort to include people who had ceased involvement in NTFP activities, particularly in those communities in which only a small number of people were actively engaged in the NTFP of interest.

Table 3 provides a summary of the number of questionnaires carried out in each country and by NTFP activity. Details for each community are provided in te Velde (2005).

Table 3. Number of household questionnaires by country and NTFP activity.

	Involved in NTFP activities		Controls		Total
	Households	Traders	Households	Traders	
Bolivia	142	25	46	25	238
Mexico	147	21	45	1	214
Total	289	46	91	26	452

3.2.6 Selection of interviewees for household questionnaires outside the community

In addition to people within the communities, we were interested in following the commercialization chain out of the community and all the way to the consumer (or last point of national exchange for internationally traded products). Data from traders outside the community were particularly important for answering hypotheses 5 and 6, which are concerned with describing the market structure for the different products and analysing how different structures affect different groups of people. Although we were predominantly dealing with traders here, some also engaged in processing. The questionnaires in appendices 5 and 6 were designed to capture the same kind of information from these non-community members as from those within the community.

Based on the initial market reports, it became clear that the numbers of people involved in the marketing chain were very limited – often only two or three people at any one 'stage' in the marketing chain. Partners therefore tried to interview all traders along the chain, with one interviewee providing information about where the next one could be contacted and so on. Given that the numbers were so small, less emphasis was put on trying to identify suitable

'control' interviewees. Nevertheless, several non-NTFP traders were interviewed particularly if they had ceased NTFP trade in order to understand the reasons for their decisions.

3.3 Development and management of the database

A database was developed in Access 2000 to hold all the information from the questionnaire survey. The data entry windows mirror the structure of the questionnaires exactly, providing drop-down boxes for pre-defined categories, as well as larger boxes for entering the answers to open-ended questions. The aim was to include all the information from the paper forms in the database.

The database together with a user's manual was designed by one of the partners in Bolivia in close discussion with the UK-based research team. In its final stages, two of the Mexican partners were also involved in trialling it. There was a debate about how best to carry out data entry. In retrospect, data entry would probably have been more consistent if it had been carried out by a single person. However, in the interests of partner capacity-building and data ownership, it was decided to let partners enter their own set of data, thus providing each partner with a complete database for 'their' products and communities. The separate databases were then merged to provide an overall project database. The empty database shell is available on the CEPFOR CD-ROM. With a view to protecting the anonymity of interviewees, and because a great deal of data cleaning had to take place before analysis, the questionnaire data are not provided in their raw form[2].

Ensuring data quality

Data collection. All partners were closely involved in developing the questionnaires and several were involved in trialling different versions. Elaine Marshall had the opportunity to collect data in the field with each of the partners thus ensuring standardized application of the questionnaires (and understanding of terms) across all partners. The intention was that partners would apply the questionnaires during the period August-October 2002 and send a set of copies of their paper questionnaires to UNEP-WCM at the end of each month during this period for spot-checking by Elaine Marshall at the same time as data entry was being checked (see next point). In the first month, 10-20% of forms were to be checked (depending on reliability of the partner concerned), decreasing to 5-10% in the following months (again depending on the level of errors encountered). In practice, the application of the questionnaires was spread over a much longer period and none of the partners sent in copies of their paper questionnaires in spite of multiple reminders (they were later collected in person but at this point the time for spot-checking had passed). The unfortunate consequence of this lack of spot-checking was that several differences in understanding of key terms did arise between partners. Most importantly, different interviewers interpreted the concept of 'total household income' in different ways, some including the value of subsistence production (as we had specified) and others only considering cash income. This critical factor only came to light during the preliminary data analysis. At this point it was possible to determine with each interviewer which definition they had used and to work around this, but some comparisons between products could simply not be made.

Data entry. All partners received a user's manual. Partners in Bolivia received training in data entry from the database designer, while those in Mexico received it from Elaine Marshall. One of the collaborators was appointed to act as a quality controller for all the data entry in Mexico. It had been intended that Elaine Marshall would combine her monthly spot-checking of the questionnaire forms with a check of how the forms had been entered but the lack of spot-checking (see above) rendered this impossible. The failure to check data entry meant that some problems with the database itself did not become apparent until fairly late in the process (e.g. that there was no space for qualitative comments to be entered, that some drop-downs were open-ended when they should have had a fixed set of options (or vice-versa) and that some questions did not specify the units to be used (e.g. currency, time,

[2] Some of the primary data are provided in spreadsheets associated with the value chain analysis report by Rushton et al. (2004). Any reader wishing to access the full set of raw data should contact the principal authors.

weight)). Some of these problems were rectified early enough so that only some re-entry was required. In other cases, it was necessary to carry out a great deal of data-cleaning during the analysis stage (see later).

3.4 Analytical frameworks

As outlined above, we had three principal data collection tools: Community reports (CR); Market reports (MR); Questionnaires (Q). The information from these three data sources was analysed in a number of ways described in more detail below:

1. Text analysis
2. Tables, Graphs and Summary statistics
3. Regression
4. Value chain analysis
5. Bayesian Belief Networks

As the different types of analysis were carried out by different people, the project team began by creating a table (see Annex 2) which highlighted the most relevant sources of data and types of analysis for each of the research sub-questions. Most sub-questions could be answered by using more than one analytical tool allowing for some triangulation. Inevitably there were also some questions for which the data requirements were not sufficiently met to carry out the intended analyses (or the analyses had to be limited to a subset of products or communities).

Two issues that needed to be dealt with by all analysts were to determine what constituted 'success' and what kind of 'changes' in commercialization had been observed. These are discussed below.

3.4.1 Defining successful commercialization

Past NTFP research has tended to define successful commercialization in terms of the levels of household income generated by a product. A desire to gain a more differentiated understanding of what constituted success was a prime motivator for this project.

Successful commercialization can be defined in different ways at different levels:

- Product level – NTFPs, particularly those traded internationally, are well-known for their 'boom and bust' market characteristics. 'Busts' can come about due to changes in fashion and substitution by alternative products. Typical examples are wild rubber and vegetable ivory (tagua), both of which have gone through dramatic declines though a small niche market recovery is now underway. Other products appear to have a more promising future. Assessment at this level drew on the market reports and secondary data.
- Community level – Certain communities are more successful at commercializing a particular product than others. 'Success' at this level can be defined in many ways (e.g. proportion of the population involved, proportion of the community income derived from the NTFP, degree of control over the product, etc.). A list of possible definitions was identified by participants at the project's two inception workshops (Marshall *et al.*, 2003).
- Household level – Just as at community level, there are a number of different ways in which household level success could be defined. Regardless of the definition used, we must bear in mind that *sustainable* success at individual level should make reference to product and community level. Taking into account the literature focus on income success, the list of definitions identified by partners (Marshall *et al.*, 2003), and considering they type of data that might be obtained at household level, the questionnaires were designed to gather data enabling us to look at several different definitions of success (Box 1).

Box 1 Definitions of success at household level elicited from the questionnaire

Success at household/trader level can be defined in quantitative terms as:

→ Level of income for those involved in NTFP activity
→ Share of income derived from NTFP
→ Labour returns (= total sales / hours to collect * frequency of such trips)
→ Profit margins at each stage (total revenues minus total costs at each stage)

Success can also be a matter of qualitative perception:
→ How important have NTFPs been in your livelihood strategy?
→ How successful do you regard yourself (ability to meet basic needs)?
→ How successful do you consider yourself in relation to your peers?

In addition to using measures of success identified within the project, we also applied a set of 'livelihood indicators' developed by CIFOR (http://www.cifor.org) as part of their project 'Assessment of the Potential for Non-Timber Forest Products Based Development'. The approach focuses on assessing the impacts of NTFP commercialization on people's livelihoods considered at three scales: household, community and national. Impacts are considered on a range of assets that are grouped into five types of capital: natural, physical, environmental, human and social. CIFOR developed a range of indicators according to this framework, which were applied in our case using the expert judgement of researchers familiar with each product and community. Our interest in using the CIFOR indicators was both to assess the usefulness of this approach and to enable us to compare our results (and share data) with the CIFOR project. Some difficulties were encountered in their application. In particular, it was often difficult to attribute changes in a specific livelihood indicator directly to commercialization of an NTFP, rather than other livelihood activities.

For each of the main forms of analysis below, different definitions of success were more or less relevant. The results were brought together within the framework of the BBN (see below).

3.4.2 Assessing the impacts of changes in commercialization

The first four hypotheses all required us to look at the impacts of changes in the commercialization. In two cases, the hypotheses specifically referred to changes in volume. Other types of change were, however, also identified at the interim data analysis workshop in Oaxaca (Guadarrama, 2002) including changes in the value or the quality of the product, changes in resource productivity, and a change in the legal (formal or informal) status of the product. Both the structure of the community report and several of the questions in the questionnaire were designed to elicit information about what kinds of changes had occurred in the past (ten years was taken as the standard reference period) and the impact they had had. We were less concerned with obtaining quantitative measures of change than with getting a qualitative estimate of trends (e.g. of volumes traded and status of the resource) and identifying any sudden (unexpected) changes that might have affected poor and vulnerable households.

3.5 Text analysis – Community reports

3.5.1 Analysis within each community

The community reports were structured in such a way that the final section drew together information relating to the first four research hypotheses. In this section, the NGO partners had an opportunity to analyse the situation in 'their' communities based on the information they had collected through community-level work with key informants and focal groups, as well as from secondary data.

