"Commercialisation of non-timber forest products: factors influencing success"

Managed by
Elaine Marshall, UNEP-WCMC, Cambridge, UK

Socio-economic component coordinated
By
Dr. Kate Schreckenberg
ODI, London, UK

Final Report on the:

"Marketing chains for a range of non-timber forest products in Bolivia and Mexico"

By
Dr. Jonathan Rushton, Ing. Agr. Luis Pérez and Lic. Cecilia Viscarra

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CEVEP
Casilla 10474
La Paz
Bolivia
Tel/Fax: 00 591 2 2483495
Mobile: 00 591 710 56202
Email: rushton@unete.com

1 EXECUTIVE SUMMARY

The report includes an analysis of the commercialisation of 11 Non-Timber Forest Products (NTFPs) in Bolivia and Mexico. This analysis is part of a wider research project on NTFP commercialisation being carried out by UNEP and ODI. This project is financed by the Forestry Research Programme of the Department for International Development, UK.

An in-depth analysis is presented for three Mexican products: mushrooms (fresh, dried and matsutake mushrooms), Palma Soyate and pita; and two Bolivian products: cocoa and rubber. The analysis was based on community and marketing reports from the areas of study, plus a formal survey of collectors and traders in these areas. For each product the most important routes of the value chain were identified. These value chains are presented in the document graphically. For each route, commercialisation margins were estimated and the proportion of the end price taken by each actor calculated. Where sufficient data were available, enterprise budgets were calculated for the activity of trading and processing the NTFP by each actor. The budgets were used to calculate total profits, profits per unit of product traded and returns to labour. These outputs were generated in local currency, US$ and PPPs. The results produced were used to comment on the commercialisation hypotheses from the wider research study

The remaining products (Mexico: Palma camedora, Maguey and Palma Tepejilote; Bolivia: Incense, Copal and Jipi Japa) have been analysed less thoroughly. The document presents their value chains and makes comments on the general development of these chains with regard to the hypotheses from the general study.

Issues discussed include how processing and end-use, substitution and cultivation of NTFPs affects the successful commercialisation of NTFPs and the management of natural resources. One of the original intentions of the analysis was to investigate the importance of transaction costs at different levels of commercialisation. However, insufficient data were available to carry out a quantitative analysis, therefore a conceptual framework of how policies could affect transactions costs of the different parts of a general value chain for a NTFP was developed.

A discussion is presented on the generality of the issues raises by the hypotheses. It is concluded that, although some of the methodologies used could be generalised, the issues raised by the hypotheses cannot be, and are specific to the products. However, the hypotheses themselves and the associated questions are an important framework for studying NTFP commercialisation.

2 TERMS OF REFERENCE

2.1 BACKGROUND

The project 'Commercialisation of non-timber forest products: factors influencing success' is funded by DFID's Forestry Research Programme (FRP) and managed by Elaine Marshall at UNEP-WCMC. ODI is providing the socio-economic and economic input to the project. Within this context, the following data have been collected in Mexico and Bolivia:

2.1.1 Market reports on 10 products

For each of 10 non-timber forest products (NTFPs), a report has been written by national partners to a common structure to outline marketing chains and synthesise existing information on transaction costs. Reports are typically 10-20 pages long and of varying quality.

2.1.2 Community reports for 17 communities

Partners have written reports on each of 17 communities (approximately 2 per NTFP, with some overlaps), again to a common structure. The reports detail everything from levels of organisation and infrastructure to resource access, levels of involvement in different aspects of NTFP production, processing and trading, and impacts of commercialisation on marginalized groups. Reports are typically 50 pages in length and of variable quality.

2.1.3 Questionnaire surveys

Four basic questionnaires have been implemented:

- Community members involved in some way in NTFP activities (approx. 20 per community)
- Control community members not involved in any NTFP activity (5-10 per community)
- Traders (outside the community) involved in trading the NTFP (2-9 per product)
- Control traders not involved in any NTFP trade (very few)

All the above questionnaire data have been entered into an Access database.

A full explanation of the project's research hypotheses, data collection tools and analysis methods is provided in the internal project report 'Methodological guidelines'. The analysis of the data is being carried out by a number of people with different specialities. The different analytical approaches are expected to complement one another and, together, enable the project team to comment on the project's 6 research hypotheses (see Schreckenberg et al., 2005, Methodological Procedures, CEPFOR Project report).

2.2 THE CONSULTANT'S ROLE

2.2.1 Market chain analysis: general points

- The role for the consultant will be to carry out the economic analysis of the marketing chains for the 10 case study products and to use the results to provide

preliminary comments on the project hypotheses 5 and 6. [note that revised versions of these will be available on the project website by mid June]

- The overall aim of each analysis (quantitative or qualitative) is to show clearly the actors and their functions, and to highlight the key points (e.g. bottlenecks) for more in-depth analysis and for policy entry-points.
- As discussed at the Santa Cruz workshop, all analysis should be done on the basis of an agreed marketing chain diagram for each product. These were agreed with participants at the Santa Cruz workshop and should only be modified in consultation with the participants concerned.
- Where there are several market routes for a single product, quantitative analysis can only be done for those routes for which we have sufficient information. However, as we are particularly interested in comparing the effects of different routes on the success of individuals participating in them, every attempt should be made to obtain sufficient information from workshop participants to allow for analysis of parallel routes where they exist.
- Where quantitative information is not available, routes will have to be described in a more qualitative way based on the market (and possibly community) reports.

Quantitative analysis will be focused on the following five products:

- Cacao
- Goma
- Hongos
- Palma soyate
- Pita

If time and data allow, then the following products will also be included:

- Incense (and copal)
- Palma camaedora

The market chains of the remaining three products (Tepejilote, Jipijapa and Maguey) will only be analysed in a descriptive way – see point 5 below.

2.2.2 Quantitative Data analysis (20 days)

- We are interested in understanding the commercialisation margins as well as the returns to labour of different activities along the chain.
- In addition to returns to labour, we agreed to calculate returns per unit (e.g. kg or litres) and per final product (e.g. bags or ponchos).
- Economic terms should be defined as agreed in the table included in the proceedings of the May 2003 Santa Cruz workshop, and any variations explained clearly.
- To take account of different definitions and the different information required from the analysis, it was agreed that the analysis would be done using a spreadsheet in which the values for certain variables (e.g. prices, costs of inputs including wage rate) could be varied. A table of local wage rates per community (varying by gender and season) was drawn up at the workshop to help with this.

- The spreadsheet approach will facilitate understanding of various poverty issues by allowing for sensitivity analysis.
- It was agreed that the calculations would be done in local currency and only converted into dollars at the end to allow for comparison between products and countries. Conversion into dollars should be done using the average dollar exchange rate for September 2002.
- In addition, in order to make a point for policy-makers dealing in poverty alleviation, we need to talk in PPP (purchase price parity) dollars. (to be provided by Dirk Willem te Velde).
- In the spreadsheet analysis it would be useful to separate out fixed costs and variable costs, as well as any transaction costs, where they can be valued. If they cannot be valued but are mentioned, we need to acknowledge in the text that these are additional costs which we have not been able to capture.

The report on the quantitative analysis should be finished by end June. It should include a table characterising different products by a variety of indicators. This is a useful exercise to enable comparison across products and highlight entry-points for policy recommendations. 20 days are foreseen for this part of the work.

2.2.3 UK-based analysis meeting (4 days)

The core project team will be meeting in the UK on 1st and 2nd May to present the different elements of the data analysis and ensure that – together – they throw light on the project's research hypotheses. The present contract includes provision for 4 days and a return ticket La Paz – London (plus subsistence for 3 days) for the consultant to attend this meeting.

2.2.4 Santa Cruz meeting (11 days)

The full project team (including all national partners) will be meeting in Santa Cruz from 19-28th May. The present contract includes provision for 11 days work and a La Paz-Santa Cruz return ticket for the consultant and his colleague, Luis Perez, to attend this meeting.

2.2.5 Qualitative Data analysis (20 days)

- For all 10 products, a descriptive analysis of the market chain will be produced. This will include – for each stage in the marketing chain – a list of all the transaction costs mentioned by interviewees, and any information relating to barriers to entry.
- Other issues to be investigated include the qualities being demanded by consumers and the perceptions of the producers on the end use of the product.
- The consultant will also analyse the information (mostly in the database) pertaining to why people do or do not wish to move up the supply chain (or move out of the NTFP activity altogether).
- Given the project's objective to develop an integrated methodology for the analysis of NTFP commercialisation, a full report on any methodological difficulties and decisions is important. This includes discussion of where (e.g. for certain

transaction costs) it has been impossible to obtain numerical data and analysis has had to be qualitative only.

The present contract foresees 20 days for this part of the analysis.2.2.6 UK-based report-back meeting (2 days)

If possible, Dr. Rushton will spend one day with the UK-based project team in July to present draft results. Flight costs are not available in this budget but UK travel costs and subsistence for one day can be covered.

2.3 REPORTING AND COLLABORATION

Data quality permitting, the initial data analysis (economic analysis of the market chains) should be completed in time for presentation at the 1st/2nd May meeting in the UK. If possible, draft results should be presented on a product-by-product basis. A presentation of the quantitative data analysis methodology should be ready for the Santa Cruz workshop, together with an assessment of any missing data for the analysis to be completed.

The report on the quantitative analysis will be ready by the end of the June and a draft of the qualitative report will be ready by the end of July. The final combined report will be ready in August. The report will be in English with major findings in both English and Spanish. Time permitting, a full translation into Spanish will be provided.

Any queries about the scope of the analysis should be addressed to Dr. Kate Schreckenberg (k.schreckenberg@odi.org.uk).

From 1st April, Erik Arancibia (eharancibia@hotmail.com) will be working for the project from La Paz. Having supervised the Bolivian data collection, he will be on hand to answer any queries concerning the market reports and questionnaire data for the Bolivian NTFPs. Queries concerning the Mexican data should, in the first instance, be addressed to Elaine Marshall (Elaine.marshall@unep-wcmc.org) with copy to Kate Schreckenberg.

Furthermore, given that the economic analysis methodology was originally developed by Dr. Alan Bojanic (alanbojanic@techemail.com), the consultant should feel free to contact Dr. Bojanic for advice at any stage in the process. Dr. Bojanic will be asked to review the final report produced by the consultant.

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6 ABBREVIATIONS

Bs.	Boliviano – Bolivian currency (rate of exchange US$ = Bs.7.30 Sept 2002 (INE, 2003))
NTFP	Non-Timber Forest Product
Peso	Mexican currency (rate of exchange US$ = Peso 10 Sept 2002)
PPP	Purchasing Power Parity (Mexico US$=1.4PPP, Bolivia US$=2.5PPP)

7 ACKNOWLEDGEMENTS

The authors would like to thank Kate Schreckenberg and Elaine Marshall for their technical inputs to the various stages of this analysis. The contributions made by Dirk Willem te Velde, Adrian Newton and Alan Bojanic are also recognised. The report would not have been possible without information from the field staff, in particular from Erik Arancibia, Bolivia and Fabrice Edouard, Mexico. Finally, thanks go to the collectors, producers and traders of the products studied for their time and openness in providing data.

8 INTRODUCTION

In March 2003 ODI contracted the principal author to begin a quantitative analysis of the commercialisation of a range of non-timber forest products (NTFPs) in Bolivia and Mexico. The products were:

1. Mexico
    a. A range of mushrooms species: Hongo de huevo (*Amanita caesarea*); Porcini (*Boletus edulis*); Duraznito (*Cantharellis cibarius*) and hongo blanco matsutake (*Tricholoma magnivelare*)
    b. Pita
    c. Brahea Dulcis (Palma soyate)
    d. Palma Camedora
    e. Palma Tepejilote
    f. Maguey
2. Bolivia
    a. Wild cocoa
    b. Rubber
    c. Incense/Copal
    d. Jipi Japa

The data for the analysis comes from a series of data collection exercises carried out by the project over the previous 18 months. This had generated information in the form of community reports, marketing reports for some products, interviews with collector and producer families and interviews with traders of the products. In addition some preliminary analysis had been carried out by Dr Alan Bojanic.

A presentation in English on a preliminary analysis of the data available was made in London at the beginning of May and a similar presentation was in made in Spanish in Santa Cruz de la Sierra in mid May. The first meeting involved the project management team and the latter meeting both the field staff and the project management team. Further results were presented at a meeting in London in early August. During the meetings, useful discussion took place on the results presented and also the methodological issues in analysing the information. This discussion focussed on how to create a quantitative framework, which did not lose the richness of the qualitative data that had been collected over the period of the project. This framework is still open to criticism and change and will be strengthened by the type of discussion, and analytical thought that has gone into its early development. The framework is also a component to begin answering the questions raised by the hypotheses set by the project in its initial stages.

During the preliminary analysis and discussions the list for quantitative analysis was reduced to five products: Mushrooms, Pita, Palma soyate, Rubber and Wild Cocoa. The products selected had sufficient data to carry out further analysis and also provided some interesting comparisons. More qualitative analysis was decided for the other products, with the possibility, if time permitted, that further quantitative analysis could be attempted on Palma Camedora and Copal/Incense.

The current document contains the following sections:

1. Methodology.
2. A quantitative and qualitative analysis of Mushrooms, Pita, Palma soyate, Rubber and Wild Cocoa.
3. A less rigorous analysis of Palma camedora and Copal/Incense.
4. A qualitative analysis of Maguey, Palma tepejilote and Jipi japa.
5. Discussion including generalisations relating to the hypotheses set by the project.
6. Conclusions.

The current document is intended to stimulate discussion, analytical thought and further improvements on the methodological framework and the findings coming out of the study. The authors believe that some of the findings are generalisable outside the field of NTFPs.

9 METHODOLOGY

9.1 DATA SOURCES

Data were made available in the form of community reports, marketing reports and a database that contained the results from interviews with collector/producers and traders. A summary of this information for Mexico and Bolivia is provided in Tables 1 and 2.

Table 1. Data available for the commercialisation of NTFPs from Mexico.

Product	Communities	Community reports	Marketing reports	Interviews
Mushroom	Cuajimoloyas Latuvi	2 reports	1 report covering a range of aspects of mushroom marketing	13 collectors from Cuajimoloyas 13 collectors from Latuvi 6 traders from DF and Oaxaca
Palma camedora	Monte Tinta Nueva Santa Flora	2 reports	1 report	24 collectors/producers from Monte Tinta 2 traders
Palma Tepejilote	San Miguel Tiltepec Santa Cruz Yagavila	2 reports	1 report	15 collectors from San Miguel Tiltepec 2 traders
Pita	Agua Pescadito Arroyo Blanco		1 report with a good overview of pita marketing and processing in Mexico	6 producers from Agua Pescadito 22 producers from Arroyo Blanco 1 trader from Oaxaca
Palma soyate	La Esperanza Topiltepec	2 reports	1 report	16 collectors from La Esperanza 20 collectors from Topiltepec 7 traders from Chilapa
Maguey	La Esperanza Topiltepec	2 reports	1 report	3 collectors from La Esperanza 9 collectors from Topiltepec

Table 2. Data available for the commercialisation of NTFPs from Bolivia.

Product	Communities	Community reports	Marketing reports	Interviews
Wild Cocoa	Carmen del Emero San Silvestre	2 reports	1 report	23 Collector/producer Carmen del Emero 14 Collector/Producer from San Silvestre 5 traders from Carmen del Emero 1 trader from Tumupasa
Rubber	Santa Rosa de Challana Tomachi	2 reports	2 reports	25 collectors from Santa Rosa de Challana 13 collectors from Tomachi 4 traders from Mapiri 2 traders from other places
Copal	Pucasucho	1 report	1 report	6 collectors from Pucasucho 4 traders from Apolo
Incense	Pucasucho	1 report	1 report	17 collectors from Pucasucho 4 traders from Apolo
Jipi Japa	Buena Vista Candelaria Carmen Surutú San Rafael	3 reports	Very detailed report	9 collectors from Buenavista 14 collectors from Candelaria 13 from Carmen Surutú 6 from San Rafael 5 traders various

In addition to the data available in the reports and the database, the authors have been in regular contact with the field staff, in particular Erik Arancibia in Bolivia and Fabrice Edouard in Mexico.

9.2 ANALYSIS OF THE DATA

The data have been analysed in order to identify and where possible quantify:

- the supply chain;
- commercialisation 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).

This process has been carried out in more detail for the selected products listed above.

9.2.1 Supply Chains

Based on the data from the marketing reports, the collector/producer and trader interview data and interviews with the field staff, a supply chain has been developed for each product. This supply chain relates to the communities of study and does not attempt to identify all the actors in the general supply chain for the products. The analysis also tries to identify which parts of the chain are 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 allows an analysis of the prices paid per unit, but this information needs to be combined with quality information as some routes may pay more per unit, but demand different qualities.

9.2.2 Commercialisation Margins

The commercialisation margins are based on information of the final unit price for a product. The formula for calculating the margin is show below

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

The calculation of the margin is made 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.

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

Similar to the commercialisation 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 commercialisation 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.

9.2.4 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 have been combined with the expected annual sales to estimate the economic profitability of the actors in the chain. The analysis structure used is an enterprise budget where costs have been split into:

1. Variable costs (The purchase of raw material has been included in the output section);
2. Labour costs (this has been divided into men, women and children); and
3. Fixed costs (where equipment is used and this equipment has a usable life, straight line depreciation has been used to calculate the costs and also an interest cost has been calculated based on the value of the equipment multiplied by the lending interest rate).

The profitability has been calculated per activity and per unit of sale in:

- local currency;
- US dollars; and

- PPPs.

There was much discussion about the difficulties of calculating labour rates to form a part of the profitability calculations. 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 PPPs.

Not every product has sufficient data to carry out economic profitability estimates for each actor in each route in the supply chain. However, analyses are presented where sufficient data are available.

9.2.5 Sensitivity analysis

The quantitative analysis described above is based on a spreadsheet model, which accompanies the report. There has been insufficient time to carry out sensitivity analysis for the current report, but the spreadsheet model 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.

9.2.6 Hypotheses questions

The project developed 6 hypotheses in its early stages and hypotheses 5 and 6 relate to the marketing analysis. Within each hypothesis there are questions to be answered. Each product has a small section with a matrix containing answers to these questions.

9.3 SUMMARY

During the analysis process, the authors have tried to identify some of the generalisations that might be brought from the general project. These can be found in the discussion section.

10 MUSHROOMS

10.1 INTRODUCTION

Mushrooms are a complicated product in that they are neither one species nor one quality. In the communities studied four different mushroom species are collected and each has a different range of qualities. Therefore, mushrooms are not a product, but a group of products. In addition, a majority of the collectors of mushrooms are also consumers (24 out of 26 surveyed).

Given this complexity it is of little surprise that very little quantitative data were available from the survey. Therefore, the majority of the analysis presented is based on the thorough marketing report produced for these groups of products and also careful consultation with Fabrice Edouard.

10.2 SUPPLY CHAINS

The community San Antonio Cuajimoloyas collects the following varieties of mushrooms:

1. Hongo de huevo (Egg mushroom, *Amanita caesarea*)
2. Porcini (*Boletus edulis*)
3. Duraznito (*Cantharellus cibarius*)

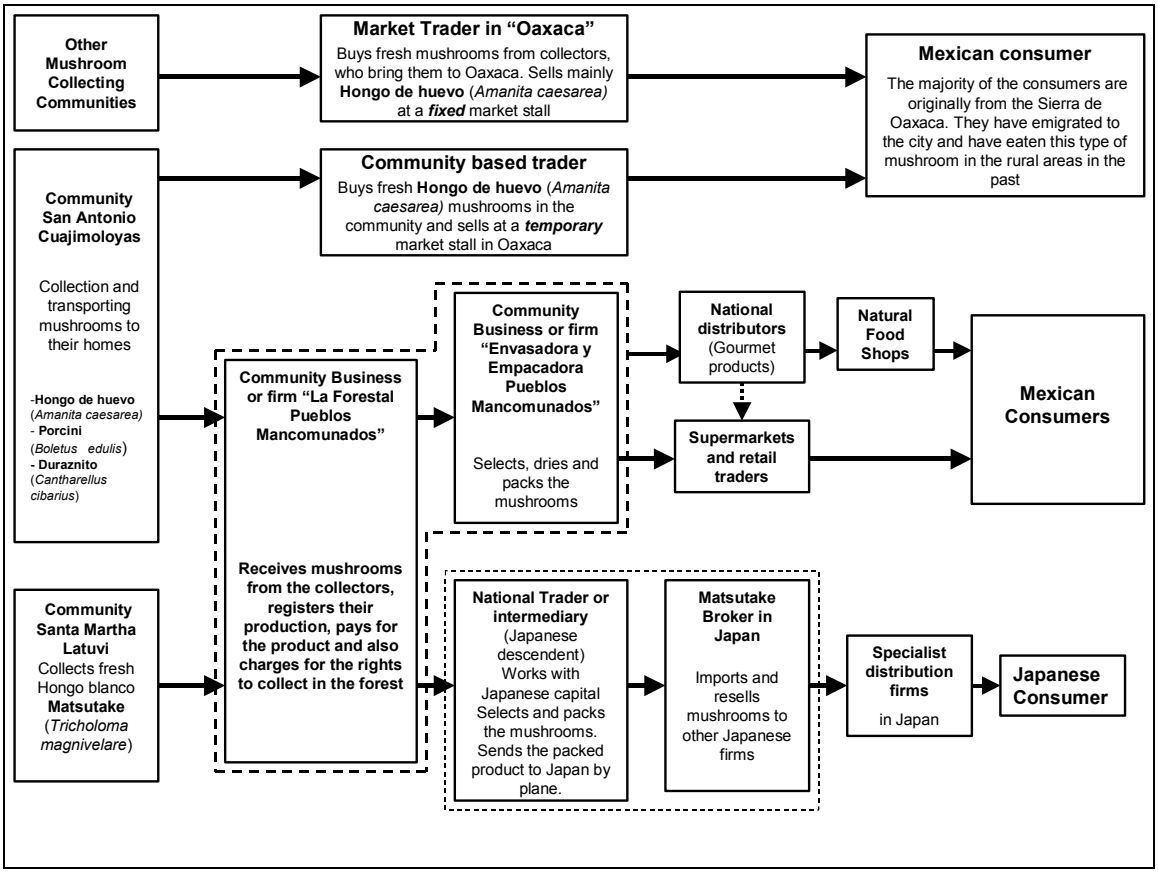
In the community of Santa Martha Latuvi only the "hongo blanco matsutake" or white mushroom (*Tricholoma magnivelare*) is collected.

Of the mushrooms collected, three distinct marketing chains have been identified:

1. Fresh mushroom marketing chain, which sells into the local Oaxaca market and is mainly involved in the transfer and sale of hongo de huevo.
    a. Traders who are based in Oaxaca and buy mushrooms from collectors who take their product to the trader. The trader identified in the analysis sells other vegetable products and has a fixed market stall. She also does not buy mushrooms from the study villages.
    b. Trader based in the San Antonio Cuajimoloyas who buys the mushrooms in the community, transports them to Oaxaca and sells them at a temporary market stall in the city.
2. Dry mushroom marketing chain, which dries and processes mainly porcini, duraznito, hongo de huevo and transfers dried product to a national Mexican market. This market is concentrated in Mexico DF and Oaxaca.
3. A matsutake marketing chain, which selects and processes hongo blanco, and transfers and sells this product to a Japanese market. The processing is carried out in Mexico, but not in the local areas and a further selection and processing is carried out in Japan.

The main actors identified in these supply chains are shown in Figure 1.

Figure 1. The main supply chains for the mushrooms collected by the communities: San Antonio Cuajimoloyas and Santa Martha Latuvi.



10.3 SUPPLY CHAIN ANALYSIS

10.3.1 Fresh Mushroom Collectors

The collectors of fresh mushrooms in Cuajimoloyas use a basket to carry the mushrooms collected, but no other equipment is required. The most important input to this activity is the time required for the collection. The mushrooms only appear and can be collected for a period of 3 months a year and the quantity of mushrooms available is very dependent on the weather conditions. According to the estimates from the NGO Methodus, within this three-month collection period only an average of 23 days yield mushrooms. The time to the collection areas, the annual amount collected and an estimation of the value of the product collected is presented in Table 3.

Table 3. Time to arrive at the collection sites, the average quantity of mushrooms collected, the price per kilo and an estimation of the value of the mushrooms collected for the supply chain selling dried mushrooms in the Mexican market.

	Time to arrive		Quantity collected (Kilos/yr)		Price per kilo		Value (min)		Value (max)	
Collector	Min	Max	Min	Max	Min	Max	1st	2nd	1st	2nd
1	6	7	40	40	20	20	800	800	800	800
2	5	7	40	50	20	20	800	800	1,000	1,000
3	3	4	2	2	20	20	40	40	40	40
4	6	6	15	15	20	20	300	300	300	300
5	2	3	5	7	20	25	100	125	140	175
6	10	10	160	160	20	25	3,200	4,000	3,200	4,000
7	0.5	0.5	15	15	15	15	225	225	225	225
8	2.5	2.5	50	50	20	20	1,000	1,000	1,000	1,000
9	2	2	25	25	20	20	500	500	500	500
10	1	5	50	50	20	20	1,000	1,000	1,000	1,000
11	3	3	30	30	25	25	750	750	750	750
12	12	14	75	75	20	20	1,500	1,500	1,500	1,500
13	1	1.5	360	400	20	20	7,200	7,200	8,000	8,000
Minimum	0.5	0.5	2	2	15	15	40	40	40	40
Maximum	12	14	360	400	25	25	7,200	7,200	8,000	8,000
Average	4.15	5.04	66.69	70.69	20.00	20.77	1,340	1,403	1,420	1,484
Total			867	919			17,415	18,240	18,455	19,290

The project team felt that a good collector would collect 300 kilos of mushrooms per year over a period of 30 days, i.e. approximately 10 kilos per day of collecting. An average collector will collect 70 kilos in a period of 20 days, i.e. 3.5 kilos a day and an occasional collector may collect 10 kilos.

From the data presented in the table above it is estimated that in the community, 15% of the families are intensive collectors with an average harvest of around 200 kilos a year, half the families are average collectors with an average harvest of 50 kilos a year and the remainder are occasional collectors with an average harvest of 10 kilos a year. The difficulty in the subsequent analysis is who to include as the collectors. A harvest of just over 5 kilos per day is necessary to cover the costs of labour, i.e. the break-even amount for collection is 5.2 kilos in a day. Where the harvest is lower than this it is an indication that either the visit to the forest is being combined with other activities[1] or the people involved are not very skilled at mushroom collection. Where the harvest is above this level the person involved is likely to be concentrating only on the collection of mushrooms. To avoid complications of assigning different percentages of time between forest visit activities the principal author has only included the intensive, specialised mushroom collectors in the subsequent analyses. It is argued that this group are the only ones where it is possible to say that 100 percent of their time is being dedicated to mushroom collection.

10.3.2 Fresh Mushrooms to the Oaxaca Market

The supply chain for fresh mushrooms to the local market of Oaxaca is relatively simple, involving collectors, trader/intermediary and local consumers. However, two different supply chains have been analysed:

[1] This was raised as being an important consideration by the field staff in both Mexico and Bolivia.

- a chain where the trader is based in Oaxaca market "Centro de Abasto"; and
- a chain where the trader is based in the community of Cuajimoloyas.

The principal product is the "hongo de huevo" and the consumers are relatively specific in that they are originally from the countryside where there was a custom of eating this type of mushroom.

10.3.2.1 Commercialisation margins

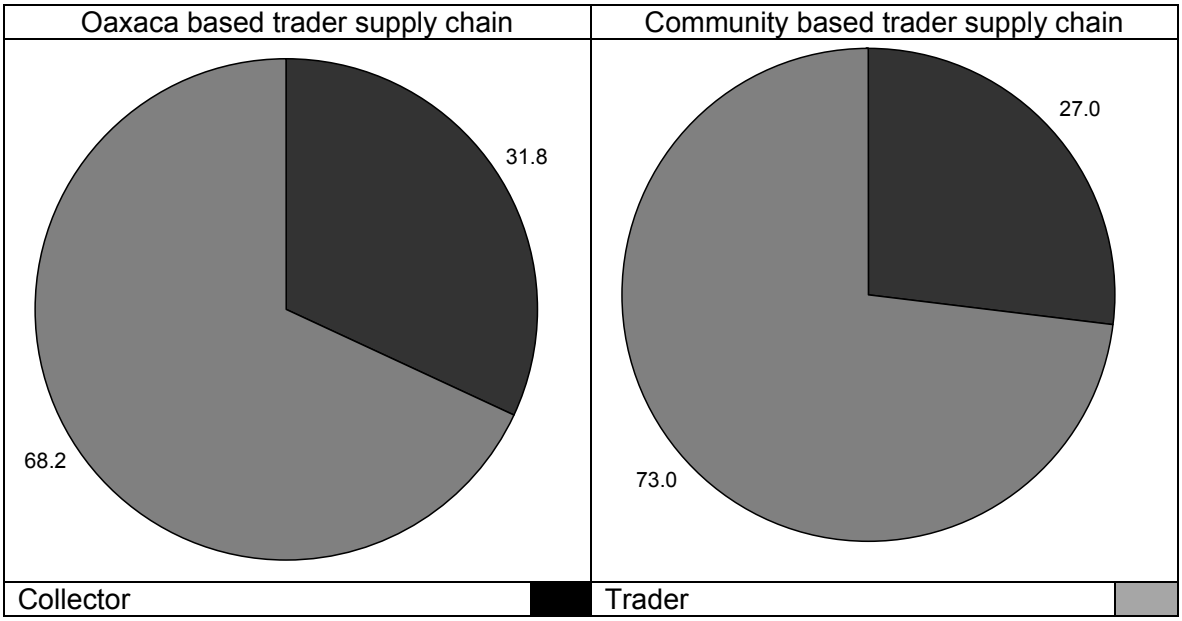
The supply has three actors: collector, trader/intermediary and consumer. The commercialisation margin in this case is not very meaningful as there is only one actor between the collector and the consumer. There is a difference between the two supply chains as the price paid to the collector is less in the chain with the community based trader and also the price received from the consumer is lower in this chain. The results of the analysis are shown in Table 3.

Table 4. Commercialisation margins for fresh mushrooms (Hongo de huevo) supplied to Oaxaca market.

	Price (Peso)		Margin		
Actor	Purchase	Sale	Peso	US$	%
Oaxaca based trader supply chain					
Collector		17.5			
Trader	17.5	55	37.5	3.75	68.18
Consumer	55				
Total			37.5	3.75	68.18
Final product value			55	5.50	100.00
Community based trader supply chain					
Collector		13.5	10.00	1.00	
Trader	13.5	50	36.5	3.65	73.00
Consumer	50				
Total			36.5	3.65	73.00
Final product value			50	5.00	100.00

Of greater interest is the proportion of the consumer price received by the different actors in the chain. Just over two thirds of the price is collected by the trader. The community based trader takes a higher proportion of the consumer price than the trader based in Oaxaca (see Figure 2).

Figure 2. The proportion of the consumer price (US$5.50/kilo in the Oaxaca trader chain and US$5.00/kilo in the community based trader chain) for fresh mushrooms (Hongo de huevo) received by the actors in the supply chain.



The reason for this difference is related to the transport costs incurred by the community based trader and these will be investigated in more detail in the following sections.

From the commercialisation margins it would appear that the traders are in a relatively strong position and taking a large proportion of the consumer price. However, this actor in the chain has larger investments and has to take higher risks than the collector. It should be remembered that the analysis presented is on the basis of average values of volumes collected and sold and for prices of purchase and sale.

10.3.2.2 Profitability of the actors in the supply chain

For collectors in the Cuajimoloyas community it is estimated that the specialised collectors spend an average of 20 days collecting and collect 10 kilos of mushrooms a day. The costs of this collection are a basket to carry the mushrooms and the time of the collector. It is assumed that the collectors in other communities have a similar level of skill, but these collectors have additional costs in terms of transporting the mushrooms from their communities to Oaxaca for sale. These costs have been included as a weekly transport cost. The latter collectors receive a better price for their product.

Tables 5 and 6 present the enterprise budgets for the collectors selling to the Oaxaca-based trader, and the Cuajimoloyas collectors, respectively. In the case of Cuajimoloyas, it is assumed that all mushrooms are sold to the community based trader.

Table 5. Enterprise budget for the collectors of mushrooms selling mushrooms to the trader based in Oaxaca.

Average days collecting per year	20
Average kilos of product collected per day	10
Average sale per year	200
Number of weeks	12
Visits to Oaxaca per week	1
Cost per visit	50

	Unit	Quantity	Price per Unit	Value (Peso) Total	Value (Peso) Per Unit	Value (US$) Total	Value (US$) Per Unit	% of the Costs
Sales or outputs								
Mushroom sales	Kilo	200.00	17.5	3500.00	17.50	350.00	1.75	
Total sales				**3500.00**	**17.50**	350.00	1.75	
Variable costs								
Transport	Unit	12	50	600	3.00	60.00	0.30	24.69
Total variable costs				600.00	3.00	60.00	0.30	24.69
Gross margin for the activity				**2900.00**	**14.50**	**290.00**	**1.45**	
Labour costs								
Men collecting	Days	20	70	1400	7.00	140.00	0.70	57.61
Men selling	Days	6	70	420	2.10	42.00	0.21	17.28
Children	Days			0	0.00	0.00	0.00	0.00
Total labour costs				1820	9.10	182.00	0.91	74.90
GM less labour costs				**1080.00**	**5.40**	**108.00**	**0.54**	
Equipment depreciation	Unit	Number	Price	Life (years)				
Basket	Unit	1	25	5 5.00	5.00	0.03	0.50	0.00 100.00
			Rate	Amount				
Interest	Unit	1	20.00%	5	5.00	0.03	0.50	0.00 100.00
Fixed costs								
Total fixed costs				10.00	0.05	1.00	0.01	0.41
Total costs				2430.00	12.15	243.00	1.22	100.00
GM less labour costs and fixed costs				**1070.00**	**5.35**	**107.00**	**0.54**	

Table 6. Enterprise budget for the collectors of mushrooms selling mushrooms for the trader based in the community, Cuajimoloyas.

