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**Value chains for a better integration of smallholders to
trade –
the case of chilli in Ghana**

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BAR	Brong Ahafo Region
CRI	Crop Research Institute
DED	Deutscher Entwicklungsdienst/ German Development Service
EDIF	Export Development Investment Fund
FDB	Food and Drug Board
FAO	Food and Agricultural Organisation of the United Nations
GAFEA	Ghanaian Assorted Foodstuff Exporters Association
GAVEX	Ghanaian Association of Vegetable Exporters
GCC	Global Commodity Chains
GDP	Gross Domestic Product
GEPC	Ghanaian Export Promotion Council
GLSS	Ghanaian Living Standard Survey
GPN	Global Production Networks
GSB	Ghana Standards Board
GTZ	German Corporation for Technical Cooperation
ISSER	Institute of Statistical, Social and Economic Research
MOFA	Ministry of Food and Agriculture
OIC	Opportunities Industrialization Centers
PNDC	Provisional National Defence Council
USAID	United States Agency International Development
VCA	Value Chain Analysis
VEPAG	Vegetable exporter and producer association of Ghana
WTO	World Trade Organisations

SUMMARY

Over the past decades, the importance of global trade has increased. Whereas the value of total merchandise exported worldwide in 1984 was 1,956 bn US\$, this figure had risen to 9,153 bn US\$ by 2004 (WTO, 2006). This increase in world trade has been accompanied by changes in the products traded and in production patterns as well as by an ongoing production sharing. Today, many firms do not integrate all steps of production and processing in-house, neither in terms of location nor with regard to ownership. Moreover, the different stages from production to processing to marketing are today often located in several geographical regions of the world and are linked through different relationships.

The increase in world trade was recognised as offering new possibilities to third world countries. Better integration into world trade is today assumed to lead to economic growth and to help overcome underdevelopment and poverty. But this raises the question of how developing countries and, in particular, the poor population sections can be successfully integrated into international trade.

In the 1990s the concept of value added chains emerged as an approach to analyse and explain the new forms of international trade. In German development cooperation, the value chain approach was adopted recently not to explain the course of international trade but as a concept to develop and implement technical development projects. These projects utilise the value chain approach to generate strategies to support production and trading capacities that are needed to improve the integration of the poor population into the targeted value chains.

The objective of this study is to compare international and national value chains with regard to potential benefits for smallholders and existing entry barriers to their integration. The research was carried out in the chilli sector of Ghana. The first hypothesis of this study is that integration into international value chains offers additional benefits. Benefits are defined as higher income, diversification of income sources, more reliable income, better cash flow and upgrading possibilities. The second hypothesis is that in international value chains, entry barriers to an integration of smallholders are higher. Entry barriers are defined as initial supplier qualifications, product quality, product quantity, frequent supply, production costs and distance to the purchaser.

To evaluate the hypotheses, the study was conducted in three steps. The first step involved a review of the relevant literature to examine the theoretical basis for the value chain approach. In the second step, a three-month field survey was carried out in Ghana to analyse the different value chains with a focus on the hypotheses mentioned above. During the field

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survey, interviews were conducted in two different regions of Ghana. With regard to the national market, 17 smallholders, five processors and 17 traders were interviewed. Additional interviews were carried out with key persons from the sector such as staff from the Ministry of Food and Agriculture and from sector institutions like the Ghanaian Standard Board. For information about the international market, an additional 10 smallholders and four exporters were interviewed as well as key individuals such as staff from the Export Promotion Council. Finally, the different value chains were compared with regard to the initial questions of this study, and conclusions were drawn.

In brief, the theory of the value chain approach defines a value chain as the different stages of a production process, e.g. input supply, production, marketing, consumption, which are linked through different relationships and can be spread around the world. In the approach, five different dimensions are defined to describe and explain the development of value chains. These are the technical structure, the actors, the territorial structure, the input-output structure and profit distribution, and the governance structure. Additionally, the institutional framework conditions are examined.