In the UK, Elaine Marshall checked that all sections of the report had been completed and that the conclusions drawn in the final section of each report could be justified on the basis of the preceding text.

As described by Petesch (2001), "Rigorous analysis of qualitative data often requires an iterative drafting process of constantly returning to the data to identify and then cross-check key messages and the most helpful supporting evidence…Moving from the very large qualitative data sets that are generated in the field to a synthetic document requires extensive training in qualitative data analysis and report writing." There are no 'shortcuts' and use of local researchers has been found to produce mixed results as some findings are oversimplified. (Petesch, 2001).

As suggested by Petesch, our community reports went through many cycles of iteration. Interim versions of the community reports were discussed at a full project workshop in April 2002. They served a useful purpose in providing the background information for each NGO to contribute fully to the design of the questionnaires. Furthermore, detailed discussions around each of the hypotheses clarified where information was missing in individual reports allowing authors to return to their communities to update reports in the following months. Further iteration took place by email and at the next full workshop in early 2003. Finally, more rewriting was required as gaps came to light during the cross-community comparison (see below).

3.5.2 Cross-community comparison

While some of the cross-community comparison was carried out at full project workshops (starting in April 2002), this served primarily to highlight areas in which the community reports needed to be improved or the data necessary for responding to the hypotheses had to be collected in other ways (e.g. through the questionnaire). The more systematic cross-community comparison was carried out by Elaine Marshall once all the reports were finalized (Marshall, 2005).

The main aim of this analysis was to highlight any factors influencing success (of different kinds) in NTFP commercialization. It was not intended to obtain a quantitative measure of the relative importance of these factors across all communities. Nevertheless, where simple categorization was possible it was considered useful to describe to what extent particular factors were important in many communities or very rarely.

It was decided to use the hypotheses and sub-questions as the structure for the comparative analysis. Each of the 18 reports was read and all text relating to the six hypotheses was colour-coded (highlighted). Footnotes were added to relate information to specific sub-questions. The footnotes and highlighted text were then transferred to a large spreadsheet organized by community and sub-question. This facilitated identification of commonalities and patterns across the data as well as specific outliers. Some of the factors that were identified as being important in determining success, and that could be easily grouped into categories, were scored for use in the Bayesian Belief Network (see below). Most of the scoring was completed by Elaine Marshall, with reference to the report authors where necessary, and checked by Kate Schreckenberg.

3.6 Text analysis – Market reports

3.6.1 Analysis by product

The initial analysis of the market reports proceeded in much the same way as that of the community reports with a great deal of iteration between the authors and the project team. The interim market reports (each dedicated to just one product) were important in providing NGO partners with sufficient background information to contribute to the drafting of a standardized trader questionnaire that could be applied across all products.

3.6.2 Cross-product comparison

The role of the market reports was to complement (and often provide an explanation for) data collected in the household questionnaires. They were used by Jonathan Rushton in his value chain analysis (see below) as well as by Dirk Willem te Velde to support the statistical and regression analysis (see below). As for the community reports, some of the factors that were identified as being important in determining success, and that could be easily grouped into categories, were scored for use in the Bayesian Belief Network (see below). Most of this scoring was completed by Kate Schreckenberg in discussion with Elaine Marshall and Jonathan Rushton.

3.7 Quantitative description: tables, graphs and summary statistics

Table 3 showed the total number of household questionnaires that were entered into the Access database. Together, these data were presented in the form of tables and graphs with simple summary statistics as comments on various parts of the research hypotheses (te Velde, 2005). Most of this analysis was carried out with the software package Stata.

The use of tables is a simple tool to test hypotheses. For instance, a table can provide means of variables across all households involved in trading a particular product (use the *tabulate* command in STATA). With respect to hypothesis 1 (looking at impacts of commercialization on the poorest), simple charts and tabulations were useful for obtaining associations between average income, access to finance/land, gender, on the one hand and the share of NTFP activities in total income on the other hand. It was also possible to test for differences in mean amongst groups, for instance to test whether the mean income differed by type of NTFP activity (production, collecting, processing, trade) carried out. For this we used the *oneway* command in STATA, and the p-value for the F-test indicated whether there was more variation in mean income across groups than variation within groups.

3.8 Regression analysis

While tabulations are informative and relatively straightforward to construct, they do not allow for the influence and interdependence of multiple factors or for explaining continuous variables such as the profit measure of success. For this, one can use a statistical modelling procedure which allows the study of the relationship between a key response of interest and one or more explanatory variables. For instance, it can show to what extent a particular selling strategy (e.g. selling at a formal market) or access to finance is associated with being successful in NTFP commercialization.

Modelling involves first defining a dependent variable *y* whose variation is to be explained by one or more explanatory variables. For example, *y* may be a measure of the success of commercialization. This variable can be quantitative (e.g. an interval scale variable such as income, or an ordered index variable). Alternatively, it may be a binary variable. In the former case, the model fitting process, i.e. the estimation of the parameters of the model, can be done using ordinary least squares (OLS). When the response y is binary, a logit estimation is needed or an ordered logit estimation if the dependent variable is discrete but ordered (ranked).

In this project, factors influencing success of commercialization (y) were explored using a logistic regression modelling procedure. For this purpose, we first identified (say N) explanatory variables which could potentially influence y, e.g. characteristics of individuals (such as education and experience; or having contacts beyond community level) and other (source of market information, selling strategies, marketing conditions etc.). Some of these were determined from the NTFP literature while others were identified during the analysis of the community and market reports and in discussion with partners during project workshops. These explanatory variables included both quantitative and categorical variables.

Where each variable was measured for a number of individuals, we could use regression analysis to assess the significance of each of these variables in determining success.

In theory it would have been possible to use information from at least two dimensions: communities and products but in practice we used only product information because this was closely linked to the community (and hence it would have been difficult to identify separate effects). More background to regression modeling and the results of the range of analyses undertaken are provided in te Velde (2005).

3.9 Value chain analysis

Based on the data collected from the cost sections of the questionnaire supplemented by the descriptions in the market reports and the community reports, as well as further interviews with the report authors, Jonathan Rushton *et al.* (2004) carried out a value chain analysis for each of the products. This involved the identification and, where possible, the quantification, of:

- The supply chain;
- Commercialization margins;
- Percentage of the end price taken by the different actors in the chain; and
- The profitability of the activity carried out by each actor (including returns to labour).

A complete analysis was carried out for five products for which sufficient data were available and which provided some interesting comparisons between communities (mushrooms, pita, Soyate palm, wild rubber and wild cocoa). Less detailed analyses were carried out for the remaining products. All quantitative analysis was carried out using a spreadsheet model. Although there was no time within the project to carry out any sensitivity analysis, the spreadsheet is available on the CEPFOR CD-ROM and is a tool that could be used:

1. To test "what if" scenarios for price changes; and
2. As a policy tool to examine what is happening when prices change over time and how this links back to smallholder producers.

3.9.1 Supply chains

Supply chains were described for each product in the form of an annotated flow chart showing the types of actors carrying out different functions in different locations. All supply chains are presented in Marshall *et al.* (2006a). The supply chains related to the study communities and did not attempt to identify all the actors in the general supply chain for the products. The analysis also tried to identify which parts of the chain were the most important in terms of the:

1. Number of collector/producers using the different routes within a chain.
2. The volume of product that moves through the different routes of the chain.
3. The monetary value that moves through the different routes of the chain.

A combination of 2 and 3 permitted the calculation of the prices paid per unit, but this information had to be combined with information about product quality as some market routes paid more per unit, but demanded different qualities.

3.9.2 Commercialization margins

Commercialization margins are based on information on the final unit price for a product. The formula for calculating the margin is shown below

$$\text{Commercialization Margin} = \frac{\text{Difference between sale and purchase price of the product}}{\text{Consumer Price}} \times 100$$

The calculation of the margin is difficult for products that are processed or transformed when passing through the supply chain, and also for products which do not have a standard unit of measure throughout the supply chain. Therefore, it was not possible to present this type of analysis for every product.

3.9.3 Proportion of the final price taken by different actors in the chain

Similar to the commercialization margins, the estimation of the proportion of the final price taken by the different actors in the chain requires information on the end price for the product. There are difficulties in calculating these proportions if the product is processed or transformed when passing through the supply chain and if the unit of measure for a product changes.

Neither the commercialization margins nor the proportion of the final price taken by the different actors in the chain take account of the costs of the activities carried out by the different actors in their role in the supply chain. Therefore, where there are significant costs, be they transaction, transport or processing costs, these measures from the marketing chain can give distorted information about the apparent "profitability" of each actor in the chain.

3.9.4 Economic profitability of each actor in the chain

In order to overcome the problems associated with the previous two measures, data on the costs of each actor were combined with the expected annual sales to estimate the economic profitability of the actors in the chain. The analysis structure used was an enterprise budget where costs were split into:

1. Variable costs;
2. Labour costs (this was divided into men, women and children); and
3. Fixed costs (where equipment was used and this equipment had a usable life, straight line depreciation was used to calculate the costs plus an interest cost calculated from the value of the equipment multiplied by the lending interest rate).