Average days collecting per year	20
Average kilos of product collected per day	10
Average sale per year	200

	Unit	Quantity	Price per Unit	Value (Peso) Total	Value (Peso) Per Unit	Value (US$) Total	Value (US$) Per Unit	% of the Costs
Sales or outputs								
Mushroom sales	Kilo	200.00	13.5	2700.00	13.50	270.00	1.35	
Total sales				**2700.00**	**13.50**	270.00	1.35	
Variable costs								
Total variable costs				0.00	0.00	0.00	0.00	0.00
Gross margin for the activity				**2700.00**	**13.50**	**270.00**	**1.35**	
Labour costs								
Men	Days	20	70	1400	7.00	140.00	0.70	99.29
Women	Days			0	0.00	0.00	0.00	0.00
Children	Days			0	0.00	0.00	0.00	0.00
Total labour costs				1400	7.00	140.00	0.70	99.29
GM less labour costs				**1300.00**	**6.50**	**130.00**	**0.65**	
Equipment depreciation	Unit	Number	Price / Life (years)					
Basket	Unit	1	25 / 5	5.00	0.03	3.57	0.02	2.53
Interest	Unit	1	Rate 20.00% / Amount 5	5.00	0.03	3.57	0.02	2.53
Fixed costs								
Total fixed costs				10.00	0.05	1.00	0.01	0.71
Total costs				1410.00	7.05	141.00	0.71	100.00
GM less labour costs and fixed costs				**1290.00**	**6.45**	**129.00**	**0.65**	

Both sets of collectors generate a profit from their activities, but the collectors in Cuajimoloyas have a slightly higher profit. These collectors receive a lower price, but do not have any marketing costs for their product.

For the trader in the fresh mushroom supply chain two examples have been taken

1. A trader in the Centro de Abasto market in Oaxaca. Her name has not been mentioned in the report for reasons of confidentiality. It is estimated that this trader sells hongo de huevo for six months a year. In total it is estimated that she buys 800 kilos of mushrooms per year for sale from collectors who bring their product to Oaxaca from communities other than the ones in the study. It is estimates that she sells 680 kilos, 120 kilos being lost due to an inability to sell all that are fresh. The trader has a permanent market stall which costs 35 peso a month. To get such a stall requires personal contacts. The largest cost in this activity is the purchase of the mushroom and the time required for sale.
2. A trader based in San Antonio Cuajimoloyas, who buys the hongo de huevo mushrooms in the community and transports them once a week to Oaxaca

where she sells the mushrooms and other products at a temporary market stall. It is estimated that she sells mushrooms for 12 weeks a year and that half of the costs of transport and the market stall can be assigned to mushroom sales as the trader also sells other products.

Table 7. Enterprise budget for the Oaxaca based trader buying and selling fresh mushrooms in market Centro de Abasto, Oaxaca.

Average annual sales	800 Kilos							
			Price	Value (Peso)		Value (US$)		% of
	Unit	Quantity	Per Unit	Total	Per unit	Total	Per unit	Costs
Output or sales								
Mushroom sales	Kilo	800	55	44000	55.00	4400.00	5.50	
Less product unsold	Kilo	120	17.5	-2100	-2.63	-210.00	-0.26	8.25
Less product purchase	Kilo	800	17.5	-14000	-17.50	-1400.00	-1.75	54.99
Total sales				**27900**	34.88	2790.00	3.49	
Variable costs								
Total Variable Costs				0.00	0.00	0.00	0.00	0.00
Activity Gross Margin				**27900.00**	**34.88**	**2790.00**	**3.49**	
Labour costs								
Men	Days			0.00	0.00	0.00	0.00	0.00
Women	Days	100	80	8000.00	10.00	800.00	1.00	31.42
Children	Days			0.00	0.00	0.00	0.00	0.00
Total labour costs				8000.00	10.00	800.00	1.00	31.42
GM less labour costs				**19900.00**	**24.88**	**1990.00**	**2.49**	
Fixed costs								
Transport	Unit	1	1300	1300.00	1.63	130.00	0.16	5.11
Market fees	Unit	1	60	60.00	0.08	6.00	0.01	0.24
Total fixed costs				1360.00	1.70	136.00	0.17	5.34
GM less labour costs and fixed costs				**18540.00**	**23.18**	**1854.00**	**2.32**	**100.00**

Table 8. Enterprise budget for the Cuajimoloyas based trader buying fresh mushrooms in the community and selling them at a temporary market stall in Oaxaca.

Average annual sales	1080
Number of weeks selling mushrooms	12
Days per week spent sourcing mushrooms	5
% losses in product unsold	20%
Weekly transport costs	100
Weekly market stall costs	20
Percentage of costs assigned to mushroom sales	50%

	Unit	Quantity	Price Per Unit	Value (Peso) Total	Value (Peso) Per unit	Value (US$) Total	Value (US$) Per unit	% of Costs
Output or sales								
Mushroom sales	Kilo	1080	50	54000	50.00	5400.00	5.00	
Less product unsold	Kilo	216	13.5	-2916	-2.70	-291.60	-0.27	12.43
Less product purchase	Kilo	1080	13.5	-14580	-13.50	-1458.00	-1.35	62.14
Total sales				**36504**	33.80	3650.40	3.38	
Variable costs								
Total Variable Costs				0.00	0.00	0.00	0.00	0.00
Activity Gross Margin				**36504.00**	**33.80**	**3650.40**	**3.38**	
Labour costs								
Men	Days			0.00	0.00	0.00	0.00	0.00
Women	Days	60	80	4800.00	4.44	480.00	0.44	20.46
Children	Days			0.00	0.00	0.00	0.00	0.00
Total labour costs				4800.00	4.44	480.00	0.44	20.46
GM less labour costs				**31704.00**	**29.36**	**3170.40**	**2.94**	
Fixed costs								
Transport	Unit	12	50	600.00	0.56	60.00	0.06	2.56
Market fees	Unit	12	10	120.00	0.11	12.00	0.01	0.51
Equipment depreciation	Unit	Number 8	Price 80	Life (years) 2	40.00	320.00	0.30	228.57	0.21	0.01
Interest	Unit	Rate 1	20.00%	Amount 128	128.00	0.12	91.43	0.08	0.00
Total fixed costs					1168.00	1.08	116.80	0.11	4.98
GM less labour costs and fixed costs					**30536.00**	**28.27**	**3053.60**	**2.83**	**100.00**

The trader based in Cuajimoloyas is estimated to generate much higher profits than the trader based in Oaxaca. The enterprise budgets are open to question and in particular the number of days that each trader dedicates to this activity. It is also noted that the volume traded by the trader based in Cuajimoloyas is 25% higher than the trader in Oaxaca.

In summary the activities of collection and of trading hongo de huevo for the market of Oaxaca generate profits. However, the community-based trader is estimated to generate very high profits in comparison to the other actors analysed in this part of the mushroom supply chain (see Table 9).

Table 9. Summary of the supply chain for fresh mushrooms to Oaxaca market.

Actor	Margin			Volume	Profit (Peso)		Profit (US$)		Profit (PPP$)	
	Value	US%	%	Collector	Total	per Unit	Total	per Unit	Total	per Unit
Collector in Cuajimoloyas	13.50	1.35		200.00	1,290.00	6.45	129.00	0.65	180.60	0.90
Community based trader	36.50	3.65	73.00	1,080.00	30,536.00	28.27	3,053.60	2.83	4,275.04	3.96
Collector in other communities	12.15	1.22	0.00	200.00	1070.00	5.35	107.00	0.54	149.80	0.75
Oaxaca based trader	37.50	3.75	68.18	800.00	18,540.00	23.18	1,854.00	2.32	2,595.60	3.24

These figures should be treated with some caution as the range between a bad to good trader of this product is unknown. In addition, the transactions costs of establishing a business trading in the Oaxaca market are not quantified here. These have not been included because of the difficulty of estimating them with any accuracy. However, it recognised that there are important costs in terms of:

- establishing a network of suppliers of fresh mushrooms;
- developing a reputation within the market for this product; and
- maintaining relationships with fellow traders and authorities monitoring market-trading activities.

Taking full account of these costs will undoubtedly reduce the profits from the trading activity, but it is unlikely to reduce them down to the profit level per unit seen at the collection level. The transaction costs of beginning a fresh mushroom collection activity are likely to be relatively small, and it is also noted here that this route of selling mushrooms avoids the need to pay for rights of collecting in the forest.

A table has also been generated to compare the returns to labour of collecting and trading activities of fresh mushrooms for the Oaxaca market (see Table 10). The returns per day for collection are between 1.59 and 1.92 times greater than the local daily labour rate in the rural areas. For the trading activities the returns per day of trading are between 3.32 and 7.36 greater than returns from other activities.

Table 10. Returns to labour for the actors in the supply chain for fresh mushrooms.

Actor	Labour Rate (per day)			Returns to labour (per day)		
	Peso	US$	PPP$	Peso	US$	PPP$
Collector in Cuajimoloyas	70	7.00	9.8	134.50	13.45	18.83
Community based trader	80	8.00	11.2	588.93	58.89	82.45
Collector in other communities	70	7.00	9.8	111.15	11.12	15.56
Oaxaca based trader	80	8.00	11.2	265.40	26.54	37.16

The above analysis appears relatively sound for the collectors, but is open to question for the traders in particular the community-based trader. If this person was really making such high profits and high returns to their time it would be expected that other community members would also begin trading. Further information on the barriers to entry to trading from the community are needed to determine if this person is making super-profits from their activities.

10.3.3 Dried mushrooms to the National Mexican Market

10.3.3.1 Collectors

The collectors of mushrooms for the dried mushroom market are the same families as those who supply the fresh mushroom market. For the analysis presented below it is assumed that a family who specialises in this activity can collect 200 kilos of mushrooms per year and in this case all the product is sold to the mushroom drying and processing company. The cost structure is the same as that presented for the mushroom collector in Cuajimoloyas in Table 6.

10.3.3.2 Mushroom Drying and Processing Company

The company "Envasadora y Empacadora de Pueblos Mancomunados" is involved in the purchase, classification, drying, packing and sale of different types of wild mushrooms. Its main activity is with Hongos de huevo or hongo rojo (*Amanita caesarea*), Porcini or hongo de pan (*Boletus edulis*) and Duraznito (*Cantharellus cibarius*). The company is based in the Department of Oaxaca and although it does sell some fresh mushrooms its main product is dried mushroom. In 2002 the company purchased approximately 700 kilos of fresh mushrooms from the communities of San Antonio de Cuajimoloyas, Las Vigas and Llano Grande. A small quantity is also purchased from the community of Santa Catarina Ixtepeji. It sells its products throughout the year and the buyers either visit the factory to make their purchase or pay for the product to be sent to their outlet.

The cost structure and income from these types of mushroom sales are shown in the enterprise budget presented below. However, the full details of the capital equipment used by the company for drying the mushrooms are as follows:

- 1 Cold room
- A computerised convection drier with a diesel caldera
- A cutting machine
- A set of plastic gates
- A stainless steel table

The total investment is reported to be 1.3 million peso, but the useful life of the equipment has not been reported. The analysis has assumed a 20-year useful life and taken an interest rate of 5% for this investment. It has also been assumed that only 25% of this capital value is assigned to the mushroom drying activity as it has been reported that this activity only constitutes 25% of the business. As can be seen in the analysis presented below, the capital investment is a large proportion of the costs for the activity. It is possible that these costs are too high, but it might be an indication that the purchase of the equipment has been subsidised and therefore there has never been the need to consider this cost in running the business.

The dried mushroom product is sold in two basic forms:

- Four different types of dried mushrooms in 30g packets
- Dried mushrooms in 1kg packets sold at 800 peso per kilo.

The product is also found in the market in 133 gram packets. In the smaller sizes the prices are not quoted, but the company reports that annual sales are around 53,000 peso.

10.3.3.3 Commercialisation margins

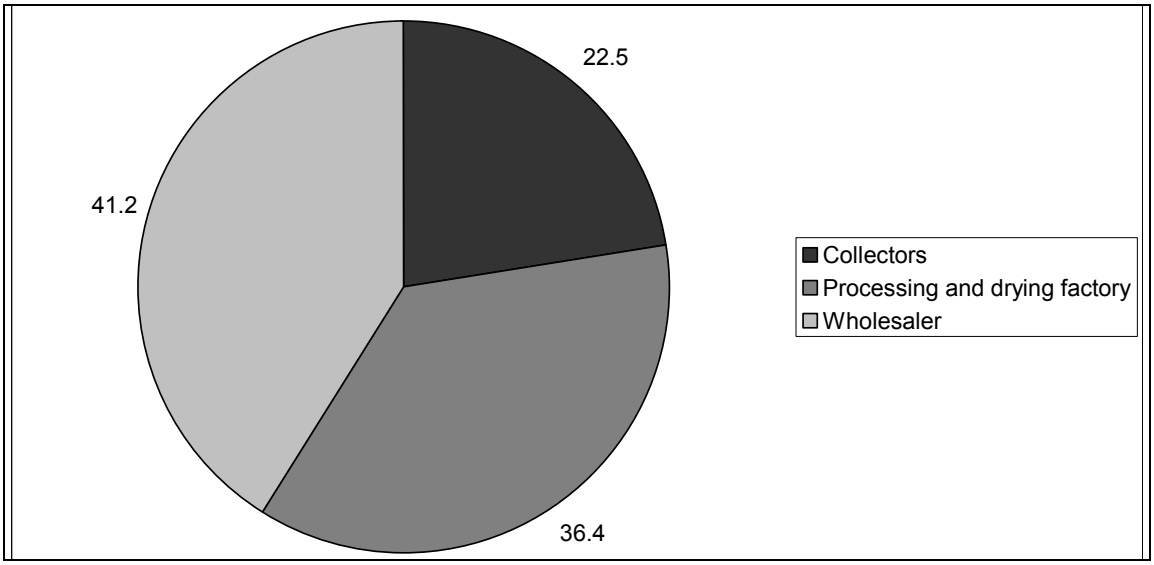
The commercialisation margins for the processing and drying factor and the wholesaler are estimated to be 36 and 41 per cent, respectively (see Table 9).

Table 11. Commercialisation margins for the supply chain for dried mushrooms for the Mexican market.

Actor	Price (kilo fresh mushroom)		Margin (per kilo fresh mushroom)		
Name	Buying	Selling	Peso	US$	%
Collectors		22.00			
Processing and drying factory	22	57.60	35.60	3.56	36.36
Wholesaler	57.60	97.92	40.32	4.03	41.18
Consumer	97.92				
Total			75.92	7.59	77.53
Final product value			97.92	9.79	100.00

As information was not available on the consumer prices, the proportion of the wholesaler purchase price taken by the initial actors in the supply chain was estimated. The processing and drying factory takes approximately two thirds of this price (see Figure 3).

Figure 3. The proportion of the wholesaler purchase price (US$9.79/kilo of fresh mushrooms) for the equivalent in fresh mushroom weight received by the actors in the supply chain of dried mushrooms for the Mexican market.



10.3.3.4 Profitability of the actors in the supply chain

The enterprise budget for the collectors in the supply chain for dried mushrooms for the Mexican market is similar to that for the collection of mushrooms for the fresh market in Oaxaca. The key difference is the price paid for the product which is 22 pesos per kilo and the existence of a market for three species of mushroom. The break-even amount of mushrooms that a collect would need to collect in a year is 72 kilos given there are 20 days in the season. The enterprise budget presented below assumes that the collector is s specialist in mushroom collection and can collect 200 kilos in the season. The analysis shows that they make a profit from this activity and the principal cost of this activity is the labour input. No transaction costs were included as it is understood that the processing and drying firm regularly visit the community during the collection season to purchase the

mushrooms. The main limiting factor for these collectors does not appear to be the market, but the climatic conditions that produce the mushrooms (see Table 12).

Table 12. Enterprise budget for the collectors of mushrooms using the supply chain for dried mushrooms for the Mexican market.

Annual Sales huevo de hongo				75	These estimates have not been generated from data observations and are only shown as an example of how the spreadsheet could be used for sensitivity analysis				
Annual sales Porcini				75					
Annual sales Duraznito				50					
Limiting factor	Climatic conditions?								
					Value		Value (US$)		%
	Unit	Quantity		Price	Total	Per Unit	Total	Per Unit	Costs
Output									
Hongo Huevo	Kilo	75		22	1650.00		165.00	0.00	
Porcini	Kilo	75		22	1650.00		165.00	0.00	
Duraznito	Kilo	50		22	1100.00		110.00	0.00	
Total sales		**200**			**4400.00**	**22.00**	440.00	2.20	
Variable costs									
Forest rights	%	10%		4400.00	440	2.20	44.00	0.22	23.78
Total variable costs					440.00	2.20	44.00	0.22	23.78
Gross margin					**3960.00**	**19.80**	**396.00**	**1.98**	
Labour costs									
Men	Days	20		70	1400.00	7.00	140.00	0.70	75.68
Total labour costs					1400.00	7.00	140.00	0.70	75.68
GM less labour costs					**2560.00**	**12.80**	**256.00**	**1.28**	
Fixed costs									
Equipment depreciation	Unit	Number	Price	Life (years)					
Basket	Unit	1	25	5	5.00	0.03	0.50	0.00	0.27
Transaction costs	Unit	0			75.00	0.00	0.00	0.00	0.00
			Rate		Amount				
Interest	Unit	1	20.00%		5	5.00	0.03	0.50	0.00	0.27
Total fixed costs						10.00	0.05	1.00	0.01	0.54
Total costs						1850.00	9.25	185.00	0.93	100.00
GM less labour and fixed costs						**2550.00**	**12.75**	**255.00**	**1.28**	

The data analysed for the processing and drying factory produce a negative enterprise budget for this activity. The main reason for this is the high fixed costs of this enterprise, which make up nearly two thirds of the cost structure. These fixed costs include investment in storage and drying equipment and an environmental impact assessment. In Cuajimoloyas Methodus paid for this assessment which cost 100,000 pesos, in order that the community could legally collect porcini which is on the national list of protected species. This cost is classified as a transaction cost and it is noted that other communities have been unable to carry such assessment. In addition to the one-off assessment cost, there is also a small annual cost for monitoring which is paid for by the community out of its 10% forest charge. Labour costs are of relatively little importance. It is suspected that the throughput may be higher than used in the calculations and possibly the sale price for

dried mushrooms used here is too low. The break-even throughput for this cost structure would be 1,780 kilos of fresh mushrooms processed per year. The break-even selling price for dried mushrooms with a throughput of 700 kilos of mushrooms and the presented cost structure would be 1,325 peso per kilo of product (see Table 13).

Table 13. Enterprise budget for the processing and drying factory in the supply chain of dried mushrooms for the Mexican market.

Purchases of hongo huevo	300
Purchases of Porcini	300
Purchases of Duraznito	100
Kilos fresh mushrooms 1 kilo dried	12.5
% fresh mushrooms lost	10%
Value of capital equipment	1,300,000
Percentage of business	15%
Limiting factor	Access to capital
Limiting factor	Throughput

						Value		Value (US$)		%
	Unit	Quantity			Price	Total	Per unit	Total	Per unit	Costs
Output										
Dried mushrooms	Kilo	50.4			800	40,320		4,032	5.76	
Less purchase huevo de hongo	Kilo	300			22	-6,600		-660	-0.94	9.88
less purchases porcini	Kilo	300			22	-6,600		-660	-0.94	9.88
less purchase duraznito	Kilo	100			22	-2,200		-220	-0.31	3.29
Total sales						**24,920**	35.60	2,492	3.56	
Variable costs										
Forest rights (paid by collectors)	%	10%								
Bags	Unit	420			1.5	630	0.90	63	0.09	0.94
Diesel	Litres	840			5	4,200	6.00	420	0.60	6.29
Electricity	Hours	140			12	1,680	2.40	168	0.24	2.52
Total variable costs						6,510	9.30	651	0.93	9.75
Gross margin						**18,410**	26.30	**1,841**	2.63	
Labour costs										
15% permanent labour	Days	36			80	2,880	4.11	288	0.41	4.31
Purchasing mushrooms	Days	24			80	1,920	2.74	192	0.27	2.88
Packing the mushrooms	Days	14			80	1,120	1.60	112	0.16	1.68
Total labour costs						5,920	8.46	592	0.85	8.86
GM less labour costs						**12,490**	17.84	**1,249**	1.78	
Fixed costs										
Equipment depreciation	Unit	Number	Price		Life (years)					
Boxes	Unit	60	30	5	6	360	0.51	36	0.05	0.54
Equipment (15% of value)	Unit	15%	1,300,000	20	65,000	9,750	13.93	975	1.39	14.60
Storage (15% of storage capacity)	month	1.8			3,000	5,400	7.71	540	0.77	8.09
Transport	Trip	24			150	3,600	5.14	360	0.51	5.39
Transaction costs (other)	Days	0			20	0	0.00	0	0.00	0.00
Environmental impact assessment	unit	1	100,000	20	5,000	5,000	7.14	500	0.71	7.49
Annual assessment									0.00	
			Rate		Amount					
Interest	Unit	1	5.00%		14,840	14,840	21.20	1,484	2.12	22.22
Total fixed costs						38,950	55.64	3,895	5.56	58.33
Total costs						66,780	95.40	6,678	9.54	100.00
GM less labour and fixed costs						**-26,460**	-37.80	**-2,646**	-3.78	

The summary of the quantitative analysis for the supply chain for dried mushrooms for the Mexican market is incomplete. However, the information presented shows that the profits are small at collector level and are negative at the processor/drier level (see Table 14).

Table 14. Summary of the supply chain for dried mushrooms for the Mexican market.

	Margin			Volume	Profit		Profit (US$)		Profit (PPP)	
Actor	Value	US%	%	Kilo	Total	per Unit	Total	per Unit	Total	per Unit
Collectors	0.00	0.00		200	2,550.00	12.75	255.00	1.28	357.00	1.79
Processing and drying factory	35.60	3.56	36.36	700	-26,460.00	-37.80	-2,646.00	-3.78	-3704.40	-5.29

According to Fabrice Edouard, the factory has yet to reach its processing capacity and it should be aiming to buy greater volumes of mushroom. The returns to labour for the collectors are higher than the rate quoted for agricultural work at this time of year.

10.3.4 Matsutake mushrooms to the Japanese Market

10.3.4.1 Mushroom collectors in the community of "Santa Martha Latuvi"

The collectors of matsutake mushrooms use a basket to carry the mushrooms collected, but no other equipment is required. The most important input to this activity is the time required for the collection. The mushrooms only appear and can be collected for a period of 3 months and the quantity of mushrooms available is very dependent on the weather conditions. According to information from Fabrice Edouard the collectors are only likely to find mushrooms for 15 to 23 days during the period of collection.

The matsutake mushrooms have 4 different quality classes and the price differences between the qualities are very large (see Table 14).

Table 15. Price paid for the different qualities of a kilo of Matsutake mushroom at collector level and paid by the trading company.

	Price (Peso/kilo)	
Quality	Collector	Trading company
First	325-355	550
Second	150-180	350
Third	70	200
Fourth	40	60

The wide variation in prices for the different qualities and the lack of information on the quantities of each quality collected put in doubt the value of the quantitative calculation presented in the later section. However the spreadsheet developed to analyse this can be used to test different scenarios.

There appeared to be two different groups of collectors: a group who collect between 14 and 20 kilos a year and another who collect 2 to 5 kilos a year. However, on closer examination of the dataset the two groups have been created by enumerator bias, the latter group seems to have asked the average collection per day rather than the total for the year. This would suggest that households collect a similar amount of Matsutake mushroom per year and this ranges from 14 to 20 kilos a year. All households report a value of 325 peso per kilo for first class mushrooms and 170 for second class.

10.3.4.2 Community firm "La forestal de Pueblos Mancomunados"

The community firm has trained staff who classify the mushrooms into 3 or 4 categories. There is a large difference between the prices for these categories (see Table 15). Ten percent of the value of sales is retained for a fund "Derecho de Monte". This fund is used to negotiate forest rights and other activities regarding the forest access. In many respects this can be regarded as a transaction cost.

10.3.4.3 Matsutake Mushroom exporters

There is currently only one national buyer of Matsutake mushrooms, a Mexican of Japanese descent. However the information used was obtained from a second buyer, a Korean entrepreneur who has since ceased activity in this market. The national buyer is based in the state of Hidalgo, which is approximately 700 kilometres from Oaxaca, whereas the Korean entrepreneur was based in Mexico City. However, during the mushroom collection season they both put bases in various Mexican states including Oaxaca.

In 2001, after having ceased trading for some years, the Korean entrepreneur created an alliance with the "Pueblos Mancomunados" to obtain permission to harvest mushrooms in the area. Part of the alliance was a commitment of his company to establish a cold room with two technical staff to carry out packing of the Matsutake mushroom in Oaxaca. The Pueblos Mancomunados contacted a further community in the area, Ixtepeji, to supply mushrooms to the Korean entrepreneur.

The Korean entrepreneur had an alliance with two Japanese firms (Korean origin). These firms provided him with the capital to collect, purchase, and pack and send Matsutake mushrooms to Japan. For this service, the Korean entrepreneur received 30% of the profits generated from the sales of mushrooms in Japan.

The Korean entrepreneur bought 1,700 kilos of Matsutake mushrooms per year in Oaxaca during the period between June and September, paying different rates for the different qualities of mushroom (see Table 14). The cost of his annual purchase was a total of 350,000 pesos, which is an average price of 206 pesos per kilo.

10.3.4.4 Japanese importers

The Japanese importers resell the imported Matsutake mushroom for between US$50 to 200 per kilo. The price fluctuates depending on the time of year and the quality of the mushrooms. The buyers are Japanese distributors.

10.3.4.5 Commercialisation margins

The commercialisation margin analysis for the Matsutake mushrooms has been developed in part on the basis of information on the collection costs and deriving prices[2] between actors rather than relying on the data collected in the questionnaires. The commercialisation margin is concentrated in the hands of the Mexican exporter and Japanese importer, with a low percentage being taken by the community firm (see Table 16).

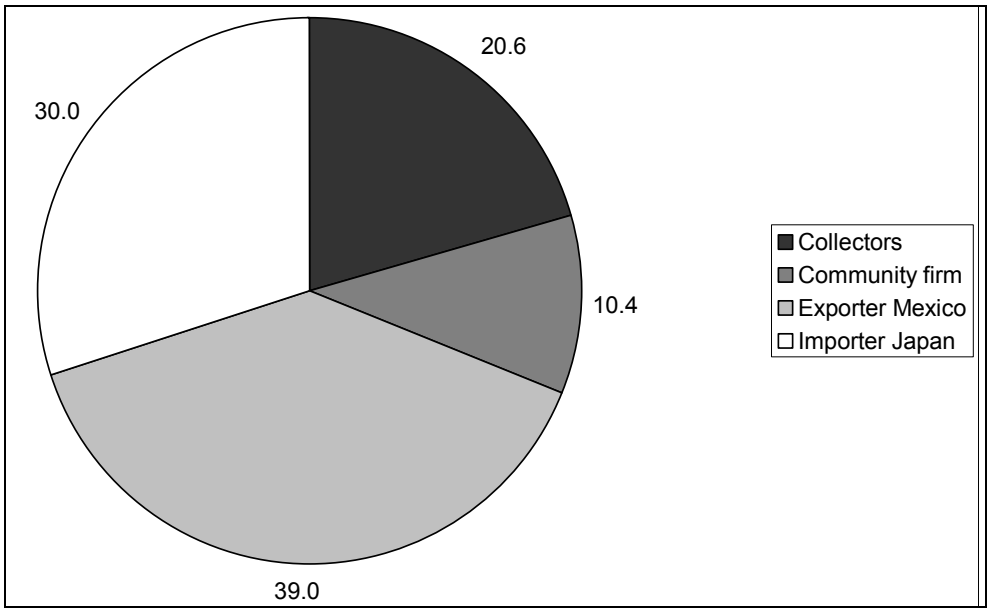
[2] Note that although the Japanese importer pays for 3 qualities, the mushrooms are reclassified in Oaxaca into 16 classes before being exported to Japan.

Table 16. Commercialisation margins for the supply chain for Matsutake mushrooms for the Japanese market.

Actor	Price (Kilo mushroom)		Margin (per kilo mushroom)		
Name	Buying	Selling	Peso	US$	%
Collectors		206			
Community firm	206	310.00	104.00	10.40	10.40
Exporter Mexico	310.00	700.00	390.00	39.00	39.00
Importer Japan	700.00	1000.00	300.00	30.00	30.00
Distributor Japan	1000.00				
Total			794.00	79.40	79.40
Final product value			1000.00	100.00	100.00

With regard to the proportion of the Japanese distributor price received by each actor, the collector receives 20% and the community firm 10%. The Mexican exporter and Japanese importer together receive a just over two thirds of the price (see Figure 4).

Figure 4. The proportion of the Japanese distributor purchase price (US$100/kilo) for Matsutake mushrooms received by the actors in the supply chain for Matsutake mushrooms for the Japanese market.



10.3.4.6 Profitability of the actors in the supply chain

The average collector of Matsutake mushrooms makes a small profit. The analysis has been simplified to state that all mushrooms sold are in one class at a price of 206 pesos per kilo with annual sales of 15 kilos. This is not the reality, but insufficient information was available to indicate the quantities of different classes of mushrooms collected. It is noted that there are collectors who do much better than the average presented, i.e. collecting more and at a better price and also others who collect less.

It is noted that nearly 100% of the costs are from labour input, which in effect means that the collector receives all the money from the sale of the mushrooms and does not have to commit him/herself to pay for any equipment, investment or risk. No transaction costs are included as the collector can sell his mushrooms to people who visit the community. The

only limitation in this situation is the climatic conditions that stimulate mushroom growth (see Table 17).

Table 17. Enterprise budget for the collectors of mushrooms using the supply chain for Matsutake mushrooms for the Japanese market.

						Value		Value (US$)		%
	Unit	Quantity			Price	Total	Per Unit	Total	Per Unit	Costs
Output										
Matsutake	Kilo	15			206	3090.00		309.00	0.00	
Total sales		**15**				**3090.00**	**206.00**	309.00	20.60	
Variable costs										
Total variable costs						0.00	0.00	0.00	0.00	0.00
Gross margin						**3090.00**	**206.00**	**309.00**	**20.60**	
Labour costs										
Men	Days	23			50	1150.00	76.67	115.00	7.67	99.14
Total labour costs						1150.00	76.67	115.00	7.67	99.14
GM less labour costs						**1940.00**	**129.33**	**194.00**	**12.93**	
Fixed costs										
Equipment depreciation	Unit	Number	Price	Life (years)						
Basket	Unit	1	25	5	5.00	5.00	0.33	0.50	0.03	0.43
Transaction costs	Unit	0			75.00	0.00	0.00	0.00	0.00	0.00
			Rate		Amount					
Interest	Unit	1	20.00%		5	5.00	0.33	0.50	0.03	0.43
Total fixed costs						10.00	0.67	1.00	0.07	0.86
Total costs						1160.00	77.33	116.00	7.73	100.00
GM less labour and fixed costs						**1930.00**	**128.67**	**193.00**	**12.87**	

The next step in the supply chain is complicated by the alliance created between the community firm and exporting business owned by the Korean entrepreneur. The principal author has attempted to separate the costs between the two companies, but there are likely to be some errors in the separation. Again the spreadsheet would allow the cost structures to be changed.

The community firm enterprise budget indicates that this is a profitable activity with very limited variable and fixed costs. The major proportion of the costs is in the purchase of the mushroom from the collectors (see Table 18).

Table 18. Enterprise budget for the community firm for Matsutake mushrooms for the Japanese market.

	Unit	Quantity	Price	Value		Value (US$)		%
				Total	Per unit	Total	Per unit	Costs
Output								
Mushroom sales	Kilo	1530	310	474,300		47,430	27.90	
Less mushroom purchases	Kilo	1700	206	-350,200		-35,020	-20.60	87.25
Total sales				**124,100**	73.00	12,410	7.30	
Variable costs								
Cooler boxes	Unit	30	10	300	0.18	30	0.02	0.07
Total variable costs				300	0.18	30	0.02	0.07
Gross margin				**123,800**	72.82	**12,380**	7.28	
Labour costs								
Purchasing mushrooms	Days	37	80	2,960	1.74	296	0.17	0.74
Total labour costs				2,960	1.74	296	0.17	0.74
GM less labour costs				**120,840**	71.08	**12,084**	7.11	
Fixed costs								
Equipment depreciation	Unit	Number	Price / Life (years)					
Cold room	Unit	1	300000 / 20	15000.00	15,000	8.82	1,500	0.88	3.74
Forest rights	Unit	1	1% value of purchase	3502.00	3,502	2.06	350	0.21	0.87
Transport to buy the mushrooms	Trip	36		400.00	14,400	8.47	1,440	0.85	3.59
			Rate / Amount					
Interest	Unit	1	5.00% / 15000	15,000	8.82	1,500	0.88	3.74
Total fixed costs				47,902	28.18	4,790	2.82	11.93
Total costs				401,362	236.10	40,136	23.61	100.00
GM less labour and fixed costs				**72,938**	42.90	**7,294**	4.29	

The Mexican exporter is estimated to make large profits from the Matsutake trading activity (see Table 19). However, the analysis has assumed that all major fixed costs are the responsibility of the community firm and it has not included the cost of maintaining an office nor the management costs of having an international exporting business. It is suggested that these are considerable. A comment is made on the transaction costs of this business later in this section.

