



Food and Agriculture Organization
of the United Nations

Guidelines for value chain analysis

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November 2006

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1. Introduction

In 2004 ESA initiated a research program on agricultural markets and their relationship to farm level decisions on utilizing crop genetic resources. It rests on the premise that agricultural markets can significantly affect farm level access to seeds and the crop genetic resources they embody, and thus farm level decisions on utilization. In order to understand better the decisions farmers make about what crop varieties to grow we need to know, amongst other things, more about:

- Seed varieties available to farmers through formal (and informal) markets.
- Whether the seed varieties on offer genuinely reflect farmers' needs
- The extent to which output markets for maize, sorghum, millet and potatoes etc. influence the varieties that farmers grow (and, hence, the types of seed that they require).

How do we do this? Do we use quantitative or qualitative tools? Above all, where do we start? A good place to start is to 'map the market', to build up an understanding of the different players or actors in the seed input and product (e.g. grain or tubers) output chains and the relationships between them, along with the factors that determine how well or badly the chains are working. We need this understanding in order to shed light on some of the factors determining why farmers are purchasing different types of seed etc. An understanding of the different actors also helps us identify where some of the other research tools, such as the vendors' survey, should be directed.

These guidelines are based on a qualitative approach to mapping value chains that we have used in Mexico, Bolivia and Ecuador. As we explain below, the value chain analysis is an iterative process and while predetermined topics for discussion can be identified, it is far harder (and somewhat restrictive) to try and prescribe specific questions that those working on other case studies should use. In this document, we present the conceptual framework that guided our work – the market map – and then detail the process that we used in Mexico. We hope that this will enable you to understand more fully how we did the value chain mapping exercise and, in turn, how you can carry it out.

We refer below to the analogy of painting a house of adding color or more detail to the way that the seed input and grain/tuber output chains work. We can see the qualitative value chain analysis as being the undercoat or first couple of layers of paint. Much more detail and richness comes from the use of other research methodologies such as the key informant and vendor survey instruments. These methodologies add more color to the input (and output) chains and shed more light on the links between market access and crop diversity.

2. Mapping the market

2.1 What is a value chain?

The first step in mapping the market is to delineate the value chain. The flow of seed to farmers and grain or tubers to the market occurs along chains. These can be referred to as value chains because as the product moves from chain actor to chain actor e.g. from producer to intermediary to consumer it gains value. A value chain can be defined as *the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final customers, and final disposal after use..* The chain actors who actually transact a particular product as it moves through the value chain include input (e.g. seed suppliers), farmers, traders, processors, transporters, wholesalers, retailers and final consumers. A simplified version of a value chain is shown in Figure 1.

Figure 1 A simplified value chain

Seed suppliers → Farmers → Traders → Processors → Exporters/importers → Retailers → Consumers

In reality, value chains are more complex than the above example, in many cases, the input and output chains comprise more than one channel and these channels can also supply more than one final market. A comprehensive mapping therefore describes interacting and *competing* channels (including those that perhaps do not involve smallholder farmers at all) and the variety of final markets into which these connect (see Figure 2).

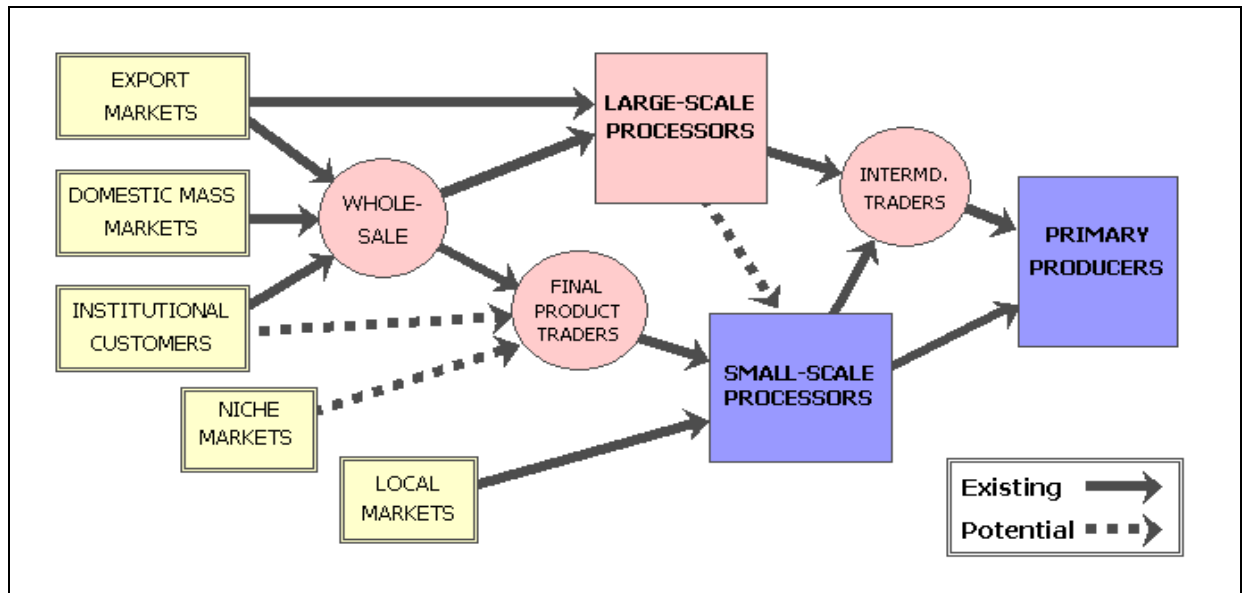
2.2 Mapping a value chain

Value chains can be mapped and analyzed using value chain analysis (VCA) which can include qualitative and/or quantitative tools. There are no fixed rules on which research approach is better but there are strong grounds for recommending that a qualitative approach is used first, followed (time and resources permitting) with a quantitative study (see Box 1). The analogy is one of painting a house: the first coat (the undercoat) is provided by short qualitative study (guidelines for the qualitative research *per se* are given below).