Profitability was calculated per activity and per unit of sale in:

- local currency;
- US dollars; and
- PPP (purchasing power parity) dollars – these allow for comparison between countries with different living standards. In 2001, at the time of the field research, a dollar in the United States was worth 150% more in Bolivia and 40% more in Mexico (US$1=PPP$2.5 in Bolivia; US$1=PPP$1.4 in Mexico)

There was much discussion about the difficulties of determining the correct labour rates to form a part of the profitability calculations. This was particularly acute in communities where there were few if any wage-earning opportunities (and hence no generic daily labour rate) and in the case of products where much of the work was done by family labour (often uncosted). In order to address this problem, particularly at the collector/producer level, further calculations were made to estimate the returns per labour day employed. Again these returns were calculated in local currency, US dollars and PPP dollars. Not every product had sufficient data to carry out economic profitability estimates for each actor in each route in the supply chain.

4. SYNTHESIS AND INTEGRATION OF RESULTS

Integration of the different research approaches and analytical tools was a continuous process from the start of the project.

Carvalho and White (1997) discuss three ways of combining the best of qualitative and quantitative approaches:

- **Integrating** the quantitative and qualitative methodologies
- **Examining, explaining, confirming, refuting and/or enriching** information from one approach with that from the other [includes triangulation]; and
- **Merging the findings** from the two approaches into one set of policy recommendations.

4.1 Integrating data collection methodologies

This project managed to achieve a large degree of integration of its qualitative and quantitative methodologies. All of the three main data collection tools (community reports, market reports and questionnaires) provided both qualitative and quantitative information. They were designed by a multidisciplinary team and implemented by NGO partners who came from a range of disciplinary backgrounds.

This approach was not without its challenges. While some of these related to theoretical differences between disciplines, some of the most difficult to manage were actually logistical in nature (see Schreckenberg *et al.*, 2005):

- *Timing of methods.* Our questionnaire could only be developed once the draft community and market reports were ready. It was then developed in a very participatory manner over the course of several project workshops. By the time it had been completed, tested and revised, the pressure to implement it quickly was very great if the project was to finish on time. Unfortunately, of the ten NTFPs studied, several were highly seasonal and some of the communities were only accessible for part of the year. Implementation of the questionnaire in some communities was therefore substantially delayed with knock-on effects on the timing of data analysis.

- *Meeting all disciplinary needs.* Given that the various data collection tools had to meet the information needs of different specialists, there was a constant danger that they might be 'inflated' beyond what was necessary to answer the six hypotheses. Conversely there was also a danger that certain key questions might be left out. The best way to avoid this was to have frequent meetings for which there was neither enough time nor money. The resulting development by email was often frustrating and could only be carried out with a restricted number of individuals leading to lack of ownership by the broader team.

- *Bringing the team together.* As for many multi-disciplinary projects, our team was often large and had only one full-time researcher (who was also the project manager). When all of a project's researchers are dividing their time between several activities, it is hard enough to schedule fieldwork let alone the cross-disciplinary project meetings that are essential for successful integration of qualitative and quantitative approaches.

- *Working with local NGOs.* Collaboration with NGOs was not only a requirement of the funder but also desirable from the point of view of providing an entry-point into communities, ensuring a more in-depth understanding of the issues, and assuring ownership of the final results. Most of the NGO partners had either a strongly qualitative development focus or a more quantitative conservation focus. While this caused some difficulties with respect to how receptive they were to multidisciplinary approaches, a more fundamental issue was their lack of experience in carrying out rigorous research. It was a constant and finally unresolved problem to ensure that all

NGO partners collected both quantitative and qualitative information in a rigorous and consistent manner.

We took a number of steps to try to ensure a sufficient level of integration. These included:

- Joint development of hypotheses. These were developed by the core project team at an early stage and refined with project partners. Based heavily on the international literature, these turned out to be an excellent way of introducing national partners to this body of theory. More importantly, they were an essential tool for ensuring that different components of the research focused on the same issues and fed into each other's analysis. They were also helpful when we were faced with difficult budget constraints. A detailed quantitative market analysis, for example, was only carried out for those products which appeared to contribute most to the understanding of the project's hypotheses.

- Capacity.building. The project provided a great deal of training to its partners both on specific subjects (e.g. market research workshops) and on general research 'best practice' through workshops, individual visits, email correspondence and mentoring on particular issues. Ongoing capacity-building was vital not just for the field staff but also for the core planning team to ensure that they understood and respected each other's approaches. This was achieved through frequent team meetings and mini seminars by each specialist enabling participants to begin to understand each other's disciplinary languages and appreciate both the potential and the limitations of different analytical approaches.

- Frequent project meetings. It is almost impossible for a project crossing disciplinary, institutional and usually also national boundaries to have too many opportunities to feed ideas from one research team/component to the other(s). As much as Email has revolutionized communications, crossing disciplinary boundaries requires a great deal of trust between collaborators, which can best be fostered through frequent face-to face meetings. In our case, meetings built rapport and enabled all collaborators to question, doubt and explore issues directly with other partners, fuelling learning curves, increasing transparency and reducing any potential confusion, misunderstanding or resentment in achieving joint project goals.

- Frequent project visits. The project manager played an essential role by visiting each of the study sites (some several times) and therefore helping to ensure consistent approaches. It also gave her the ability to evaluate the quality of the data collected at each site.

4.2 Examining, explaining, confirming, refuting and/or enriching information from different sources

As has been described in other sections, much of the qualitative analysis was carried out – at least in a trial manner – during project workshops involving all partners. For some of the quantitative analysis and the cross-community qualitative analysis, it was decided, however, that individual experts had to take on the whole task.

Once most of the data had been collected, an early joint analysis workshop was held to which each analyst brought a summary of key points or some preliminary findings. This was a very important meeting as it:

- Clarified the analytical tools that each analyst intended to use and the extent to which they were dependent on receiving data from another part of the project. Thus the regression analysis needed to have information about important factors to use as explanatory variables from the text analysis of the community reports.
- Identified some problems with the data. Conclusions based on the quantitative data were challenged by the qualitative information, and further inspection revealed an error in the original data.

- Highlighted which of the project's hypotheses and research questions were not being sufficiently tackled by any analysis.

The final analysis gave rise to three major documents on the community reports (Marshall, 2005), value chain analysis (Rushton et al., 2004) and quantitative household and trader analysis (te Velde, 2005). Each of these reports was structured around the six hypotheses and sub-questions. The three reports were read by Kate Schreckenberg and the results combined. This involved:

- Examining for each sub-question whether the results from the different authors complemented, supplemented or contradicted each other.
- Explaining conclusions made by one analyst using information from another. This was particularly true for the quantitative analysis of the household data which sometimes gave rise to conclusions which would have appeared strange had the community reports not provided an explanation. Where there was contradiction, it was sometimes necessary to go back to the original data (i.e. the individual community reports or household questionnaires) to resolve the issue.
- Confirming the conclusions made by one analyst with additional evidence from another. Thus the community reports tend to reflect the stated preference for the community as a whole (e.g. of which factors are important in determining success), whereas the quantitative description using tabulation and regression analysis can determine the revealed preference on the basis of household level data.
- Refuting conclusions made by different analysts. In practice the main issue that caused problems was the differing definition of household incomes used by different interviewers. Unless supporting evidence was available from another source, it was therefore decided to ignore any conclusions that depended solely on comparisons of income between different communities (unless the interviewers in the communities in question were known to have used the same definitions).
- Enriching individual conclusions by providing supporting evidence from other parts of the analysis (sometimes the relevant information was located under different sub-questions in the different reports. Where only one author had an interesting point to make, checking to see if further information might be available for analysis by the other authors.

5. OUTPUTS

The project will deliver the following outputs:

(i) a short book presenting a summary of the research project's outputs and findings, published in both English and Spanish and accompanied by a CD-ROM;
(ii) an electronic decision-support tool (DST) an Expert System developed through Bayesian Belief Networks, for use by decision-makers to evaluate the potential for successful NTFP commercialisation, and disseminated on the CD-ROM;
(iii) a methods manual for data collection and analysis, developed and tested with research project partners, for use separately or in conjunction with the DST.

5.1 Output 1: A short book presenting a summary of the research project's outputs and findings, published in both English and Spanish and accompanied by a CD-ROM

A book (Marshall *et al.*, 2006a) was written to present the project's combined results in a thematic manner. It was structured to provide an overview of the project's research objectives and methods, followed by a brief review of each product case study and a number of chapters dealing with the results relating to each of the project's research hypotheses. A final chapter made recommendations for policy interventions that could improve the success of NTFP commercialization under specified conditions. As outlined above, the analysis presented in the book drew on and integrated the separate analyses carried out by Marshall (2005), Rushton *et al.* (2004) and te Velde (2005) using the project's six research hypotheses as an organizing framework. See Table 4 for a summary of the key findings.