Table 19. Enterprise budget for the Mexican exporters of Matsutake mushrooms for the Japanese market.

				Value (Bs.)		Value (US$)		%
	Unit	Quantity	Price	Total	Per unit	Total	Per unit	Costs
Output								
Mushrooms sales	Kilos	1377	700	963,900	630.00	96,390	63.00	
Less purchase of mushrooms	Kilos	1530	310	-474,300	-310.00	-47,430	-31.00	82.65
Total sales				**489,600**	**320.00**	**48,960**	**32.00**	
Variable costs								
Packaging	Unit	1530	10	15,300	10.00	1,530	1.00	2.67
Transport to Japan	Per kilo	1530	30	45,900	30.00	4,590	3.00	8.00
Total variable costs				61,200	40.00	6,120	4.00	10.66
Gross margin				**428,400**	**280.00**	**42,840**	**28.00**	
Labour costs								
Classifiers	Months	8	3000	24,000	15.69	2,400	1.57	4.18
Total labour costs				24,000	15.69	2,400	1.57	4.18
GM less labour costs				**404,400**	**264.31**	**40,440**	**26.43**	
Fixed costs								
Transport from Oaxaca to the airport	Trip	36	400.00	14,400	9.41	1,440	0.94	2.51
Total fixed costs				14,400	9.41	1,440	0.94	2.51
Total costs				573,900	375.10	57,390	37.51	100.00
GM less labour and fixed costs				**390,000**	**254.90**	**39,000**	**25.49**	

An important comment on the alliance between the community firm and the exporter is that the concentration of Matsutake mushroom exports into the hands of just two companies in Mexico is probably stimulating strategic alliances with producing communities by the exporting communities to guarantee supplies. In this way, this sector is moving towards vertical integration where the consumer demand is dictating the method of selection and processing. This is indicated very clearly by the large variations in prices between qualities. It appears that the chain with the consumers most distant from the collectors has the best system of market information and market signals.

The summary of the enterprise budget information for the three Mexican based actors is very lopsided. The collectors and the community firm make small profits, whereas the exporter is predicted to make large profits (see Table 20). However, this table should be interpreted with caution as some important costs in the exporter enterprise budget have not been included.

Table 20. Summary of the supply chain for Matsutake mushrooms for the Japanese market.

	Margin			Volume	Profit		Profit (US$)		Profit (PPP)	
Actor	Value	US%	%	Kilo	Total	per Unit	Total	per Unit	Total	per Unit
Collectors	0.00	0.00		15	1,930	128.67	193	12.87	270	18.01
Community firm	104.00	10.40	10.40	1700	72,938	42.90	7,294	4.29	10,211	6.01
Mexican exporter	390.00	39.00	39.00	1530	390,000	254.90	39,000	25.49	54,522	35.6

The returns to labour are interesting in that the return per day of collecting is more than twice the local manual labour rate. This would indicate that even less specialised collectors would do well in this activity.

A focus of the current study is the transactions costs for the different actors in the supply chains. What has not been included in the Matsutake mushroom chain are the costs of entry and maintenance of market position in Japan. The Japanese food market is perhaps one of the most attractive in terms of price in the world, but it is a market that is difficult to enter. The costs of entry, which are transaction costs, are likely to be very high, but

estimating them is difficult. If it were easy to enter this market, it is suggested that there would be many more Mexican exporters of Matsutake mushrooms. These high barriers to entry need to be considered when interpreting the high profits for the Mexican exporter. The difficulties of maintaining a market share in Japan are also show by the fact that the company who provided much of the information have stopped trading in Matsutake mushrooms. It is noted here that Mexico is not the only supplier of this type of mushroom to Japan.

10.4 HYPOTHESES

10.4.1 Hypothesis 5

The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.1 Does the successful commercialisation of an NTFP depend critically on the existence of an accessible market?	In all mushroom cases there are accessible markets. However, the dried mushrooms and the matsutake mushrooms markets are made accessible by road infrastructure and in the case of matsutake mushroom airport access. **This is important**.
5.2 Does the successful commercialisation of an NTFP depend critically on potential demand?	The fresh mushroom is a very specific demand of people with rural origins moving to the city. It would appear that this is a very specific demand that will only continue if the urban consumers maintain their rural traditions. Potential demand for the other two mushroom products appears to be strong and this is important in terms of investment in the value chain. In the case of matsutake, demand will depend on the Japanese consumers continuing to believe in the value of the mushroom as a natural medicine. **This is important**.
5.3 Does the successful commercialisation of an NTFP depend critically on the absence of substitutes?	No substitutes have been identified for these products, but it is doubtful if the absence of a substitute is critical to successful commercialisation.
5.4 Does the successful commercialisation of an NTFP depend critically on access by producers, processors and traders to market information?	In the case of the fresh mushroom the market is local and appears that information is readily available, with little cost. For the national dried mushroom market it is understood that a local NGO has helped producers break into this market and in this respect have been important providers of market information. It is suggested that without the NGO the collectors may not have known about this opportunity. For the matsutake mushroom the market information is much more advanced given that there are such large differences between the prices of different qualities. Here the exporting firms have played an important role in providing market information and translating this information into price variations for the type of quality demanded by the consumer. The contrast between the different mushroom qualities sold is interesting and indicates that to develop activities of collectors requires good information systems on the market. It is also commented that good market information systems are key to medium and long-term success of marketing the mushrooms. **This is important.**
5.5 Does the successful commercialisation of an NTFP depend critically on technical management capacity?	Dried mushrooms and matsutake mushrooms require a strong technical input to ensure that the product reaches the consumer in good condition. The fresh mushroom is less dependent on technical expertise. **This is important for the processed product and for products that are sold to consumers who are some distance from the collection areas.**
5.6 Does the successful commercialisation of an NTFP depend critically on organisation?	The locally marketed fresh mushrooms require very little organisation in their marketing. This appears to be more of an opportunistic activity. However, organisation is critical to supply the dried mushrooms and matsutake to consumers who far from the collection areas and have very specific preferences. It is suggested that without good organisation these supply chains would

	quickly have difficulties in maintaining market share and hence profitability. **This is of little importance for locally marketed fresh product, but of great importance for the dried and matsutake mushrooms which require processing, transport and presentation skills.**
5.7 Does the successful commercialisation of an NTFP depend critically on high value / unit wt?	This is more important for the product that is shipped some distance from the collection areas, i.e. matsutake mushroom followed by the dry mushrooms. **It is suggested that this factor becomes more critical the greater the transport costs are.**
5.8 Does the successful commercialisation of an NTFP depend critically on trader characteristics (age, experience, education, etc)?	The traders for the matsutake mushrooms are very few, indicating that some special characteristics are required to enter and maintain a position in the Japanese market. **The more specialised the market the more critical are the trader characteristics.**

10.5 HYPOTHESIS 6

The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.

Key questions	**Comments on the basis of the analysis presented**
6.1 What is the equitability of profit distribution along the market chain?	The fresh mushroom supply chain favours the trader, and this appears to be particularly extreme in the case of the trader who is based in the community. The dried mushroom chain is being subsidised, and currently the processing factory is making losses. The matsutake mushroom supply chain favours the Mexican exporters and the Japanese importers. However the entry costs to this market and the costs to maintain market share were unavailable when this study was carried out so it is difficult to say whether these actors are making super-normal profits. The fact that one of the exporters has dropped out of the market indicates that it is not an easy market.
6.2 Who controls the profits along the value chain?	The dried mushrooms appear to have been subsidised at the processing level. The traders are benefiting in the fresh mushroom market, but there was no explanation about why other families were not entering this trading activity. The matsutake mushroom market appears to be controlled by the Japanese importers.
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	In the case of the collectors, returns seem to equate to the labour rates. Processing of dried mushrooms does not seem to relate costs to income. High profits are made in the export of matsutake mushrooms, indicating that few people have the characteristics to enter this market.
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?	Demand appears to be increasing for processed product.
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?	The marketing network for mushrooms appears to be evolving through interventions of private traders in the case of matsutake and investments by NGOs in the case of dried mushrooms. It would appear that the collectors are not being exploited.
6.6 Are there actually a variety of trading networks for different NTFPs?	There are different networks for the different mushroom types. However the network for dried mushrooms appears to be concentrated. In the case of matsutake mushrooms there is only one trading company that exports this mushroom.
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	Only one trader exists for matsutake mushroom, but this does not appear to be a problem as the trader is offering infrastructure and technical advice to guarantee supplies. The power appears to be balanced between the trader and collector.
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	The intervention of the NGO in the dried mushroom market appears to have provided key market information, credit to establish processing and storage facilities and transport. Similarly the intermediary has also provided technical expertise, storage facilities and transport to reach distance markets. Therefore, these problems have been addressed by a non-profit making organisation and private company. At the collector level there does not seem to be a problem with credit nor equipment.
6.9 To what extent do prices fluctuate and to what extent does this represent a risk to producers and traders?	Although people were asked about the price changes, the information generated was felt to be insufficient to answer the question.
6.10 Do state marketing (or non-state) institutions play a	No state institutions are recognised. There is local

role?	control in terms of access to forest resources.

Poor collectors of mushrooms appear to have benefited from interventions by a NGO in the dried mushroom market and a private company in the matsutake market. These interventions have provided important inputs in terms of processing infrastructure, transport and handling skills and marketing skills. These have brought customers of mushroom products, who are geographically long distances from the communities studied, closer in terms of market access to the collector. This vertical integration has been important in providing collectors, rich and poor, with additional economic opportunities. The number of buyers of mushrooms appears to be limited, in all chains. In the case of fresh mushrooms there was a community based trader or the dried mushroom processing factory. What is of interest here is why collectors sell mushrooms to the community based trader when it is reported that she buys at a much lower prices than the dried mushroom factory. In the case of matsutake mushrooms the market has concentrated to one exporter of this product with strategic alliances with communities. The entry costs to the Japanese market and the competition from other sources of this product appear critical in the successful commercialisation. In terms of the number of collectors, the fresh mushroom collectors could be split into specialists, average and occasional collectors. The quantitative analysis shows that the volumes that need to be collected to cover the time involved was often higher than the volumes reported to be collected by the average collectors. This would suggest that for the majority of the families in the area, mushroom collection was a secondary activity on the visits to the forest. Only a few families or people specialise in this activity. For the matsutake mushrooms the families seem all to be involved in the collection, which perhaps reflects the high unit value of this product.

11 WILD COCOA

11.1 INTRODUCTION

Wild cocoa is a product that cannot be sold directly, but requires some processing at the collector level. There are two options of processing the cocoa seed, either to ferment and dry the seed and then sell it, or to process the dried seed into cocoa paste. Therefore, from the community level there are two possible products produced from cocoa collection: dried seed and cocoa paste. In the communities studied, 38% of the families interviewed (14 out of 37) reported to be growing cocoa as well as collecting it from wild sources.

In the community of San Silvestre production levels are lower (in part because of the lower density of cocoa trees per hectare) than in Carmen del Emero, where a larger percentage of the production comes from collection of wild cocoa rather than cultivated cocoa. In San Silvestre the families consume less cocoa in terms of weight, but they consume more product in terms of the proportion of the product collected and cultivated (see Table 21).

In terms of income, San Silvestre has an income per family which is only 54% that of Carmen del Emero and the income per family from cocoa sales is 20% that of the families in Carmen del Emero. The proportion of family income derived from cocoa is 7% and 14% in San Silvestre and Carmen del Emero, respectively. Erick Arancibia stated that one reason for the differences in income levels between the two villages is that the families in Carmen del Emero sell fish and this is an important economic activity. He also reported that San Silvestre is a village with indigenous people with lower levels of natural resources. Carmen del Emero also has a significant trading activity in cocoa beans, whereas San Silvestre does not report the buying or selling of beans within the community (see Table 21).

The price for cocoa beans was estimated by dividing the income from cocoa bean sales by the quantity sold. The price of cocoa beans is higher in San Silvestre (Bs. 6.65 per kilo or Bs. 76.5 per arroba) than in Carmen del Emero (Bs. 5.55 per kilo or Bs.63.8 per arroba) (see Table 21). The difference in prices could be related to the greater supply of cocoa seeds in Carmen del Emero, but also the distance from a main trading centre for the two communities. Carmen del Emero is 8-12 hours by boat from a trading centre whereas San Silvestre is only 2 hours by road. However, on further investigation of geographical access it appears that although San Silvestre is closer to the trading point, it has some difficulties in moving bulky products from the community to the main road.

Table 21. Production, purchases, sales and consumption of cocoa beans and the income generated by this product in the communities of San Silvestre and Carmen del Emero (information estimated from the community interviews i.e. the household collector interviews)

	Volume (kilos)					Income (Bs.)		Bs. per kilo
	Production		Cocoa	Sale/consumption				
	Collected	Cultivated	Purchased	Sold	Consumed	Cocoa	Total	
San Silvestre								
Number of producers	14	6	0	14	14	14	14	
Total	458	253	0	575	135	3,826	63,930	6.7
Average	33	18	0	33	10	319	4,566	
Percentage	64.40	35.60		77.21	22.79	7%		
Carmen del Emero								
Number of producers	23	8	4	22	23	22	22	
Total	4,060	1,012	2,392	4,796	420	26,595	167,966	5.5
Average	177	44	104	209	18	1,564	8,398	
Percentage	80.05	19.95		91.95	8.05	14.4%		

Just over half of the families interviewed reported that they sold their cocoa products to traders and the rest of the families reported that they sold to local consumers. All the families selling to traders are from the community Carmen del Emero and the principal product is dried seed. In San Silvestre the majority of the families sell cocoa paste in 600 gram blocks and those who sell dried seed sell in kilos rather than arrobas. All families in this community reported that they sold to consumers in other communities (see Table 22).

Table 22. Producer sales of cacao silvestre by buyer type, number of producers, quantity (arrobas) and value of annual sales (Bs.)

Purchaser	**Producers**		**Product**	**Location of Purchaser**	**Unit of Measure**	**Price per unit**	**Annual Quantity Sold**	**Annual sales**	
	Number	**%**						**Value**	**%**
Carmen del Emero									
Trader	19	82.61	Dried Seeds	In the community	Arroba	50	401	20,050	98.65
Consumer	1	4.35	Dried Seeds	Other community	Kilos	5	35	175	0.86
Consumer	2	8.70	Cocoa Paste	Other community	600 grs	5	20	100	0.49
Family consumption	1	4.35	Cocoa Paste	In the community	Arroba		4	0	0.00
Total	23	100.00						20,325	100.00
San Silvestre									
Consumer	11	78.57	Cocoa Paste	Other community	600 grs	5	454	2,270	79.79
Consumer	3	21.43	Dried Seeds	Other community	Kilos	5	115	575	20.21
Total	14	100.00						2,845	100.00

The difference between the price estimated in Table 21 and that reported directly by families in Table 22 is interesting. The former is derived from income derived and quantities sold of cocoa beans, whereas the latter is what people state they receive per

unit of product sold. The analysis in the subsequent sections has used the price stated by the families rather than the derived value, as it was felt that the derived value contained errors.

Therefore, cocoa is an important product in terms of generating income and also as a part of the local diet. This means that the families have a local and an external market for their forest product.

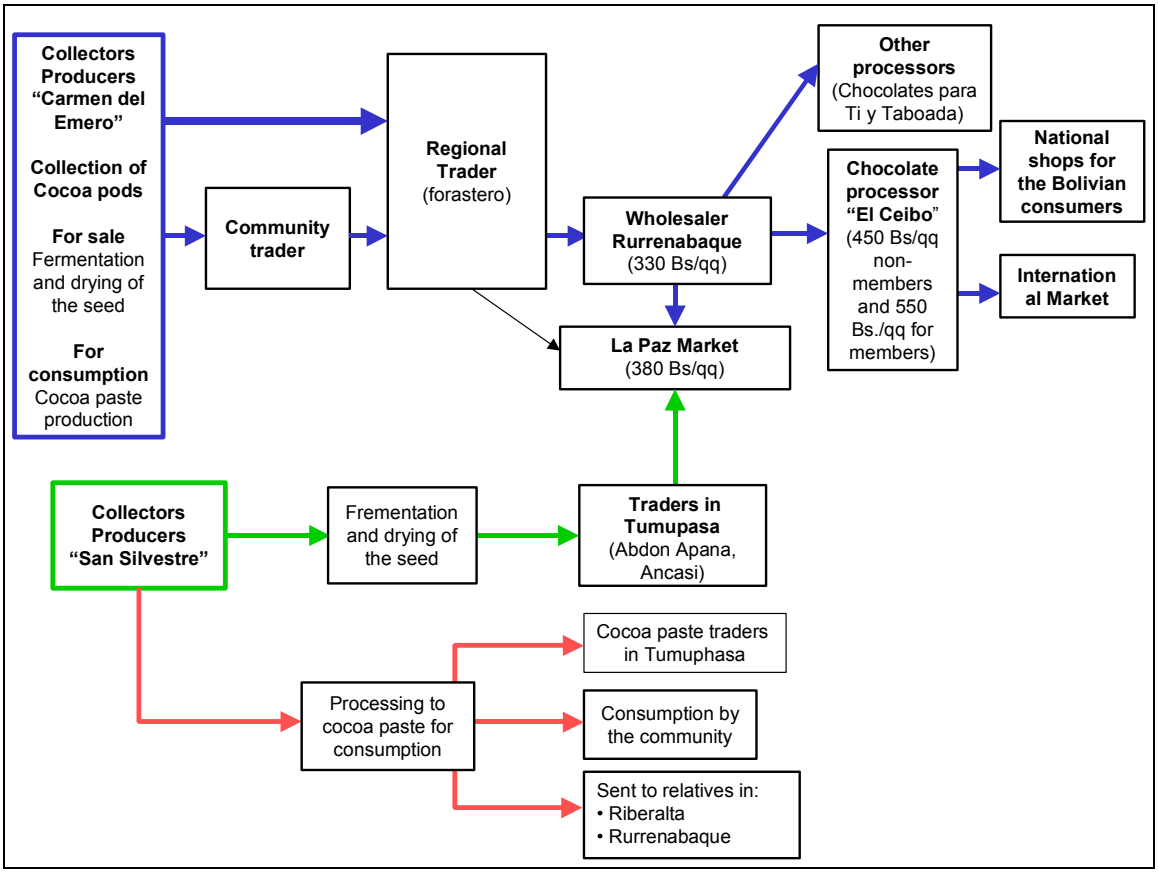
11.2 SUPPLY CHAINS

Three supply chains have been identified in the two communities of study:

1. Dried seed sold for the formal chocolate processors who sell chocolate into the national market and also export chocolate as an organic product. This chain is used by the collector/producers in Carmen del Emero and would appear from the community interview data to be the main supply chain used.
2. Dried seed that is sold to an informal market in La Paz. This chain is used by collector/producers in both communities. This chain appears to be of little importance.
3. Cocoa paste that is consumed at local level, sent to relatives in nearby towns and also sold to traders in towns. This chain is used by the collectors/producers in San Silvestre and appears to be the most important chain for this community.

Figure 5 provides details of the actors in the chains identified.

Figure 5. Wild cocoa supply chains.



11.3 SUPPLY CHAIN ANALYSIS

11.3.1 Dried seed to formal chocolate processors

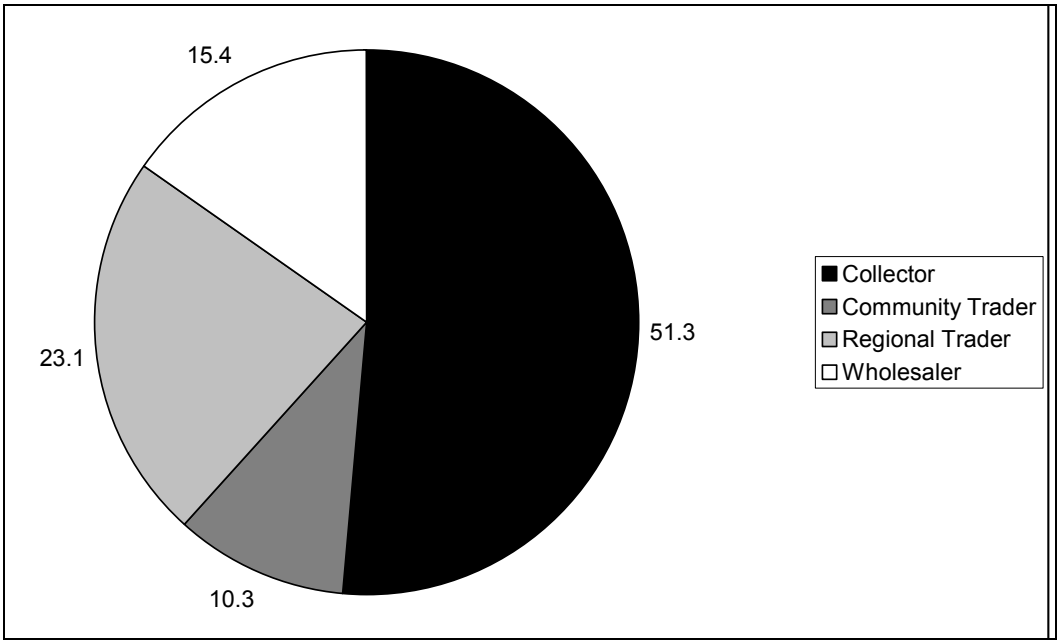
The commercialisation margins indicate that the regional trader takes the largest share of the margin (see Table 23).

Table 23. Commercialisation margins for the actors in the dried cocoa seed value chain from Carmen del Emero to the formal chocolate processors.

Actor	Price		Margin		
Name	Purchase	Sale	Boliviano	US$	%
Collector		50			
Community Trader	50	60	10	1.37	10.26
Regional Trader	60	82.5	22.5	3.08	23.08
Wholesaler	82.5	97.5	15	2.05	15.38
National company (El Ceibo)	97.5				
Total			49.63	6.80	50.90
Final product value			97.5	13.36	100.00

A largest proportion of the final price for the dried cocoa seed is taken by the collector followed by the regional trader (see Figure 6). However this analysis like the commercialisation margins takes no account of the costs for each actor.

Figure 6. Proportion of the final price for the dried cocoa seed taken by each actor in the value chain.



The community Carmen del Emero supplies the formal chocolate processors. The community is found on the banks of the river Beni and this is the only access to this community from San Buenaventura, Rurrenabaque and other communities. The community has 274 people in 47 families. It is a community known for its cocoa seed production, selling dried seeds and also making cocoa paste for home consumption.

The area has a high density of cocoa trees and Carmen del Emero is reported to produce nearly 7 tonnes per year (150qq/year). The environmental conditions are good for cocoa production and in the area there is good regeneration of cocoa trees with a density of 950 trees per hectare.

As reported above the majority of the cocoa production is sold as dried seed to traders who come to the community from San Buenaventura and Rurrenabaque. Collection and processing of the seed involves the following stages:

11.3.1.1 Collection

Collection takes place between December and March and is carried out by all the family. On average 1 quintal (46.5 kg) can be collected by one person in a 6 day period. The community report states that 150 quintals are collected per year by all the families in the community; of this amount 100 quintals are sold to traders. Therefore, the collection of cocoa seed takes a total of 900 man days or 45 man months. This means that this activity alone employs 11 people full time during the collection season (45 man months divided by the length of the collection season which is 4 months). In addition it is possible to say that a quarter of all families would have the equivalent of one person working fulltime on cocoa seed collection. The estimates of the value of a day's labour vary. The official quoted rate to hire a day of labour in the zone is Bs. 30 per day, but another price is quoted in the community report, which is Bs.10 per day. The latter price covers only the cost of food for that person, but is perhaps a better reflection of the opportunity cost of time in the area,

which appears to have limited employment opportunities, i.e. the Bs. 30 a day rate is only available during limited times of the year and there is unlikely to be sufficient work to employ everyone. The fixed costs for collecting cocoa pods in the community include a machete, a rubber bag and jute bag. There is information on the cost of these items but not their useful life estimates. The calculations have estimated that each item would have a useful life of 5 years. This value can be changed in the spreadsheet if it is felt to be incorrect.

In the community report it is reported that there are 6 areas of cultivated cocoa trees with a total coverage of 4 and half hectares and a density of 420 trees per hectare. It is reported that the families in the community understand that yields from cultivated areas are greater than those from wild cocoa. However only 6 families have established plots and of these 4 plots were established 16 years ago. This would seem to indicate that the investment in establishing a cultivated area is high and the returns are not rapid.

11.3.1.2 Removal of the pulp from the pods

The collectors remove the pulp of the pods using their machetes at the site of the collection. The pulp is emptied into the rubber bag and used to make a juice or alcoholic beverage. There are no data on the quantity or value of this juice, but it is presumably consumed within the household.

11.3.1.3 Washing

The seeds are washed and this activity is normally carried out in the house by the women. The extract from the washing is the juice.

11.3.1.4 Fermentation

Fermentation of the seed improves its quality, but it is reported that this process is rarely adequately implemented in the community. What normally happens is that the seeds are left in a jute bag overnight to extract the juice.

11.3.1.5 Drying

Generally the seeds are dried on the ground, which is either covered by plastic or jute bags. A small proportion of the families use wooden boxes ("esteras") that measure 40 by 60 by 80 centimetres. These boxes are placed over rustic tables ("chapapas") which are 2 by 1 metre and are not particularly high. These wooden constructions are made by the collectors and no price was available for these investments, but given that these constructions are not commonly used in the community it appears that the returns are not great. This would be a fixed cost and has not been included in the general analysis. However, the spreadsheet provided has adequate space to include the costs of these boxes and tables. The drying process takes between 1 to 3 days depending on the weather conditions. The average sale price for an arroba (11.5 kg) of dried seeds is Bs. 50.

11.3.2 Community traders

The community traders buy the cocoa seeds from the collectors and sell the dried seed to regional traders, who visit the community every 15 days. The community traders dry the cocoa seeds every 3 days. They do not appear to have any significant costs, the collectors deliver the cocoa seed direct to their houses and the regional traders visit the communities to buy the dried seed.

It is suggested that the community traders perform an important processing function, and are probably known to be good at processing the cocoa seeds. These families also serve a useful trading function by gathering the cocoa seeds from the community, and thereby reducing the transaction costs of the regional traders. For this service the regional traders pay around 10% more than they would if they purchased directly from each household. The database reports that the community trader pays the families 45-50 Bolivianos per arroba and they sell the product for 50-55 Bolivianos. Therefore these traders appear to be adding value to the community production by maintaining the seed quality (through frequent drying in the sun) and also help to reduce the costs of the regional traders by bulking up the seed. The role within the community would appear to be important in making this an attractive place for regional traders to visit and buy cocoa seeds.

One of the community traders reported that he purchased 180 arrobas a year, although the average taken from the database is 51 arrobas per year. The costs of this activity are mainly bags for storage and time to dry the seeds. There is also a cost in terms of time required to buy the cocoa seeds from the collectors and there is potentially some loss during storage. The spreadsheet has been adapted to allow a user to enter these two costs. For the current analysis, these costs have been estimated as there were no data available. A 2 per cent storage loss was used and a time of 0.25 days of time for each arroba handled. Finally there is a cost to build a construction that can store the seeds between the visits of the regional traders. Again data on this fixed cost is not available. An estimated cost of Bs. 100 for this building has been included with a useful life of 20 years.

11.3.3 Regional traders ("Intermediarios forasteros")

The regional traders buy dried seed from the local traders and also from the collectors. These traders are often related to the community traders or are godparents to the community trader's children (this can be as many as 30 or 40 children). As a godparent, the regional trader will give gifts and favours that are repaid in the future by the children when they grow up. Therefore, the regional traders have a strong social network either through blood relations or through social contracts.

They visit the community every 15 days and according to the community and marketing reports they pay for the seed through a barter system, exchanging food and other goods for the seed. However, in the database they have given a monetary value for the purchase of an arroba of dried seed.

The average purchases and sales per year for the 5 traders in the database was 435 arrobas with an average sale price of Bs. 91.25 per arroba and average purchase price of Bs.60 per arroba. The sale price data do not correspond with the purchase price given by the wholesalers nor the price collected in more informal situations from the regional traders, which was lower at Bs. 82.5 per arroba. The latter price has been used in the analysis. The price of Bs. 60 per arroba for purchasing the dried cocoa seed also does not match with the informal interviews, but when calculating the value of food and goods carried for bartering it would appear that 60 is the correct value. Therefore this value has been used in the analysis.

For each trip the regional traders travel around 300 kilometres, for the purposes of the analysis it was originally assumed that each trader does 6 trips each collection season as they estimate that for each trip they would collect between 60 and 80 arrobas per trip.

However, the costs of doing 6 trips would put this activity heavily into loss. Therefore further information was gathered on the nature of the trips. Between January and March the regional traders buy cocoa beans and small quantities of dried fish on the trips. In April, the quantities of cocoa beans are less and dried fish becomes more important. From April until December, fish is the only product purchased. Therefore, the analysis has used 4 trips as a basis for the activity, as each trip is not entirely dedicated to the purchase of cocoa seed. This number of trips generates a small profit.

It is also noted that the trips bring products from outside the community and provide an important point of sale of products.

Unfortunately there are no data on the fixed costs of these traders, but it is assumed that they have some kind of warehouse for storing the dried seed. A value of Bs. 500 has been given to this warehouse with a useful life of 20 years. Again the spreadsheet has been adapted to allow these factors to be modified.

11.3.4 Wholesaler

The wholesalers buy dried cocoa seed from the regional traders and sell the seed to the chocolate processing firm "El Ceibo". The wholesalers buy and sell between 150 and 200 quintals of dried cocoa seed a year. The purchase price is taken to be Bs. 82.5 per arroba and the selling price is Bs. 97.5 per arroba.

The only information on costs is that the trader buys bags to deliver the product, no data were collected on the transport and labour inputs nor the losses incurred during storage in the wholesaling activity. Fixed costs were also not available. Therefore a figure of 0.1 days per arroba and variable costs of Bs.5 per arroba have been included in the analysis. Storage losses of 5% have been included. A warehouse cost has also been included of Bs. 1000 with a 20 year useful life. These parameters have also been made easily accessible within the spreadsheet so that they can be changed if better data become available.

11.3.4.1 Profit and Commercialisation Margins

The collector/processors in the value chain make a small profit from their activities (see Table 24). However, some items in their budget have not been costed or valued, for example the juice produced from the pods has had no value included and the equipment used for drying the seeds have not been costed. The latter equipment has not been included as it is not used by all the families and no data on costs were available.

Table 24. Enterprise budget for the collector/processor families involved in the cocoa dried seed value chain in Carmen del Emero

	Unit	Quantity	Price	Value		Value (US$)		% of costs
				Total	Per unit	Total	Per unit	
Cocoa seeds	Arrobas	22	50	1,100.00	50.00	150.68	6.85	
Juice	litres			0.00	0.00	0.00	0.00	
Byproduct sales 2				0.00	0.00	0.00	0.00	
Total sales				**1,100.00**	**50.00**	150.68	6.85	
Variable costs								
Total variable costs				0.00	0.00	0.00	0.00	0.00
Activity gross margin				**1,100.00**	**50.00**	**150.68**	**6.85**	
Labour costs								
Family labour	Days	33	30	990.00	45.00	135.62	6.16	91.83
Total Labour costs				990.00	45.00	135.62	6.16	91.83
GM minus labour costs				**110.00**	**5.00**	**15.07**	**0.68**	
Fixed costs								
Equipment depreciation	Unit	Number	Price	Life (years)				
Machete	Unit	1	18	2	9.00	9.00	0.41	1.23	0.06	0.83
Rubber bag	Unit	1	60	2	30.00	30.00	1.36	4.11	0.19	2.78
Yute bag	Unit	1	5	2	2.50	2.50	0.11	0.34	0.02	0.23
Wooden boxes (esteras)	Unit					0.00	0.00	0.00	0.00	0.00
Tables (chapapas)	Unit					0.00	0.00	0.00	0.00	0.00
Transaction costs	Days	1			30	30.00	1.36	4.11	0.19	2.78
			Rate		Amount					
Interest	Unit	1	20.00%		16.6	16.60	0.75	2.27	0.10	1.54
Total Fixed costs						88.10	4.00	12.07	0.55	8.17
Total costs						1,078.10	49.00	147.68	6.71	100.00
GM minus labour costs and fixed costs						**21.90**	**1.00**	**3.00**	**0.14**	

The community level traders are also estimated to make a small profit from their activities. Their major costs are the purchase of the cocoa seed from the collectors (see Table 25).

Table 25. Enterprise budget for the community traders in the cocoa dried seed value chain in Carmen del Emero.

					Value		Value (US$)		% of costs
	Unit	Quantity		Price	Total	Per unit	Total	Per unit	
Product sales	Arrobas	51.5		60	3,090.00	60.00	423.29	8.22	
less losses during storage		1.0		50	-51.50	-1.00	-7.05	-0.14	1.7
Less purchase of the product		51.5		50	2,575.00	50.00	352.74	-6.85	84.3
Total sales					**463.50**	9.00	63.49	1.23	
Variable costs									
Bags	Unit (arroba bag)	7		2.5	17.50	0.34	2.40	0.05	0.6
Total variable costs					17.50	0.34	2.40	0.05	0.6
Activity gross margin					**446.00**	8.66	**61.10**	**1.19**	
Labour costs									
Male	Days	12.9		30	386.25	7.50	52.91	1.03	12.6
Total Labour costs					386.25	7.50	52.91	1.03	12.6
GM minus labour costs					**59.75**	1.16	**8.18**	**0.16**	
Fixed costs									
Equipment depreciation	Unit	Number	Price	Life (years)					
Storage unit	Unit	1	100	20 5	5.00	0.10	0.68	0.01	0.2
					0.00	0.00	0.00	0.00	0.0
					0.00	0.00	0.00	0.00	0.0
			Rate	Amount					0.0
Interest	Unit	1	20.00%	20	20.00	0.39	2.74	0.05	0.7
Total Fixed costs					25.00	0.49	3.42	0.07	0.8
Total costs					3,055.25	59.33	418.53	8.13	100.0
GM minus labour costs and fixed costs					**34.75**	0.67	**4.76**	**0.09**	

The regional traders make a profit if the analysis uses an estimate of 4 trips rather than 6 during the collection season. The major cost is the purchase of the cocoa seed, followed by the variable costs that relate to the river transport (see Table 26).