The initial study adds a little color but several coats of paint are needed in order to appreciate the final effect. What we have done to date is the equivalent of our undercoat. We can see who the different value chain actor are but we have no idea of the relationships between them, the prices and quantities of seed moving through the first bit of the chain, the crop diversity found in farmers' fields, the prices and quantities of grain or tubers as they move to the right of the chain, the rationale for why farmers are purchasing seed x, y or z. We need more color: we need more layers of paint. We can add this color via qualitative (e.g. semi-structured interviews and focus groups) and/or quantitative (e.g. household survey or a questionnaire) tools (see

Figure 3). If time and funds are short it may be best to focus on qualitative research bearing in mind that a great deal of information on prices and quantities can still be gleaned from qualitative research and often secondary sources such as national statistics.

Figure 2 A more complex value chain*



*Defying convention, Figure 2 reverses the direction of the chain. It shows the flow of *income* from markets along the chain to primary producers, rather than (as is conventional) the flow of *goods* in the opposite direction. This counter-intuitivism emphasises a demand-led perspective.

Box 1 Unlocking the complexity of value chain actors' realities: combining qualitative and quantitative research

Endeavours to find out about the realities of different value chain actors are plagued by difficulties. Inevitably, researchers like us are dependent on information from the different actors themselves. We need to question continuously whether the indicators developed are valid *i.e.* do they measure the concept they are designed to measure, and whether the information we collect is reliable *i.e.* a question is of little use if a some of the value chain actors such as farmers answer it in one way one day and another the next. Ensuring a high degree of validity and reliability is one of the persistent concerns in any social science research strategy. It can be particularly difficult in the context of smallholder agriculture and value chains.

One of the most widely used quantitative research tools are questionnaires. There are many advantages to questionnaires of course but the drawback of relying exclusively on a research tool such as a questionnaire is that there is no way in which increased rigour during analysis can compensate for the unknown and degree of inaccuracy involved in the measurement process. Furthermore, questionnaires may entail interpersonal relationships of power and distort value chain actors' realities by fitting them into centrally pre-set frameworks. Questionnaires may also suffer from the same degree of subjectivity as that normally attributed to qualitative research by reflecting the predisposition of the researcher.

Questionnaires often fail to capture many of the nuances of actors' realities, the reason being that their knowledge systems are often not verbally or numerically codified. In this case, qualitative data, such as that gained by participant observation techniques and semi-structured interviews may better represent their perceptions and realities. Indeed, observation, interview and casual conversation also cause less suspicion and less guarded comment than research methods that involve outsiders writing down responses.

In our value chain research, the best way to proceed may involve a judicious combination of quantitative and qualitative research tools (see Figure 3). When quantitative studies are combined with a credible understanding of complex real-world situations that characterise good qualitative studies, we can gain a sound understanding of the problems and opportunities faced by different players in the various value chains that we are focusing on. A real understanding of the way that a particular value chain works can 'unlock doors': farmers, processors and other value chain actors may well judge us on the basis of our behaviour, attitudes and questions, hence, irrelevant and culturally insensitive questions can result in scepticism, distrust and lack of co-operation. Much can be gained by building up an understanding of how these chains work before designing a questionnaire.

Figure 3 Tools for value chain research

Participant observation

- Fundamental to much qualitative research especially anthropological research
- Leads the inquirer to a greater understanding of the characteristics of the situation being researched

Semi-structured interviews and focus group meetings

- Guided conversations in which topics are predetermined and during which new questions and insights arise as a result of the discussion and visualised analyses¹
- They are more an art than a set of fixed procedures and the interview process is dynamic and iterative
- One-to-one conversations and group meetings are needed because a frequent bias in development is to think in terms of 'the farmer' (and other value chain actors) despite the fact that decisions about farming are not made by the farmer in isolation and decision-making is influenced by social pressures and beliefs
- Furthermore interviews with groups may be more instructive than those with individuals because group members have an overlapping spread of knowledge, which may cover a wider field than any single person

Questionnaire

- Quantitative data permit a more objective assessment and facilitate an assessment of larger-scale patterns, trends and relationships among different value chain actors
- Questionnaires focused on what value chain actors are doing, qualitative research tools not only provided a means to check the reliability of data from questionnaires, but can also gave more insight into why actors are doing what they do and how they formulate their decisions

¹ Suggestions will be given in section 3

2.3 The Market Map

If we want to understand more about the rationale behind farmers' decisions *vis-à-vis* the types of seeds that farmers purchase etc. then we also need to know about the extraneous factors that influence the way that the value chain works. This is where the market map comes in useful. The market map is a conceptual and practical tool that helps us identify policy issues that may be hindering or enhancing the functioning of the chain and also the institutions and organizations providing the services (e.g. market information, quality standards) that the different chain actors need in order to make better informed decisions.