Table 4. A summary of the key research findings from CEPFOR, structured around a key research question of defining success, and the research hypotheses (from Marshall, Schreckenberg and Newton, 2006)

Successful commercialization means different things to different people. Success cannot be summarized by a single variable, and community perceptions of success need to be assessed and incorporated in project planning and evaluation.	Key findings include: • There is a need to engage directly with communities and other stakeholders in the NTFP value chain, to jointly identify criteria of success and discuss the trade-offs that might be needed between them. • Success should not simply be defined at the product level; success should be defined in relation to the needs of people. • Different actors along a product value chain may have very different perceptions of what constitutes success. • Success can usefully be considered at different levels, including households and the individuals within them, communities, and at district or national level. • At each level there are social, economic and environmental aspects of success. • Definitions of success may be dynamic, changing in response to variations in socio-economic circumstances and the behaviour of the market.
NTFP activities provide an important opportunity for poverty reduction. NTFPs are important in the lives of the rural poor. NTFP income varies greatly even between households engaged in the same activity.	Key findings include that NTFP activities: • contribute between 7% and 95% of a household's annual cash income • regularly provide a safety net for the poor to fall back on when other activities, such as subsistence agriculture or cash crops like coffee, fail to deliver as expected • sometimes provide a stepping stone to a non-poor life, and never lead to an increase in poverty. NTFP activities often involve poor people but may also involve the less poor. • The importance of NTFPs in household livelihood strategies is closely linked to their seasonality and the way they may be combined with other income-generating activities. • The more months a product can be traded, the more favourably households view the activity. Conversely, households involved in seasonal products are more likely to transfer from NTFP activities into other livelihood options, reflecting their desire for a more consistent and year-round source of income.
NTFP activities can provide women with a greater sense of self-confidence and improved status within the household and the community. NTFP activities are one of the few cash-generating opportunities for women in marginalized rural communities.	Key findings include: • Few product value chains involve only women. The involvement of both men and women can make an activity economically viable at household level, because skills and time are shared. • Women are more likely than men to be involved in processing and cultivation activities. • Labour-saving technical innovation can improve the low returns to labour of women's NTFP activities.
Regardless of tenure, in the majority of cases, increased commercialization initially leads to overexploitation of the resource. Tenure influences the variety of community and individual	Key findings include: • In the case of communally owned resources, improved management of the natural resource and better harvesting practices are common. • If land is held privately and the plant can be easily propagated, individuals begin to engage in small-scale domestication.

strategies to ensure NTFP supply is sufficient to meet the demands of increased commercialization.	• There is no evidence that NTFP commercialization reduces access rights to the wild resource for the poor. • Industrial plantations can displace harvesters of the wild resource and small-scale collectors/cultivators.
There is little policy or legislation specific to NTFPs in either Mexico or Bolivia. Improved cross-sectoral coordination would help ensure that poor producers, processors and traders are better placed to meet the legislative and institutional requirements for successful NTFP commercialization.	Key findings include: • Communities are often obliged to trade NTFPs in the informal sector because they lack the capacity to comply with the legal requirements for formal-sector commercialization. • NGO involvement can be important, but currently most NGO support is provided through donor-funded projects, which are rarely coordinated with government programmes. • National policy interest in NTFP commercialization is justified on the basis of its contribution to national economic development, local livelihoods and conservation. • All the products studied could benefit from being marketed as speciality (e.g. organic or community-traded) products. However, certification costs could place trading beyond the reach of small-scale producers.
NTFP value chains are highly dynamic. Producers, processors and traders show a remarkable degree of resilience to external shocks and a great ability to adapt to changing contexts. Regardless of the governance of a value chain, the ability to negotiate prices and define the rules of trade is vital in determining the satisfaction levels of poor producers, processors and traders in NTFP value chains.	Key findings include: • Innovation, both in terms of resource management and product processing and marketing, is often critical to maintaining market share. • A specialized market niche and product quality can help protect against substitution. • Most NTFP value chains are demand driven, and establishing a new NTFP value chain solely on the basis of existing supply is unlikely to succeed. • The viability of a particular NTFP value chain may also depend on demand for another product. • Entrepreneurs can play a key role in facilitating access to markets by providing information, skills and financial support. • Concentration of power in the hands of a few is most likely in the value chains of highly processed or perishable products for an international market.
Lack of market information is the key barrier into NTFP trade. Information about markets, together with the capacity to act upon it, is an important prerequisite for entering, and maintaining a hold in, new markets.	Key findings include: • A lack of market contacts and knowledge, followed by lack of financial capability and poor infrastructure, consistently constrained poor producers, processors and traders from advancing within NTFP value chains. • The real value of market information lies in ensuring that the commercialization process is equitable, efficient and sustainable. • Good organization of NTFP producers and processors contributes to improved product quality and quantity, more cost-effective transportation and increased negotiating ability. • Access to credit can enable poor people to improve their NTFP-based income generation through increased volume of trading. • General improvements in market, transport and communications infrastructure would facilitate commercialization of many products including NTFPs. • There is no significant difference in formal education between households engaged in NTFP commercialization and those that are not, although NTFP traders often have significantly higher levels of education than producers. • Traditional knowledge can be very important in determining a community's interest and capacity to successfully commercialize an NTFP.

5.2 Output 2: An electronic decision-support tool (DST) an Expert System developed through Bayesian Belief Networks, for use by decision-makers to evaluate the potential for successful NTFP commercialisation, and disseminated on the CD-ROM

Integration of qualitative and quantitative information can usefully be achieved by representing both kinds of variable as probabilities. The CEPFOR study used the development of a probabilistic model as a novel approach to data integration and analysis, and for the development of an analytical framework enabling different case studies to be compared. The model was constructed as a Bayesian belief network or BBN (Neapolitan 1990, Pearl 1988), which enables the probabilistic relationships between variables to be represented and examined graphically. Specifically, the BBN was designed to enable the impact of different factors on the success of NTFP commercialization to be evaluated.

Marshall *et al.* (2003) describe how a Bayesian Belief Network (BBN) was constructed using NETICA software (Norsys 1998) to further explore the results of the project inception workshops relating to definitions of success. To construct a belief network, nodes are used to represent variables. Nodes are connected by directed links, which are indications of conditional dependence, and are related by Bayes theorem that states:

$$p\langle y \mid x \rangle = \frac{p\langle x \mid y \rangle . p\langle y \rangle}{p\langle x \rangle}$$

where y and x take the values of the possible states of the nodes A and B. When networks are compiled, the application of Bayes theorem results in appropriate changes in the probability distribution of linked nodes if further knowledge is acquired. After the inception workshops, two BBNs were constructed (using data from the case studies profiled at the Mexican and Bolivian workshops respectively) by considering the factors that influenced the probability of each process in the commercialization of an NTFP (i.e. production, transport, storage, processing, marketing, sale) being undertaken successfully as separate nodes in the network. The overall success of NTFP commercialization was then considered as a node to which all of the processes were linked. In this way, the overall probability of success could be predicted as a function of the probability of each process being performed successfully. Each of the factors was weighted equally in terms of its impact on a given process. The two BBNs provided very similar results.

During the course of the research, it became clear that the factors that affect the success of the different processes that make up the overall activity of NTFP commercialization are not sufficiently distinct or unique to make this a useful basis for the final analysis. Taking into consideration the project's particular interest in the impact of NTFP commercialization on livelihoods, it was therefore decided to use the sustainable livelihoods framework as an organizing structure for a new BBN drawing on all the project data. Newton *et al.* (submitted) describe how the BBN was constructed according to a livelihoods framework, which considers the different assets – physical, natural, human, social and financial – that are required for living.

The BBN was based on the concept that the impacts of NTFP commercialization on the different assets required by people to support their livelihoods are influenced by a variety of different factors. These factors include the characteristics of the product to be commercialized, but also include the socio-economic characteristics of the communities involved, and the characteristics of the value chain. A large number of factors could potentially influence the success of NTFP commercialization. The list of factors that could be important varies among products and among the socio-economic circumstances under which commercialization takes place. The research results generated by the CEPFOR project were used to identify a total of 66 factors that were found to be important in the case studies

examined. Each of these factors was then scored by the project team, to indicate the relative influence of the factor on each of the case studies considered by the project.

The BBN was validated by independently assessing the impact of NTFP commercialization on livelihoods using the CIFOR scoring approach described in section 4.1.1. Further details of how the BBN was developed, tested and deployed are provided on the accompanying CD-ROM (Newton, 2006).

An electronic decision support tool was constructed based on the BBN, to enable NTFPs with high potential for commercialization to be identified, and to help determine how successful commercialization might be achieved in practice. The CEPFOR Decision Support Tool and an accompanying User Guide (Newton *et al.*, 2006) are both available on the CEPFOR CD-ROM.

5.3 Output 3: A methods manual for data collection and analysis, developed and tested with research project partners, for use separately or in conjunction with the DST.

The manual draws on the experience of the project 'Commercialization of Non-timber Forest Products (NTFPs) in Mexico and Bolivia: Factors Influencing Success' (CEPFOR), a multidisciplinary research initiative involving partners drawn from the UK, Mexico and Bolivia. The research methodologies developed by the CEPFOR team are documented briefly in the publication Marshall, Schreckenberg and Newton (2006), namely, outlining the way in which the project collected, analysed and integrated different types of data. In developing a research methodology, the project had three objectives, namely to:

- combine qualitative and quantitative information;
- undertake joint research with NGO partners;
- carry out participatory research in communities.

Some of the research methods were specific to a large-scale research project undertaking comparative analysis between communities in different countries. For example the CEPFOR approach includes household surveys, which are not detailed in this manual. The tools selected for the manual are felt to be most appropriate and useful to organisations working at community level, and for understanding the opportunities and constraints of NTFP commercialization. The manual draws on lessons learnt from the implementation in the field of the different data collection and analysis methods described. It also draws on the development of the CEPFOR decision support tool (CDST), an analytical framework that presents the factors identified by the project as determining successful NTFP commercialization (see Annex 3 for factors list). The CDST allows users to: compare the potential success of different NTFP development options; the opportunities & constraints of current NTFP initiatives; and to explore the potential livelihood impacts of different policy options. The current manual provides the methods to help the user of the CDST investigate and consider some of the factors - often presented as questions - which influence success. Information can be directly input into the CDST, facilitating further impacts and outcomes of NTFP commercialization to be explored (see CDST user manual on CD-ROM). In this way the manual complements and supports the use of CDST.