Table 26. Enterprise budget for the regional traders in the dried cocoa seed value chain for Carmen del Emero.

					Value		Value (US$)		% of costs
	Unit	Quantity	Price		Total	Per unit	Total	Per unit	
Product sales	Arrobas	435	82.5		35,887.50	82.50	4,916.10	11.30	
Less product lost in storage	Arrobas	21.75	60		-1,305.00	-3.00	-178.77	-0.41	3.8
Less purchase of product	Arrobas	435	60		-26,100	-60	-3,575	-8.22	75.3
Total sales					**8,482.50**	19.50	1,161.99	2.67	
Variable costs									
Bags (quintals)	Unit	109	2.5		272.50	0.63	37.33	0.09	0.8
Boat Hire[3]	Days	40	40		1,600.00	3.68	219.18	0.50	4.6
Motor Hire	Days	40	30		1,200.00	2.76	164.38	0.38	3.5
Petrol	Litres	400	3.31		1,324.00	3.04	181.37	0.42	3.8
Oil	Litres	16	14		224.00	0.51	30.68	0.07	0.6
					0.00	0.00	0.00	0.00	0.0
Total variable costs					4,620.50	10.62	632.95	1.46	13.3
Activity gross margin					**3,862.00**	8.88	**529.04**	**1.22**	
Labour costs									
Boat captain	Days	40	30		1,200.00	2.76	164.38	0.38	3.5
Trader during trips (food costs only for trader and captain)	Days	80	15		1,200.00	2.76	164.38	0.38	3.5
Trader time for administration	Days	4.35	30		130.50	0.30	17.88	0.04	0.4
Total Labour costs					2,530.50	5.82	346.64	0.80	7.3
GM minus labour costs					**1,331.50**	3.06	**182.40**	**0.42**	
Fixed costs									
Equipment depreciation	Unit	Number	Price	Life (years)					
Storage unit	Unit	1	500	20 25	25.00	0.06	3.42	0.01	0.1
			Rate	Amount					
Interest	Unit	1	20.00%	100	100.00	0.23	13.70	0.03	0.3
Total Fixed costs					125.00	0.29	17.12	0.04	0.4
Total Costs					34,681.00	79.73	4,750.82	10.92	100.0
GM minus labour costs and fixed costs					**1,206.50**	2.77	**165.27**	**0.38**	

The wholesaler also has the major proportion of his costs in the purchase of cocoa seed, but still makes a small profit on the activity of trading the seed (see Table 27).

[3] The boat visits other communities but the round trip to this community is estimated to be 40 days.

Table 27. Enterprise budget of the wholesaler in the dried cocoa seed value chain for Carmen del Emero.

					Value		Value (US$)		% of costs
	Unit	Quantity	Price		Total	Per unit	Total	Per unit	
Product sales	Arrobas	600	97.5		58,500.00	2,659.09	8,013.70	364.26	
Less losses during storage	Arrobas	30	82.5		-2,475.00	-112.50	-339.04	-15.41	4.3
Less purchase of product	Arrobas	600	82.5		49,500.00	2,250.00	6,780.82	308.22	86.0
Total sales					**6,525.00**	**296.59**	893.84	40.63	
Variable costs									
Bags	Units	150	5		750.00	34.09	102.74	4.67	1.3
Administration handling cost	Units	600	5		3,000.00	136.36	410.96	18.68	5.2
Total variable costs					3,750.00	170.45	513.70	23.35	6.5
Activity gross margin					**2,775.00**	**126.14**	**380.14**	**17.28**	
Labour costs									
Wholesaler time	Days	60	30		1,800.00	81.82	246.58	11.21	3.1
Total Labour costs					1,800.00	81.82	246.58	11.21	3.1
GM minus labour costs					**975.00**	**44.32**	**133.56**	**6.07**	
Fixed costs									
Equipment depreciation	Unit	Number	Price	Life (years)					
Storage unit	Unit	1	1000	20	50	50.00	2.27	6.85	0.31	0.1
			Rate		Amount				
Interest	Unit	1	20.00%		200	200.00	9.09	27.40	1.25	0.3
Total Fixed costs						50.00	2.27	6.85	0.31	0.1
Total costs						57,575.00	2,617.05	7,886.99	358.50	100.0
GM minus labour costs and fixed costs						**925.00**	**42.05**	**126.71**	**5.76**	

The commercialisation margins for the value chain indicate that the regional trader takes the highest proportion of the margin followed by the wholesaler and then the community trader. Profit per unit of product marketed is highest for the regional trader followed by the collector and then the wholesaler. These results should be treated with some caution as the transport costs for the regional trader may well be higher than estimated in the enterprise budget presented above. It is this actor in the chain who probably bears the most risk and the highest transaction costs (see Table 28).

Table 28. Commercialisation and profit margins for the actors in the dried cocoa seed value chain from Carmen del Emero to formal chocolate producers

	Margin			Volume	Profit		Profit (US$)		Profit (PPP)	
Actor	Boliviano	US%	%	Arrobas	Total	per Unit	Total	per Unit	Total	per Unit
Collector	2.13	0.29		22	21.90	1.00	3.00	0.14	7.50	0.34
Community Trader	10.00	1.37	10.26	51.5	34.75	0.67	4.76	0.09	11.90	0.23
Regional Trader	22.50	3.08	23.08	435	1,206.50	2.77	165.27	0.38	413.18	0.95
Wholesaler	15.00	2.05	15.38	600	925.00	1.54	126.71	0.21	316.78	0.53

The returns to labour are greatest for the wholesaler followed by the community trader, the collector and then the regional trader (see Table 29).

Table 29. Returns to labour for the actors in the supply chain for dried cocoa seed for the formal chocolate processors.

	Labour Rate (per day)			Returns to labour (per day)		
Actor	Days	US$	PPP$	Days	US$	PPP$
Collector	30	4.11	10.27	30.66	4.20	10.50
Community Trader	30	4.11	10.27	32.70	4.48	11.20
Regional Trader	30	4.11	10.27	30.05	4.12	10.29
Wholesaler	30	4.11	10.27	45.42	6.22	15.55

The analysis would seem to indicate that the profit per unit of product is greatest at the regional trader level, but the data on transport is uncertain for this actor. It is suggested that the risks are greatest for this actor as he has to contract transport and move the seed from difficult zones back to Rurrenabaque. Therefore it is likely that there will be a wide variation in the profit between traders and also between years for individual traders. It is also likely that the transaction costs for this group are relatively high in comparison to the other actors in the chain. These traders have significant entry costs to their activity, they need to develop a knowledge of the areas that produce cocoa, in terms of quality and quantity. They also need to develop relationships of trust with the community traders, which as mentioned above is either through blood relation contacts or through acting as a godparent to the children of the community traders.

11.3.5 Cocoa paste to traders and relatives in local towns

Unfortunately insufficient data were available to make an analysis of this value chain for cocoa.

11.4 HYPOTHESES

11.4.1 Hypothesis 5

The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.1 Does the successful commercialisation of an NTFP depend critically on the existence of an accessible market?	Access to markets is important, but what stimulates that access is a chicken and egg question for the communities studied. Carmen del Emero produces relatively large quantities of cocoa so attracts traders and therefore has good access. San Silvestre does not attract traders, which appears to be due to low supply and perhaps low quality of dried seed. The activities of the community traders in terms of processing and improving the quality of the seeds and also bringing together important quantities of seeds could be something that is important in attracting traders. The role of these individuals in the community deserves to be more carefully studied. **Important**
5.2 Does the successful commercialisation of an NTFP depend critically on potential demand?	Potential demand was not available. However, the demand for organic cocoa seed seems to be growing and is of importance in the Carmen del Emero community. In San Silvestre the demand for cocoa paste seems more restricted and provides fewer opportunities for expansion. Cocoa seed has an industrial demand and therefore a large potential. Cocoa paste is a product for consumers and is limited by the number of consumers in the region unless a more complex marketing chain can be developed to deliver this product to the cities. A question of relevance is why cocoa seed is not sold by San Silvestre when the price for cocoa paste is similar to this product. It is relevant to mention that cocoa paste is made with sugar, but in other areas is made as a pure cocoa product. There are markets for different qualities of cocoa paste, but San Silvestre only sell one quality. By putting sugar into the product, potentially the money earned per kilo of cocoa seed is higher. This depends on the price relationship between sugar and cocoa and here it should be remembered that sugar has to brought in from the outside. This is perhaps one reason why processing is not common in Carmen del Emero where access to inputs like sugar is likely to be more difficult than in San Silvestre.
5.3 Does the successful commercialisation of an NTFP depend critically on the absence of substitutes?	There exist substitutes for wild cocoa and this undoubtedly influences the prices and therefore the commercialisation of wild cocoa. Within the local context of the community Carmen del Emero some families have planted and cultivated cocoa trees, but it has not become a common feature of production and the majority of the cocoa seed from this community continues to come from wild cocoa plants. With regards to cocoa paste, there are many substitutes, the majority of which are more refined, of higher quality and more expensive. It is noted that the recent introduction of food safety laws in Bolivia will have added higher transactions costs for the cocoa paste if it is to be marketed formally. Every food and drink product officially marketed in Bolivia needs to be registered. The details of the registration process are not known. For wild cocoa seed stimulating

	demand for organic cocoa products seems to be of **key importance**. For the cocoa paste, it is suggested that help is needed in marketing this product to consumers in the cities, including the registration of locally produced cocoa products.
5.4 Does the successful commercialisation of an NTFP depend critically on access by producers, processors and traders to market information?	Market information on demand for wild cocoa from El Ceibo appears to be stimulating trader activity and hence contact with communities. There is a potential demand for cocoa paste in the cities of Bolivia, but there seem to be no adequate information nor information channels. **Important**
5.5 Does the successful commercialisation of an NTFP depend critically on technical management capacity?	In Carmen del Emero the community traders process the seeds and appear to have a specialised function in the value chain. However, there seems to be little variation in the price of the product according to quality. In San Silvestre most collectors produce cocoa paste, which requires some technical skill, but again there is no price differentiation for quality. At current levels of production technical management capacity does not seem very important. **Low importance.**
5.6 Does the successful commercialisation of an NTFP depend critically on organisation?	Hardly any organisation in the case of San Silvestre. Greater but loose organisation in the case of Carmen del Emero. **Medium importance** and dependent on the general importance of cocoa in the local economy. In the case of Carmen del Emero it would be interesting to know the costs and benefits of the community organising themselves to take over the role of the regional trader. Two issues are important here: does the community have people with the capacity for this role and secondly the profits made by this trader do not seem large enough to encourage other to enter this part of the supply chain.
5.7 Does the successful commercialisation of an NTFP depend critically on high value / unit wt?	In comparison to other local products (e.g. coffee and rice) the cocoa beans have a higher value per unit weight. To add further value there needs to be high level quality production and good presentation.
5.8 Does the successful commercialisation of an NTFP depend critically on trader characteristics (age, experience, education, etc)?	It is suggested that the community traders are also good at maintaining seed quality. This role of adding value could be of importance and deserves further study. The tight margins for the regional traders indicate that these people are risk takers and if they manage to continue trading they must be astute business people. Potentially trader characteristics are important, but require further study to reach definite conclusions.

11.5 HYPOTHESIS 6

The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.

Key questions	**Comments on the basis of the analysis presented**
6.1 What is the equitability of profit distribution along the market chain?	Reasonably equitable distribution in the Carmen del Emero chain. The value chain in San Silvestre is not particularly well developed to say very much on the distribution
6.2 Who controls the profits along the value chain?	Everyone gains a little. The use of bartering to exchange cocoa seeds for goods indicates that there is potential that the collector could be cheated. The data collected suggest however that this is not the case.
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	The Carmen del Emero prices are close to the production costs and therefore by this definition the market could be said to be close to perfect.
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?	Resource depletion does not seem to be a problem. There are collectors who have cultivated cocoa trees, but this pattern of production is not common.
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?	There does not appear to be exploitation of the collectors, prices paid for the product appear to be fair and give a return on the labour inputs
6.6 Are there actually a variety of trading networks for different NTFPs?	There are a number of traders for cocoa, but few networks. Most in the area studied are concentrated in the supply of El Ceibo.
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	Monopolisation does not appear to be a problem.
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	These factors do not appear to have come out as being important in the maintenance of the current systems. However, if the collectors wanted to enter a Bolivian city market for cocoa paste this would require investments that would be beyond the reach of the collectors.
6.9 To what extent do prices fluctuate and to what extent does this represent a risk to producers and traders?	Unknown
6.10 Do state marketing (or non-state) institutions play a role?	It is understood that El Ceibo was originally supported by project money. Other parts of the chain are private.

The Carmen del Emero collectors have a good potential for producing cocoa seeds and also the community is regularly visited by traders. It is suspected that the high potential for cocoa seed production attracted the traders rather than traders arriving and asking for this product. The lack of distinction in the quality of the product and the low level of technology in processing the seed reduces the need for vertical integration. However, vertical integration may become a more important issue if the sources of organically produced cocoa seed are more carefully monitored. At the moment it is suspected that there is little or no control of certification of organically produced cocoa products. It is also noted that companies such as El Ceibo market their product as organic, but the supply chain does not pass on a premium for organic cocoa seed to the producer. There appears to be a problem with the supply chain in passing on this message, which may be related to the wholesalers on who El Ceibo relies to guarantee a set supply of a certain quality (Eric Arancibia, pers. comm.).

In summary, Carmen del Emero which has good access to traders (with boats arriving every two weeks) is a more prosperous community than San Silvestre. This success is in part due to a good supply of cocoa seed and good links with the company El Ceibo who process this product, as well as higher cocoa tree density in the area.

12 RUBBER

12.1 INTRODUCTION

The communities of Santa Rosa de Challana and Tomachi were studied in the collection and production of latex rubber. All the producer/collectors interviewed in Tomachi sold latex to processors based in the cities of La Paz and El Alto. There appears to be no culture in this community to carry out processing of latex to make rubber products. The average income from the sale of liquid rubber in this community is Bs. 11,600 per year with a total yearly income of Bs.151,000 from all producers interviewed.

In the community of Santa Rosa de Challana, nearly all the families that collect and/or produce latex, process this product into a range of rubber products. The quantity of latex produced in this community is less per family than in Tomachi, but there were more families involved (25 versus 13). The income from selling rubber products per family was Bs.4,066 per year and a total of little less than Bs. 100,000 for all families interviewed.

Therefore, the study has selected two very different latex collecting communities. Tomachi has relatively high volumes of production per family, but no processing activities. Santa Rosa de Challana has much lower volumes and high processing activity. Despite what appears to be value added activities in the latter community the income per family and over the whole community was less. The reasons behind these differences are difficult to explain, but may be related to lower tree densities, poorer transport connections with major urban centres, limited incentives for traders to visit the lower volume community or a combination of the two or three reasons mentioned. There are similarities in the differences between these two rubber producing communities and the cocoa communities.

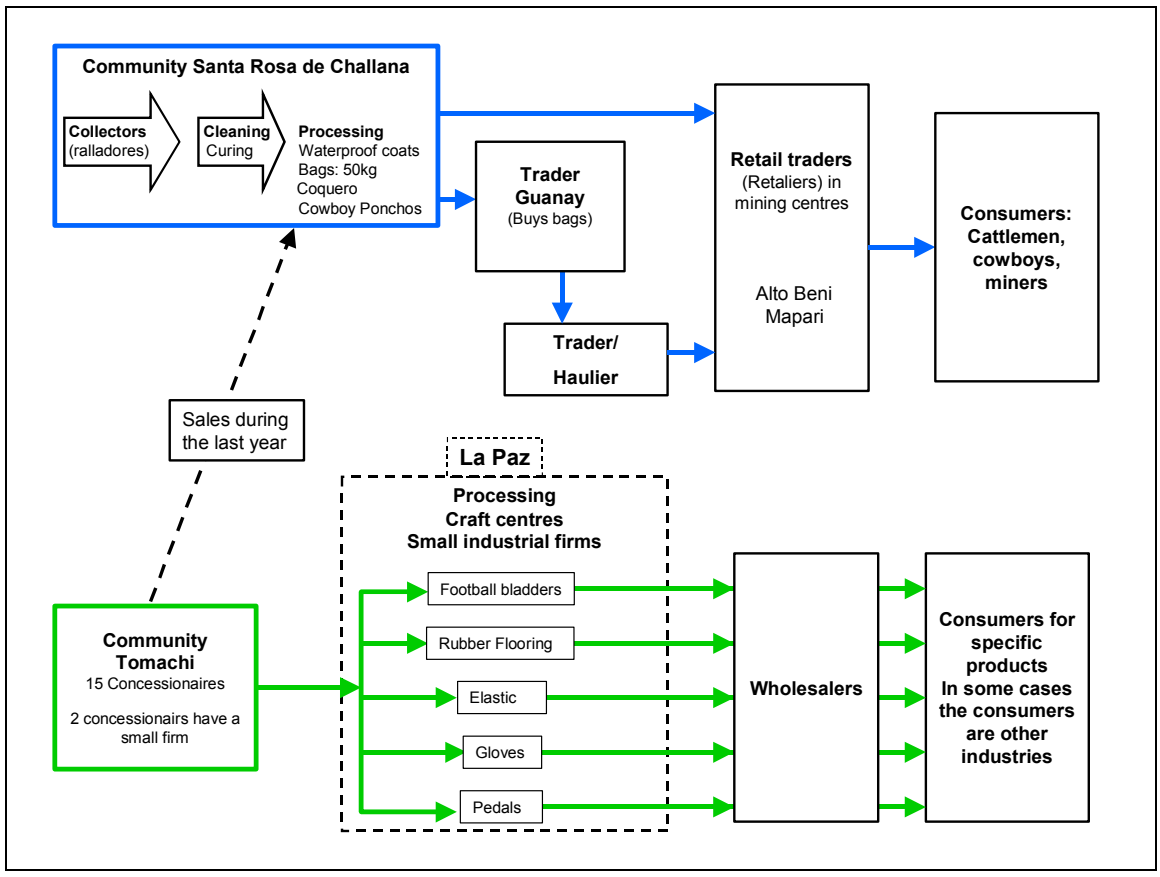
12.2 SUPPLY CHAINS

Two supply chains have been identified:

1. Producer/collectors in the community Santa Rosa de Challana who make waterproof covers or coats, bags and ponchos. These products are sold to traders who then sell them to miners, cattlemen and cowboys.
2. Producers/collectors who sell the liquid latex in litres or turriles (200 litres) to small industries in La Paz that produce a range of rubber products from rubber flooring to car parts. The supply chain is simpler in this case and 2 of the rubber concessionaires actually have their own factories in La Paz which carry out the processing of the latex into rubber products.

Figure 7 has details of the supply chains identified for the two communities.

Figure 7. Supply chains for liquid latex and rubber products from the communities of Santa Rosa de Challana and Tomachi



12.3 SUPPLY CHAIN ANALYSIS

12.3.1 Liquid latex rubber used for the rubber processing industry in La Paz

The supply chain for latex rubber to the rubber processing industry in La Paz produces football bladders, elastic, gloves, pedals and rustic rubber flooring. Tomachi is the community involved in this chain and the rubber trees are either in communal areas (quite far from the community) or in concessions. Very few of the concessionaires live in the community and they contract local labour to collect the latex. The latex is then transported by boat and road to the small processing factories in La Paz. The collection work is carried out solely by men, and women are not involved at any stage of the chain.

The rubber concessions are between 20 minutes to 3 hours from the community and are natural plantations. Each concessionaire has between 20 to 36 estradas and each estrada has 250 rubber trees. The distance between estradas is 200 metres, with 15 metres between trees within the estrada. Productive trees have a diameter of 50 cm. The production of latex involves four stages: clearing of the estrada; tapping of the tree; collection of the latex and transport of the latex to La Paz.

12.3.1.1 Clearing the estradas

Clearing of the estrada is carried out twice a year using machetes. The cost of clearing an estrada is Bs.150 or Bs.300/year. The local labourers manage an average of 4 estradas per person and the work can be completed in 2 to 4 days. Therefore, each worker receives Bs.1200 per year for this service.

12.3.1.2 Tapping of the rubber trees

The concessionaires hire men from the communities to carry out the rubber tapping. A camp is created in the estrada as a base for the rubber collection. Once the clearing has been carried out the tappers score the bark and attach the tin channels to guide the latex. Between 25 to 45 litres of latex can be collected per day per estrada. The process begins at 2 o'clock in the morning with the scoring of the bark. The collection begins at around 8 o'clock and ends at 2 o'clock in the afternoon. This is the best period of the day to collect latex. The afternoon produces less latex due to high evaporation levels from the leaves.

The latex from each tree is collected in rubber coated bags and taken to the camp for storage. The weather conditions can affect the speed of collection and also the quality of product. In the rainy season the collection of 200 litres (one 'turril') takes 15 days and the rain coagulates the latex affecting its quality. In the drier seasons the same quantity takes just 9 days to collect. During the months of April to July it is estimated that one person can collect 3 turrils per month. In August only one turril is collected due to the change in the leaves. Therefore, it is estimated that one person can collect approximately 20 turriles per year or 4000 litres of latex.

12.3.1.3 Latex collection and conservation

The latex is stored in 10 litre tins and later transferred to 35 litre tins. There are 3 of the 35 litre tins in the camp and to each 35 litres of latex half a litre of ammonia solution is added. In total 5 litres of ammonia solution is added to each 200 litres of latex[4].

12.3.1.4 Transport

The latex is transported from the community to the port of Guanay by boat (26 kilometres). It is transported in 200 litre turriles (barrels). In Guanay it is unloaded and stored until road transport can take it to La Paz, a distance of 246 kilometres (see Table 30).

Table 30. Transport costs of taking a 200 litre barrel of latex from the community of Tomachi to La Paz

Journey or activity	Price per barrel (Bs.)	Price per journey (Bs.)
Transport from Tomachi to Guanay by boat	50	200 (4 Barrels)
Unloading and storage in Guanay.	15	60 (4 Barrels)
Transport from Guanay to La Paz by road	10	40 (4 Barrels)

Source: Adapted from the Marketing and Community reports and the interviews in the Hotel Cortez

12.3.1.5 Processing firms in La Paz

The processing firms purchase a 200 litre barrel of latex for Bs. 1,100. They are unaware of the production and transport costs for this product. There is obviously a considerable margin between the production cost price of Bs.4/litre plus transport (estimated to be

[4] This is twice the amount added to latex in Santa Rosa de Challana

Bs.75 per barrel or Bs. 0.375/litre total of Bs.4.375/litre) and the purchase price of Bs.5.5/litre. The range of products manufactured in the factories in La Paz is shown in Table 31 with the approximate ratios per quantity of latex.

Table 31. Manufacture of rubber products in the factories of La Paz

Product	Transformation	Price per unit
Football bladders	1.400 bladders / barrel (7 bladders per litre)	Bs. 5/bladder
Rubber bands	2,000 metres/barrel (10 metres/litre)	Bs. 2/metre of rubber band

Source: Marketing report

12.3.1.6 Commercialisation margins

Insufficient data were available to carry out an adequate commercialisation margin analysis. The main reason is that the distinction between the different actors in the value chain is not clear. One concessionaire is also the owner of a processing factory based in La Paz.

12.3.1.7 Profitability of the actors in the supply chain

An enterprise budget for the concessionaries has been produced which shows that the activity is profitable and that the main costs are labour inputs (see Table 32).

Table 32. Enterprise budget for the concessionary for the rubber plantations in Tomachi.

Average annual sales (litres)	4000
Average collection per day (litres)	25
Trees per estrada	240
Production per tree (litres/year)	1
Number of estradas	20
Limiting factor	Production per tree??
Limiting factor	Poor control and management at plantation level??

						Value		Value (US$)		%
	Unit	Quantity		Price		Total	Per Unit	Total	Per Unit	Costs
Output										
Latex	Litres	4000.00			4	16,000	4.00	2,192	0.55	
Total sales						**16,000**	**4.00**	2,192	0.55	
Variable costs										
Ammonia	5 Litres	17.00			54	918	0.23	126	0.03	6.97
Total variable costs						918	0.23	126	0.03	6.97
Gross margin						**15,082**	**3.77**	**2,066**	**0.52**	
Labour costs										
Men (clearing estradas)	Days	240			25	6,000	1.50	822	0.21	45.58
Men (tapping and collecting)	Days	160			25	4,000	1.00	548	0.14	30.39
Total labour costs						10,000	2.50	1,370	0.34	75.97
GM less labour costs						**5,082**	**1.27**	**696**	**0.17**	
Fixed costs										
Equipment depreciation	Unit	Number	Price		Life (years)					
Machete	Unit	5		25	2	12.50	63	0.02	9	0.00	0.47
Knife	Unit	5		80	2	40.00	200	0.05	27	0.01	1.52
Tins (sardine tins no cost)	Unit	500		0	5	0.00	0	0.00	0	0.00	0.00
Wire	Unit	5		10	5	2.00	10	0.00	1	0.00	0.08
Collection bag	Unit	5		30	1	30.00	150	0.04	21	0.01	1.14
Collection bucket	Unit	1		30	10	3.00	3	0.00	0	0.00	0.02
Turril	Unit	4		35	10	3.50	14	0.00	2	0.00	0.11
Transport	Turril	20				75.00	1,500	0.38	205	0.05	11.40
Transaction costs (payment to community)	Unit	1	1% production			160.00	160	0.04	22	0.01	1.22
			Rate			Amount					
Interest	Unit	1	20.00%			145	145	0.04	20	0.00	1.10
Total fixed costs							2,245	0.56	307	0.08	17.05
Total costs							13,163	3.29	1,803	0.45	100.00
GM less labour and fixed costs							**2,838**	**0.71**	**389**	**0.10**	

No information is available on the processing costs of the factories producing rubber products in La Paz.

Labour returns were available only for the concessionary actor in this value chain. These indicate a reasonable return to labour in comparison to local labour rates (see Table 33).

Table 33. Labour returns for the supply chain for rubber products produced in La Paz

	Labour Rate (per day)			Returns to labour (per day)		
Actor	Boliviano	US$	PPP$	Boliviano	US$	PPP$
Concessionary	25	3.42	8.56	32.09	4.40	10.99

Unfortunately the analysis of this rubber value chain is not very in depth due to a lack of data at the processing end of the chain. It is also emphasised that probably a majority of this chain is amalgamated into the hands of a few individuals who own the rights to harvest the latex and also own the factories that produce rubber products in La Paz.

12.3.2 Rubber products produced at community level for cattle and mining workers

12.3.2.1 Introduction

The main products produced in this supply chain are:

1. Coats or jackets used by miners;
2. Bags used to transport rice;
3. Bags used to transport coca;
4. Tarpaulins used to cover loads of rice; and
5. Ponchos used by cattlemen and cowboys.

The collector/producer/processors sell these products in gold-mining centres and towns that are close to the communities. They sell the rubber products to the stores in the towns Guanay, Mapiri Tipuani, Santa Rosa de Challana, Unutuluni and Chima.

In terms of division of activities, the men, either the husbands or elder males, collect the latex from the forest. The latex is then used by the women in the households to produce the list of products shown above. Finally the gluing together of the pieces of rubber cloth to make the items is carried out by the women and girls in the family.

12.3.2.2 Latex collectors

The rubber tree groups are between an hour to three hours from the family's houses. They are natural rubber trees and each family in the area has the right to collect rubber from 3 or 4 rubber tree sections or "estradas". Each "estrada" has an average of 70 trees. The distance between "estradas" is 200 metres and between trees 15 metres. The minimum diameter for a productive rubber tree is 50 cm. There are three distinctive phases in the collection of the rubber from the forest:

1. Clearing
2. Tapping
3. Collection

12.3.2.2.1 Clearing

The clearing of the "estrada" is carried out twice a year using machetes. The families either use their own labour or hire labour to help in this process. In the first year of production the clearing is carried out in September and at the end of the year.

12.3.2.2.2 Collection and conservation

Once the latex has been collected it is important to add ammonium solution to it in order to conserve the material. For every 20 litres collected 0.125 litres of ammonium solution is added. The ammonium solution costs Bs. 35 for 10 litres.

12.3.2.3 Processing of the latex to finished rubber products

The processing of latex to finished rubber products is a family activity in the community of Santa Rosa Challana, which is carried out mainly by women and children. The rubber products produced are: miners jackets (sacos), bags for transporting rice, bags for transporting coca, tarpaulins and ponchos for cattlemen and cowboys. However, the main products produced are miner's jackets and bags for transporting rice. Therefore, the following section will provide details of the manufacture of these items and the quantitative analysis will also focus on these items.

12.3.2.3.1 The manufacture of rubber bags for transporting rice

The rubber bags manufactured for transporting rice have a capacity of 1 quintal or 45 kilos. The production of 30 bags requires 30 litres of latex. The rubber is coloured to make it more attractive for sale and around 185 bags are produced per year per family with an average sale price of Bs.10.47 per bag. The stages of production are as follows:

- Cloth bags are washed and sewn together to form either a shape of a bag or a poncho.
- Harvest the latex.
- Paint the cloth bags and ponchos with latex and leave them to dry.
- The following day maize flour is spread over the bags and ponchos so that when they are stacked and stored they do not stick together.
- To make the rubber strong some families smoke the bags and ponchos and others apply ammonia

12.3.2.3.2 Manufacture of jackets for miners

The jackets produced are made for miners to protect them from water and small stones in the mines. The miners apparently prefer these garments to industrially produced ones. The processors colour the rubber to make the garments more attractive. From the household interviews it has been estimated that families produce around 160 jackets per year, which is half the value from the community report (300/year). The calculations have used the estimation from the interviews. The process of manufacturing a jacket is the same as that for a bag.

12.3.2.3.3 Transport

In order to sell the jackets and bags produced, the processors have to take the products to the local market town or in some cases to the mining centres. The distances and costs of a journey to these centres are shown in Table 34. However, for the main calculations it is assumed that a majority of the products are sold in Guanay which would cost a processor Bs.50 per visit to cover the costs of transport and hotels. It is recognised here that such a visit would normally combine other activities such as the purchase of food and clothes. A similar visit to a mining centre would cost Bs.100 per visit.

Table 34. Distance and travel costs to the nearest market towns and mining centres to Santa Rosa de Challana in order to sell rubber products.

Centre	Distance from the community (Km)	Travel cost (Bs.)
Guanay	22	20 (return)
Mapiri	100	150 (plus food)
Unutuluni	67	No information
Tipuani	30	100 (plus food)
Compañía Sorata (gold company)	No information	200
Yolosani	47-52 (via Guanay)	No information
Palos Blancos	172 (via Guanay)	No information

Source: Community report, Santa Rosa de Challana 2002.

A summary of the data on the manufacture of jackets and bags in the community is shown in Table 35.

Table 35. Production of rubber bags and jackets in the community of Santa Rosa de Challana, La Paz, Bolivia.

	Number of	Number produced		Value (Bs.)		Unit Price	
	Families	Total	Average	Total	Average	Bs.	US$
Bags	16	2,968	186	31,156	1,947	10.50	1.44
Jackets	17	2,720	160	53,996	3,176	19.85	2.72
Total	25			85,152			

12.3.2.4 Traders

A total of 6 traders were interviewed and all were based in the town of Mapiri, which is 100 kilometres from Santa Rosa de Challana (see Table 34). An analysis the data collected from these traders indicated that on average they sell 207 bags and 252 jackets per year. The sale of these rubber products generates between 25 and 50% of their annual income. Unfortunately there is no information on the cost of running their stores or the costs of sourcing the products. However, from the information on the processors it is believed that the costs of sourcing the products is minimal. The major costs for these traders are likely to be labour in terms of manning their stores, investments in stock maintained in the stores and also the cost of either owning or renting a store. There was no information on the whether these traders are part of the formal economy, therefore there is little that can be said on the transaction costs of entering the formal sector and maintaining this position. In the quantitative analysis, it has been assumed that: a third of the time spent in the store is devoted to selling the rubber products (70 days); an interest charge of 20% has been applied to a quarter of the annual sales of rubber products; a nominal cost of Bs.50 per month has been applied for the rent of a store and it is assumed that a third of a monthly bill of Bs.10 for electricity is met from rubber sales. These details are open to criticism, but it is argued that some costing had to be included for this actor in the supply chain.