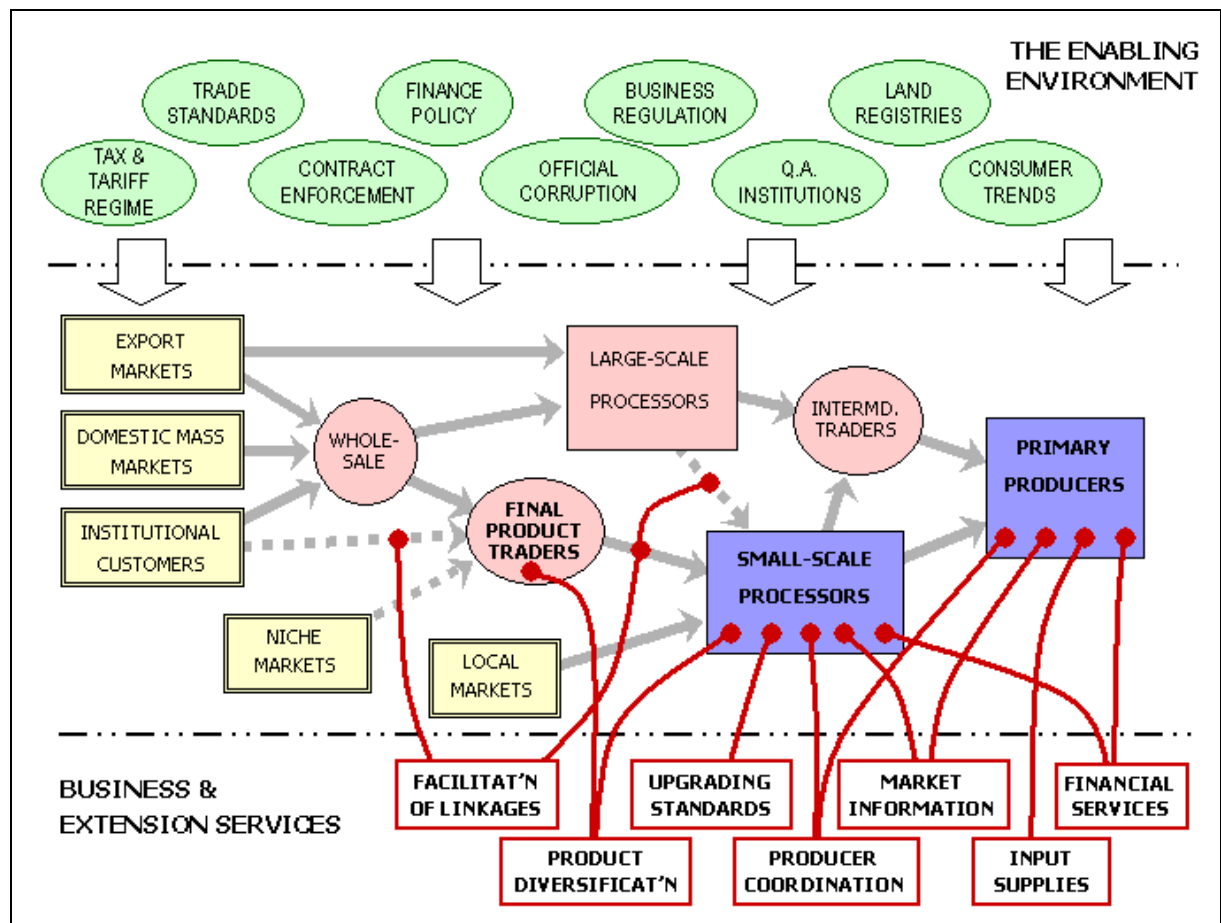
For example, a group of farmers may not know that a particular seed supplier has on offer a seed type that no other seed supplier has in stock. If the farmers do not know the seed is on offer, they may not buy it and, consequently, that particular variety will not be planted. Another example is that farmers might hear from the radio that there is an increasing demand for a particular type of maize. On hearing this on the radio they may well then go and seek out seed of the maize type in question. In order to understand farmer decision-making *vis-à-vis* what seed they purchase, it is important to note where farmers do or do not get their information from.

The Market Map is made up of three inter-linked components (see Figure 4):

- Value chain actors (see above)
- Enabling environment (infrastructure and policies, institutions and processes that shape the market environment)
- Service providers (the business or extension services that support the value chains' operations)

The enabling environment consists of the critical factors and trends that are shaping the value chain environment and operating conditions, but may be amenable to change. These “enabling environment” factors are generated by structures (national and local authorities, research agencies etc.), and institutions (policies, regulations and practices) that are beyond the direct control of economic actors in the value chain. The purpose of charting this enabling environment is not simply to map the *status quo*, but to understand the trends that are affecting the entire value chain, and examine the powers and interests that are driving change. This knowledge can help determine avenues and opportunities for realistic action, lobbying and policy entrepreneurship (admittedly activities that we are unlikely to be engaged in as part of the Seed Markets project).

Figure 4 The full market map



In most effective value chains the actors who actually form the chain (i.e. transact the main product) are supported by business and extension services from other enterprises and support organisations (e.g. seed suppliers and intermediaries). There is an on-going need for chain actors to access services of different types both market and technical. The third component of the Market Map framework is concerned with mapping these services that support, or could potentially support, the value chain's overall efficiency. The services that can potentially add value is huge and include:

- Input supplies (seeds, livestock, fertilizers etc.)
- Market information (prices, trends, buyers, suppliers)
- Financial services (such as credit, savings or insurance)
- Transport services
- Quality assurance - monitoring and accreditation
- Support for product development and diversification

We have already introduced above the middle layer of the market map – the value chain – but the other layers – the enabling environment and service providers – have a big impact on how the value chains function and, hence, in our case the impact of markets on crop diversity (see Box 2).

Box 2 The enabling environment, service providers & crop diversity in Mexico

The market map, for example, proved to be a useful tool during the work in Mexico. Farmers and seed suppliers pointed out to us that seed availability is very influenced by the subsidies that the state and federal government make available to the producers of hybrid and open pollinated varieties (OPV) seed. There is evidence that these subsidies are undermining farmers' traditional seed recycling practices: with the subsidy, OPV seed is free so there is little incentive to continue growing land races when you can get hold of a 20 kg bag of treated seed at no cost. In the context of the market map, one of the biggest influences on what seed farmers purchase is the policy environment.

3. Practical use of the market map framework**3.1 From theory to practice: the challenge**

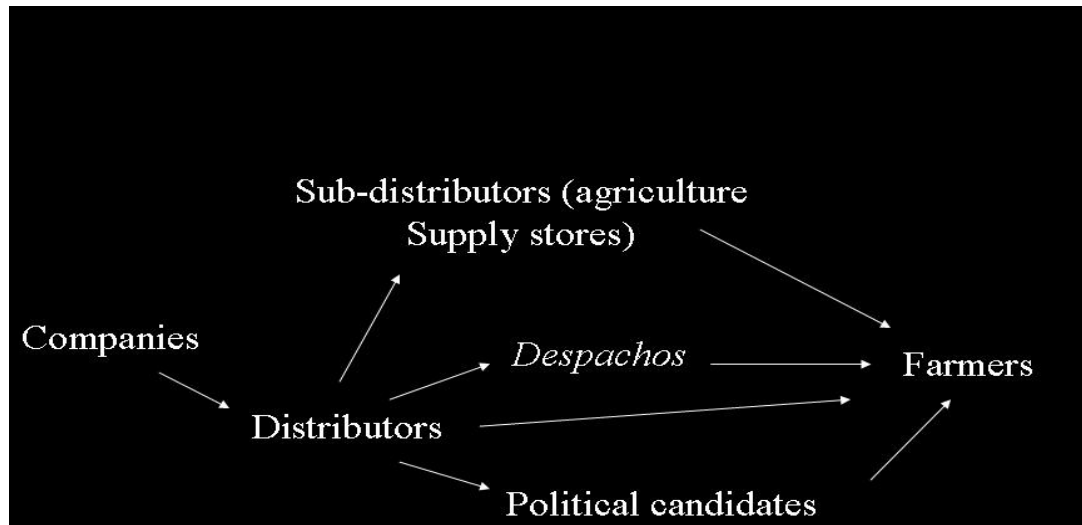
Section 2 outlined a conceptual framework, the market map, to help us understand how a value chain functions and the extent to which crop diversity is being maintained, enhanced or undermined. Conceptual frameworks are great but we need to turn the framework into a practical tool: how are we going to use the framework to guide our qualitative research activities?