Finally, although the overarching concept of the manual and CDST is to highlight where the potential for successful NTFP commercialization may lie and where external support may be required through information generation, neither tools, used separately or in conjunction, assist the user in making value judgements. In exploring NTFP commercialization, it may be necessary to make trade offs between environmental, social and economic objectives, for example, natural resource use versus financial gain.

The manual is designed to be of use to organizations that are currently supporting community based NTFP commercialization, or are intending to provide support to communities who want to develop commercialization of NTFPs. Possible users may include:

- Government organizations
- NGOs
- Civil society organizations
- Research groups
- Community based organizations
- Private sector organizations
-

It is not envisaged that any particular training be required prior to using the manual. A basic understanding of, and familiarization with, some widely used participatory research tools and basic interview and observation techniques will be useful. The manual presents some key, locally adaptable methods. One of the most important criteria for successful research with communities is to have an established trust based relationship, often a product of prolonged interaction between the researcher and the case study community. A transparent explanation of the research aims, objectives and outputs is an integral component of participatory research approaches.

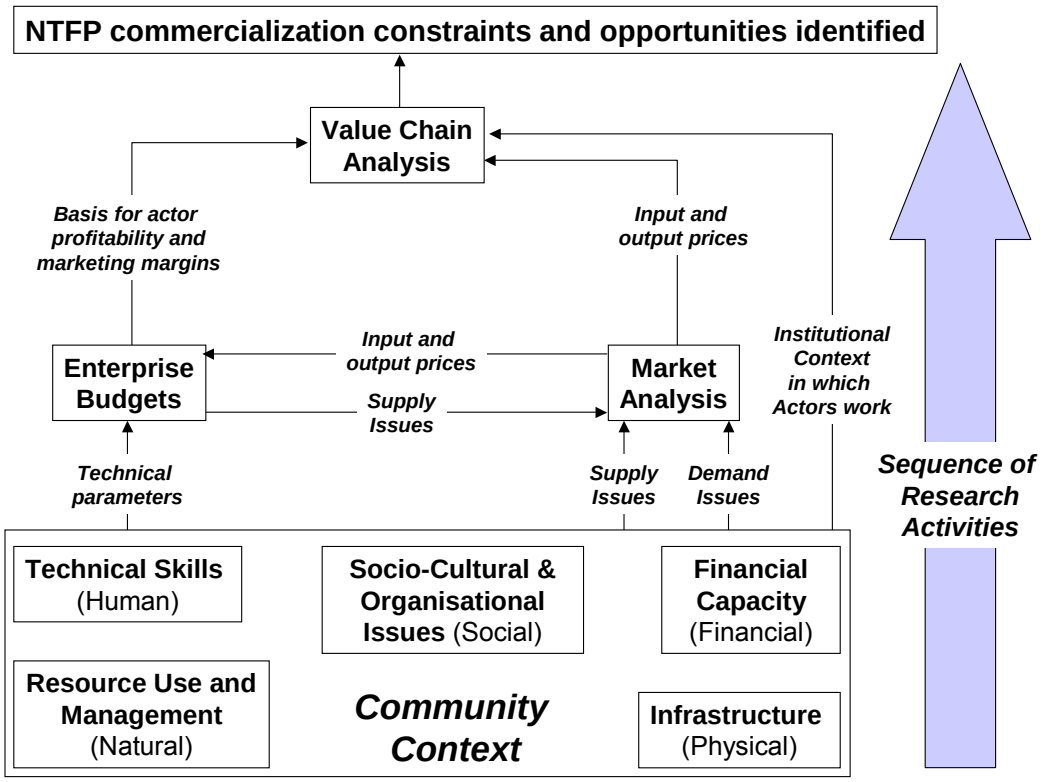
It is intended that the methods described in the manual generate information that can be used to help identify opportunities and obstacles to NTFP commercialization at community level, and along the marketing chain. The overall aim of the tool is to provide information to guide external interventions and support communities in their decision-making concerning NTFP commercialization.

The manual presents a range of different research tools, each of which gives rise to different sets of information. How they fit together and build on each other is shown in the conceptual framework presented in Figure 1. First of all, participatory analysis at community level can be used to understand technical capacity, resource use and management, community organization and socio-cultural issues. This set of information is sufficient to allow for a rough prioritization of NTFPs with potential for further development. Decisions can be further refined by developing an enterprise budget based on technical parameters from the data set, and carrying out a market analysis using information on supply and demand data, trends and cultural preferences. The value chain analysis in turn requires information generated from the enterprise budgets and market analysis, in addition to information on the institutional context in which people involved in the chain are found. The manual, therefore, provides a holistic framework that includes technical, ecological, cultural, social and economic data and analyses, and provides a powerful base to examine present commercialization networks in order to highlight both opportunities and constraints that need to be addressed.

The manual has six main chapters:

- Theoretical background
- Management of data collection and analysis
- Participatory research at community level
- Developing and analysing enterprise budgets
- Analysing markets and market trends
- Value chain analysis

Figure 1. Conceptual framework showing the relationship between different data collection and analysis tools required in identifying constraints and opportunities for NTFP commercialization.



6. CONTRIBUTION OF OUTPUTS

The project's outputs contribute to the to DFID's developmental goals, in the fields of policy and socio-economic development in the following ways:

1) There existed a lack of understanding of factors influencing success at various stages of the commercialization chain for small-scale producers, processors and traders. This project has defined success at different levels and for different people, and with clear definitions and information to develop indicators, it is possible to monitor and evaluate impact, overcome constraints, and focus future research and development efforts efficiently.

2) This project contributed to enhanced sustainable livelihoods of marginalised communities, through increased understanding of how different NTFP commercialization strategies impact on poverty alleviation, women's livelihoods, resource overexploitation, and access rights – and as such, helping to empower rural forest dependant communities and inform decision makers where and how best to financially support NTFP based development initiatives.

3) This research has provided information and tools to support the decisions being made by a wide range of stakeholders, including not only the local communities considering investing in the establishment of a commercial enterprise, but also the development and conservation agencies, government agencies and NGOs that work with them, and the private sector institutions involved in trading and marketing forest products. Previous research suggested that the main constraints to successful NTFP development were related to limited access to the 5 capital assets, around which DFID's livelihoods framework is structured, by small-scale poor farmers and landless poor families (especially women):
    - natural: secure tenure or usufruct rights over land and resources (Gray, 1992; Richards, 1993; Ruiz-Perez and Byron, 1999);
    - human: labour constraints (especially time spent away from home by women), awareness of the commercialisation potential of some products, knowledge about processing and storage, and market information and marketing know-how (Southeimer, 1991; Falconer, 1997; Tommich, 1998; Banana, 1998);
    - financial: to invest in improved physical capital (FAO, 1991; Very and Reindeers, 1998; ILO, 1995);
    - physical: market access (especially transport), inputs for new processing/ storage techniques (Dixon, 1991; Clay, 1992; Paddock, 1992, Falconer, 1997; Fontana, 1998; van Dick, 1998; Tommich, 1998);
    - social: negotiating power (especially for female producers with respect to male market intermediaries), and willingness to collaborate in order to secure improved marketing outcomes (Marshall and Newton, 2000);

The Decision Support Tool (DST), is structured around DFID's Rural Livelihoods Framework, and enables the potential impact of NTFP commercialization - on a wide variety of different measures including resource conservation and community development - to be predicted. A more holistic understanding of the different combinations of factors determining success *can* result in more efficient investment of financial, technical and political support. Use of such tools to inform decision-making should assist in increasing the value of forests through sustainable development of NTFP resources, while reducing the risk of failure for poor producers, processors and traders, resulting from inappropriate interventions.

4) In addition, the authors have identified potential contributions to the United Nations Millennium Development Goals, that NTFP commercialization can make:

Millennium Development Goal	**Contribution of NTFP commercialization**
Goal 1. Eradicate extreme poverty and hunger	NTFP subsistence activities can directly reduce hunger, while NTFP commercialization activities contribute to household incomes, thus enabling families to buy food and, in a few cases, save enough to engage in other activities that will enable them to escape poverty outright.
Goal 2. Achieve universal primary education	The timing of much NTFP income is critical for enabling households to pay for school fees and books.
Goal 3. Promote gender equality and empower women.	Those activities that involve women play an important role in raising their status within their households and communities by providing them with an independent source of income.
Goal 4. Reduce child mortality	The impact of NTFP commercialization on Goals 4, 5 and 6 is likely to be indirect. In the case of Goals 4 and 5, the accrual of income to women from NTFP commercialization can lead to a higher level of expenditure on children's and women's health. Organization into groups gives women the opportunity to share experiences in the area of health and, in some cases, provides access to minor credits that can help women maintain their own and their children's health.
Goal 5. Improve maternal health	
Goal 6. Combat HIV/Aids, malaria and other diseases	
Goal 7. Ensure environmental sustainability	Under certain circumstances, NTFP harvesting can lead to improved management of the natural resource and/or small-scale domestication. If well managed, both of these can decrease overexploitation of the specific resource and possibly reduce forest degradation.
Goal 8. Develop a global partnership for development	The impacts of NTFP commercialization on this goal are marginal. However, global NTFP commercialization can benefit from the development of an open, rule-based predictable and non-discriminatory trading and financial system (Target 12). Expansion of NTFP commercialization activities with greater recognition of the environmental services rendered could provide decent employment for young people in rural areas (Target 16).