12.3.2.5 Commercialisation margins

For the quantitative analysis a further actor has been added in the supply chain that provides rubber products for the mining and agricultural sectors. A division has been made between the collectors of latex and the processors of the latex into rubber products. In family economy terms this division is artificial, but given that these activities are gender

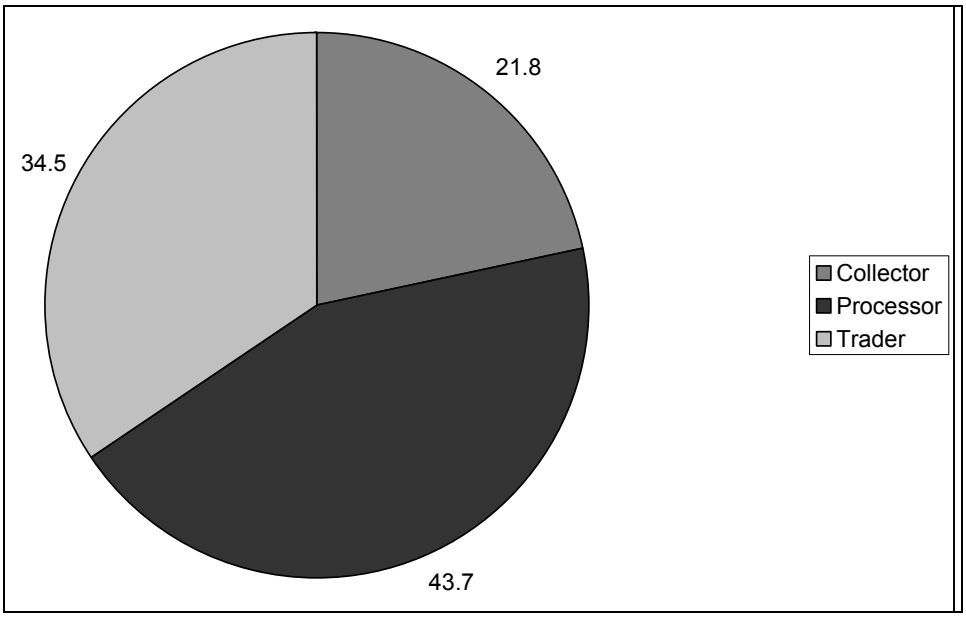
related it was felt that the separation was necessary in order to investigate returns to labour more thoroughly. The commercialisation margins for the three actors identified in the supply chain are presented in Table 36. The margins have been calculated on the basis of a litre of latex.

Table 36. Commercialisation margins for rubber that moves through the supply chain from the community Santa Rosa de Challana to finished rubber products for the mining and agricultural sectors.

Actor	Price (Litre latex)		Margin (per litre latex)		
Name	Buying	Selling	Boliviano	US$	%
Collector	3.41	4	0.59	0.08	
Processor	4	12.03	8.03	1.10	43.72
Trader	12.03	18.37	6.34	0.87	34.51
Consumer	18.37				
Total			14.37	1.97	78.22
Final product value			18.37	2.52	100.00

In terms of the proportion of the consumer price received by the different actors in the supply chain, just over 40% goes to the processors and around a third to the traders (see Figure 8).

Figure 8. Proportion of the consumer price (US$2.52/litre of latex) received by the different actors in the supply chain of rubber products for the mining and agricultural sectors in Bolivia from the community Santa Rosa de Challana.



12.3.2.6 Profitability of the actors in the supply chain

The collectors of latex rubber in the community of Santa Rosa de Challana are estimated to make a small profit from their activities. Their output appears to be limited by two factors: equipment for tapping the trees and the demand for latex. A number of collectors report that they only collect when there is demand for making rubber products (depends on

opening of new gold mines). The most important cost for this activity is the labour required for collecting the latex (see Table 37).

Table 37. Enterprise budget for latex rubber collectors in the community of Santa Rosa de Challana.

Average annual sales (litres)	864	8 collections of 12 litres per month for 9 months
Average collection per day (litres)	10	Slightly less per day to take account of journeys to and from the estradas
Number of estradas	3	It assumed that not all the estradas are in production at the same time
Limiting factor	Equipment for tapping	
Limiting factor	Demand for latex	

					Value (Bs.)		Value (US$)		%
	Unit	Quantity		Price	Total	Per Unit	Total	Per Unit	Costs
Output									
Latex	Litres	864.00		4	3456.00	4.00	473.42	0.55	
Total sales					**3456.00**	**4.00**	473.42	0.55	
Variable costs									
Ammonia	Litres	6.00		3.5	21.00	0.02	2.88	0.00	0.71
Total variable costs					21.00	0.02	2.88	0.00	0.71
Gross margin					**3435.00**	**3.98**	**470.55**	**0.54**	
Labour costs									
Men (clearing estradas)	Days	6		25	150	0.17	20.55	0.02	5.09
Men (tapping and collecting)	Days	86.4		25	2160	2.50	295.89	0.34	73.36
Total labour costs					2310	2.67	316.44	0.37	78.45
GM less labour costs					**1125.00**	**1.30**	**154.11**	**0.18**	
Fixed costs									
Equipment depreciation	Unit	Number	Price	Life (years)					
Machete	Unit	1	25	2 12.50	12.50	0.01	1.71	0.00	0.42
Knife	Unit	1	80	2 40.00	40.00	0.05	5.48	0.01	1.36
Guides	Unit	100	10	5 2.00	200.00	0.23	27.40	0.03	6.79
Tins	Unit	100	1	5 0.20	20.00	0.02	2.74	0.00	0.68
Wire	Unit	1	10	5 2.00	2.00	0.00	0.27	0.00	0.07
Collection bag	Unit	1	30	1 30.00	30.00	0.03	4.11	0.00	1.02
Transaction costs (forest rights)	Days	2		20.00	40.00	0.05	5.48	0.01	1.36
Transaction costs (other)	Days	2		20.00	40.00	0.05	5.48	0.01	1.36
			Rate	Amount					
Interest	Unit	1	20.00%	229	229.00	0.27	31.37	0.04	7.78
Total fixed costs					613.50	0.71	84.04	0.10	20.84
Total costs					2944.50	3.41	403.36	0.47	100.00
GM less labour and fixed costs					**511.50**	**0.59**	**70.07**	**0.08**	

The latex processors producing bags and jackets are estimated to make a small loss with their enterprise. The most important costs are the latex required for the manufacturing process, the variable costs and the labour costs. In particular the cost of buying the fabric bags to use as a mould for the products is an important cost. These bags are originally for the transport of flour or sugar and are purchased by the processing families, unstitched and then washed before they are used for the production of rubber bags and jackets (see Table 38).

Table 38. Enterprise budget for the latex processors producing bags and jackets.

	Unit	Quantity	Price	Value Total	Value (US$) Per unit	Value (US$) Total	Value (US$) Per unit	% Costs
Output								
Bags for rice (bolsas)	Unit	185	10.47	1,937	4.56	265	0.62	
Miners Jackets (sacos)	Unit	160	19.85	3,176	7.47	435	1.02	
Less the cost of the latex	litre	425	4	-1,700	-4.00	-233	-0.55	32.48
Total sales				**3,413**	8.03	468	1.10	
Variable costs								
Fabric moulds for bags	Unit	247	2.5	617	1.45	84	0.20	11.78
Sulphur for bags	Kilo	3.08	12	37	0.09	5	0.01	0.71
Thread for bags	Unit	6.17	3	19	0.04	3	0.01	0.35
Paint	Unit	6.17	5	31	0.07	4	0.01	0.59
Firewood	Unit	6.17	5	31	0.07	4	0.01	0.59
Vinegar	Unit	6.17	34	210	0.49	29	0.07	4.01
Fabric moulds for jackets	Unit	267	2.5	667	1.57	91	0.21	12.74
Thread for bags	Unit	5.33	3	16	0.04	2	0.01	0.31
Paint	Unit	5.33	5	27	0.06	4	0.01	0.51
Firewood	Unit	5.33	5	27	0.06	4	0.01	0.51
Vinegar	Unit	5.33	34	181	0.43	25	0.06	3.46
Total variable costs				1,861	4.38	255	0.60	35.55
Gross margin				**1,552**	3.65	**213**	0.50	
Labour costs								
Women (bags)	Days	31	20	617	1.45	84	0.20	11.78
Women (Jackets)	Days	27	20	533	1.25	73	0.17	10.19
Total labour costs				1,150	2.71	158	0.37	21.97
GM less labour costs				**402**	0.95	**55**	0.13	
Fixed costs					0.00		0.00	
Equipment depreciation	Unit	Number	Price	Life (years)				
Sewing machine	Unit	1	500	20 25.00	25	0.03	3	0.00 0.23
Needles	Unit	1	0.2	0.2 1.00	1	0.00	0	0.00 0.01
Frames for bags	Unit	30	1	1 1.00	30	0.03	4	0.00 0.28
Frames for jackets	Unit	30	1	1 1.00	30	0.03	4	0.00 0.28
Bucket	Unit	1	13	5 2.60	3	0.00	0	0.00 0.02
Transport	Unit	6		50.00	300	0.35	41	0.05 2.82
Transaction costs (other)	Days	1		20.00	20	0.02	3	0.00 0.19
			Rate	Amount				
Interest	Unit	1	20.00%	114.64	115	0.13	16	0.02 1.08
Total fixed costs					523	1.23	72	0.17 10.00
Total costs					5,234	12.32	717	1.69 100.00
GM less labour and fixed costs					**-121**	-0.28	**-17**	-0.04

The traders buying and selling bags and jackets to the mining and agricultural sectors are estimated to make a small profit with this activity. Their most important costs are the purchase of the products from the processors and the time they have to dedicate in selling these items (see Table 39).

Table 39. Enterprise budget for traders buying and selling rubber bags and jackets to the mining and agricultural sectors.

	Unit	Quantity	Price	Value (Bs.) Total	Value (Bs.) Per unit	Value (US$) Total	Value (US$) Per unit	% Costs
Output								
Bags for rice	Unit	207	16.39	3392.73	5.80	464.76	0.79	
Miners jackets (sacos)	Unit	252	29.18	7353.36	12.57	1007.31	1.72	
Less purchase of bags	Unit	207	10.47	-2167.29	-3.70	-296.89	-0.51	21.32
Less purchase of jackets	Unit	252	19.85	-5002.20	-8.55	-685.23	-1.17	49.20
Total sales				**3576.60**	6.11	489.95	0.84	
Variable costs								
Total variable costs				0.00	0.00	0.00	0.00	0.00
Gross margin				**3576.60**	6.11	**489.95**	0.84	
Labour costs								
Men and women	Days	70.00	30	2100.00	3.59	287.67	0.49	20.66
Total labour costs				2100.00	3.59	287.67	0.49	20.66
GM less labour costs				**1476.60**	2.52	**202.27**	0.35	
Fixed costs								
Electricity	Months	12	3	36.00	0.06	4.93	0.01	0.35
Rent	Months	12	50	600.00	1.03	82.19	0.14	5.90
		Rate	Amount					
Interest	Unit	1 20.00%	261	260.98	0.45	35.75	0.06	2.57
Total fixed costs				896.98	1.53	122.87	0.21	8.82
Total costs				10166.47	17.38	1392.67	2.38	100.00
GM less labour and fixed costs				**579.62**	0.99	**79.40**	0.14	

A summary of the actors in the supply for rubber products sold to the mining and agricultural sectors is shown in Table 40.

Table 40. Commercialisation margins and profitability of activities of the actors in the supply chain of rubber products for the mining and agricultural sectors manufactured in the community of Santa Rosa de Challana.

	Margin			Volume	Profit (Bs.)		Profit (US$)		Profit (PPP)	
Actor	Value	US%	%	litre	Total	Per Unit	Total	per Unit	Total	per Unit
Collector	0.59	0.08		864	511.50	0.59	70.07	0.08	175.17	0.20
Processor	8.03	1.10	43.72	425	-121.12	-0.28	-16.59	-0.04	-41.48	-0.10
Trader	6.34	0.87	34.51	585	579.62	0.99	79.40	0.14	198.50	0.34

The returns to labour of the actors in the supply chain is shown in Table 41.

Table 41. Returns to labour of the actors in the supply chain of rubber products for the mining and agricultural sectors manufactured in the community of Santa Rosa de Challana.

	Labour Rate (per day)			Returns to labour (per day)		
Actor	Boliviano	US$	PPP$	Boliviano	US$	PPP$
Collector	25	3.42	8.56	30.54	4.18	10.46
Processor	20	2.74	6.85	17.89	2.45	6.13
Trader	30	4.11	10.27	38.28	5.24	13.11

In summary, although the processors in the supply chain have the highest commercialisation margin and also the highest proportion of the consumer price, they have poor profitability and low returns to labour. The reasons are obvious from the enterprise analysis in that this activity has relatively high variable and labour costs. The interesting issue that potentially deserves further investigation is that this activity is principally carried

out by women, whose labour opportunity costs are likely to be significantly lower than for men.

12.4 HYPOTHESES

12.4.1 Hypothesis 5

The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.1 Does the successful commercialisation of an NTFP depend critically on the existence of an accessible market?	It would appear that access to a market determines how the latex is processed. In the case of Tomachi a strong production and strong demand from La Paz mean that liquid latex is sold from the community. In Santa Rosa de Challana lower levels of production and lower demand mean that latex is processed into rubber products at community level. In both communities there is access to a market, but it is for different products. **Important**
5.2 Does the successful commercialisation of an NTFP depend critically on potential demand?	In Tomachi there is a demand for latex rubber stimulated by small-scale rubber product industry in La Paz. For Santa Rosa de Challana the mining and cattle industry have demanded rubber products that keep goods and people dry. The potential demand is important for the success of the commercialisation of latex and rubber products. **Important**
5.3 Does the successful commercialisation of an NTFP depend critically on the absence of substitutes?	Oil based substitutes exist for products produced from latex rubber and the demise of the rubber industry associated with Manaus in Brazil demonstrates that natural rubber products face difficult competition. However, it appears that the small-scale natural rubber based products have found a niche in Bolivia. The rubber jackets, ponchos and bags produced in Santa Rosa de Challana also have substitutes, but it is reported that the rubber products are preferred by the miners and cowboys. This preference might be a cost and quality issue. **Important**
5.4 Does the successful commercialisation of an NTFP depend critically on access by producers, processors and traders to market information?	The Santa Rosa de Challana community are aware of the need to colour the rubber to make it more attractive for sale. The Tomachi chain is directed by La Paz factory owners who presumably are very aware of the demand for the rubber products they produce. In both communities market information for their specific markets appears to be important. It is suggested that the awareness of additional markets is probably limited. **Important**

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.5 Does the successful commercialisation of an NTFP depend critically on technical management capacity?	Technical expertise is required for making the rubber products in the community and the rubber products in La Paz. The quality of the products produced is not known and possibly if the collectors were to have access to more demanding markets the technical capacity would have to improve. Such markets would probably provide better economic opportunities. **Important**
5.6 Does the successful commercialisation of an NTFP depend critically on organisation?	The Tomachi chain appears to be an integrated one and well organised. The Santa Rosa de Challana chain is looser in its organisation and much more based on individual family enterprise. **Depends on the chain.**
5.7 Does the successful commercialisation of an NTFP depend critically on high value / unit wt?	The latex is a low value to weight product. The processing of the latex to rubber products increases the value to weight ratio and makes the rubber easier to transport. So in Tomachi this ratio is not important, but it appears to be important in Santa Rosa de Challana. When there is an absence of road transport this hypothesis becomes more relevant. The latex is transported from Tomachi via river so it is possible to transport much greater quantities. In Santa Rosa de Challana there is only access by road and here it is important to remember that the majority of the roads in this part of Bolivia are mud roads that are poorly maintained. **This depends on access to latex market, with good access the ratio is not important, but with poor access it is important.**
5.8 Does the successful commercialisation of an NTFP depend critically on trader characteristics (age, experience, education, etc)?	The latex rubber product chain is run by people who own the concessions and rubber processing factories. They have assumed all the aspects of the value chain and it is likely that they have important business skills. It should also be mentioned that this value chain competes with oil-based rubber products, which are probably of higher quality and in some cases cheaper. So to maintain market share requires active sales skills. The case of the community produced rubber products is more difficult to assess. It is likely that the families producing these products have experience and skills in the manufacture of products of reasonable quality. Their skills in terms of trading are not known. **Trader characteristics appear important in the La Paz rubber product chain, but are probably less important for the community based rubber product chain.**

12.5 HYPOTHESIS 6

The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.

Key questions	**Comments on the basis of the analysis presented**

Key questions	**Comments on the basis of the analysis presented**
6.1 What is the equitability of profit distribution along the market chain?	The information from Tomachi suggests that a small number of people own all aspects of the value chain. These owners employ people to collect the latex, transport the latex to La Paz and process the latex to rubber products in their factories. The payment for these services appears to be in line with labour and transport rates. The lack of information on the costs of latex processing in the factories makes it impossible to judge if these owners are abusing their position, but it is important to remember that these people have established and maintained these systems, which would suggest that people are willing to work for them. In the Santa Rosa de Challana chain women and children get a lower return for their labour, but this reflects their lower opportunity cost of time.
6.2 Who controls the profits along the value chain?	The owners of the concessions and rubber factories probably gain most in the La Paz rubber product chain. They also control sales, but carry most of the risks, i.e. they have invested money in these systems. In Santa Rosa de Challana the collector and the trader gain most, the latex processor the least
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	The community based rubber product chains seems to reflect the opportunity cost of time and seems close to being perfect. The La Paz rubber product chain did not have sufficient information to say if the market was perfect. However, the fact that latex price seems to be standard indicates that market information is consistent.
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?	Demand for latex and community based rubber products appears to be strong. The future demand would appear to depend on competition from substitute products. Matching the quality and price of the substitutes will be important if demand is to be maintained. The availability of substitutes would suggest that resource depletion is unlikely, but it seems that in Santa Rosa de Challana there is over-exploitation of the rubber trees that are close to the community (Eric Arancibia, pers. comm.). This would suggest that in the future this community might begin to plant rubber trees.
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?	The marketing network does not appear to exploit the collectors in Santa Rosa de Challana, but it is possible that the workers collecting latex in Tomachi could be exploited. In any future analysis of Tomachi it should be remembered that the owners of the concessions and factories have invested money and time in establishing their supply chains and markets for rubber products. Part of their profits are a reward for this effort.
6.6 Are there actually a variety of trading networks for different NTFPs?	The Tomachi chain is restricted by the ownership of the concessions and factories. But it should be noted that this community does have the possibility of selling latex to the Santa Rosa de Challana community. The chain in Santa Rosa de Challana is restricted by the markets available which are for miners and cowboys. In general there are not many trading networks for these products.

Key questions	Comments on the basis of the analysis presented
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	Perhaps a monopoly of supply from Tomachi has allowed investment in rubber processing factories in La Paz, but this is only a theory. There appears to be no monopoly in Santa Rosa de Challana
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	Do not appear to be limiting constraints
6.9 To what extent do prices fluctuate and to what extent does this represent a risk to producers and traders?	The reduction in prices would affect labour returns in Santa Rosa de Challana and make this chain less viable.
6.10 Do state marketing (or non-state) institutions play a role?	No in both communities. It would however be interesting to know how the rubber concessions were won in Tomachi and whether this has had any influence on the success or viability of this supply chain.

The Tomachi community is competing with oil-based rubber products and the nature of how the people, who own these value chains, won their concessions might have given them an economic advantage to compete with these products. The suggestion here is that the concessions were won with little cost. These chains are not vertically integrated they are wholly owned by a number of individuals. The Santa Rosa de Challana community have been successful in supplying rubber products for the mining and cattle industries. This has been achieved by families acting as collectors, processors and traders, but there appears to be little coordination between families. Therefore, this structure has been successful in supplying easily accessible markets, but it has not achieved success in more distant markets.

In conclusion, the concessionaires in Tomachi have a value chain structure that has allowed them to develop urban based markets, which the Santa Rosa de Challana community have not achieved. The way in which the concessions were granted (number of trees and cost) perhaps gave the Tomachi concessionaires sufficient economic power to invest in rubber processing technology and marketing skills, i.e. they had a sufficient resource base to look for new markets. Therefore, the concentration of economic resources (i.e. rubber trees) may have been important in the development of this supply chain. The small scale nature of the Santa Rosa de Challana activities would suggest that no one individual in this community could make an investment in looking for new markets, and without outside help, either private, NGO or public, this community will always be restricted to the easily accessible mining and cattle industry markets for rubber products.

13 PITA

13.1 INTRODUCTION

The original market was for pita to make fishing nets and for thread to make sew sandals in the south east of Mexico. Approximately, 100 years ago the pita thread was sold to people making leather products in northern Mexico. These craftsmen used the thread to embroider the leather goods. The traditional market has disappeared with the introduction of synthetic fibres. The newer market has grown rapidly in the 90s as the leather products embroidered with pita have been much sort after as a fashion item related to Mexican style country and western music – "Onda Grupera". The new demand is from Mexicans in Mexico and USA. The response of the producers of these leather goods has been to make products that are cheaper and more accessible. The new demand outstripped supply in the 1990s and has led to the domestication of the plant in the last ten years. The domestication has been carried out by the original collectors who are indigenous groups.

During the study, Fabrice Edouard reported that the community of San Rafael de Agua Pescadito had stopped collecting and selling pita due to fungal infections of the plants. Therefore, the analysis presented will concentrate on the community of Arroyo Blanco, and the cooperative, UPIS-L (Union de Pueblos Indigenos de la Sierra de Lalana), which has members in 18 communities in this regions.

13.2 SUPPLY CHAIN ANALYSIS

Three distinct supply chains have been identified for the pita sold by the communities in the study:

1. Local producers who process the pita and sell the product to handicraft workshops in Veracruz. These workshops sell their products to customers in Mexico and USA.
2. Regional traders of pita who contract local people to carry out their trading activities at community and to process the pita fibre. The processed product is mainly sold to leather craftsmen who make embroidered leather goods. These craftsmen have workshops that also function as shops in Jalisco. A secondary market is to the inmates of the prisons who make products that are sold to shops who specialise in country and western leather products. These shops are found in the Mexican-USA border and their main clients are Mexicans in these two countries.
3. The most important supply chain for the community, Arroyo Blanco, according to the community interviews (see table 42) is the sale of pita to UPIS-L. The cooperative processes the pita fibre and sells the majority of the processed product to handicrafts union, Consejo Regulador del Artisania Piteada, which is based in the north of Jalisco. The union acts a wholesaler for pita fibre and also regulates the quality of pita products. The union sell the pita to their members based in handicraft workshops in Jalisco, with the possibility of offering the product on a credit term basis. The workshops sell the pita products directly to customers in Mexico and USA or to the shops that specialise in cowboy products in the Mexican-USA border.

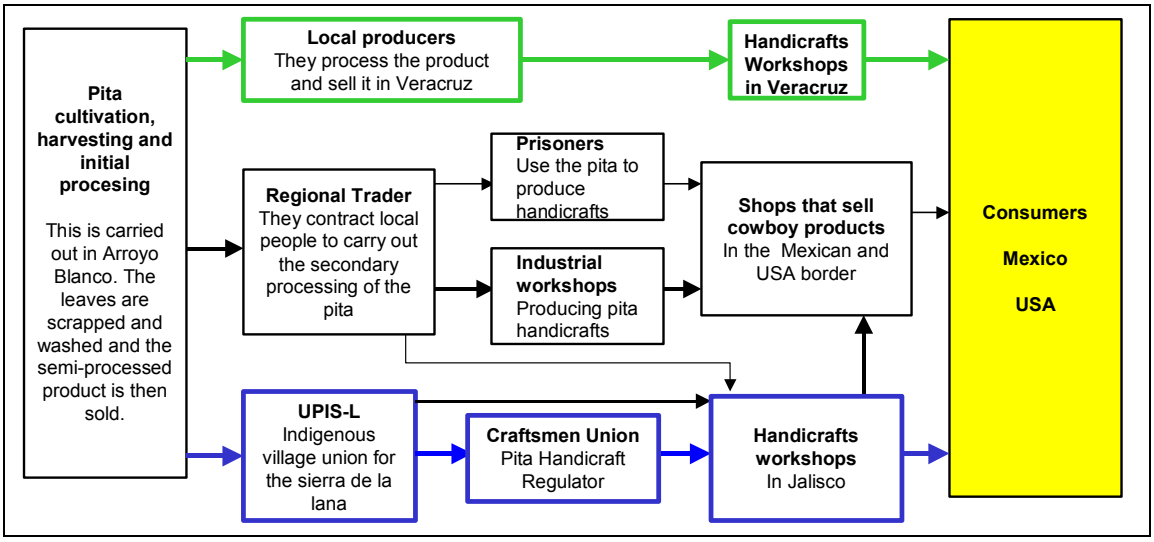
Table 42. Sales of Pita by the collectors on the basis of types of buyers, quantities and values sold per year.

	Producers		Annual sales		Annual sales	
	Number	%	Quantity	%	Value	%
Traders	17	65.38	98	55.68	30,150	49.88
Organization UPIS La Lana	9	34.62	78	44.32	30,300	50.12
TOTAL	26		176		60,450	

Source: Community interviews

The supply chains identified are shown in the Figure 9.

Figure 9. Supply chains for Pita.



The processing of the pita is done at two stages. The producers harvest the pita leaves and then carry out an initial processing which involves scraping and washing the leaves. The semi-processed product is then sold to the Cooperative, national traders or local producer/processors. These actors carry out a further, more thorough processing that also involves washing and bleaching the pita. Pita fibres that are of a short length are also twisted into thread, longer fibres are not processed in this way. The long processed pita fibres and the twisted pita thread is then sold to the craftsmen who use the pita to produce embroidered leather goods.

13.2.1 Producers

The community of Arroyo Blanco is part of the Municipality of San Juan la Lana and is found in the south of the Chinantla, District Choapan close to the border of Veracruz state. The community has a population of 554 people, nearly all this population (93%) are bilingual speaking the local language "Chinanteco" and Spanish. The main activities are coffee and maize production. The majority of maize produced is for home consumption, whereas coffee is a cash crop. A majority of the families have a 2 to 3 hectare plot of coffee which produces between 400 to 500 kilos of coffee beans per year. Pita production is the second most important activity in terms of cash generation. A family produce 5 kilos of pita "en greña" (scraped and washed) per year. Pita's big advantage as an activity is that it can be cut and collected at any time of the year. However, between May and

September the plant produces a greater quantity of leaves. The pita activity is particularly important during the slack labour months for coffee and maize production and in a livelihood context this is an important consideration.

There are four categories of social groups in the community:

- Farmer-traders;
- Farmers with livestock and maize;
- Farmers who grow coffee, collect and process pita and grow maize; and
- Farmers who sell their labour and also produce maize.

This would seem to indicate that pita collection and process is not an activity of the poorest groups, but is related to land access and communal property rights. It is stated that the collectors and processors of pita are not only in one group, but generally they have slightly more land and are interested in the conservation of the forest. Conservation is reported not to be of much interest to the livestock owners.

13.2.1.1 Pita cultivation

Wild pita was found in the tropical forest, particularly in the more humid areas such as streams, rivers and flooded areas. Between 1990 and 1997, demand for pita outstripped the supply from wild pita and small pita plantations (a quarter to half a hectare) were established by the people from Arroyo Blanco. These plantations were established on land that belonged to the families and was either existing forest or areas with secondary growth.

A hectare of cultivated pita has between 1,500 to 2,000 plants and 4 years after establishment can produce 10 to 14 kg of pita per year. The majority of the families with pita cultivations have a plot of between a quarter and half a hectare and produce 4 to 8 kg of pita per year. Harvesting of one hectare takes 4 days of family labour. One kilogram of pita fibre requires 350 mature leaves (greater than 4 years old), which implies that the production of 14 kilograms requires 4,900 leaves.

The cultivated pita requires an investment of 10,000 Mexican peso for a hectare, based on 2,000 plants at 5 Peso per plant. During the establishment of the plantation the area has to be modified to provide shade and humidity to the pita plant. It is estimated that this requires 20 days of labour in the first year. The following two years require weeding of the plantation which requires a further 10 days of labour per year. In the fourth year the plantation is ready for harvesting, what is not clear is how long the plantation will last. Experience from the other community indicates that disease problems are difficult to control in the plantations, which implies that the investment in a plantation is quite risky. A useful life of 20 years has been included in the analysis. Given that this parameter is one of interest in terms of the risk of the investment, the spreadsheet has been developed to allow this to be changed easily.

In addition to the labour and plant costs the family needs some basic tools such as a machete, file and sickle. It is assumed that these tools are used for both the establishment of the plantation and the harvesting. A useful life of 5 years has been put on these tools.

13.2.1.2 Pita processing at producer level

The pita leaves are first scraped and washed. This is an activity carried out by the women and children of the family. The leaves are scraped with an implement made from palm

stem or bamboo shaped to have a sharp edge. The pita is then soaked and washed using detergent in a bath and left to dry in the sun. It takes approximately 2 days of work to scrape and wash 1 kilogram of pita. A machine has also been developed to process the pita leaves into fibre. However, it is only used when there is insufficient labour to carry out the scraping by hand.

The end product called pita "en greña" is then sold either to the cooperative UPIS – L or traders. The affiliation of these traders is generally not known by the producers and they could be working for the regional traders or as individual processors. The value of this product is 250 a 350 Peso per kilogram. The buyers of the pita "en greña" demand that a certain quality of pita is produced. The quality is based mainly on the fibre length but also colour and the level of scraping and washing that has been carried out.

13.2.2 Supply Chain involving UPIS – L in the processing and marketing from the Community of Arroyo Blanco

The cooperative is based in Cerro Coquito, which is 4 kilometres from Arroyo Blanco. It has 1,200 members in 18 communities and 550 members are pita producers. UPIS-L buys the crude pita ("en greña") and this product is then graded, processed (washed, bleached and combed) packed and distributed to Handicraft Union. The president is also the manager director of the company. The cooperative has working capital from the Fondo Nacional de Empresas en Solidaridad (FONAES) and also has a three ton truck which is mainly used for transporting coffee.

In the last few years the cooperative has become one of the main buyers of pita in the region and in Arroyo Blanco. It employed local people to carry out the buying of the fibre, paying them 10 Peso per kilogram of pita purchased. The producers who deliver the crude pita to the cooperative are given breakfast in recognition of their journey. The cooperative also incurs costs to transport the crude pita from the central collection point to the families who carry out further processing. It is estimated that this is a fixed cost of 180 pesos per week to cover transport and labour.

13.2.2.1 Processing at Cooperative level

The bleaching and combing of the pita fibre is carried out by the Cooperative through contracting families, who specialise in this activity. The process involves washing, rinsing and drying the crude fibre a number of times to leave it totally clean. When the fibre is clean it is then bleached with lemon juice and chemical bleach. The whole process can take up to a week. It is estimated that a kilo of detergent is used per kilo of fibre and it requires 2 days of labour. The cooperative pay 140 pesos per kilo to the families and also provide the detergent, lemons and bleach.

The pita fibre has different qualities according to its length at producer level and also after the second processing. Table 43 provides information on the values of the different qualities and also the percentage of the pita in different qualities.

Table 43. The quality of pita fibre produced during the processing at Cooperative level.

Fibre length	Percentage purchased	Purchase price (Peso/kg)	Percentage after processing	Sale price (Peso/kg)
> 2.00 m	35	350	27	750
1.70 to 1.90 m	65	300	56	700
1.50 to 1.60 m			7	630
Losses			10	

The processing is contracted out by the Cooperatives and carried out by people who specialise in this activity. One of the people involved is the president of the cooperative[5].

The processed pita is packaged at a cost of 1.2 pesos per kilo. The president of UPIS-L stores the product in his house and no cost has been assigned to this aspect of the process. It is reported that the Cooperative has a loan of 200,000 pesos at an interest rate of 6%, which is only for the commercialisation of the pita. Methodus Consultora played an important role in obtaining this loan and have also been key in the technical support and advice in the creation and development of the Cooperative.

13.2.2.2 Marketing of the Pita by the Cooperative

The high and medium quality pita fibre is transported to Tuxtepec in order to be sent mainly to the Craftsmen Union in Jalisco. The purchasers of the pita assume the cost of sending the pita from Tuxtepec to their own workshops. The Craftsmen Union distribute the fibre to their members. Further processing is carried out by "talabarteros", who twist the fibre in order to make thread. These same craftsmen use this thread to make embroided leather goods.

A small quantity of the fibre, which is of a lower quality, i.e. shorter length, is difficult to sell and therefore is distributed by UPIS-L to local families who specialise in twisting the fibre into thread. This thread is sold either by the dozen or by the kilo to other clients such as prisoners and other workshop. The quantities of fibre sold in this way are not significant and have not been included in the quantitative analysis.

There are no data on the cost structure of the craftsmen who manufacture the pita goods (see below).

13.2.2.3 Commercialisation and profit margins

The commercialisation margins for Pita show that the Cooperative takes the majority of the margin (see Table 44).

[5] This would seem to support the opinion of Dirk Willem te Velde, that individuals are important in the successful marketing of products. We would agree that entrepreneurs are needed to get the most out of market opportunities.

Table 44. Commercialisation margins for the actors in the pita value chain which uses the Cooperative UPIS-L.

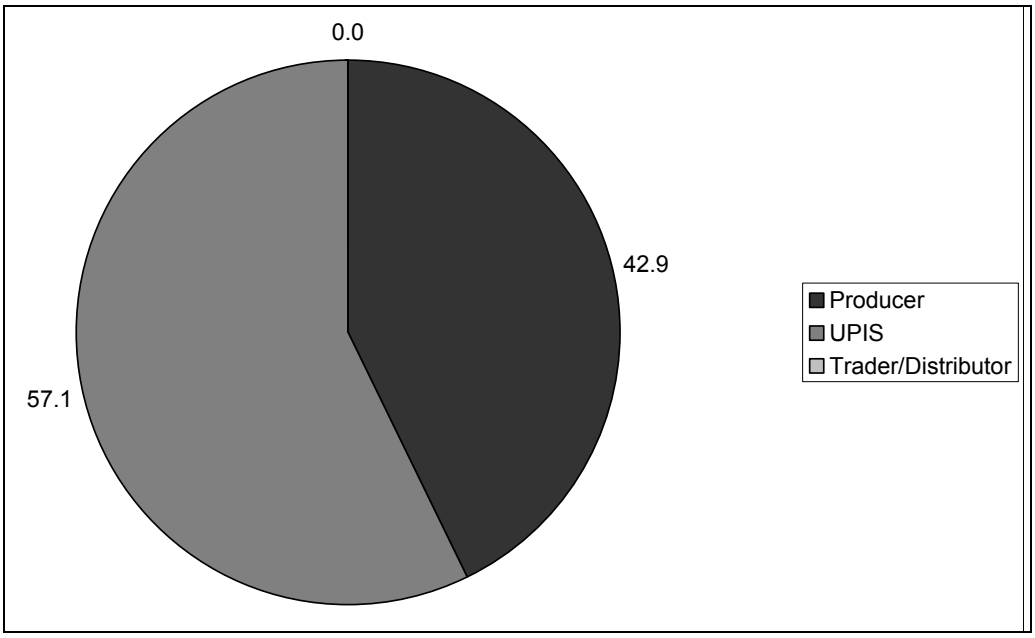
Actor	Price		Margin		
Name	Purchase	Sale	Peso	US$	%
Producer		300			
UPIS-L	300	700	400	40.00	57.14
Union*	700	700	0	0.00	0.00
Craftsmen	700				
Total			400	40.00	57.14
Final product value			700	70.00	100.00

* The Union receives a subsidy from the Jalisco State government and for this means that they do not charge for their services.