There have been requests for a detailed list of questions for the semi-structured interviews and focus group meetings. Please bear in mind, though, that as indicated in Figure 3, semi-structured interviews (and focus group meetings) consist of an interview process that is dynamic and iterative. The process involves conversations in which topics are predetermined but in which questions and insights arise during the discussion. The project is more of an art than a science. We can't provide a detailed list of questions for each case study but we can describe the process that we used in Mexico, Bolivia and Ecuador and this can, hopefully, help you carry out the qualitative research. Please also note that Jon can be contacted at any stage (j.hellin@cgiar.org) to discuss any aspect of the value chain work.

3.2 The case of Chiapas, Mexico: the first coats of paint**Selecting a project area**

CIMMYT has carried out research in La Frailesca in Chiapas since 2002 and, hence, we knew that there was a thriving seed market in existence and that this would make a suitable location. This, clearly, will not be the case for everyone. In the event that you need to select a project area then the first thing to do is discuss the project with 'people in the know' e.g. in the case of Bolivia, this involved talking to PROINPA who have carried out extensive research on potatoes.

CIMMYT had the advantage of having worked in La Frailesca before and had previously identified the main actors in the seed input (and maize output) chains and the relationships between them (see Figure 5).

Figure 5 Actors in seed input chains in La Frailesca, Chiapas

We had, therefore, already applied more than one coat of paint. Had we not had this information, we would have had to build up a rough map of the different chain actors and explore in more detail how they interacted with each other. As it is, despite our knowledge of the key chain actors, we knew that the situation was fluid and that the relationship between the actors had probably changed. Hence, we went back to basics. We identified a number of issues that we wanted to explore further during the qualitative research:

1. Types of maize seed that farmers are demanding
2. Reasons why farmers choose particular seed (the seed's attributes, the existence of government subsidies for different seed types)
3. Frequency with which farmers purchase seed
4. Extent to which improved seed is entering the informal seed system.
5. Reasons why farmer continue or discontinue growing land races
6. Structure of the maize grain market and prices offered to farmers
7. Impact of grain market on farmer decision-making *vis-à-vis* what types of seed to plant

The above list can be seen as our predetermined topics (see section 3.1 above). These topics could only be comprehensively addressed by talking to all actors in the chain. For example, by talking only with the seed distributors we could have dealt with number 1 (types of maize that farmers are demanding) but not number 2 (the reasons why farmers chose particular seed), this could only come about by talking to the farmers themselves.

Our qualitative value chain analysis enabled us rapidly to gain a greater understanding of the different actors in the input (seed) chains and output (grain). We achieved this by talking to key informants e.g. going into a village and talking to farmers, then driving to the nearby town and talking to the seed distributors and the grain purchasers. The qualitative approach is very much an 'anthropological' one.

Seed distributors

We knew that the formal seed market only dealt with hybrid and open pollinated varieties (OPV) of maize and we already had a list of all the seed distributors in La Frailesca. We also knew that almost all of them had their distribution centre in Villaflores - the major town. We (Jon and Dagoberto, a CIMMYT research assistant) spent two days visiting the seed distributors (see Photos 1 and 2) and talking about the seed distribution system.

Photo 1 Seed distributor of Cristiani Burkard seed



Photo 2 **Semi-structured interview with a seed distributor**

We knew what information we wanted and guided by this we explored with each distributor the following:

- What types of seed are they distributing?
- What volumes are they selling each year?
- What price do they sell their seed at?
- What percentage of sales is of subsidised seed?
- How does the subsidised seed system work?
- Where do you procure your seed from (region and who from?)

The iterative nature of this work is exemplified by the last question. The seed distributors' responses set us off on a path of further questions:

- What would happen to seed provision if the government removed the subsidy?
- Do you actively promote your hybrid or OPV seed during field days?
- Do you work with any *despachos*?
- Do you sell seed via the village stores?

Again, answers to the above led to a further set of questions, particularly around the role of the *despachos* and the fact that they seemed to be playing a less prominent role in seed distribution than they did a few years ago. We wanted to find out more about

why the role of the *despachos* has changed. The seed distributors had given us a list of some of the *despachos* so we went to visit their offices in VillaFlores.

Despachos

The semi-structured interviews with the *despachos* focused on their (changing) role in the seed supply chain:

- Can you explain how you work?
- What is your relationship with the seed distributors?
- What sort of maize seed do farmers ask for?
- How is your work financed (we knew that the *despachos*' work is partly subsidised)

The *despachos* were quite open that the situation had changed: working with farmers had proved difficult because of farmers not paying for the technical packet that the *despachos* offer (despite this packet being subsidised). Some *despachos* had 'given up' on the agricultural sector and were offering technical and marketing advice to those working in small-scale manufacturing. It became clear during the interviews that the continued role of the *despachos* in terms of agriculture and maize rested on their being a conduit for farmers' groups to access subsidised credit. We decided to go and talk to the organisation that provides credit.