The following actions and research are required to maximise the development benefit of the project findings:

1) Continued dissemination of the book and CD-ROM contents across Mexico, Bolivia and Central America (including participation by the Project Coordinator in a workshop organised by FAO – CATIE, titled "*Small and medium forest enterprise development for poverty reduction: Opportunities and challenges in globalizing markets*, to be held in Costa Rica in May 2006).

2) Interventions which the project identified to support successful NTFP commercialization

1. Government interventions at the national level

1. Policies	• Macro-level policies affecting input cost and output prices • Stimulation of demand for some products through trade policies affecting competitive imports • Rural livelihood support policies focused across several sectors • NTFP subsector-specific policies (special trade promotion, branding, food standards, support for SPS trade requirements) • Support to intermediaries, both entrepreneurs and NGOs • Natural resource use and conservation policies
2. Public investments	• Rural infrastructure (roads, electricity, communications) • Rural markets • Education

2. Direct assistance to communities by governments, NGOs or the private sector

Community organization	• Promote organization at producer and processor levels • Build on existing community organizations • Facilitate links between actors in the value chain
Support to women	• Focus activities close to home and/or help to overcome constraints imposed by traditional domestic role
Support to entrepreneurs	• Basic business development skills
Market information	• Provide information and training/support to use it to community's advantage
Resource management	• Technical and organizational know-how for resource management • Support to fulfil regulatory requirements

7. DISSEMINATION OF KEY OUTPUTS.

KEY CEPFOR final project outputs	Author	Language
Commercialization of non-timber forest products in Mexico and Bolivia: factors influencing success. Research Conclusions and Policy Recommendations for Decision-makers	Marshall, E., Schreckenberg, K. and Newton A.C. (eds) 2006	English and Spanish
CDST: CEPFOR decision support tool and user guide	Newton, A.C. et al.	CDST English & user guide English and Spanish
Methods Manual: practical tools for assessing successful NTFP commercialization	Schreckenberg, K., Marshall, E., Rushton, J., Edouard, F., Arancibia, E.	Spanish and English
Journal publications		
Entrepreneurship in value chains of non-timber forest products. *J. of Forest Policy and Economics*. Forthcoming.	Te Velde, D.W., Rushton, J., Schreckenberg, K., Marshall, E., Edouard, F., Newton, A.C., and Arancibia, E. 2005	English
Commercialising non-timber forest products: first steps in analysing the factors influencing success. *International Forestry Review* 5(2): 128-137.	Marshall, E., Newton, A.C. and Schreckenberg, K. 2003	English
Use of a Bayesian Belief Network to predict the impacts of commercializing non-timber forest products on livelihoods.(*In press*)	Newton, A.C. et al (2006)	English
Poster presentation		
XXII IUFRO World Congress. Informing decision-making for successful NTFP commercialization: research findings & policy implications from Mexican and Bolivian case studies.	Marshall, E., Newton, A.C. and Schreckenberg, K. 2005	English
CEPFOR data analysis reports:		
Policy papers x2		
Value chains for a range of non-timber forest products in Bolivia and Mexico. With additional data sheets	Rushton, J., Pérez, L. and Viscarra, C. 2004	English
Successful NTFP commercialization. A quantitative analysis based on household and trader level data With additional data spreadsheets	Te Velde, D.W. 2005	English
Analysis of case study communities from community level reports written by research partners in Bolivia and Mexico. With additional data sheets	Marshall, E. 2005	English
BBN report & AN data sheets		
Different definitions of successful NTFP commercialization obtained by the CEPFOR project	CEPFOR 2005	
Internal Project reports - MARKET:		Spanish
Organic cocoa	Florencio Maldonado	
Natural rubber	Isidro Rodriguez	
Incense and copal	Cesar Enqrique	
Jipi japa palm.	Fausto Lopez	
Soyate palm	Grupo de Estudios Ambientales	
Maguey/mezcal	Grupo de Estudios Ambientales	
Wild mushrooms	Fabrice Edouard	
Pita fibre	Fabrice Edouard	
Camedora palm	Janette de los Santos, Jorge López, Álvaro González.	

Tepejilote palm	Juan Carlos Flores	
Internal project reports - Community:		
Organic cocoa: Carmen del Emero; San Silvestre	Florencio Maldonado	
Natural rubber: Santa Rosa de Challana; Tomachi	Isidro Rodriguez	
Incense and Copal: Pucasucho	Cesar Enqrique	
Jipi japa palm: Carmen Surutú; Candelaria; Potrero San Rafael	Fausto Lopez	
Soyate palm: La Esperanza; Topiltepec	Grupo de Estudios Ambientales	
Maguey/mezcal: La Esperanza	Grupo de Estudios Ambientales	
Wild mushrooms: San Antonio Cuajimoloyas; Santa Martha Latuvi	Fabrice Edouard	
Pita fibre: Arroyo Blanco; Agua Pescadito	Fabrice Edouard	
Camedora palm: Monte Tinta	Janette de los Santos, Jorge López, Álvaro González.	
Tepejilote palm: Santa Cruz Yagavila; San Miguel Tiltepec	Juan Carlos Flores	
Policy papers:		
Institutional framework, Norms and Policies for the Management and Commercialization of non-timber forest products.	Esteban García Peña, 2002	
Legal Framework and relevant policies for the Domestic Commercialization and Export of NTFPs in Bolivia.	Alan Bojanic, 2002.	Spanish
Policy briefing paper: Mexico A policy briefing for the government forest departments in Mexico: The challenges facing small-scale producers in NTFP commercialization.		
Policy briefing paper: Bolivia Promoting the benefits of Non-Timber Forest Product commercialization for the forest-based poor in Bolivia		
Data collection tools:		
Methodological guidelines		English
Detailed community report structure		English
Marketing methodology		English and Spanish
Questionnaires: Community Community Control Trader Trader Control		Spanish
Database shell in MS Access		

Additional Dissemination of Results – oral presentations:

Oral presentation	Cuzco, Peru. Conservation of Biodiversity in the Andes and the Amazon Basin, linking Science, NGOs & Local Communities 2001: Initial thoughts on successful NTFP commercialization.
Oral presentation	University of Swansea, Institute of Development Studies: Combining qualititative and quantitative methods symposium, 2002. " Trade offs between management costs and research benefits:lessons from the forest and farm.
Oral presentation	CFA and British Council: Promotion of non-timber forest resources in Zambia, 2004. "Sharing lessons learnt from an international NTFP research project".
Oral presentation	ZSL, London, UK, 2004: What can the bushmeat trade learn from the commercialization of plant NTFPs?
Oral presentation	Commonwealth Forestry Association, The Eden Project. "The Latin American Case Study".
Oral presentation	University of Gainesville, Florida, 2005. Working Forests in the Tropica: The Develolpment of a Decision Support Tool for successful NTFP commercialization.
Poster presentation	IUFRO XXII World Congress, Session 115: Building synergies between institutions and conventions dealing with Non-Wood Forest Products, 2005. "Development of a decision-support tool to predict the success of NTFP commercialisation"
Oral presentation	Royal Roads Univeristy, Victoria, BC. Future Beneath the Trees symposium, 2005. "NTFP commercialization in Mexico and Bolivia: innovation and adaptation for success"

Training and data analysis

Workshop	Inception workshops x 2 Mexico & Bolivia
Workshop	Training in market methodology and data collection, Mexico
Workshop	Training in market methodology and data collection, Bolivia
Workshop	Intermediary Analysis workshops 1a Mexico and 1b Bolivia
Workshop	Final Data Analysis in Mexico
Meetings	Core team meetings undertaken calculated at over 60, between November 2000 and November 2005.

Dissemination and launch: also see Annex 1.

Workshop	Workshop and presentation x 2 in Oaxaca, and Mexico City, 2006
Workshop	Workshop and presentation x 2 in La Paz and Santa Cruz, 2006
Workshop	Presentation and book launch, ODI, London. 2006.

Various booklets and articles:

Promotional Flier and Poster	Community fliers for all households involved in the project and posters to all partner organisations
Booklet	Partner produced booklets as feedback on key finding for all case study communities (Bolivia)
Neswspaper articles	ETFRN, FAO Non Wood News, Fair Trade in Wild Natural Resources press launch, UNEP-WCMC articles in Geographical Magazine, NRI "Have you heard?" and "Positive Developments" publication

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ANNEX 1: Promotion and dissemination strategy, for key clients, developed at FRP-IMA training course, Costa Rica, 2004.

Comercialización de Productos Forestales No Maderables en México y Bolivia: Factores que influyen en el Éxito (CEPFOR) DFID FRP R7925/ZF0137

Se Han identificado cuatro grupos clave para la promoción de los resultados de investigación logrados por el proyecto, tanto durante la implementación como al finalizar el mismo.

Estos son tomadores de decisión de alto nivel, incluyendo a donantes, ONGs, investigadores nacionales e internacionales, y finalmente el equipo del proyecto que abarca a personal de 7 instituciones y tres paises .