The purchase price for the producer is an estimate of the production costs per kilo of pita and show that the sale price is very close to the production costs.

The Cooperative also takes over half of the proportion of the price to the craftsmen and the producer takes only 43% (see Figure 10).

Figure 10. Proportion of the pita price at handicraft workshop level taken by the actors in the value chain for pita marketed through the Cooperative UPIS-L



It is estimated that the pita producers make a small profit if they sell their product to the Cooperative. The main costs in this activity are labour (59%) and the investment in the plantation (20.6%) (see Table 45).

Table 45. Enterprise budget for the pita producers.

Average annual sales	5
Area cultivated (hectare)	0.35
Number of plants per hectare	2000
Days preparation per hectare year 1	20
Days weeding per hectare (per year)	10
Number of years weeding	2
Price per plant	60
Labour rate	5
Estimated cost of establishment	12400
Years of useful life	15
Days per year to harvest 1 ha	4
Quantity harvested per hectare (kilo)	14
Labour input to process 1 kilo	2
Detergent per kilo pita (kg)	0.1

	Unit	Quantity	Price	Value		Value (US$)		% of costs
				Total	Per unit	Total	Per unit	
Pita sales	Kilos	5	300.00	1,500.00	300.00	150.00	30.00	
Total sales				**1,500.00**	**300.00**	150.00	30.00	
Variable costs								
Detergent	Kilos	0.5	10.00	5.00	1.00	0.50	0.10	0.4
Total variable costs				5.00	1.00	0.50	0.10	0.4
Activity gross margin				**1,495.00**	**299.00**	**149.50**	**29.90**	
Labour costs								
Harvest (male)	Days	2	60.00	120.00	24.00	12.00	2.40	9.3
Processing (Female)	Days	10	50.00	500.00	100.00	50.00	10.00	38.8
Weeding (male)*	Days	3.5	60.00	210.00	42.00	21.00	4.20	16.3
Total Labour costs				830.00	166.00	83.00	16.60	64.5
GM minus labour costs				**665.00**	**133.00**	**66.50**	**13.30**	
Fixed costs								
Depreciation	Unit	Number	Price	Life (years)				
Cultivation investment	Unit	0.35	12400	20	620.00	217.00	43.40	21.70	4.34	16.9
Machete	Unit	1	30	2	15.00	15.00	3.00	1.50	0.30	1.2
File	Unit	1	8	5	1.60	1.60	0.32	0.16	0.03	0.1
Wooden scrapper (no value)	Unit	1	0	5	0.00	0.00	0.00	0.00	0.00	0.0
Plastic bath (no value assigned)	Unit	1	0	5	0.00	0.00	0.00	0.00	0.00	0.0
			Rate		Amount		0.00	0.00	0.00	0.0
Interest	Unit	1	5.00%		218.9	218.90	43.78	21.89	4.38	17.0
Total Fixed costs						452.50	90.50	45.25	9.05	35.1
Total costs						1,287.50	257.50	128.75	25.75	100.0
GM minus labour costs and fixed costs						**212.50**	**42.50**	**21.25**	**4.25**	

* This mainly during the early years of the plantation

The Cooperative is estimated to make a profit (see Table 46).

Table 46. Enterprise budget for the Cooperative UPIS-L

					Value		Value (US$)		% of
	Unit	Quantity		Price	Total	Per unit	Total	Per unit	costs
Pita > 2.0 m	Kilos	324		750	243,000.00	202.50	24,300.00	20.25	
Pita 1.7 to 1.9 m	Kilos	672		700	470,400.00	392.00	47,040.00	39.20	
Pita 1.5 to 1.6 m	Kilos	84		630	52,920.00	44.10	5,292.00	4.41	
Less pita purchase > 2.0 m	Kilos	420		350	-147,000.00	-122.50	-14,700.00	-12.25	22.7
Less pita purchase 1.7 to 1,9 m	Kilos	780		300	-234,000.00	-195.00	-23,400.00	-19.50	36.1
Less losses in processing	Kilos	120		300	-36,000.00	-30.00	-3,600.00	-3.00	5.6
Total sales					**385,320.00**	321.10	38,532.00	32.11	
Variable costs									
Commission	Kilos	1200		10	12,000.00	10.00	1,200.00	1.00	1.9
Transport for collection	Unit	10		70	700.00	0.58	70.00	0.06	0.1
Transport to point of sale	Kilos	1200		3	3,600.00	3.00	360.00	0.30	0.6
Breakfast for producers	Week	10		100	1,000.00	0.83	100.00	0.08	0.2
Packing	Unit	1080		1.2	1,296.00	1.08	129.60	0.11	0.2
Other packing costs	Unit	1080		20	21,600.00	18.00	2,160.00	1.80	3.3
Detergent	Kilos	1200		10	12,000.00	10.00	1,200.00	1.00	1.9
Total variable costs					52,196.00	43.50	5,219.60	4.35	8.1
Activity gross margin					**333,124.00**	277.60	**33,312.40**	**27.76**	
Labour costs									
Male	Days	2		60	120.00	0.10	12.00	0.01	0.0
Processing labour	Days	2400		70	168,000.00	140.00	16,800.00	14.00	25.9
Total Labour costs					168,120.00	140.10	16,812.00	14.01	26.0
GM minus labour costs					**165,004.00**	137.50	**16,500.40**	**13.75**	
Fixed costs									
Depreciation	Unit	Number	Price	Life					0.0
Warehouse	Unit	1	10000	20	500.00	500.00	0.42	50.00	0.04	0.1
Representation Jalisco	Trips	1				3,500.00	2.92	350.00	0.29	0.5
Representation Oaxaca	Trips	5				500.00	0.42	50.00	0.04	0.1
			Rate		Amount		0.00	0.00	0.00	0.0
Interest	Unit	1	5.00%		5712.5	5,712.50	4.76	571.25	0.48	0.9
Total Fixed costs						10,212.50	8.51	1,021.25	0.85	22.7
Total Costs						647,528.50	539.61	64,752.85	53.96	100.0
GM minus labour costs and fixed costs						**160,504.00**	**154,791.50**	128.99	**15,479.15**	**12.90**

The main costs in the Cooperative pita processing activity are the purchasing of the raw pita, the losses during the processing and labour costs.

The profit analysis shows that the producers and the Cooperative both make profits, but the profits per unit at the Cooperative level are six times those at the producer level. There

were insufficient data to give an analysis of the profit margins at the trader distributor level (see Table 47).

Table 47. Summary of the commercialisation margins and profit margins for the actors in the pita value chain that involves the Cooperative UPIS-L

	Margin			Volume	Profit		Profit (US$)		Profit (PPP)	
Actor	Peso	US$	%	Unit	Total	per Unit	Total	per Unit	Total	per Unit
Producer	19.33	1.93		5	96.67	19.33	9.67	1.93	13.53	2.71
UPIS	400.00	40.00	54.79	1200	154,792	128.99	15,479	12.90	21,671	18.06
Trader/Distributor	30.00	3.00	4.11	?	?	?	?	?	?	?

The returns to labour for the activity at producer level are similar to the labour rate, which given that this activity is dominated by labour costs is not very surprising. At the Cooperative level the returns to labour are more than twice those at producer level, but the cost structure of the pita activity is very different, where the most important costs are the purchase of raw materials (see Table 48).

Table 48. Labour rate and returns to labour for the actors in the pita value chain that involves the Cooperative UPIS – L.

	Labour Rate (per day)			Returns to labour (per day)		
Actor	Peso	US$	PPP$	Peso	US$	PPP$
Producer	60	6.00	8.40	59.78	5.98	8.37
UPIS	70	7.00	9.80	134.43	13.44	18.82
Trader/Distributor	?	?	?	?	?	?

The analysis of this pita value chain seems to indicate that all actors are making profits and these profits relate to the risks and cost burdens that each actor undertakes.

13.3 VALUE CHAIN OF NATIONAL PITA TRADERS AND PROCESSORS

The national pita traders and processors are entrepreneurs who live in Oaxaca, Guadalajara, Mexico, Jalapa or Colotlan. Some of them own pita workshops and contract the services of local people to purchase and process pita. These businessmen collect pita from different sites and their volumes of trade can be much higher than the Cooperative. It is reported that they sell the pita to various prisons in the country at a price that can reach 1,000 peso a kilo. Their costs are reported to be similar to the Cooperative, but there are insufficient data to make a comparison between these two routes in the value chain.

13.4 VALUE CHAIN OF LOCAL PROCESSORS

There are a number of farmer families who carry out the second level processing of the pita and then market the processed product to the craftsmen in the city of Emilio Carranza. In general these families pay less per kilo of pita at producer level than the Cooperative and the national pita traders. The costs for processing are similar to those described for the Cooperative, but with slightly higher costs in terms of chemicals used in the processing. One of the families involved used only family labour to carry out the bleaching and combing, but employed other people to carry out the twisting of the thread. They sell two different qualities of pita:

- Bleached and combed fibre that is a long length; and
- Twisted thread for the fibre that is short.

There are no data on the cost structure of the workshops that they sell the pita fibre to (see below).

13.4.1.1 Commercialisation and profit margins

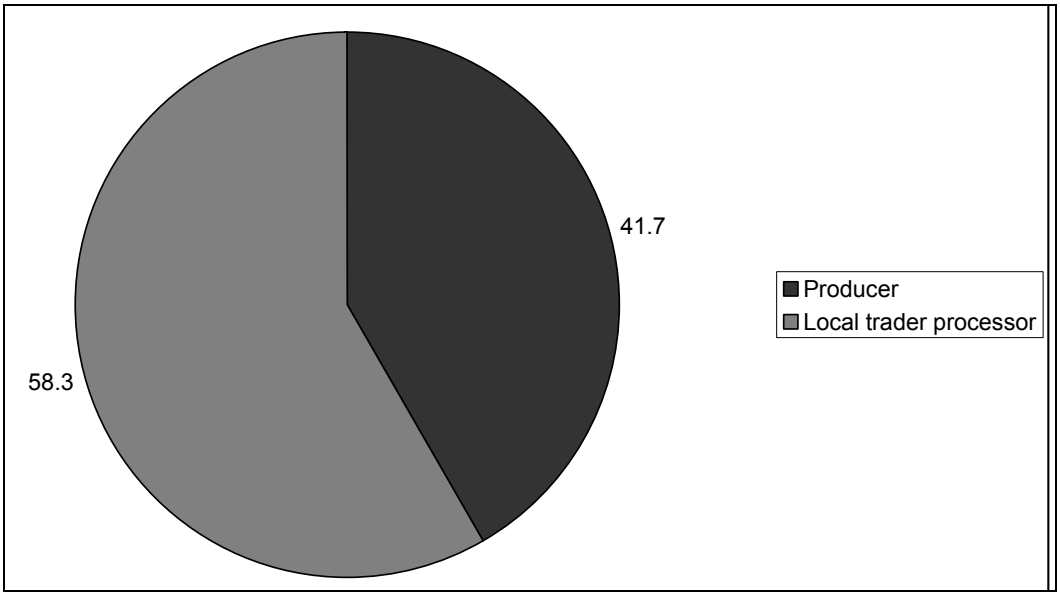
There is only one actor between the producer and the local trader processor so this actor takes the entire commercialisation margin (see Table 49).

Table 49. Commercialisation margins for the actors in the pita value chain that uses the local traders.

Actor	Price		Margin		
Name	Purchase	Sale	Peso	US$	%
Producer		250			
Local trader processor	250	600	350	35.00	58.33
Craftsmen	600				
Total			350.00	35.00	58.33
Final product value			600	60.00	100.00

The local trader processor takes 58% of the craftsmen's' price for processed pita (see Figure 11).

Figure 11. Proportion of the craftsmen's' price for pita taken by the actors in the value chain that uses the local traders.



The producer costs are assumed to be the same as for the producer supplying pita to the Cooperative, but they receive a lower price. The enterprise budget for the local trader processor is shown in Table 50.

Table 50. Enterprise budget for the local producer trader in the pita value chain that sells to the craftsmen in Jalisco.

					Value		Value (US$)		% of costs
	Unit	Quantity		Price	Total	Per unit	Total	Per unit	
Pita > 2.0 m	Kilos	180		600	108,000.00	270.00	10,800.00	27.00	
Pita 1.7 to 1.9 m	Kilos	180		600	108,000.00	270.00	10,800.00	27.00	
Less pita purchase > 2.0 m	Kilos	200		300	-60,000.00	-150.00	-6,000.00	-15.00	27.6
Less pita purchase < 2.0 m	Kilos	200		200	-40,000.00	-100.00	-4,000.00	-10.00	18.4
Less losses in processing	Kilos	40		300	-12,000.00	-30.00	-1,200.00	-3.00	5.5
Total sales					**116,000.00**	290.00	11,600.00	29.00	
Variable costs									
Transport to point of sale	Month	10		3000	30,000.00	75.00	3,000.00	7.50	13.8
Bleach	Unit	400		5	2,000.00	5.00	200.00	0.50	0.9
Lemon	Unit	400		1.5	600.00	1.50	60.00	0.15	0.3
Detergent	Kilos	480		10	4,800.00	12.00	480.00	1.20	2.2
Total variable costs					37,400.00	93.50	3,740.00	9.35	17.2
Activity gross margin					**78,600.00**	196.50	**7,860.00**	**19.65**	
Labour costs									
Processing labour for twisting	Days	100		60	6,000.00	15.00	600.00	1.50	2.8
Processing labour	Days	1000		60	60,000.00	150.00	6,000.00	15.00	27.6
Total Labour costs					66,000.00	165.00	6,600.00	16.50	30.4
GM minus labour costs					**12,600.00**	31.50	**1,260.00**	**3.15**	
Fixed costs									
Depreciation	Unit	Number	Price	Life					0.0
Warehouse	Unit	1	3000	20	150.00	150.00	0.38	15.00	0.04	0.1
			Rate		Amount		0.00	0.00	0.00	0.0
Interest	Unit	1	5.00%		1550	1,550.00	3.88	155.00	0.39	0.7
Total Fixed costs						1,700.00	4.25	170.00	0.43	0.8
Total Costs						217,100.00	542.75	21,710.00	54.28	100.0
GM minus labour costs and fixed costs						**10,900.00**	27.25	**1,090.00**	**2.73**	

The producers supplying pita to the local trader/processor do not make a profit. The local trader processor does make a profit, but it is much less per unit of product than the Cooperative (see Table 51).

Table 51. Commercialisation and marketing margins for the pita value chain that involves the local producer/processors.

	Margin			Volume	Profit		Profit (US$)		Profit (PPP)	
Actor	Peso	US$	%	Kilos	Total	per Unit	Total	per Unit	Total	per Unit
Producer	-30.67	-3.07	0.00	5	-153.33	-30.67	-15.33	-3.07	-21.47	-4.29
Local trader Processor	350.00	35.00	?	400	10,900	27.25	1,090	2.73	1,526	3.82
Craftsmen	?	?	?	?	?	?	?	?	?	?

There were no data on the cost structure of the craftsmen supplied by this chain.

13.4.1.2 Labour returns for the actors

The returns to labour for producers selling to the local processors are less than the local labour wage rate. The returns for the local processors are very close to the local wage rate (see Table 52).

Table 52. Labour returns for the actors in the pita value chain that involves the local producer/processor/trader.

	Labour Rate (per day)			Returns to labour (per day)		
Actor	Peso	US$	PPP$	Peso	US$	PPP$
Producer	60	6.00	8.40	43.66	4.37	6.11
Local trader processor	70	7.00	9.80	69.91	6.99	9.79
Craftsmen	?	?	?	?	?	?

The pita value chain that supplies product through the local processors is much less profitable than the Cooperative branch. Less is paid for the product at producer level and less is received for the fully processed product at the trader level. It is unknown if the finished pita products produced by the craftsmen in this chain are also of lower value or whether the bargaining power of the local processors is insufficient to demand prices paid to the Cooperative.

13.4.2 Pita workshops

The majority of the pita workshops are in the north and central part of the country in the cities of Colotlán (Jalisco), Guadalajara (Jalisco), Jerez (Zacatecas), Emilio Carranza (Veracruz) and Mexico (Distrito Federal). They are mainly family businesses, which occasionally employ other people. The smaller workshops manufacture high quality products to order and the larger workshops make more commercial items and can manufacture 500 belts a month. It is estimated that there are 500 pita workshops in Mexico. One of the workshops in Colotlán employs 1,200 craftsmen and produces items sold in various shops in Mexico and USA. The craftsmen use pita to decorate leather goods such as belts, boots and saddles. A belt of high quality can be sold for 1,000 pesos and a saddle for 100,000 pesos. There is also a growing market for more affordable products such as simpler belts and purchases. There were insufficient data to provide information on the cost structure of these enterprises and also the variety of enterprises at this level from large factory to small workshop means that it is difficult to determine average costs.

13.5 HYPOTHESES

13.5.1 Hypothesis 5

The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.1 Does the successful commercialisation of an NTFP depend critically on the existence of an accessible market?	Data presented clearly shows how important access to markets is. The cooperative and the private traders with their better organisation and market contacts are able to reach markets with better prices. The local processors cannot do this and in turn the prices they pay for the pita do not cover the labour and investment costs of the producer collector. The evidence therefore suggests that market access is key to collector producer profitability. **Important**
5.2 Does the successful commercialisation of an NTFP depend critically on potential demand?	Similar to the answer above, the demand at community level comes through three trading routes. The cooperative and private traders appear to be better placed to identify demand and in turn pay better prices. The local processors do not have this power within the market, but serve a useful function in buying pita that perhaps would not be sold otherwise. **Important**
5.3 Does the successful commercialisation of an NTFP depend critically on the absence of substitutes?	There exist substitutes for pita and this has affected the traditional markets for this product. However, the response by the supply chain has been very positive, people within that chain have looked for new markets and have developed accreditation schemes that appear to maintain the market share of pita. So rather than the absence of substitutes being important, the presence of substitutes seems to have stimulated the development of the value chain. **Important**
5.4 Does the successful commercialisation of an NTFP depend critically on access by producers, processors and traders to market information?	The channels for market information seem to function well in the pita value chain. The demand for a high value product of known quality is well transmitted with differing prices for different qualities. The producers, collectors and processors have responded to these market signals, which is perhaps most clearly shown by the existence of specialists in the processing of the product.
5.5 Does the successful commercialisation of an NTFP depend critically on technical management capacity?	The processing of the pita requires technical capacity to ensure that the majority of the product produced is of long length and high value. **Important**
5.6 Does the successful commercialisation of an NTFP depend critically on organisation?	The Cooperative UPIS-L and the private traders are well organised in terms of processing and marketing the pita. These two groups pay prices that produce small profits for the pita collectors and producers. The less organised local processors pay lower prices. Therefore, it could be concluded that organisation has an important role in maintaining profitability levels at producer and collector level. **Important**
5.7 Does the successful commercialisation of an NTFP depend critically on high value / unit wt?	Pita has a high value to weight ratio, but this ratio does not seem critical to the success of the value chain as the volumes of product are relatively small.
5.8 Does the successful commercialisation of an NTFP depend critically on trader characteristics (age, experience, education, etc)?	The president of the Cooperative UPIS-L appears to be key in its success. His ability at maintaining this organisation and also his skills at processing the pita appear very important. **Important**

13.5.2 Hypothesis 6

The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.

Key questions	**Comments on the basis of the analysis presented**
6.1 What is the equitability of profit distribution along the market chain?	Where local traders/processors are involved the producers do not receive adequate prices to make a profit. However, taking the value paid for pita by all traders the collectors/producers probably cover their costs and make small profits. The chain appears equitable.
6.2 Who controls the profits along the value chain?	The processor/trader appears to receive the greatest share of the returns. However, this actor has the greatest risks in terms of money invested in the product, processing skills and marketing contacts.
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	In the case of the local trader chain, no. The other chain appears to be relatively perfect.
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?	Demand for pita appears strong and the establishment of plantations suggests that the natural resource supply was inadequate. The future demand would also appear strong as the demand for high quality horse and cowboy products is likely to increase with the growing USA economy.
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?	The marketing network has evolved and perhaps the poor prices that were paid by local trader processors have stimulated the creation of the Cooperative. In general the producer/collectors are not exploited.
6.6 Are there actually a variety of trading networks for different NTFPs?	Yes, there are a number of trading networks, there are also different networks for different qualities of raw pita and processed pita. This appears to be a very well developed value chain.
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	There is no monopoly.
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	These do not appear to be a constraint, but perhaps in the past this has been a problem. The fact that the cooperative have taken out a loan would indicate that such a community level organisation was necessary to obtain this type of investment input. The impression is that the investment has been well used to provide better prices at producer level.
6.9 To what extent do prices fluctuate and to what extent does this represent a risk to producers and traders?	Prices seem stable. Drops in price would affect producer/collector profitability and make this a less attractive activity. This is shown by the fact that the lower prices paid by local processor/traders generate losses at the producer/collector level.
6.10 Do state marketing (or non-state) institutions play a role?	No state institutions, but the Cooperative is a key institution in this area and its loan is probably from a state subsidised source.

The pita value chain has private traders and a cooperative who pay higher prices and are looking for good quality product. There are also local processor/traders who pay lower prices and are dealing with lower quality product. The range of outlet for pita from collectors/producers appears to be important in guaranteeing that all product is sold. The

vertical integration for the high quality pita is important in maintaining the successful commercialisation of the pita. The market demand is specific and is well transmitted by price differentials for different qualities. The value chain for pita appears well developed, with healthy competition between buyers and these traders are actively looking for better markets.

14 PALMA SOYATE

14.1 INTRODUCTION

14.1.1 Palma Soyate

Palma Soyate (*Brahea dulcis)*, is a plant that produces a range of important products such as saddlebags for the donkeys and horses, the dried leaves are used for thatched roofs and the young unfolded shoots (locally known as Velilla) are used for handicrafts. Nearly all the families (98%) in the study area of Topiltepec are collectors and plaiters of Palma Soyate and the community is known as a "cintera" i.e. it produces rolls of plaited palm. The collection and plaiting is done at a family level with a division of labour between the collection and the plaiting.

Palma Soyate is collected and processed during a part of the year that is traditionally not very busy in the communities of study. It appears to be an activity that fills an important socio-economic role of providing petty cash at a time when there are few other economic options. It is reported that the weaving of this product by the members of the family is something that everyone does and they are carrying out this processing all the time. It is seen as a secondary activity that can be carried out whilst doing other activities. However, it can only be carried out with an activity that does not require the use of hands, such as herding animals, watching over children, socialising. It noted that these "other activities" are of low value in the general family economy.

14.1.2 Community Topiltepec

The community Topiltepec belongs to the Zitlala Municipality, which is located in the central region of the Guerreo State. It has a population of 2,034 people and 406 families. The main activity in the community is agriculture with just over 600 hectares of cultivable land of which nearly 20% is irrigated. The most important crop is maize and then garlic in terms of area (no information was available in terms of income). The NTFPs that are important in terms of volume extracted are Palma Soyate (*Brahea dulcis*), followed by Maguey Mezcalero, and then Magueyes Ixtleros (again no information was available on the economic importance of these different NTFPs). As mentioned above the Palma Soyate and the other NTFPs are an important aspect of the household livelihood strategies.

There is a high level of knowledge on the use of Palma Soyate in the manufacture of various products. The most important uses are:

- Young unopened leaves (velilla) to produce plaited strips,
- Green leaves to bundle together fodder,
- Green leaves for roofing,
- Dry leaves for fuel,
- To make products that are for daily use such as chairs, ties, baskets.

In the community, the collection of velilla is to make plaited strips that are then sold. The strips are then used to make a wide range of handicraft products such as: hats, bags, table cover, place mats, files, basket for tortillas, larger baskets, Christmas decorations etc.

14.1.3 General information on the commercialisation of Palma Soyate

A large amount of information was available from the household interviews on the commercialisation of Palma Soyate. One of the interesting things is that there is a lot of buying and selling between the collector families as well as sale to people outside the community. In Table 53 the information on the purchases made by the families collecting Palma Soyate has been summarised. The most important source of purchased Palma Soyate is the local trader followed by fellow collectors. It appears that there is some quality issue in the purchase as the value per unit varies enormously between the sources.

Table 53. Annual purchases by producers of Palma soyate by source (Quantity is in rollos and value is in Mexican Pesos).

Purchased from	Producers		Annual Purchases		Annual Purchases		Value per unit
	Number	%	Quantity	%	Value	%	
Collector	3	25	14,400	47.35	20,654	26.3	1.43
Local trader	8	66.67	15,951	52.45	57,344	73.01	3.60
Manufacturer	1	8.33	60	0.2	540	0.69	9.00
TOTAL	12	100	30,411	100	78,538	100	2.58

Table 54 includes information on the buyers of the plaited Palma Soyate. Again the most important buyer is the trader, and there appears to be a quality variation in the product as the unit value varies enormously.

Table 54. Annual sales by producers of Palma soyate by type of buyer (Quantity is in rollos and value is in Mexican Pesos).

Sold to	Producers		Annual Sales		Annual Sales		Value per unit
	Number	%	Quantity	%	Value	%	
End user	6	16.22	19,176	10.17	134,568	18.56	7.02
Trader	28	75.68	120,334	63.8	331,881	45.78	2.76
Distributor	3	8.11	49,095	26.03	258,443	35.65	5.26
TOTAL	37	100	188,605	100	724,892	100	3.84

Most of the plaited Palma Soyate is purchased by the interviewed traders from what they describe as weavers and this product has a much lower unit value than that from the other sources who were a collector and two local traders. Again there appears to be a quality issue with the pricing (see Table 55).

Table 55. Annual purchases of the traders of Palma soyate by source (Quantity is in rollos and value is in Mexican Pesos).

	Traders		Annual Purchases		Annual Purchases		Value per unit
	Number	%	Quantity	%	Value	%	
Weavers	4	57.14	216,000	96.77	545,400	72.78	2.53
Collectors	1	14.29	2,400	1.08	60,000	8.01	25.00
Local traders	2	28.57	4,800	2.15	144,000	19.22	30.00
TOTAL	7		223,200		749,400		3.36

The plaited Palma Soyate is sold by the traders to a range of buyers. The most important are the manufacturers who buy large volumes of low value product (see Table 56).

Table 56. Annual sales of the traders of Palma soyate by buyer type (Quantity is in rollos and value is in Mexican Pesos).

Buyer	Traders		Annual sales		Annual sales		Value per unit
	Number	%	Quantity	%	Value	%	
Distributor	1	14.29	24,000	15.38	252,000	18.35	10.50
Wholesalers and retailers	1	14.29	1,200	0.77	234,600	17.08	195.50
Weavers and Craftsmen	1	14.29	3,650	2.34	127,750	9.3	35.00
Manufacturer	1	14.29	120,000	76.9	420,000	30.58	3.50
Retailer (or vendor) and consumer	2	28.57	7,200	4.61	244,560	17.81	33.97
Craft shops and wholesalers	1	14.29		0	94,374	6.87	
TOTAL	7	100	156,050	100	1,373,284	100	8.80

The brief descriptive analysis shows that the commercialisation of plaited Palma Soyate is complex as many people are involved and there appears to be a wide range of qualities. Presenting a simplified analysis of this situation is not easy and is open to criticism, but as with the previous products an analysis of the value chain, and where possible, the profitability of the actors are presented.

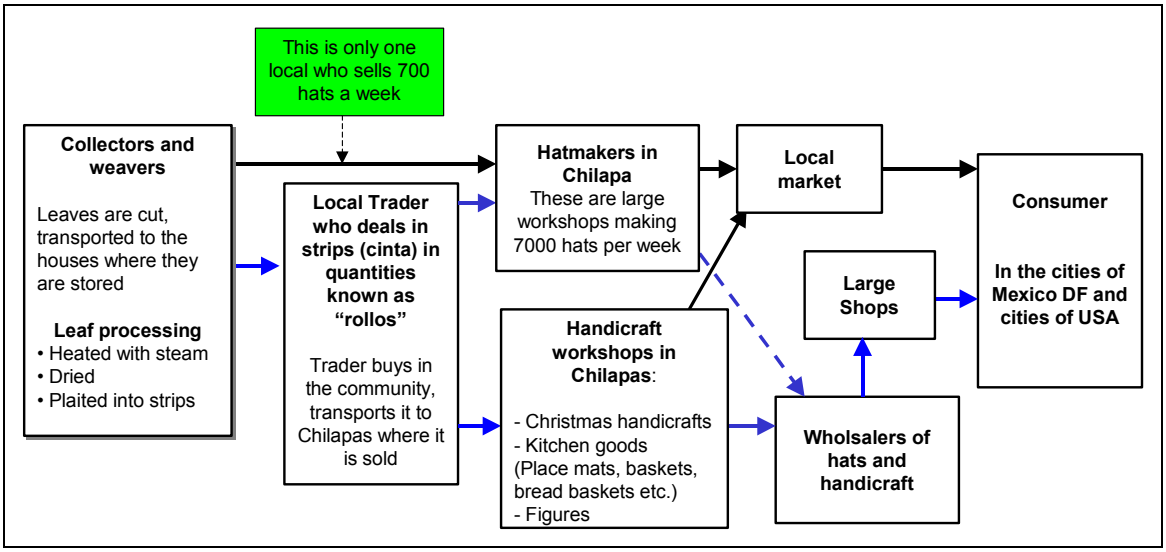
14.2 SUPPLY CHAIN ANALYSIS

Two supply chains have been identified for the communities:

1. Sale of the woven (plaited) Palma soyate for the manufacture of hats. This chain either supplies the plaited palm directly to the manufacturers or through a local trader. The hats are then sold in local markets and in to a lesser extent to wholesalers. The main customers for the hats are tourists either Mexican or international in the local markets.
2. Sale of the woven (plaited) Palma soyate for the manufacture of a range of handicraft products. The woven palm is sold to a local trader who sells the product to handicraft workshops. These workshops sell their products either in the local markets or to wholesalers. The wholesalers sell to large shops. Again the main customers for these products are Mexican or international tourists.

A graphical representation of the supply chains described is shown in Figure 12.

Figure 12. Supply chains for Palma soyate.



Insufficient data were available to carry out an analysis of both identified value chains, but some information was available on the chain involving the production of rollos to produce a range of handicrafts. This is presented in the following sections.

14.2.1 Collectors and manufacturers of "cinta"

14.2.2 Collection

The cutting and collection of the "velilla" is a delicate process in that the cutting should not damage the new velilla that is being formed. A special tool called a "cahualito" is used to do the cutting and this is sold in Chilapa. This is generally a job done by men, women only get involved when men are not available. After cutting the velilla from the palm, some of the small leaves are removed and the velilla is then opened and piled on top of each other. They gather a hundred pairs (200 velillas) and this is then put on a donkey and transported back to the village. The alternative is for the person to carry this back to the village.

Generally they collect a quantity that they believe they can plait in one or two weeks, but before the rains some families collect larger quantities as during the rainy season it is difficult to collect the velilla in a good state.

The collection is carried out during the entire year, but during February and May greater quantities of Palma Soyate are collected. This is understood to be a slack time of the year in terms of agricultural activities. One man can collect 200 velillas a day or a hundred pairs. A rollo is made from 3 to 4 leaves

14.2.2.1 Processing

The palm leaves are made into "cintas" by plaiting the leaves. This work is done by everyone in the household who is older than 8 years old. The leaves need to be boiled (which requires firewood) and dried before they can be plaited. The processing involves the following steps:

- Boiling of the collected leaves for 10 minutes

- Drying of the leaves in the shade for between 1 to 3 days depending on the weather
- Drying in the sun for between 3 hours to one day
- Resoaking in hot water for 20 minutes
- Plaiting into rollos of 20 metres
- Selling of the rollos to local traders or traders from Chilapa

It is estimated that a family is able to plait 2 rollos per day, and each rollo is 20 metres long. The sale of the rollos is to meet daily basic needs such as oil, sugar, bread, or pencil and pens for school.

Two types of cinta are produced:

- Fine cinta which is sold for between 1.20 and 1.50 peso per rollo
- Thick cinta which is sold for between 2.30 and 2.50 per rollo

Despite the low income from the sale of the Palma Soyate rollos it is one of the few activities that is available to generate income.

14.2.3 Traders

The trading routes for the Palma Soyate cintas are complex and there are traders of first and second levels. In the community of Topiltepec, there are 25 traders or 7% of the families are involved in trading. 118 families sell their cinta to traders outside the community and 215 sell to the community traders.

Some trades have shops where they buy and sell cintas, and in many cases they barter the cintas for small goods such as soap or pens. They will also loan money against the sale of cintas. In the analysis an estimate has been made for the costs of administering the business for local traders and also a cost of building a warehouse or a shop. Other costs are not considered to be important for this type of trader, but the spreadsheet can be modified to include other costs if needed.