Fideicomisos Instituidos con Relación a la Agricultura (FIRA)

FIRA is the government body dependent of the Bank of Mexico that provides credit to farmers. The meeting with FIRA was straightforward because we basically wanted to know more about FIRA:

- What it does
- How it channels credit to farmers
- Its views on the future of smallholder maize production

We explored these topics during a 90 minutes relaxed conversation in FIRA's office in VillaFlores. Out of this meeting, we gained more insight into the ways that farmers access seeds and credit. FIRA lends money at low interest rates to a number of banks who in turn provide credit to farmers at lower interest rates than would be the case if the banks were lending their own money. FIRA and the banks such as HSBC used to support the agricultural sector more than they do now: the day-to-day work was outsourced to the *despachos*. The banks, FIRA and *despachos* only work with groups of farmers and not individuals. There is, therefore, an incentive for farmers to organize. The *despachos* make money by selling a technical package to groups of farmers. FIRA also subsidizes the producer groups so that they are better able to pay for the technical package that the *despachos* provide. FIRA reduces the subsidy on a sliding scale from 70% of the package in the first year to 20% in the fourth year. FIRA confirmed what the *despachos* had told us i.e. the farmers often defaulted on loans and that the *despachos* were increasingly working with small enterprises.

Farmers

It was time to go into the field and talk to the farmers. Again, CIMMYT took advantage of the fact that we had worked in several of the farming communities in La Frailesca. It was relatively easy to turn up in the villages, arrange a meeting for later on in the day, and in the intervening hours visit farmers' fields and talk to those farmers we met. The focus group meetings (see Photo 3) were conducted in a similar way to the semi-structured interviews in terms of us having selected a few predetermined topics.

Photo 3 Focus group meeting with farmers in Chiapas



Going back to the list above, the discussions with farmers gave us the opportunity to explore in more detail:

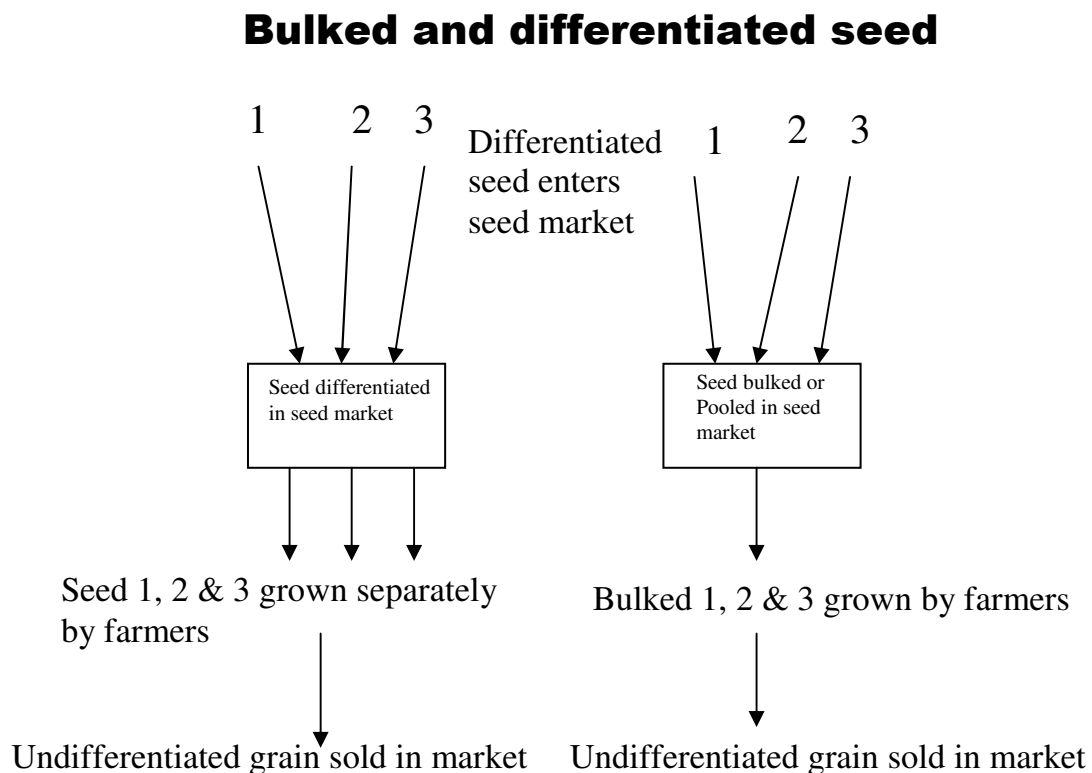
- Types of maize seed that farmers are demanding
- Reasons why farmers choose particular seed (the seed's attributes, the existence of government subsidies for different seed types)
- Frequency with which farmers purchase seed
- Reasons why farmer continue or discontinue growing land races

Farmers explained why they worked (or didn't) with the despachos, they explained how the seed subsidy system worked and the fact that there was more chance of obtaining subsidised seed if they made a request as a group rather than as individuals. We asked about the use of land races and what types of maize farmers grow. Farmers

confirmed that they grow far fewer land races now than in the past. They added that the hybrids and OPVs give better yields than land races and that the seed subsidy is a big incentive for them to purchase bags of improved maize seed. Information on all of the above topics was gleaned by asking questions around our pre-determined topics.

Maize buyers

During the workshop in Rome in March 2006 we briefly discussed the following scenario whereby seed on the left hand side is kept separate by farmers but the ‘bulked’ by the buyers when farmers sell their grain (this is the situation in Chiapas: farmers keep seed lots separate for cultural reasons), while in the case of the right-hand example, seed is bulked in the seed market.



If we had come across the example on the right-hand side, we would have wanted to know more about *why* the seed is bulked. In this case we would have asked some or all of the following questions to different actors in the chain:

- Why is the seed pooled in the market?
- Do traders mix up varieties because they do not know what differences are between maize varieties?
- Do traders mix seed because it is cheaper for them to deal with the seed this way?