Donantes bilaterales y autoridades nacionales

1. El lider del proyecto identifico en cada pais a donantes y personal gubernamental relacionado a la tematica, tanto durante las fases de preimplementacion, como en la impleementacion, y se lo mantuvo informado del avance del proyecto
2. Participacion de Los funcionarios gubernamentales en los talleres de arranque del proyecto
3. Se invitaron a autores de documentos que definen el contexto legal relacionado a los PFNM, dentro del sector forestal
4. Participacion de un Asesor del gobierno de Bolivia, en el diseño de la metodologia de investigacion de Mercado y en las reuniones del equipo central de investigación
5. Participacion de funcionarios gubernamentales en el taller de analisis de datos con l todas las contrapartes del proyecto en Mexico
6. Participacion del asesor politico del gobierno de Bolivia en taller de resultados preliminaries con todas las contrapartes
7. Las contrapartes locales de la investigación (ONGs) han mantenido informado a su personal relevante informado sobre el progreso del proyecto
8. Los lideres del proyecto mantuvieron reunions con donantes y tomadores de desiciones en los dos paises, completando una base de datos que contempla: El interes en revisar los materiales finales del proyecto, apoyo en el lanzamiento y diseminación de los mismos y identificando mecanismos para comunicar los resultados a nivel politico, mediante resumenes escritos;
9. Comunicación con la oficina regional de latinoamerica y el caribe de PNUMA para el lanzamiento de los productos finales en mexico, en medio del foro de ministros a realizarse en el segundo semestre del 2005
10. Resúmenes escritos con las conclusiones finales han sido acordados con las contrapartes locales, en ambos países. Estos serán preparados para ambos gobiernos y para una audiencia internacional con interés en la comercialización de los PFNM
11. Una publicacaion final del proyecto y la red bayesiana de analisis, seran incorporados en un CD ROM que sera entregado a tomadores de desicones clave de cada pais)
12. En RU se hara un lanzamiento de los mismos documentos con el fin de promover la publicación y los mensajes politicos de la misma

Organizaciones no gubernamentales y la comunidad investigadora cientifica

1. Las contrapartes fueron involucradas en un acuerdo de enfoque inical en el taller de lanzamiento del proyecto
2. Talleres de inicio del proyecto contaron con la presencia de Contrapartes nacionales, ONGs nacionales e intrenacionales y parte de la comunidad investigativa
3. Un sitio Web del Proyecto fue establecido para comunicar y compiartir los avances y resultados del proyecto
4. Articulos publicados en revistas especializadas
5. Se realizaron prrsentaciones del Proyecto en 5 conferencias internacionales

6. Se circularon actualizaciones via electrónica en ECO-Index, IUFRO y FAO en su seccion de noticias de no maderables)
7. Presentación de posters del proyecto en el congreso mundial forestería
8. Numerosos mails intercambiados y reunions con CIFOR
9. Una publicación final con los resultados y herramientas del proyecto, incluyendo el modelo Bayesiano. Organizaciones gubernamentales y no gubernamentales e investigadores seran invitados al taller de capacitacion para el uso de las herrameintas y resultados del proyecto
10. Lanzamiento en UK para promover la publicacaion y los mensajes politicos)

Las Comunidades de Estudio de Caso:

1. Las contrapartes del proyecto buscaron el permiso formal para emprender la investigación en las comunidades de estudio de caso seleccionadas, y acordaron la participación de los miembros de la comunidad emprendiendo la investigación. El rol de la comunidad en la investigación y los objetivos del proyecto fueron claramente comunicados.
2. Se preparó un afiche a colores y fue distribuido en las casas de los habitantes de las comunidades de estudio de caso.
3. Las contrapartes en cada comunidad agendaron reuniones de retroalimentación luego de la realización de la fase de investigación, incluyendo la preparación y la diseminación de un resumen de bolsillo a través de CARE Bolivia, para las comunidades bolivianas.
4. Participación de las comunidades de estudio de caso representativas en los talleres de entrenamiento final.

El equipo central de la investigación:

1. El equipo central de la investigación (Elaine Marshall, Adrian Newton, Kate Schreckenberg + el staff de ODI) se reunió aproximadamente 30 veces durante los 4 años de vida del proyecto. Adicionalmente, los colaboradores en cada país se reunieron al menos una vez por año con este equipo central, como se detalla más abajo ;
2. Los talleres de inicio del proyecto tanto en México como en Bolivia dieron la oportunidad de ponerse de acuerdo con las contrapartes, comunidades de estudio y productos;
3. El taller de análisis de datos intermedio sostenido en el año 2 del proyecto en México con todos los investigadores del proyecto para evaluar el progreso, poner fechas y acordar la metodología para las siguientes fases;
4. Carteles del proyecto preparados para colaborar a las instituciones;
5. La página web del proyecto tiene un área de seguridad donde cada colaborador posee una clave de acceso a todos los productos internos según fecha;
6. Taller de análisis de datos realizado en Bolivia durante el año 3 del proyecto, con todos los investigadores participantes, para presentar los resultados preliminares e identificar las inconsistencias y los datos gaps;

Taller final: acuerdo de los resultados de investigación y mensajes de política

ANNEX 2: Table of research hypotheses, sub-questions and proposed forms of data analysis

1. Changes in commercialization in NTFPs have a greater impact on the poorest producers[3], processors and traders.	**Data source** [MR= market report CR=Community reports Q= hhd questionnaire]	**Form of analysis**	**Responsibility**
		General comments – household analysis Key variables (source hhd ques) We aim to include significance levels and where possible disaggregate the analysis by stage/community/product	DWtV
1.1 What changes in commercialization have occurred in the last 10 years?	MR2; CR9	Text analysis	EM
1.2 Are the same individuals involved in production (wild collection and cultivation), processing and trade?	Q 1.1; CR7.5, 7.6	Tabulation by products and communities Text analysis	DWtV EM
1.3 What is the level of poverty of those involved in NTFP extraction – is it true that it is the poorest that are most involved, and what share of income do they derive from NTFP trade?	CR 2.4 Q1.3 and 6.1 on income Q6.2 on share of income from NTFP	Text analysis Relating income (and wealth ranks) to NTFP involvement (using tabulations) including stage of involvement. May also be possible to do Chi-Square.	EM DWtV
1.4 Do people engage in NTFP extraction because they are poor or are they poor because they are dependent on extraction for their livelihoods?	Q6.9 - 6.11 on exit from NTFP trade	Model decision to be involved in NTFP (logit regression); need to include control group (non-NTFP traders may have different characteristics from NTFP traders) and determine explanatory variables Determine what type of households want to move out of NTFP trade	DWtV
1.5 Do NTFP extraction activities primarily make up shortfalls in income or do they provide a path to socio-economic advancement? In other words, are they alleviating poverty or just providing a means of survival?	CR7.2; 5.1 Exit questions in Q6	Text analysis Identify products with a Shortfall scenario (i.e. only engage when situation economically bad) and those that are Alleviating poverty (look at whether NTFPs help people to move onto better things)	EM
1.6 Does reliance on NTFPs perpetuate poverty, e.g. by increasing debt?	MR3 & 4 Q3.1, 5.1 CR 8.2	Text analysis, Tabulation of forms of payment: proportion of credit vs cash	EM DWtV

[3] 'Producers' here refers both to people who collect from the wild and those who cultivate the plant.

2. Changes in commercialization of NTFPs have a greater impact on women's livelihoods.	**Data source**	**Form of analysis**	**Responsibility**
		General comments – household analysis Key variables (source hhd ques) We aim to include significance levels and where possible disaggregate the analysis by stage/community/product	DWtV
2.1 To what extent are women involved in harvesting, processing, transport and marketing the NTFP?	CR3.4 and 7.3-7.7 Q1.1 (by gender)	Text analysis Relate income (and wealth ranks) to NTFP involvement by men and women separately (using tabulations). We can distinguish between female only, male only and joint households, and we could examine joint households more closely to see whether females dominate certain stages. Tabulate percentage (type of activity and gender)	EM DWtV
2.2 To what extent do women have control of the income derived from NTFPs, and therefore, to what extent do they benefit from their sale?	CR7.7	Text analysis	EM
2.3 Are women displaced by men when new technologies for NTFP processing are introduced?	CR7.5 and CR 9.4	Text analysis	EM
2.4 Is women's social, political and economic status being helped or harmed by NTFP commercialization?	CR 9.4 Q6.2, 6.3, 6.4 and 6.7 and link to Q1.1	Text analysis. Economic status: Tabulate the percentage of women for whom NTFPs make a contribution to their livelihoods – see also Ho 2.1	EM DWtV

3. Increase in the volume of NTFP commercialization leads to (i) forest overexploitation, (ii) domestication and/or (iii) management strategies for the wild resource.	**Data source**	**Form of analysis (Note: Undertake an analysis for each product separately)**	**Responsibility**
3.1 Is there any evidence of an increase in the volume of NTFP trade in the last 10 years: overall & for the community? And if so, why?	MR4; CR9.1	Text analysis	EM
3.2 Is there evidence of resource depletion? What are social, economic or biological causes of any depletion observed?	CR9.5 Q1.3, 2.3 and 2.4	Text analysis Tabulation of transport times	EM DWtV
3.3 Is there evidence of harvesting moving to different areas in response to depletion?	CR 7.3	Text analysis Tabulation of transport times	EM DWtV
3.4 Is there any relationship between property regimes / institutional conditions and forest overexploitation, domestication or development of management strategies for	CR7.3; (3.3 & 3.4); 4.1	Text analysis	EM

the wild resource?			
3.5 Is there a relationship between biological characteristics of the NTFP and whether increased NTFP trade leads to domestication?	CR7.4, 9.5	Text analysis	EM
3.6 Are there biological / ecological constraints to successful commercialization? E.g. low or variable productivity? etc.	CR 7.3 Q3.4	Text analysis	EM
3.7 Is there a relationship between poverty and domestication, and poverty and distance to resource?	Q2.4, 2.5 and 2.9	Tabulation. Link individual variable on distance to individual variable of success in regression analysis. Individual variable of success VS proportion of product obtained from wild / cultivated source	DWtV