The regional traders are considered to have higher costs in terms of transport, general labour costs and costs in time for purchasing the cinta. In addition a cost for administration has been included and a cost of the shop or warehouse.

The data on these actors in the value chain is not very accurate, but given the diversity of traders in the commercialisation of cinta this is not very surprising.

14.2.4 Commercialisation and profit margins

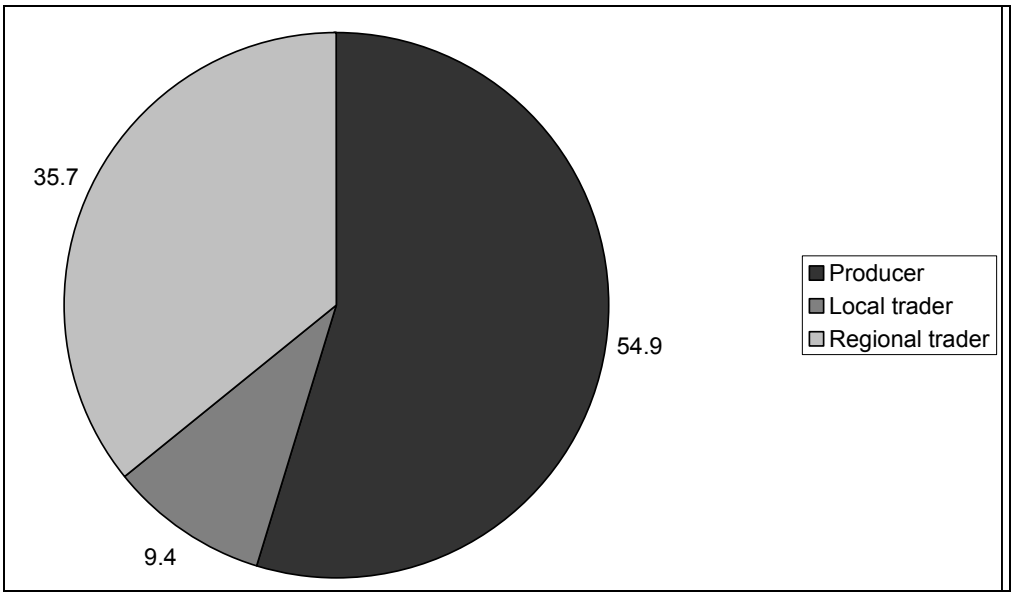
A majority of the commercialisation margin is taken by the regional trader in the Palma Soyate cinta value chain (see Table 57).

Table 57. Commercialisation margins for the actors in the Palma Soyate cinta value chain.

Actor	Price		Margin		
Name	Purchase	Sale	Peso	US$	%
Producer		1.92			
Local trader	1.92	2.25	0.33	0.03	9.43
Regional trader	2.25	3.5	1.25	0.13	35.71
Retailer	3.5				
Total			1.58	0.16	45.14
Final product value			3.5	0.35	100.00

The producer/processor receives 55% of the price paid by the craftsmen in the Palma Soyate value chain (see Figure 13).

Figure 13. Proportion of the Palma Soyate price taken by the actors in the value chain.



The enterprise budget for the collector and processing families is hugely negative when a local labour rate is put into the budget. The most important cost item in the budget is the labour used for plaiting the palm (see Table 58).

Table 58. Enterprise budget for the families collecting and processing Palma Soyate into plaited cinta.

	Unit	Quantity	Price	Value Total	Value Per unit	Value (US$) Total	Value (US$) Per unit	% of costs
Product sales	Rollos	1674	1.92	3,214.08	1.92	321.41	0.19	
Total sales				**3,214.08**	**1.92**	321.41	0.19	
Variable costs								
Total variable costs				0.00	0.00	0.00	0.00	0.0
Activity gross margin				**3,214.08**	**1.92**	**321.41**	**0.19**	
Labour costs								
Collection (male)	Days	21	60	1,260.00	0.75	126.00	0.08	2.3
Rollo production	Days	837	60	50,220.00	30.00	5,022.00	3.00	93.2
Preparation of the leaves	Days	40	60	2,400.00	1.43	240.00	0.14	4.5
Total Labour costs				53,880.00	32.19	5,388.00	3.22	100.0
GM minus labour costs				**-50,666**	**-30.27**	**-5,067**	**-3.03**	
Fixed costs								
Depreciation	Unit	Number	Price / Life					
Machete	Unit	1	30 / 5	6.00	0.00	0.60	0.00	0.0
File	Unit	1	8 / 5	1.60	0.00	0.16	0.00	0.0
Cahualito	Unit	1	30 / 5	6.00	0.00	0.60	0.00	0.0
			Rate / Amount					
Interest	Unit	1	5.00% / 3.4	3.40	0.00	0.34	0.00	0.0
Total Fixed costs				13.60	0.01	1.36	0.00	0.0
Total costs				53,893.60	32.19	5,389.36	3.22	100.0
GM minus labour costs and fixed costs				**-50,680**	**-30.27**	**-5,068**	**-3.03**	

The enterprise budget for the local trader is positive, but this is assuming that there are very few costs in this type of activity. The major cost is the purchase of the Palma Soyate cinta from the collector/processors (see Table 59).

Table 59. Enterprise budget for the local trader in the Palma Soyate cinta value chain

					Value		Value (US$)		% of costs
	Unit	Quantity		Price	Total	Per unit	Total	Per unit	
Product sales	Rollos	15026		2.25	33,808.50	2.25	3,380.85	0.23	
Less purchase of the product		15026		1.92	28,849.92	1.92	2,884.99	0.19	91.9
Total sales					**4,958.58**	0.33	495.86	0.03	
Variable costs						0.00			
Total variable costs					0.00	0.00	0.00	0.00	0.0
Activity gross margin					**4,958.58**	0.33	**495.86**	**0.03**	
Labour costs						0.00			
Administration	Days	38		60	2,280.00	0.15	228.00	0.02	7.3
Female	Days				0.00	0.00	0.00	0.00	0.0
Children	Days				0.00	0.00	0.00	0.00	0.0
Total Labour costs					2,280.00	0.15	228.00	0.02	7.3
GM minus labour costs					**2,678.58**	0.18	**267.86**	**0.02**	
Fixed costs						0.00			
				Life					
Depreciation	Unit	Number	Price	(years)					
Warehouse	Unit	1	5000	20	250.00	250.00	0.02	25.00	0.00	0.8
			Rate		Amount				
Interest	Unit	1	5.00%		250	250.00	0.02	25.00	0.00	0.8
Total Fixed costs						250.00	0.02	25.00	0.00	0.8
Total Costs						31,379.92	2.09	3,137.99	0.21	100.0
GM minus labour costs and fixed costs						**2,428.58**	0.16	**242.86**	**0.02**	

The estimated enterprise budget for the regional trader also shows that they make a profit. The major costs for this actor are the purchase of the cinta and transport costs (see Table 60).

Table 60. Enterprise budget for the regional trader in the Palma Soyate cinta value chain

					Value		Value (US$)		% of costs
	Unit	Quantity		Price	Total	Per unit	Total	Per unit	
Product sales	Rollos	31210		3.5	109,235.00	3.50	10,923.50	0.35	
Less purchase of product	Rollos	31210		2.25	-70,222.50	-2.25	-7,022.25	-0.23	65.6
Total sales					**39,012.50**	1.25	3,901.25	0.13	
Variable costs									
Transport	Months	12		2000	24,000.00	0.77	2,400.00	0.08	22.4
Total variable costs					24,000.00	0.77	2,400.00	0.08	22.4
Activity gross margin					**15,012.50**	0.48	**1,501.25**	**0.05**	
Labour costs									
Administration	Days	32		80	2,560.00	0.08	256.00	0.01	2.4
Purchasing	Days	48		60	2,880.00	0.09	288.00	0.01	2.7
Other labour costs	Days	120		60	7,200.00	0.23	720.00	0.02	6.7
Total Labour costs					12,640.00	0.40	1,264.00	0.04	11.8
GM minus labour costs					**2,372.50**	0.08	**237.25**	**0.01**	
Fixed costs									
Depreciation	Unit	Number	Price	Life					
Warehouse or shop	Unit	1	5000	20	250.00	250.00	0.01	25.00	0.00	0.2
			Rate		Amount				
Interest	Unit	1	5.00%		250	250.00	0.01	25.00	0.00	0.2
Total Fixed costs						250.00	0.01	25.00	0.00	0.2
Total Costs						107,112.50	3.43	10,711.25	0.34	100.0
GM minus labour costs and fixed costs						**2,122.50**	0.07	**212.25**	**0.01**	

In summary, the collectors/processors make a huge loss if their time in processing is valued at local labour markets rates (see Table 61). The types of trader are estimated to make profits, with the regional trader taking a larger percentage of the commercialisation margin, but making a lower profit per unit of product. This indicates that the costs for the regional trader are higher than those of the local trader.

Table 61. Commercialisation and profits margins for the Palma Soyate cinta value chain.

	Margin			Volume	Profit		Profit (US$)		Profit (PPP)	
Actor	Peso	US$	%	Rollos	Total	per Unit	Total	per Unit	Total	per Unit
Collector				1,674	-50,680	-30.27	-5,068	-3.03	-7,095	-4.24
Local trader	0.33	0.03	9.43	15,026	2,429	0.16	243	0.02	340	0.02
Regional trader	1.25	0.13	35.71	31,210	2,123	0.07	212	0.01	297	0.01

The returns per day of labour for the producer/processor are very low at US$0.36 per day. This perhaps reflects that the processing although a lengthy process is not really considered a main activity, but something that can be combined with other jobs. It is also an activity carried out by people in the household who probably have a very low opportunity cost, i.e. the young and the old. The returns per day of labour for the trader are a little more difficult to interpret, with the returns being higher for the local trader than the regional trader (see Table 62).

Table 62. Labour rate and labour returns for the actors in the Palma Soyate cinta value chain.

	Labour Rate (per day)			Returns to labour (per day)		
Actor	Peso	US$	PPP$	Peso	US$	PPP$
Producer	60	6.00	8.40	3.56	0.36	0.50
Local trader	70	7.00	9.80	123.91	12.39	17.35
Regional trader	70	7.00	9.80	73.81	7.38	10.33

It is suggested that the data for the analysis of the traders is not of high enough quality to draw many conclusions from this analysis. In particular the local trader costs are probably too low and for this reason the profit per unit and the returns per day of labour are too high.

14.3 HYPOTHESES

In general the Palma soyate value chain is very difficult to understand as the collector and the families who plait the palm make very little per day of work carried out. It is suggested that either there are some very serious faults in the input parameters for the enterprise activity model, in particular the number of days required to produce a cinta. Or the labour used for the plaiting has no value, i.e. it is the time of people who have no local labour value or for those people who have a local labour value plaiting is carried out during times when they are at leisure. These doubts are supported by the fact that in total 470 man years are taken to produce the annual product of rollos (188,000 rollos divided by 2 (2 rollos per day) divided by 200 days (average number of days worked per year). Given all these doubts this activity obviously serves an important function in the family and community economy as total sales of US$70,000 indicate. The very fact that so many families are involved in this activity also indicates that it continues to be an attractive economic activity.

14.3.1 Hypothesis 5

The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.1 Does the successful commercialisation of an NTFP depend critically on the existence of an accessible market?	There is an accessible market for the cinta, but the prices paid for the product are low in relation to the amount of work involved. There is a market for products made from the cinta and these markets are accessible in that tourists arrive to buy these products. This appears to be an important aspect for the continued existence of the Palma soyate value chain. Of **medium importance**
5.2 Does the successful commercialisation of an NTFP depend critically on potential demand?	There continues to be demand and people continue to produce the plaited palm, but at a very low price. The demand for products produced from the cinta is important in maintaining an economic activity in the communities. **Important**
5.3 Does the successful commercialisation of an NTFP depend critically on the absence of substitutes?	There are substitutes for the product which presumably affect prices paid for the plaited palm. The presence rather than the absence of substitutes is **important**
5.4 Does the successful commercialisation of an NTFP depend critically on access by producers, processors and traders to market information?	There are two different qualities of plaited palm of which the producers are aware. The market pays different prices for these qualities, but the majority of the product produced and used is of the lower quality. Perhaps the higher quality has a higher value, but low demand. Market information appears well developed, but difficult to interpret without further information.
5.5 Does the successful commercialisation of an NTFP depend critically on technical management capacity?	There is a high degree of technical capacity in the harvesting, processing and plaiting of the palm. However, the production is also limited by the time required for plaiting. Reducing time inputs would reduce costs at collector and plaiter level. Technology at this level would appear **important** to reduce costs.
5.6 Does the successful commercialisation of an NTFP depend critically on organisation?	There is a very loose organisation of traders. To break into other markets and improve prices would probably require greater organisation. **Not important** for current systems, perhaps important for other markets
5.7 Does the successful commercialisation of an NTFP depend critically on high value / unit wt?	Palma soyate and the rollos have a low value per unit of weight. However, the products produced would have a high value to unit weight. But this does not appear to be a critical aspect of the successful commercialisation of Palma soyate.
5.8 Does the successful commercialisation of an NTFP depend critically on trader characteristics (age, experience, education, etc)?	There are so many traders that individual characteristics **do not appear to be important**

14.4 HYPOTHESIS 6

The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.

Key questions	**Comments on the basis of the analysis presented**
6.1 What is the equitability of profit distribution along the market chain?	Very poor returns at producer level due to time required for plaiting. Returns at other levels are only achieved by high volumes of sales. This is not an equitable chain according to the analysis presented above.
6.2 Who controls the profits along the value chain?	More than half of the craftsman's price goes to the producer, but this does not reflect the time required in the processing.
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	If labour costs are taken at opportunity costs, then perhaps the market is perfect. Inadequate data is available on these opportunity costs and requires more research.
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?	There are no plantations of Palma soyate so the resource has not been depleted. Demand appears strong and production levels are high. Future demand is likely to depend on the sales to tourists of Palma soyate products.
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?	The analysis presented shows that there is exploitation of the plaiters of the palm who earn very low returns for their labour. The question is why people continue to produce something that generates so little income for the time involved. There are two potential answers: one it is secondary activity combined with something else and the second is the returns reflect the opportunity cost of their time. The former answer needs to be taken with some caution as this activity can only be combined with another activity that does not require the use of your hands. There are few productive activities like this, but there are many social activities where hands are not employed.
6.6 Are there actually a variety of trading networks for different NTFPs?	Large numbers of traders exist and many producers are also traders. A very active economy is associated with the trading of Palma soyate cinta.
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	No monopoly for the trading of the cinta
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	The authors felt that there did not appear to be limiting factors. However, field staff report that there are limits on credit, transport and market information on prices. It is difficult to see how credit is a serious issue in this supply chain.
6.9 To what extent do prices fluctuate and to what extent does this represent a risk to producers and traders?	Producer/plaiters continue to produce cinta even though their labour input receives hardly any reward. It is difficult to believe that prices could go lower and make this activity even less profitable.
6.10 Do state marketing (or non-state) institutions play a role?	No, there seems to be no influence of the state in terms of marketing, policies or subsidies

The Palma soyate value chain has a large number of producers, plaiters and traders. It seems to be a very active economy even though the returns at producer level are low. There appears to be no ability of the producer/plaiter to exert market power, but it is probably because the value for Palma soyate products is added when the cinta is converted into finished products. The barriers to entry for trading appear low as there are so many traders, but appear high for producing finished products. The latter is probably related to the skill levels required to produce quality products. The principal author feels that on the basis of the quantitative analysis this value chain cannot be said to be a

"success" for the poor producers. It is a value chain that maintains income levels, but at a very low level.

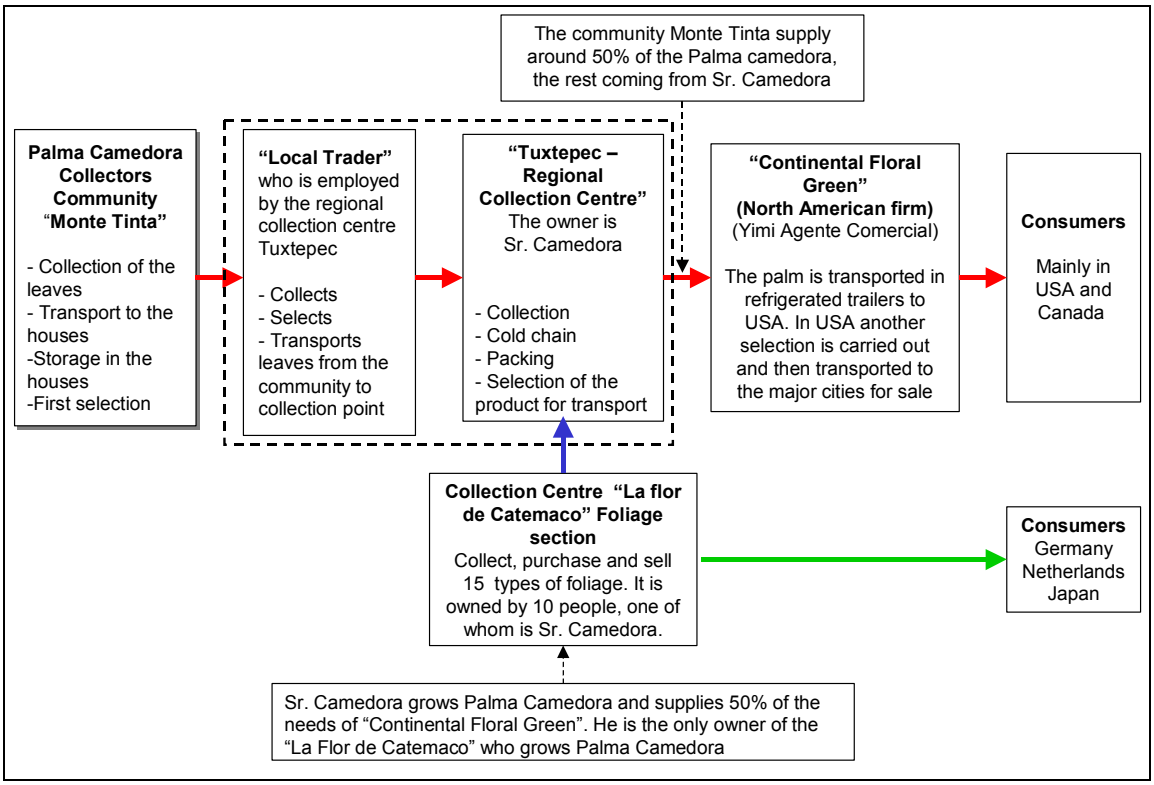
15 PALMA CAMEDORA

15.1 INTRODUCTION

Palma camedora is a product used in floral displays and is important in the European and North American markets. Mexico is the world's largest producer and exporter of this palm. For the community of Monte Tinta, in the Chinantla region of Mexico, the most important supply chain is to the North American market, with the European market being supplied by company called "La flor de Catemaco". This production, processing and commercialisation of Palma camedora appears to be dominated by one man. He is the only representative of the North American company that import Palma camedora, Continental Floral Green. He produces a large percentage of the exported palm and also owns a large proportion of the businesses that trade and export this product to the European and North American markets. His name will not been mentioned in the report for reasons of confidentiality and he will be referred to as Sr. Camedora.

Only one supply chain has been identified for the community Monte Tinta. A local trader who is employed by a regional collection centre buys the palm from the community. This regional collection centre carries out selection of the palm and has a cold chain and packing unit. The processed palm is sent to the North American company "Continental Floral Green" which distributes the palm around the USA and Canada in refrigerated trucks. Figure 14 shows the chain and the also details the chain that supplies the European market.

Figure 14. Supply chain of Palma Camedora.



There are number of questions that are unanswered with Palma camedora which relate to the dominant position in the marketing chain of one trader. This trader buys the wild palm from the community of study, and also cultivates and sells the palm. There obviously appears to be competition between the wild and cultivated product. There are no adequate explanations in the reports or the data to understand why the communities have not begun cultivating Palma Camedora themselves, but the following list are a range of issues that deserve further investigation: land tenure problems; lack of knowledge; poor returns; or a combination of this list. During a meeting of the project team there were discussions of how the building of a reservoir had restricted the access of one community to selling Palma Camedora.

15.2 HYPOTHESES

15.2.1 Hypothesis 5

The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.1 Does the successful commercialisation of an NTFP depend critically on the existence of an accessible market?	The community have access to Mexican, USA, and Canadian markets through the businessman, Sr. Camedora. Without this businessman the communities would not have access to these markets. The European market is supplied by cultivated palm. Access to the North American market is undoubtedly important in the successful commercialisation of this product. The impact of not having access to the European market deserves investigation, particularly the prices and qualities demanded and the costs of entry into the market. **Important**
5.2 Does the successful commercialisation of an NTFP depend critically on potential demand?	Strong demand exists in the North America market and there appears to be a growing demand in Europe. The demand is **important** in the successful commercialisation of the product**.**
5.3 Does the successful commercialisation of an NTFP depend critically on the absence of substitutes?	It would appear that wild palm is being substituted by cultivated Palma Camedora. However, according to the field staff the demand from Europe is for cultivated palm, whereas the markets in the USA and Canada demand the wild palm. Therefore there are niche markets for the cultivated and wild palm that are distinct. What is not clear is whether this demand has been created by only offering a certain type of palm and not providing all the possible options. There are also probably other plants that are used for floral displays. There are obviously a number of substitutes and the successful commercialisation does not depend on an absence of substitutes. **Not Important**

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.4 Does the successful commercialisation of an NTFP depend critically on access by producers, processors and traders to market information?	Market information appears to be controlled by the vertically integrated company in the middle of the value chain. This transmits information to the collectors in the community only for the North American market. The impact this has on present or future success of commercialisation of Palma camedora is that it restricts the size of the market and economic opportunities of the community. This may be inhibiting decisions on investment in Palma camedora plantations. It may also be reducing the ability of this NTFP to improve the well-being of poor collectors. According to the field staff, it is impossible for the collectors to have access to the North American markets. The information on these markets is controlled by Sr. Camedora who has received training from the North American importing company. The collectors do have information on the quantity and quality of the palm demanded by buyers through the central market.
5.5 Does the successful commercialisation of an NTFP depend critically on technical management capacity?	It is critical that the collectors know how to select the palm demanded thus reducing the selection costs of the traders. If this is not done then there is a possibility that the traders will not return to the communities. The technical management of Palma camedora is important in terms of storage and transport of the product from the community to the consumers who are long distances from the source of production. Without this technology the community would not have access to distant markets so this is a **critical aspect** of the commercialisation of this product. It is noted that the technical capacity is provided by a private company.
5.6 Does the successful commercialisation of an NTFP depend critically on organisation?	At community level the organisation is very weak. The field team feel that the community should be thinking of creating an organisation that will assist in improving output from the wild palm, creat a small collection centre and provide training. Apparently the buyer has said that he would pay 20% for the product if this organisation existed. Above the community level and given the distance from the production areas to consumers there is need for strong organisation for the transportation of the product and also for its successful marketing. Organisation is critical in providing these economic opportunities for communities. **Important**
5.7 Does the successful commercialisation of an NTFP depend critically on high value / unit wt?	At collector level the weight of the product is critical constraint, because the transport from the point of collection to the point of sale is usually by foot. The prices for this product have not changed for some time and this has demotivated a number of collectors from working in this activity. Above the collectors weight of product does not appear to be critical as transport is good and relatively cheap. **This is important for the collectors and of less relevance for the traders.**

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.8 Does the successful commercialisation of an NTFP depend critically on trader characteristics (age, experience, education, etc)?	The value chain is dominated by one individual who began working in Palma camedora 20 years ago. He went to central America to receive training in palm management. Therefore, the characteristics of the trader appear very **important** in the development of this market

15.3 HYPOTHESIS 6

The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.

Key questions	**Comments on the basis of the analysis presented**
6.1 What is the equitability of profit distribution along the market chain?	It is suspected that the major profits in the marketing are made by the trading company which buys and then exports the Palma camedora. The lack of investment in plantations by the community suggests that the collector families make only small profits from this enterprise.
6.2 Who controls the profits along the value chain?	It is estimated that the collector receives 39% of the price paid by the distributor according to the data from the household interviews. The distributor controls the majority of the sales revenue.
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	The monopoly position of the distributor perhaps raises the question whether this is a perfect market, but it must be remembered that this distributor is supplying a market where there is competition from other types of flower products. It is felt unlikely that this distributor is making super-profits, but it is something that needs to be investigated further
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?	Demand appears strong and the investment in cultivated Palma Camedora indicate that returns on investments in plantations, particularly for the European market, are high enough to cover costs. The very existence of plantations demonstrates that natural sources are insufficient to cover demand. However, whether resource depletion is occurring is difficult to say. The other issue that needs to be investigated is whether the cost of producing a quality product is lower under controlled plantation conditions than from natural sources.
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?	The value chain studied is now dominated by one trader and producer of cultivated palm. This domination is a relatively new. This trader is using the collectors to supplement his own production of palm. It is not certain that this monopoly has led to an exploitation of the collectors and, as this change is relatively new, it is probably too early to see any impact. It remains to be seen if the creation of plantations will begin to reduce the marketing power of the collector communities. The field staff state that there are less exporters than before and the monopoly power of Sr Camedora is keeping prices down to levels that exploit collectors for what is a difficult job.

Key questions	Comments on the basis of the analysis presented
6.6 Are there actually a variety of trading networks for different NTFPs?	There appear to be two routes to the main markets, but the community studied has access to only one route. According to the field staff, there are two routes to sell Palma camedora: through Continental or through the central market in Mexico. For Monte Tinta Continental is the most important. However, this community have successfully marketed coffee through a state marketing group so they have experience of using other chains and options.
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	There appears to be a monopoly in the chain, but at this stage of the evolution of the chain, this monopoly appears to have been used to find new external markets, in particular Europe
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	The active investment in plantations and market information would suggest that credit, transportation etc are not lacking in the chain. However, these aspects are concentrated in the hands of one firm and the community is simply a supplier to this firm. The collectors have limited access to credit through the NGO Grupo Mesofilo, but would require extra credit if they wanted to market the palm themselves.
6.9 To what extent do prices fluctuate and to what extent does this represent a risk to producers and traders?	There is a stronger demand for the product during the wedding season in USA. However for 5 years the prices have been stable, which may be related to there being fewer buyers for the palm.
6.10 Do state marketing (or non-state) institutions play a role?	Large American company is key in this market. Mexican government has played an important role through an institution called SEMARNET which helped to carry out studies on obtaining permits for harvesting the palm, training on establishing plantations and palm gardens.

The Palma camedora supply chain is dominated by a single firm. The community studied supply the product to this firm and it is difficult to see how they can exert much influence on the system. Perhaps a worry is the establishment of plantations for Palma camedora. If these prove profitable and sustainable this may put at risk the community's market for wild collected product. It may suggest the need for a closer association of the community to the firm with perhaps a branding of their product as from a naturally harvested sustainable source. Such a strategy would obviously be attractive to the community, but would only be of relevance to the company if they could then sell this product for a premium.

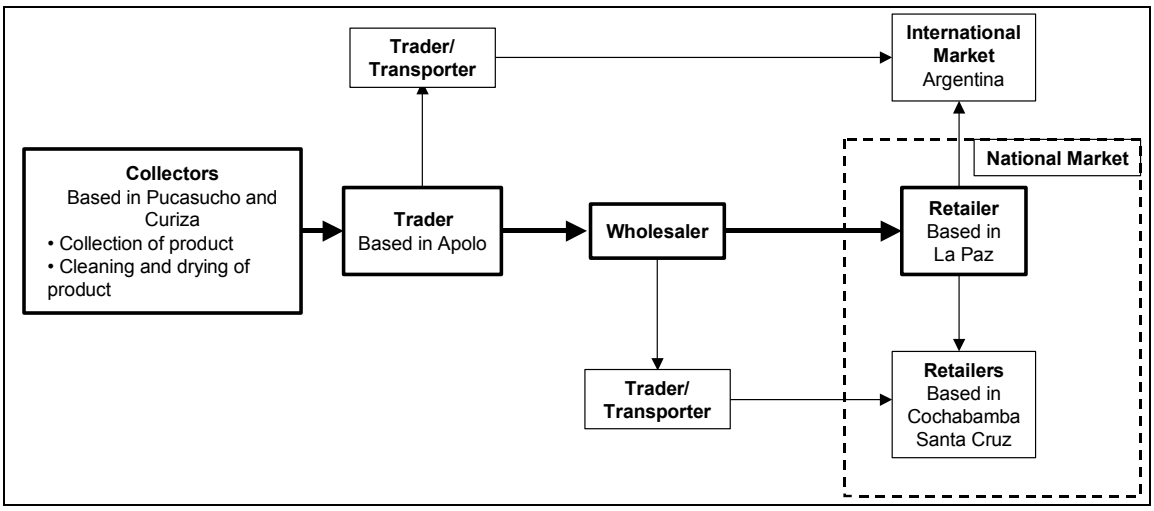
16 COPAL AND INCENSE

16.1 INTRODUCTION

Copal and incense will be dealt together as they are collected by the same families and are complementary activities. It would appear that they are direct substitutes, because they are marketing in the same way, but they are used in different ways that are historically dictated.

The value of incense is higher than that for copal and the market for incense is also different in that there exists an international demand for this product. The supply chain for the two products is centred on delivering the majority of the product to trading centres in La Paz where it is distributed for both the local, national and international markets. Smaller amounts are also traded through transporter/traders to the international market, mainly Argentina and also the national markets in Cochabamba and Santa Cruz. A graphical representation of this supply chain is shown in Figure 15.

Figure 15. Supply chain for incense and copal in Bolivia.



To clarify the supply chain details it is important to mention that the export of incense to Argentina goes through the border point at Yacuiba in the Chaco. The transport route therefore is likely to be through Santa Cruz and then to the Argentinean border as the road network is much better in this direction. The alternative route to Argentina across the Altiplano to Villazon appears not to be important. It has also been reported that the export to Argentina either goes directly from La Paz or via Cochabamba.

16.2 HYPOTHESES

16.2.1 Hypothesis 5

The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)

Hypothesis 5 with key questions	**Comments on the basis of the analysis presented**
5.1 Does the successful commercialisation of an NTFP depend critically on the existence of an accessible market?	There are markets for these products, but they do not appear to be very accessible. Of all the products studied this seems to be one of the most difficult in terms of collection. It seems more like a mining process where there are small pockets of product. Once collected the products have to be transported from areas with some of the worst transport connections in Bolivia. The international market in Argentina is also very inaccessible, with a journey time to the border point from La Paz of 3 to 4 days. This is not important for the successful commercialisation of these products. **Not important**
5.2 Does the successful commercialisation of an NTFP depend critically on potential demand?	There is demand for this type of product both national and international markets. However, copal is normally restricted to the national market. The international market pays for the higher valued incense. It would be interesting to know what has happened to the demand for incense with the economic crisis in Argentina. This is an **important** aspect of the successful commercialisation of these products. The fact that there is demand for low and high value product is important.
5.3 Does the successful commercialisation of an NTFP depend critically on the absence of substitutes?	Incense and copal would appear to be substitutes for each other, but are used in different ways. It would also appear that incense is generally exported and copal is used locally. The latter is the lower value product. There do not appear to be other substitutes. This would appear to be **important** in maintaining a high price for these products
5.4 Does the successful commercialisation of an NTFP depend critically on access by producers, processors and traders to market information?	From the limited information available, the collectors are aware of the demand for these products. But given that the markets are so distant from the collection points it is unlikely that the collectors are fully aware of the final market value of the product. It would appear that they receive little of the final value for the product. Market information is probably of **medium importance** in the successful commercialisation of copal and incense.
5.5 Does the successful commercialisation of an NTFP depend critically on technical management capacity?	Very little processing is involved and given the stability of the product its transportation is not complicated. **This is not considered to be important.**
5.6 Does the successful commercialisation of an NTFP depend critically on organisation?	Very little organisation in terms of collection, trading and direct sales seems to be involved in the value chain for copal and incense. **Organisation is not critical.**
5.7 Does the successful commercialisation of an NTFP depend critically on high value / unit wt?	**Yes**, the incense is a high value product. **Very Important**
5.8 Does the successful commercialisation of an NTFP depend critically on trader characteristics (age, experience, education, etc)?	The traders need to be able to understand and know the forest communities in the tropical zone of La Paz and also maintain contacts with people buying and selling the product for national and international markets. **Their abilities in terms of personal contacts are probably important**

16.3 HYPOTHESIS 6

The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.