- Are there extraneous policy issues that account for why traders bulk seed i.e. a government subsidy for the number of bags of seed sold irrespective of the type of seed?
- Would farmers prefer the seed to remain differentiated?
- Do traders understand that farmers would prefer that seed lots be kept separate?
- Would farmers be prepared to pay more for differentiated as opposed to pooled seed?
- Do traders know that farmers would be prepared to pay more for differentiated seed?
- How much more would farmers have to pay for differentiated seed in order to make it worthwhile for traders to provide this?
- Would farmers be prepared to pay more for differentiated seed if there was a market for differentiated grain?
- Would traders be able to sell more seed (and at a higher price) if they provided farmers with differentiated seed and information on the seed? i.e. are the same quantities of seed per farmer in the left hand and right hand chains?

These questions can be gleaned by using qualitative and/or quantitative research tools. In this case, we are adding more coats of paint and by doing so we are seeing more details (more color). By adding more color, we can document the transaction costs involved in selling seed, the prices and quantities of seed moving through the chain and the crop diversity found in farmers' fields etc.

In the Chiapas case, we wanted to know why farmers in the left hand chain sow seed lots separately when the grain they sell is pooled by the grain merchants (this we gleaned by talking to the farmers (see above). It is also of interest to know why the grain is pooled: is there no market demand for differentiated maize? To help us answer these questions we went to talk to the two biggest maize purchasers in the region: Buenaventura who produce chickens and MASECA who produce maize tortillas (see Photo 4).

Semi-structured interviews with Buenaventura revealed that the company sources grain locally (predominantly white maize) and from the United States (yellow maize). Buenaventura commented that it is more expensive to transport maize from the local area to factory than it is to import maize from the United States (this warrants further investigation) In 2005, Buenaventura needed 120,000 t of maize for its operations: it imported 100,000 t and purchased 25,000 t locally from i) contracted farmers and ii) from local farmers. Buenaventura pointed out that the chickens don't care what sort of grain they eat and, hence, there are no incentives to separate out grain from land races, OPVs or hybrids.

Similarly MASECA sees no reasons to offer premia prices for different types of maize: the industrial maize tortilla process uses whatever type of maize assuming that it meets certain minimum quality standards. Further research is still warranted to see whether there is a market demand for differentiated maize and, hence, the opportunity to make markets work for crop diversity.

Photo 4 MASECA is one of the biggest maize buyers in Chiapas

So what have we learnt so far?

Through the use of some secondary literature but mostly through qualitative work, CIMMYT has built up a comprehensive picture of the seed input and maize output chain actors, the relationships between them and the policy environment that influences how the chains are structured and function. Throughout the process, the market map proved to be an invaluable conceptual tool to help us understand why the chains are as they are and why they function as they do. We have much more information but in summary the chains are structured as follows:

Seed certification is carried out by the *Certificadora Nacional de Semillas* (SNIC)s which is part of the *Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación* (SAGARPA). SNIC certifies seed when it is shipped from the hybrid maize production sites (mostly in the north of Mexico). On arrival in La Frailesca, the hybrid seed is again Frailesca. The second test is to ensure that the germination rate meets with quality requirements. OPV seed is also tested but this seed is produced locally.

Several **seed companies** including well-known ones such as Pioneer sell hybrid and OPV maize seed in La Frailesca. The seed is sold through official **distributors** the vast majority of whom have outlets in the town of Villaflores, the major town in La Frailesca. CIMMYT discovered in the early 1990s that a key actor in the agricultural

sector, particularly in terms of seed supply, though they are not seed companies or stores, are private consulting firms, locally known as “*despachos*” who provide technical and administrative assistance as well as inputs (including seed) to farmers. The *despachos* are also the conduit for government subsidies. The *despachos* appeared in 1994 with the privatization of government extension services. Farmers who want to work with the *despachos* organize themselves into groups and name a representative. The representative negotiates with the *despacho*. The most important function of the *despacho* is to carry out all bureaucratic procedures required by the *Fideicomisos Instituidos con Relación a la Agricultura* (FIRA) the government body dependent of the Bank of Mexico that provides credit to farmers, in order to obtain the credit and disburse it to groups of farmers. The credit is tied to a technological package that includes a set of inputs: fertilizers, pesticides, herbicides and seed.

FIRA’s mission is to facilitate farmers’ access to credit. FIRA lends money at low interest rates to a number of banks who in turn provide credit to farmers at lower interest rates than would be the case if the banks were lending their own money. FIRA and the banks such as HSBC used to support the agricultural sector more than they do now: the day-to-day work was out-sourced to the *despachos*. The banks, FIRA and *despachos* only work with groups of farmers and now individuals. There is, therefore, an incentive for farmers to organize. The *despachos* make money by selling technical package to groups of farmers. FIRA also subsidizes the producer groups so that they are better able to pay for the technical package that the *despachos* provide.

The subsidized system worked well for a number of years but in recent years, maize has become less profitable, farmers have defaulted on their loans, the banks are less interested in lending to farmer groups and the number of *despachos* has fallen since the mid-1990s. There were other problems with the way that the scheme worked. The lending banks insisted that farmers needed to take out an insurance policy that was based on a maize yield of 3 t/ha. Farmers complained that their yields are normally higher than this so that they were essentially under-insured. Furthermore, few farmers felt that they needed all the components of the technical package offered by the *despachos* and were increasingly reluctant to pay for the elements of a package that they did not really want or need.

The *despachos* are one of the ways that farmers are able to access another critical input: subsidized maize seed. Farmers can access improved maize seed in a number of different ways: a) from the *despachos*, b) from the seed companies in Villaflores c) from **village shops** that sell agricultural inputs, and d) during elections from **candidates to political office** who are seeking votes. While traditionally farmers recycled their maize seed, many farmers also plant hybrids and OPVs (CIMMYT, 2005). Much of this improved seed is subsidized by the Mexican government. While there is some variation from year to year, in 2006 the subsidy amounted to 300 pesos per bag of seed with a limit of two bags per farmer i.e. 600 pesos per farmer. Each bag contains enough seed to plant 1 hectare. Farmers pay the difference between the cost of the seed and the subsidy.