4. Changes in the volume of NTFP commercialization lead to reduced rights/access to the resource for the poorest producers.	**Data source**	**Form of analysis**	**Responsibility**
Note: refer to Ho 3.1 for any evidence of an increase in the volume of NTFP trade in the last 10 years: overall & for the community			
4.1 Has the change in commercialization had an impact on rights/access to the resource?	CR 3.1 & 3.3; 9.5; 7.3 (& 3.3, 3.4)	Text analysis	EM
4.2 Does the type of access to, or ownership regime of resource constrain successful commercialization?	CR 7.3 Q3.4	Text analysis	EM

5. The successful commercialization of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; capacity to innovate; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)	**Data source**	**Form of analysis**	**Responsibility**
5.1 Does the successful commercialization of an NTFP depend critically on the existence of an accessible market? (levels of access, physical market or access via an intermediary]	CR 2.3 MR2 Q5.5, Q5.6	Text Regression. Accessible markets: individual variable based on categorisation of answers to Q5.5 and 5.6 on distance to markets.	EM JR DWtV
5.2 Does the successful commercialization of an NTFP depend critically on potential demand?	Q6.8, MR4	Regression and Text	JR DWtV
5.3 Does the successful commercialization of an NTFP depend critically on the absence of substitutes?	MR 4	Text	JR
5.4 Does the successful commercialization of an NTFP depend on the capacity to innovate?	MR CR	Text	JR EM

5.5 Does the successful commercialization of an NTFP depend critically on access by producers, processors and traders to market information?	CR 7.8, 8.2 MR 9 Q5.6 and Q3.4	Text Regression on access to information: individual variables based on classification of Q5.6; or member of association, Q3.4	EM JR DWtV
5.6 Does the successful commercialization of an NTFP depend critically on technical management capacity?	CR 3.4, 7.8 MR	Text	EM JR
5.7 Does the successful commercialization of an NTFP depend critically on organisation (concerted action)?	CR 8.2, 9.3, 4.1, 4.2 MR	Text	EM JR
5.8 Does the successful commercialization of an NTFP depend critically on high value / unit wt?	MR 1	Text	JR
5.9 Does the successful commercialization of an NTFP depend critically on trader characteristics (age, experience, negotiating skills, market contacts, education, gender, etc)?	CR8.3, 9.3 MR Q1.1	Text Regression of Trader characteristics: individual variables from Q1.1	EM JR DWtV

6. The success of poor producers, collectors, processors and traders in NTFP commercialization depends critically on the number of suppliers and demanders (market structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.	**Data source**	**Form of analysis**	**Responsibility**
6.1 What is the equitability of profit distribution along the market chain?	MR 7, & 8 All transaction cost questions, eg Q2.?, 3.3, 4.2, 5.3,	Text. Determine profit based on Q3, 4 and 5 and examine average across different stages: output in table. Compare average profit margins at different stages	JR
6.2 Who gains and how is sales revenue controlled and distributed?	CR 7.7 Q3, Q4, Q5	Text. See 6.1 above: profit flows, identification of key indivuals in the value chain	EM JR
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	MR 5 CR 8.3	Text.	JR EM
6.4 What is the demand, and are the demand curves inelastic? What is the likely trend in future demand? Is there a link between price and resource depletion as Homma suggests?	MR	Need to know about overall trends in consumption /production, but may only be possible for a few products with good secondary data. (also in relation to increases in income) Link to Q6.8 (expectation of demand) and to demand variables in MR.	JR
6.5 How does the marketing network (more precisely: a trading network) function? Do they result in the exploitation of extractors? Does the network change over time?	MR 2	Text. Value chain description.	JR
6.6 Are there actually a variety of trading networks for	MR 2, CR 8.1	Value chain analysis	JR

different NTFPs?		Text.	EM
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	MR 9	Text. Regression analysis: determine effect of no. of traders in successive stages on success.	JR DWtV
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	CR 8.2 MR Q1.4, 5.5, 5.6	Text. Explanatory variables in regression analyses determining success (see also hyp 5 above)	EM JR DWtV
6.9 To what extent do prices fluctuate (at local and international level, over the last 5 years) and to what extent does this represent a risk to producers and traders?	MR 5 CR 8.3	Text.	JR EM
6.10 Do state (or non-state) institutions play a role in marketing?	MR 10 CR 4, 8.2, 8.4 Q4.3, 5.4	Text. Explanatory variables in regression analyses determining success	JR EM DWtV

ANNEX 3: factors influencing success and data collection and analysis tools matrix.

For users of the CEPFOR Decision Support Tool, this matrix provides suggestions for data collection and analysis tools to obtain the information required to score the factors in the CDST. The 66 factors are listed in the left-hand column in the order in which they appear in the CDST. The various data collection and analysis tools described in this manual are listed across the top row. Information on most factors can be obtained from at least one tool. 'Smiley faces' indicate tools that may be particularly useful for obtaining certain information while ticks indicate other useful tools that can allow for triangulation.

☺ = preferred tool, √= additional methods, *several methods*

FACTOR INFLUENCING SUCCESS	Interview and evaluation checklist: producer processor groups	Resource mapping: product id and access and tenure	Transect: Evaluating production and land management	Timeline: Capturing changes and trends	Seasonal calendars: analysing activities and resources	Institutional support diagram	Interview evaluation checklist: trader	Cross rank matrix	Enterprise budget	Markets & market trends analysis	Value chain analysis
F1. National trend in volume or value	√			√			√			☺	
F2. Local trend in volume or value	√			√			√			☺	
F20. Substitution	√						√	√		☺	
F21. Brand identity	√						√	√		☺	
F16. Perfect market							√			☺	
F12. Price variation	√			√			√	√		☺	
F17. Income elasticity							√				☺
F13. Variable costs	√						√		☺		
F14. Returns to labour	√						√		☺		
F15. Fixed costs	√						√		☺		
F18. Consumer preference	√						√		☺		
F10. Regulations	√	√					√		☺		☺
F19.Losses	√						√		☺		☺
F4. Vertical integration						√					☺
F9. Entrepreneurs						√					☺
F3. Buyer number						√					☺
F6. Buyer link organization						√					☺
F5. Combinability					√						☺
F8. Credit	☺										

FACTOR INFLUENCING SUCCESS	Interview and evaluation checklist: producer processor groups	Resource mapping: product id and access and tenure	Transect: Evaluating production and land management	Timeline: Capturing changes and trends	Seasonal calendars: analysing activities and resources	Institutional support diagram	Interview evaluation checklist: trader	Cross rank matrix	Enterprise budget	Markets & market trends analysis	Value chain analysis
F7. Investment capital	☺										
P9. Accessible market						√					☺
P5. Energy	√								☺		
P6. Materials and facilities	√						√		☺		
H10. Innovation	☺			√			√				
H14. Technical support	☺					√					
H1. Traditional use	☺			√							
H2. Tradition link	☺			√							
H11. Labour combinability	☺										
H12. Women's involvement	☺										
H9. Entrepreneur	☺										
H13. Technical information	☺										
H15. Health and safety	☺										
H5. Processing required	☺										
H8. Trader characteristics	☺										
H7. Processors market info	☺										
H6. Technical processing	☺										
H4. Producer experience	☺										
H3. Technical management production	☺										
N7. Quality variation	☺		√								

FACTOR INFLUENCING SUCCESS	Interview and evaluation checklist: producer processor groups	Resource mapping: product id and access and tenure	Transect: Evaluating production and land management	Timeline: Capturing changes and trends	Seasonal calendars: analysing activities and resources	Institutional support diagram	Interview evaluation checklist: trader	Cross rank matrix	Enterprise budget	Markets & market trends analysis	Value chain analysis
N8. Production per unit area	☺		√								
N6. Yield variation	☺		√								
N9. Domestication	☺		√								
N10. Seasonal availability	☺		√								
N4. Overharvesting	☺		√								
N3. Competing land uses	☺		√								
N5. Poor harvesting	☺		√								
N11. Resource management	☺		√								
N14. Pests and diseases	☺		√								
N13. Resource availability	☺										
N12. Rights of access	☺										
P1. Market information	☺					√					
P2. Perishability	☺										
P3. Infrastructure to production site	☺										
P4Communication network	☺										
P5. Energy	☺								√		
P6. Materials	☺								√		
P7. Storage requirements	☺								√		
P8. Transport	☺	√					√		√		
S2. Community norms	☺			√		√					
S3. Community organization	☺										
S4. Equitable	☺										

FACTOR INFLUENCING SUCCESS	Interview and evaluation checklist: producer processor groups	Resource mapping: product id and access and tenure	Transect: Evaluating production and land management	Timeline: Capturing changes and trends	Seasonal calendars: analysing activities and resources	Institutional support diagram	Interview evaluation checklist: trader	Cross rank matrix	Enterprise budget	Markets & market trends analysis	Value chain analysis
access											
H11. Labour combinability					☺						
H12. Women's involvement					☺						
H4. Producer experience					☺						
N10. Seasonal availability					☺						
S1. Women control income					☺						
N3. Competing land uses		☺	√								
N11. Resource management		☺	√								
N13. Resource availability		☺	√								
N12. Rights of access		☺									
N1. Proportion wild harvested		☺						√ (sites quantity)			
N2. Proportion cultivated		☺						√ (sites quantities)			
P3. Infrastructure to production site		☺									
S2. Community norms		☺									
H8. Trader characteristics							☺				
P10. Value per unit weight							☺		√		
S5. Market power							☺		√		√