Key questions	**Comments on the basis of the analysis presented**
6.1 What is the equitability of profit distribution along the market chain?	The copal chain does not seem very equitable
6.2 Who controls the profits along the value chain?	The copal collectors receive only 18% of the distributor price, but the incense collectors receive 72% of the distributor price. This perhaps reflects the relative power in the marketing chain for the different products.
6.3 Are markets for NTFPs perfect (e.g. are prices closely linked to the cost of production?)	The copal and incense value chains do not appear perfect and the traders are possibly abusing their powers of information.
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?	Demand exists nationally for copal and internationally for incense. The economic crisis in Argentina has probably reduced demand for incense. However, the economy in this country is now growing rapidly again, which will probably bring demand back to previous levels. In Bolivia, the economy has confusing signals. Popular press continue to talk of economic crisis, but according to official estimates the economy continues to grow and information on construction would also suggest that the economy continues to grow. So if this is the case the demand for copal will remain strong and perhaps as the society gets richer there will be a growing national demand for incense. When considering resource depletion it is important to recognise that the collection of copal is a complementary activity to the collection of the more expensive incense. Field reports by Eric Arancibia suggest that there is over harvesting of incense that is causing excessive damage and disease to the trees. Therefore the demand for particularly incense is having an important impact on the natural resource source for this product.
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?	The copal collectors appear to be being exploited. The evolution of this network is difficult to say, but given the small size of the market it is unlikely that many people could be involved.
6.6 Are there actually a variety of trading networks for different NTFPs?	There are a limited number of traders, but the routes to end consumers seem very similar. The diversity in the chain appears to be through the transporter/traders
6.7 Is there monopolization (eg of transport, information) at various NTFP stages and how does this affect success at previous stages?	There does not seem to be monopoly, but not many people are involved in trading copal and incense from the forest areas to La Paz. It is reported that only 3 people are trading in this product and they agree the price between themselves, there is a oligopoly
6.8 Is there a lack of access to credit, transportation, information on price fluctuations, storage facilities?	Storage for these products does not seem important and it can probably be transported relatively easily. Credit also does not seem to be an issue, but market information for the collectors may be a problem particularly for copal.
6.9 To what extent do prices fluctuate and to what extent does this represent a risk to producers and traders?	Unknown, it would be interesting to examine the information on the incense demand during the early stages of the economic crisis in Argentina
6.10 Do state marketing (or non-state) institutions play a role?	No, there are no state marketing institutions and there appear to be no policies, programmes or projects supporting the marketing of copal and incense.

The value chain for copal and incense contains only a small number of traders from collector to city distribution. The ability of the producers to exert power on the market appears to be low for both products. Perhaps an important impact of this lack of power of negotiation, is that the collectors are poorly paid for their activities. It is suggested that this may have a negative impact on the conservation of the trees in the forest as the collectors cannot afford to employ harvesting strategies that will guarantee the longevity of the sources, i.e. they are mining the source due to the need to survive. The organisation of the value chain appears very loose.

17 PALMA TEPEJILOTE

17.1 INTRODUCTION

Palma tepejilote produces an inflorescence which is eaten mainly in the Mexican states of Chiapas and Oaxaca. In these two regions the most important market is found in the northern Sierra of Oaxaca where there are large indigenous populations. According to the information from the household interviews, nearly a third of the product collected (28%) is consumed by the family. Of the product sold half the collectors sell their product to traders and the remainder either sell directly to consumers or actively search for consumers to buy their product, knocking door to door in neighbouring towns and market areas. In terms of value and quantity, product sold direct to consumers is the most important route. However, there may be an underestimation of the value of product sold to traders and also most traders pay for the product with a mixture of money and goods (see Table 63).

Table 63. Summary of the sales by collectors of Palma tepejilote (source Community Interview data).

Type of Buyer	Producers		Form of Exchange	Quantity sold per year (manojos)			Value sold (Pesos/year)			Average price (peso/manojo)
	Number	%		Total	Average	%	Total	Average	%	
No response	1	6.67	-	-	-	-	-	-	-	-
Consumer*	6	40.00	Money	1,940	323	56.40	8,875	1,479	70.44	4.57
Consumer direct	1	6.67	Money	300	300	8.72	1,050	1,050	8.33	3.50
Trader	7	46.67	Money and goods	1,200	171	34.88	2,675	382	21.23	2.23
Total	15			3,440			12,600	840		3.66

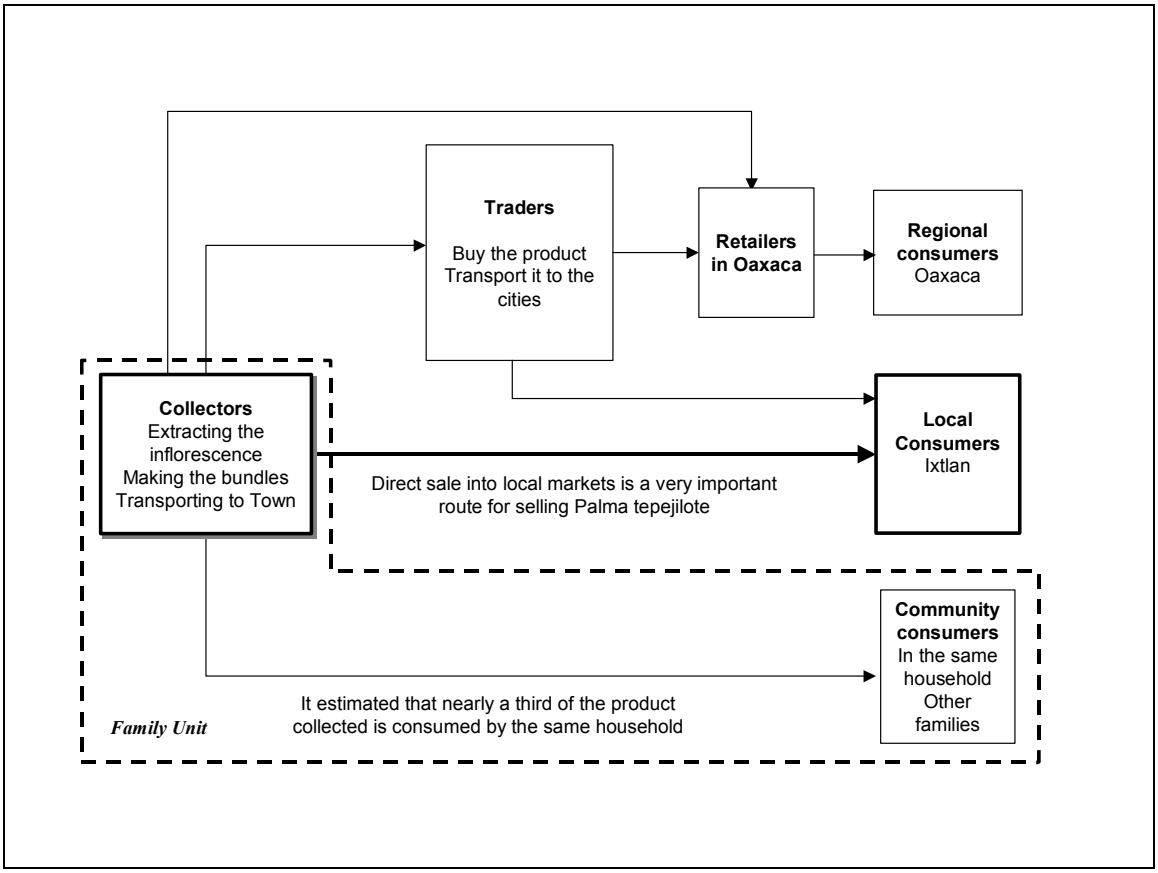
* Actively search for buyers knocking door to door.

The main routes in the supply chain identified for Palma tepejilote are:

1. Household consumption.
2. Direct sales to consumers in local towns. This appears to be the most important route by value and quantity of Palma tepejilote sold (see Table 63).
3. Sales to traders who then sell to large towns and cities.

Figure 16 shows the supply chain identified for Palma tepejilote in Mexico.

Figure 16. The supply chain for Palma tepejilote in Mexico.



18 MAGUEY

18.1 INTRODUCTION

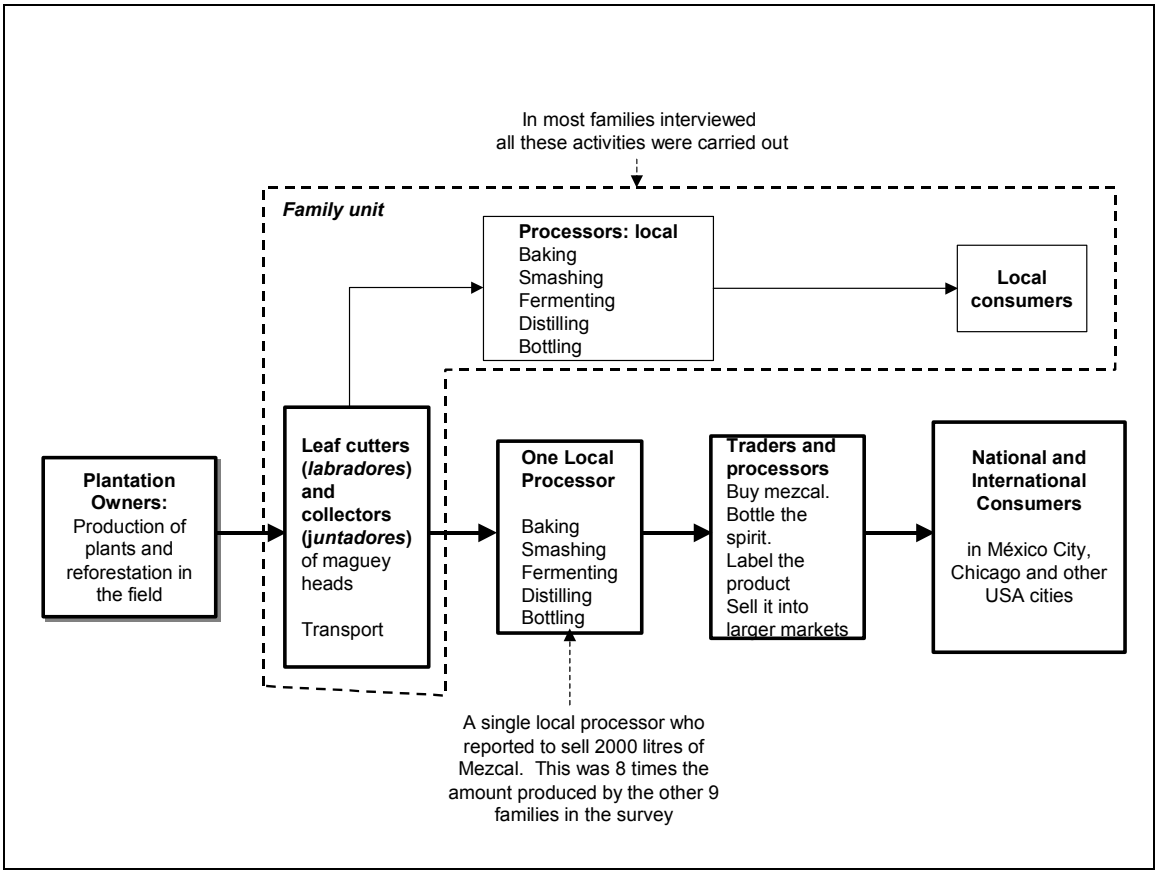
Maguey is used in the production of the Mexican spirit Mezcal. In the area of study, this product is processed and the Mezcal is consumed by the family itself or other local consumers. However, the processed Mezcal is also sold to traders and processors outside the community who repackage the product and sell it into markets in Mexico and also export the product to USA.

There are two routes in the supply chain in the community studied:

1. Home processing of the maguey to mezcal and either home consumption or sale to local consumers. In terms of numbers of local people involved either processing or consuming this is the most important route of the supply chain.
2. Larger scale processing of maguey to mezcal and sale of the mezcal to traders. The traders repackage the mezcal and sell the product in the national and international markets. In terms of quantity and value this is the most important route in the supply chain.

Figure 17 shows the supply chain for maguey in Mexico.

Figure 17. Supply chain for maguey in Mexico.



A maguey 'head' collected to make mezcal is worth 14 peso in the community and a litre of mezcal can be purchased for an average price of 46 peso. There is one big producer of the Maguey liquid who sells 2000 litres per year with an annual income of 12800 Mexican peso per year. This producer sells to a distributor at a price of 20 peso per litre with total annual sales of 41,000 pesos. This is substantially more than he reported as his annual income from this product. A further nine producers sell direct to consumers and have combined annual sales of 252 litres, a producer average of 29 litres per year. However their average price is 48.88 peso per litre with an average producer annual income of 1,417 pesos.

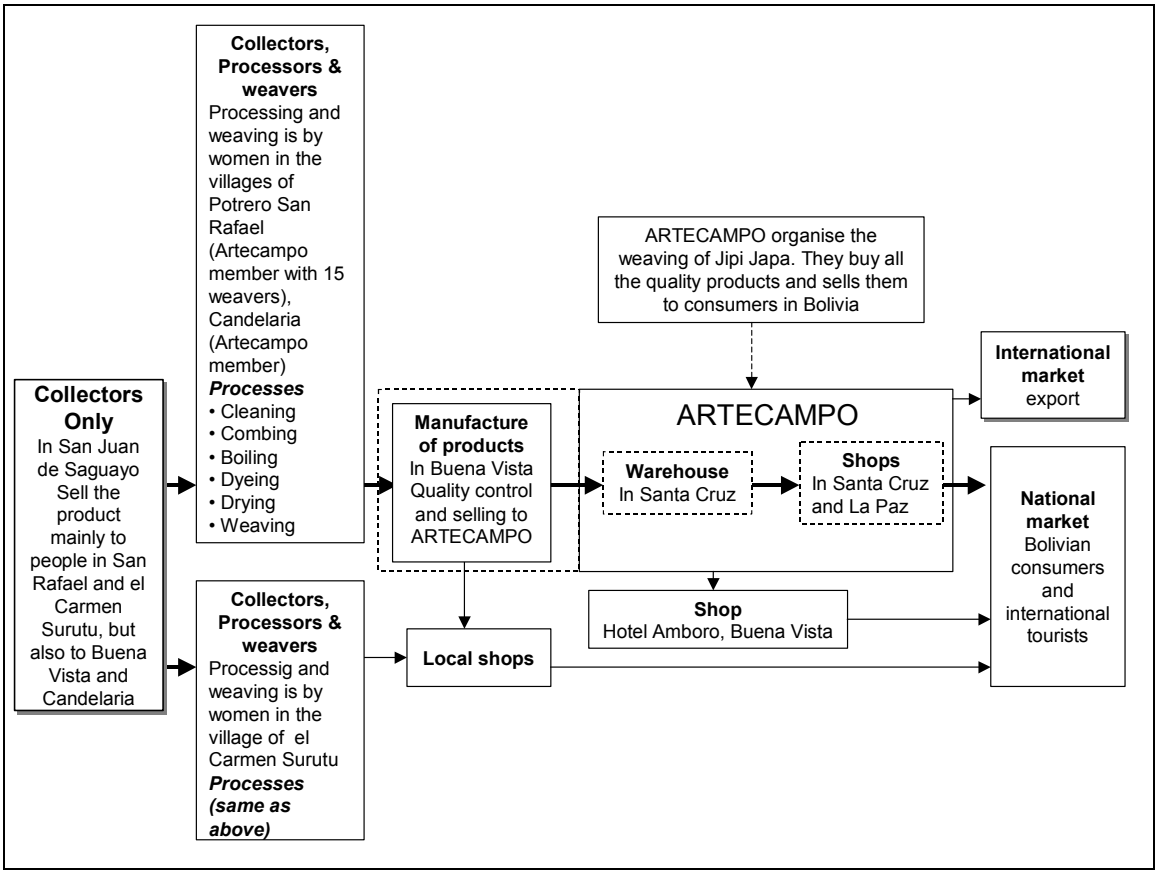
19 JIPI JAPA

19.1 INTRODUCTION

Jipi Japa (pronounced in Spanish "Hipi hapa") is a palm that can be woven and the material produced can be made into different products such as hats, placemats, bags etc. Information has been collected for the study from communities based around the town called Buena Vista, which is 100 kilometres from Santa Cruz de la Sierra on the main road between Santa Cruz and Cochabamba. The location of the study area is important, because it is a very strong contrast from the other NTFP study areas in Bolivia. This study area has easy access to one of the best roads in Bolivia. It is only around an hour and half from the county's biggest and most prosperous and cosmopolitan city, Santa Cruz and between 5-7 hours from Cochabamba, another rapidly growing city. Therefore, access to markets is not a problem for the products produced from jipi japa and in many respects its marketing chain is perhaps the most advanced in terms of structure of the products studied in Bolivia.

The supply chain for products produced from jipi japa is dominated by a company called Artecampo. This company has implemented a quality control system for the manufacture of jipi japa products. The best quality items are purchased by the group and they have a warehouse in Santa Cruz. They also own shops in Santa Cruz and La Paz and are reported to export jipi japa products. A representation of the supply chain is shown in Figure 18.

Figure 18. Supply chain for Jipi Japa products in Bolivia.



Given the dominant position of the company Artecampo in the supply chain there were few data to carry out a quantitative analysis of the chain. In addition, the range of products produced by the processors makes a commercialisation margin analysis virtually impossible. However a number of interesting qualitative observations are available.

The communities in this area have different roles in the supply chains:

- Candelaria which is 4 kilometres to the north of Buena Vista has one person who collects Jipi Japa and supplies processors in Candelaria and Buena Vista;
- The families in San Juan de Saguayo, which is some distance south of Buena Vista, collect Jipi Japa and supply processors in Potrero San Rafael and El Carmen Surutu and to a lesser extent Buena Vista and Candelaria. All these communities lie on the road between Saguayo and Buena Vista.
- Therefore there are two separate raw Jipi Japa palm supply chains. Candelaria supplying the communities to the north and Saguayo the communities to the south.
- This specialisation in terms of collection and processing of palm is interesting and probably related to access to the natural palm and also markets for processed product

There appear to be barriers to entering in the processing and selling of Jipi Japa products:

- Ethnic barriers – settlers from the Altiplano are said to be excluded from entering into this activity.
- Quality control issues – it is questioned if these are used to give preferential treatment to certain processors.

Payment of products by Artecampo takes the following form:

- An amount paid on delivery;
- An amount paid on sale of the product;
- A quality premium paid for some products; and
- An amount paid to a group fund which is used to finance housing development[6].

The control of the group fund is not available and it is potentially open to abuse and patronage. The fact that a percentage of the price paid for the product is not given to the processor until it has been sold, shows that some of the risks of the commercialisation are borne by the processor.

Finally, the position of Artecampo as a monopoly buyer of Jipi Japa products raises some questions about market development

- Does their monopoly position strengthen or weaken market development? The main person in the institution demands only certain products that are low value basket fillers. The core business activity for the company appears to be in carved wood and stone goods. If Jipi Japa products are a relatively small proportion of the income for the company it is unlikely that it will dedicate much time searching for new market opportunities or developing new Jipi Japa products. It is reported that 20% of the Artecampo's income is derived from the sale of Jipi Japa products.

[6] Full details of the pricing structure for different Jipi Japa products can be found in the marketing report for this NTFP

20 DISCUSSION AND CONCLUSIONS

20.1 INTRODUCTION

The current document has attempted to carry out an analysis of the commercialisation of 10 different NTFPs. Five have been analysed in depth and five have had the main supply chains identified for the communities studied and some qualitative analysis presented. The lack of analytical depth for the latter products is due to a combination of a lack of data, short supply chains making a quantitative analysis relatively meaningless and finally inadequate time to complete a more thorough analysis.

The objective of the analyses was to draw conclusions about the supply chains for the products studied and to reach generalisations for the commercialisation of NTFPs. The conclusions on the specific products can be found in the sections relating to those products. The issues relating to generalisations are found in this chapter and are split into:

- Methodology
    - Data quality
    - Analytical framework
- Product classification issues
    - End use and processing
    - Availability of substitutes
    - Possibility of cultivation
- Transaction costs and policy issues
- General issues relating to hypotheses 5 and 6

These sections are followed by conclusions from the analysis

20.2 METHODOLOGY

20.2.1 Data quality

The general study has generated large amounts of data using different collection tools, from informal participatory methods to formal quantitative interviews. The authors have some views on the data collection and storage methods used, which are made from the point of view of having entered the study after the completion of the collection period, so from hindsight.

- It is understood that the community and marketing reports were designed to have a very similar structure for all products and study sites. However, some are better than others and it appears that for the marketing studies there was inadequate detail on what was required and the types of analysis that should be applied.
- The quantitative analytical structure for the commercialisation of the NTFPs has developed over the period of the study, which has been a very important process. However, it is also one which can cause data problems. A clear analytical structure at an early stage in a study helps plan data collection, in that analytical models identify data gaps. One potential way around this in the future would be a small

pilot study for a NTFP to define the analytical structure followed by an expansion of the work.

- The data storage of the household and trader interviews was poorly designed in terms of quantitative analysis. The database does not contain a distinction between numeric and text values and there were also no data screening fields on the input screens. This has meant that a large amount of time was devoted to data cleaning before any analysis could begin.
- Some of the problems on the data quality have been solved by producing a spreadsheet model that leaves the parameters included from poor data easily available to another analyst.
- The variable quality of the data has meant that the authors have had to use their judgement in terms of using averages from the community and trader interviews, data from the community and marketing reports and expert opinion[7]. The basis for this has been on the quality of the data and in some cases whether the outcomes of the profitability analysis made sense. It is also noted that for many of the NTFPs there were insufficient traders to generate averages.
- The strength of the study has been the richness of the data, particularly the qualitative data produced, which allows more triangulation of the information and where individual producers or traders are identified, there is often sufficient information to build a more personal picture of their lives.

20.2.2 Analytical framework

The analytical framework used for the commercialisation of NTFPs initially focussed on commercialisation margins and profitabilities of actors in the identified value chains. The profitability model originally proposed was a cost-benefit analysis. The following changes have taken place over the last 5 months:

- While the commercialisation margins are of value in some situations and for some NTFPs, the fact that they do not take into account costs incurred by each actor in a chain can lead to a distorted impression of who gains and who looses. This type of analysis can only be the starting point of a much deeper cost and profitability analysis.
- A graphic has been produced to show the proportion of the end price taken by the actors in the chain. This helps in some senses in answering part of Hypothesis 6.
- The graphical representation of the value has been made much clearer over the last three months. Through a mixture of quantitative analysis and discussion with key informants the critical chains have been identified. In addition, in some of the chains the vertical integration of certain institutions and individuals has become clear, e.g. matsutake mushrooms, Palma Camedora and Jipi Japa. However, certain improvements to the figure produced remain outstanding:
    - The boxes should have a title to indicate who the actor is "trader" "Collector" etc

[7] In most cases this has come from Fabrice Edouard for Mexican products and Erick Arancibia for Bolivian products

  - The box should have information on the activities of those actors
  - Where information is not available on the activities of the actors there is a need to indicate this either by colour coding or a simple question mark or comment

- Much hard discussion has taken place on how to value labour, which is the most important input to a majority of NTFPs at collector level. This has been dealt with in two ways: total profits and per unit of product profits were calculated using a local labour rate and then returns to labour input were calculated for each actor. With the exception of Palma Soyate this has produced results which suggest that returns to labour at collector level are similar to the local labour rates. Palma Soyate labour returns can really only be explained by the opportunity cost of labour inputs being very close to zero. The methodology used has been helpful in comparing actors across a chain, but a word of caution is that the actors further down the chain have different cost structures which makes labour inputs much less important than at the collector level.
- The quantitative model has been developed in a spreadsheet, with key parameters easily available.

20.3 PRODUCT CLASSIFICATION

20.3.1 Products by processing and end use

The products are here grouped into three very broad classes of products by processing and end use:

1. Food and drink products:
    a. Palma tepejilote
    b. Maguey
    c. Mushrooms
    d. Cocoa
2. Palm products and products used in the manufacture of other items
    a. Palma Soyate
    b. Jipi japa
    c. Pita
    d. Rubber
3. Products that require little processing and are used directly
    a. Incense and copal
    b. Palma camedora

This simple classification can aid thinking on the successful commercialisation of NTFPs. The food or drink products require guarantees of quality and food safety if they are to achieve better prices at consumer level, win larger markets and continue to keep market share. Good examples of this are the market development for dried and matsutake mushrooms and also the production of environmentally friendly chocolate. In the case of manufactured products, it would appear that having an accreditation scheme for the quality

of the product is key to maintaining traditional markets and entering new ones. Pita appears to be a good example. Finally, products that require little or no processing will be open to competition and substitute. Perhaps the only way for these products to maintain a market share would be to reduce costs, probably through creating plantations.

20.3.2 Products by availability of substitutes

A number of the NTFP products studied have direct substitutes and in some cases the value chains have reacted to these substitutes:

- Rubber – oil based products. No specific reaction has been detected in the value chains studied, but it is presumed that the rubber goods produced are competitive with the oil based alternatives
- Pita – cotton and synthetic fibres. There has been a development of an accreditation scheme for pita and pita products
- Baskets and other handcrafts – plastic goods, wood goods, leather products. In some cases there has been the development of quality control of products. Also some products are sold from a region or town which is well known for the quality of their palm based products. In the case of Jipi Japa people purchase products with information of the individual who made the product.
- Incense and copal are substitutes for each other. Copal, which is the lower value product, is sold in markets with the weakest economic demand, i.e. Bolivia, and incense is sold in international markets. This would appear to be the perfect way to satisfy the demand from the national market and increase economic income of the country.
- Plantation cocoa. Cocoa marketing niches for environmental and healthy products

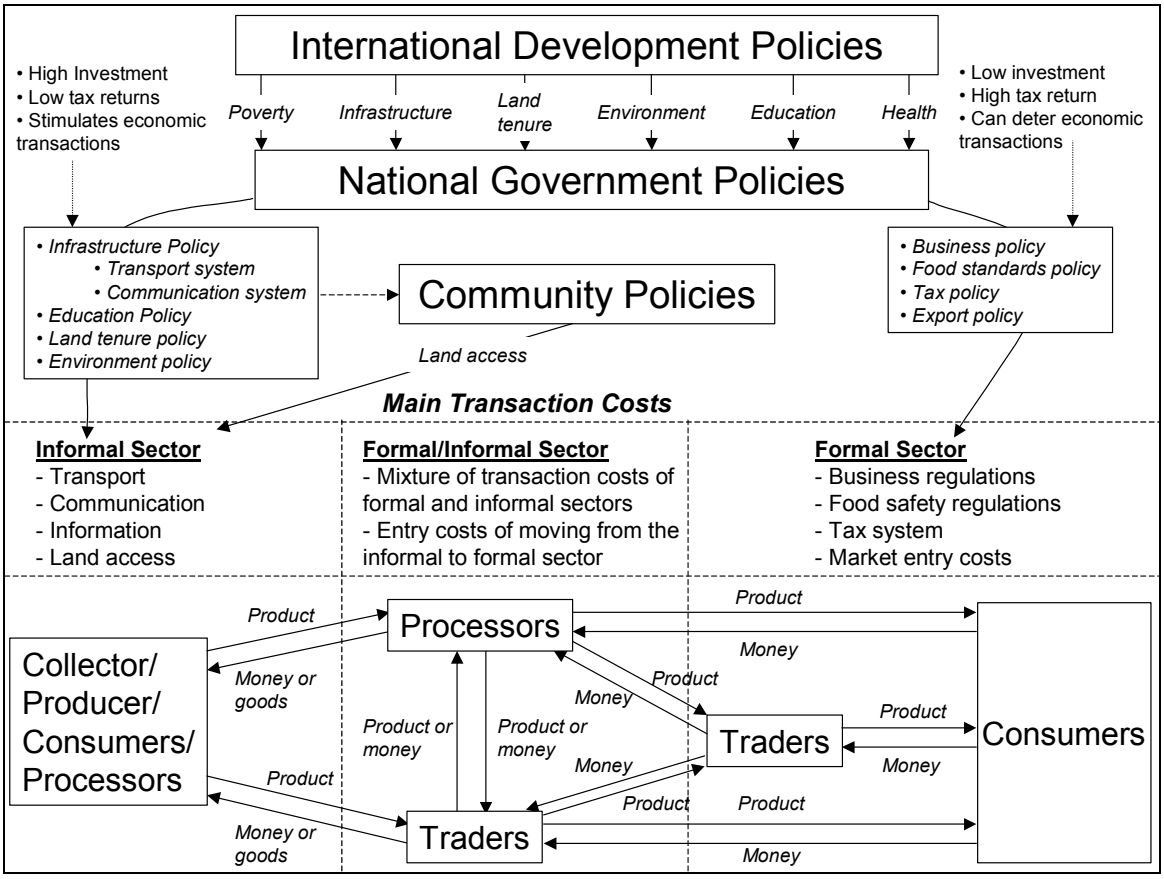
20.3.3 Ability to cultivate the product

With price increases due to increased demand and a shortage in the availability of natural sources, the reaction will be to cultivate the plants to produce these products. For difficult to cultivate NTFPs, increased demand which increases prices will probably lead to greater harvesting of the plants that produce them and therefore a need to regulate the access to these plants in order to avoid environmental and potentially irreparable damage. In the case studies, there are good examples of community self-regulation. Government regulation is probably less effective in that the people who write and implement the regulation are unlikely to be beneficiaries of the output from such rules. They may even benefit more by allowing individuals or groups to break the rules. In countries prone to corruption and poor ability to enforce and police regulations, it is suggested that self-regulation should be promoted and encouraged especially where there is a danger of environmental damage. Perhaps such self-regulation could be incorporated into local, regional and national visions of environmentally friendly use of NTFPs, i.e. let's start at the bottom with the people who will benefit from better control and improved market prices rather than trying to implement a top down system.

20.4 LINKING TRANSACTION COSTS WITH POLICY

Figure 19 presents a conceptual model of how policies can affect the transaction costs or linkages between people in a value chain. It is important to emphasise that transaction costs relate to the costs associated in the interchange of a product for money or goods. Some of the policies also have additional impacts which affect people's "capabilities" to carry out an activity or business. For example education policies will have an important impact on individual capabilities and the capabilities of actors within the value chain will in turn affect transaction costs, because the individuals will be better equipped to search out and understand information and perform transactions in a methodical way. Therefore, risks in a transaction are reduced and leave few opportunities for hiding information.

Figure 19. How transaction costs are related to policies.



This discussion raises the question of how business linkages can be promoted? In the principal author's experience of running businesses in the UK and Bolivia, it is suggested that promotion of business linkages requires that the transaction costs are kept to an absolute minimum, but sufficient to cover the interests and risks of the parties involved. Heavy regulation will discourage people to participate, perhaps forcing them into the informal or illegal sector, and if the regulation is applied by poorly paid government bureaucrats it encourages corruption within the system. Within this context the application of regulations ideally should be carried out by people who have a personal interest in the application of rules and the efficient functioning of the sector. In this situation no single

actor is key to a value chain nor would he/she be able to gather the information necessary and bear all the costs.

With regard to application of policies, the land tenure and environmental policies are important in allowing access to NTFPs. A policy vacuum with poor local control of resources can lead to non-sustainable harvesting of NTFPs. However, as highlighted above, policies to control NTFPs that are applied by transitory government bureaucrats are also unlikely to be the solution. These bureaucrats will have little interest in the correct application of the rules as they will see few benefits from these actions. In fact their presence as policemen of the more valuable NTFPs could stimulate corruption and hence unsustainable harvesting. It would appear that the ideal control of the harvest of NTFPs would be in the hands of local people and authorities who have a vision for future use of these products in the livelihoods of the local people. Therefore, there appears to be a need for decentralisation of power in NTFP harvesting.

20.5 HYPOTHESES 5 AND 6

The hypotheses 5 and 6 are shown below with comments on the issues raised:

5. The successful commercialisation of an NTFP depends critically on: the existence of an accessible market; potential demand; the absence of substitutes; access by producers, processors and traders to market information; technical management capacity; organisation; high value / unit wt; trader characteristics (age, experience, education, etc.)
    a. Accessible markets appear to be key to a large number of products, the comparison between the study communities for rubber and cocoa clearly shows that access to traders can affect the development of how an NTFP is processed and traded
    b. Absence of substitutes as previously mentioned is probably most critical for products that require little or no processing
    c. Market information is important in terms of breaking into new markets and maintaining market share. This would appear to be the case for the matsutake mushroom
    d. Technical capacity is particularly important for NTFPs that require processing and the market demand is for a high quality product, e.g. dried and matsutake mushrooms, pita
    e. Organisation is important for similar reasons as the technical capacity
    f. High value to weight appears to be important for mushrooms, copal and incense
    g. Certain value chains have very influential individuals. The matsutake mushroom value chain is dominated by two exporters; Palma Camedora is dominated by a businessman who grows, trades and exports this palm; at a smaller scale the pita value chain seems to be influenced by an active President in the Cooperative; and in Bolivia a woman running Artecampo has created a specific demand for Jipi Japa products. Potentially the local traders and processors of cocoa seeds in Carmen del Emero play a key role in adding value to the product and also reducing the transaction costs

of the regional traders. These chains appear to be successful and the conclusion would be that successful chains require successful entrepreneurs to search, create and maintain markets.

6. The success of poor producers, collectors, processors and traders in NTFP commercialisation depends critically on: the number of suppliers and demanders (mkt structure); capacity to exert market power; barriers to entry; degree of vertical and horizontal integration.
    a. As mentioned above the number of traders reaching the rubber and cocoa producing communities appears to have influenced how the collectors process and market their products. Where few traders reach the communities, local processing takes places, but this appears to add very little value to the original raw product
    b. The only NTFP where market power appears to be an issue seems to be copal, which is sold for a much lower value in terms of the proportion of the end product value than its direct substitute incense.
    c. Where vertical integration has taken place in the value chains studied it is probably too early to tell the long term impacts. Initially it may be an advantage to the collectors, but once the companies or individuals realise their market power they may start to lower raw product prices. This is nothing new in that agricultural products have constantly dropped in value for the last 20 twenty years

20.6 CONCLUSIONS

The current study has been an analysis of a dataset generated on the commercialisation of eleven NTFPs in Bolivia and Mexico. It has produced interesting developments in terms of methodological issues of studying the commercialisation of NTFPs, in particular: identifying important value chains; and comparing profits and returns to labour by different actors in the marketing chain. The study has also examined the hypotheses set in the original research design and the conclusion is that one or more of the issues raised in the hypotheses are important for all products, but there does not seem to be a general list of issues important to all products. Given the difficulties of quantifying the transactions costs a more generic conceptual framework has been developed to identify policy that can affect transaction between the actors involved in NTFP value chains. Finally, some of the developments in the study may be applicable to studies of the commercialisation of agricultural products.