The seed distributors who represent seed companies such as Pioneer, Monsanto and Christian Burkard and who provide farmers with hybrid and OPV seed (both subsidized and unsubsidized) much prefer working with groups of farmers as it

reduces their transaction costs. While in theory individual farmers can access the subsidy, the process takes longer and farmers have more chance of receiving subsidized seed if they are part of a group. Farmers have to make a request for the subsidized seed to the *Secretaría de Desarrollo Rural* (SDR). According to the SDR, the seed subsidy in 2006 was sufficient to cover 20,000 bags of seed. In June 2006, just before the beginning of the planting season, farmer requests for subsidized seed had reached 36,000 bags. Hence, some farmers (groups or individuals) would not have received their seed.

Farmers in the focus group meetings as well as interviews with the seed companies and *despachos* confirmed that groups of farmers stood a far higher chance of securing subsidized seed rather than individuals. On applying for the subsidy, farmers receive a voucher that can be used to purchase subsidized seed from the seed distributors (e.g. Pioneer, Monsanto and Christian Burkard). One seed distributor explained that he supplied over 800 bags of subsidized seed to one village. He did so because the farmers in the village in question were very well organized. He ‘helped’ them access the seed subsidy and because of the volume of seed that they purchased, he was able to offer them a further discount on top of the 300 pesos per bag subsidy.

The seed subsidy seems to be a critical factor in preventing a collapse of maize farming in La Frailesca. The almost universal opinion among all the actors along the seed input and maize output chains is that if the government removed the seed subsidy fewer farmers would purchase improved seed, many more maize producers would stop growing maize or at least reduce the area grown to maize, they would either diversify into other crops or exit farming all together. A removal of the subsidy would also have a huge impact on the seed distributors. Semi-structured interviews with eight distributors showed that over 60 % of their seed sales were made up of subsidized seed. However, it is also clear that the seed subsidy, essentially a distortion of the market, is leading to more farmers getting hold of hybrid and OPV seed. While the removal of the seed subsidy may well lead to more farmers abandoning maize production, it is also possible that those remaining will use more *criollo* and creolized seed which is acquired through farmer re-cycling of seed i.e. using seed from the previous harvest.

The government organization ASERCA fixes the grain price that farmers receive. Farmers sell grain to buyers called *bodegas* who set up buying centers outside villages throughout La Frailesca. Farmers bring their grain to these centers and assuming that the grain meets certain quality standards, the farmers will receive from the buyer 1,400 pesos/t (the price fixed by ASERCA). The farmer is issued with a document confirming the amount of grain that has been sold. The document subsequently enables the farmer to access a federal government subsidy of 300 pesos/t of grain sold. There is no differentiated market for maize i.e. farmers receive the same price irrespective of whether the grain in question is a land race, OPV or hybrid. Furthermore, there is no price differentiation for white or yellow maize (the vast majority of maize grown in Mexico is white maize).

Next steps in Chiapas

It became clear from early on in the research process that a key factor in determining the types of seed that farmers are buying is the policy environment and particularly

the seed subsidy that the government provides for hybrid and OPV seed. CIMMYT is, therefore, exploring the whole policy environment (at the macro- and meso-levels) so as to better understand the impact of current policies and programs on crop diversity. This is being carried out via a desk-based literature review and

3.3 The case of Bolivia and Ecuador: the first coats of paint

Context: trends in the agricultural economy

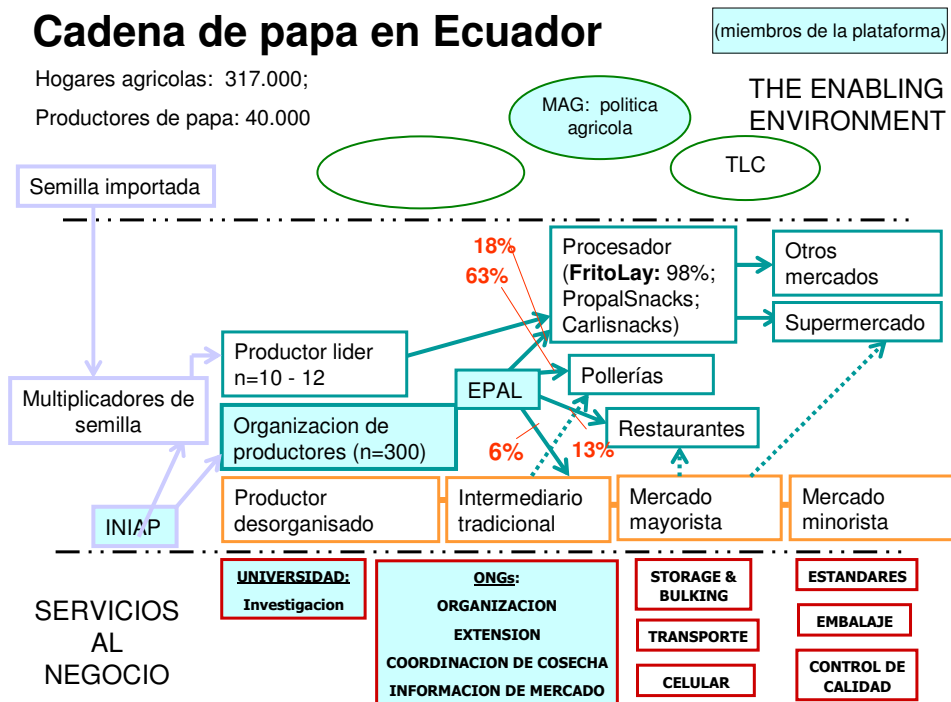
A similar approach to the Mexico case study was used in Bolivia and Ecuador, although it started from a different entry point: from the predetermined topics as mentioned in section 3.2, emphasis was put on bullets 6 and 7, i.e. the structure of the potato output market and the impact of changes in this market on farmers' production systems. So the main topics were:

- Mapping the different market outlets
- Identifying trends in these markets
- Identifying the type of farmers supplying these market outlets

FAO started by drawing up a map and describing the value chain actors. The purpose was to get a first idea of the chain-organization (“the first layer of paint”): how many actors do we find in each of the chains? This serves two objectives:

- a) To understand the relative power balances in the chain (it is common to find many small scale farmers, many intermediaries but few in each village, few processing companies, and many consumers.
- b) Get the information required for the sampling frames for the household survey and the retail market surveys.

Where possible, FAO obtained a list of names of traders that will be used shortly to identify the sample population for the quantitative research.



Identify barriers and opportunities and impact on natural resources

FAO sought to compare the market requirements (demand side) with actual production systems (supply side)

- Quality
- Volume
- Prices
- Technology
- Varieties
- Altitude

For both the context and the identification of barriers and opportunities, key actors in the chain were interviewed, either through the use of focus groups or through semi-structured interviews. Where available, extensive use was made of secondary literature and the primary information was collected to update the information, fill up gaps or verify.

Topics for the farmer focus groups

(Some of this information may be already available from the secondary sources and can thus be omitted or will need to be quickly verified)

Tools:

Market Map; show the 'draft map' and add observations from the group. Discuss:

- Where do you get the seeds from? Where do you prefer to get your seeds from? Why? Is the seed mixed? How does that impact yields?
- Time it takes to get from one actor to another (transport (hours); negotiation, etc.) - % loss of the production on the road? How often does a truck crash? At what time of the day do you sell your produce?
- Relation with the buyers: terms of the (verbal) contract?

- Role of trust (between producers, producers and intermediaries, producers and technical assistants)

Time line:

- When did new seed come in? Who brought it in? Why did you start using it?
- Which major (political) events influenced in the functioning of the chain?

Venn diagram: have the group draw out the relevant actors and institutions (size and distance) – these will add details to the service provision and enabling environment sections of the Market Map.

- How many buyers come by a week/daily in the season? / ...
- Where do you get your (market) information from?
- How to overcome and take advantage of identified barriers and opportunities: e.g. quality of technical assistance, technical package required, who provides the information on that? When were new varieties introduced and why? By whom? Who did (not) access? etc.

Semi-structured interviews

Description of the market: interview key informants such as the market administrator (use secondary information where available)

- Location
- Linkages
- Market area
- Frequency of operation, hours, all year?
- Number and type of stalls
- Number of traders in the market
- Volumes and prices data

Seed sellers

- Type of actor (farmer selling surplus, (non) local trader, specialized seed distributor)
- Principal occupation / importance seed sales for total income
- Seed sales and prices
- How often do you sell at this / other markets, how long have you been selling for?
- Do you need a permit to sell in the market (costs, time, validity)?
- Do you own or rent a stall?
- Do you get inspected?
- Do you differentiate seed from final product?
- To whom do you typically sell your seed?
- Where do you get your seed from? (if multiple sources: why?)
Do you know the sellers?
- What information do you have about the seed? (variety name, source, production traits, consumption traits) – what of this information do you provide buyers?

- Do you sort and sell seed based on quality levels?
- How do you store your seed?
- How do you establish your selling price (other vendors, buyers' demand, costs, location, year)?
- What kind of sales arrangements do you have? (cash, credit, discounted for bulk, discounted for preferred customer)?

By potato variety:

- How many years have you been selling it for?
- How did you find out about the variety?
- What is the place of origin? (if useful)
- Which of the varieties do you sell most? Why?

Experts from Proinpa and other institutions

- Why is the seed mixed? Does it indeed impact yield?
- Do production losses occur during transport?
-

What have we learned so far? Example Ecuador

The bulk of the fresh potatoes are still being sold through traditional market. (orange boxes of the market map). **We focus on the market outlet for processed potatoes (potato chips and French fries)** (green boxes), in particular we are interested in the contractual agreements that farmers have with FritoLay.

Of the approximately 40,000 small potato producers, the majority is not organized. They mainly sell through the traditional market channels (orange boxes). Our interest is to find out how market dynamics change the structure of the system (and eventually how that impacts farmer welfare):

- With increased consumer demand for processed potatoes, retailers and processors cater to this demand. (*find out how much growth potential is in total demand, get consumption estimates*).

- Originally, they procured from the traditional system.
- However, it is expected that with increasing standards and requirements for quality control, this traditional market cannot provide what the more dynamic market is looking for, hence the expected increased importance of a different kind of provider: preferred procurement from either the lead farmer or an organized group of farmers.

-
Some organized producers sell through the platform (300 in total). The *Empresa de Productores de Licto* (EPAL) serves as an intermediary between the producers and the market. The percentages here show what volume they sell to the various market outlets.

Another organizational form which will be interesting to assess is the so-called 'lead farmer', such as for example Mr. Henry Enriquez (who is not small himself, but associates with a few smaller farmers). The characteristics of these different groups of small farmers will have to be described in more detail in the course of the study.

An important aspect of FritoLays requirements, is that the potato-variety had a good propensity for frying, so seed supply becomes critically important.

Aside from these direct actors, the presence and quality of Business Development Services (BDSs) strongly influence chain-functioning, as does the enabling environment. In particular in Ecuador, the implication of the free trade agreement with the United States (if it is ratified) TLC will have a strong impact on the functioning of the system.

Note on the platform: the highlighted boxes indicate actors that participate in the platform: you see them at the three different levels (direct chain actors; BDSs and enabling environment). One supposes that working in collaboration will make the chain overall more efficient.

The main bottleneck observed is the lack of quality potato seed. To be asked in focus groups during the next mission:

- at what other stages do you perceive bottlenecks?
- Any actors / activities in the system that are missing? (also pay attention to the BDSs and enabling environment)
- Do we have data to quantify the arrows?

4. Summary

In summary, a value chain analysis that takes into account the policy environment and provision of business (livelihood) services (basically the Market Map) is a very powerful tool for analysing:

- How existing chains are structured and operate
- The impact that the chains have on farm level decisions on utilizing crop genetic resources
- The leverage points in the chain that would maintain or enhance crop diversity as opposed to its reduction

There are no fixed rules as to how the analysis should be carried out. A range of qualitative and/or quantitative research tools are available. To date the work in Mexico, Bolivia and Ecuador has used qualitative tools but shortly we will be using surveys. During the qualitative research we identified a series of topics that we wanted to discuss with each of the value chain actors but we only really ‘thought up’ specific questions during the interviews, this tends to be the nature of semi-structured interviews and focus group meetings (see Figure 3).