In accordance with this subdivision, the four main value chains of chilli were analysed during the field survey. These are the value chains of the products fresh chilli for the national market, fresh chilli for the export market, and dry chilli and chilli powder, both for the national market. The analysis of the national value chains shows differences between value chains supplying traditional and those supplying non-traditional markets. The first ones have a great deal in common. They supply only traditional markets; the actors are traditional retailers and wholesalers at the marketing and processing stage, individual smallholders at the production stage and at the processing stage as well, and small agrostores as the main input suppliers. Geographically, all stages generally occur in the same region and sometimes even in the same district. Only to a smaller degree do marketing activities extend to other regions of Ghana or even neighbouring countries. In all chains, profits/ unit sold are highest at the stage of production and thus for the smallholders. But taking into account the turnover of the different actors, wholesalers are assumed to have the highest profits followed by retailers and then smallholders. No statement can be made about agrostore owners. The governance structure in these chains is favourable to wholesalers and retailers and leaves smallholders in a very weak position. These chains exist for all chilli products found in Ghana.

Value chains supplying non-traditional markets are found only for fresh chilli and chilli powder. They differ from the other value chains mainly in regard to three aspects: market supplied; actors; and governance structure. Markets supplied are non-traditional, namely

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supermarkets. The actors are small-scale businesses in the marketing and processing stage and, as above, smallholders in the processing and production stage, but ones who are better qualified and organised in groups with common marketing activities. The governance structure of this chain is more favourable to smallholders than in the other chains, so that they have a stronger position in the chain through which they can realise more benefits.

The value chain of fresh chilli for the international market supplies foremost Asian communities in the UK. Actors at the marketing stage in Ghana are export companies. Processing does not occur, and in the production stage smallholders can be found once again. Their qualification lies between that of smallholders of traditional chains and smallholders in the non-traditional chain of chilli powder. Input suppliers are the same as in the other chains. All national stages take place in the area within one day's travel from Accra. Concrete statements about profit distribution cannot be made due to a lack of data. The governance structure in this chain leads to a situation in which the position of smallholders lies between the ones in traditional and non-traditional national chains.

Answering the initial questions of the study on the basis of this analysis, the following picture emerges. Neither hypothesis can be confirmed without reservation. A direct comparison of the national and the export chain of fresh chilli shows that the export market offers additional benefits in the form of higher income, a more secure income source, diversified income and upgrading possibilities. It further demonstrates that entry barriers are higher in the export market with market distance being the foremost barrier, followed by personal relations, which are necessary to establish contact with buyers and become integrated. However, a comparison of all value chains in the national market with the one for the international market reveals different results. The non-traditional chain of chilli powder offers even more benefits than the export chain, in particular with regard to the level and security of income and upgrading possibilities. Furthermore, entry barriers are highest in this chain as well, primarily the higher qualification of smallholders and the even more important personal relationships necessary for integration.

It can be concluded from these results that the difference between export and national markets is not the decisive distinction for possible benefits and entry barriers; it is rather the final product that is supplied. The case study shows a tight correlation between the complexity of the final product and the governance structure on the one hand and between the governance structure and the benefits and entry barriers for smallholders on the other hand. The more complex and the higher the quality of the final product, the stronger the relationship between producers and traders become. And the stronger these relationships, the more benefits accrue

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to smallholders in the case of chilli chains in Ghana. These two findings confirm the general assumptions made in value chain research, that complexity of the final product plays an important role.

With regard to world trade in which developing countries are often still only raw material exporters, these results call into question how a better integration offering new benefits for developing countries can be realised. At the same time, they show that the national market holds potential for the national supply of more complex and higher valued products. The example of the value chain of chilli powder shows that national businesses have the chance to supply non-traditional markets and may even compete with imported products. In these markets, demand continues to rise so that supporting national value chains supplying these markets offers genuine opportunities to integrate a wide range of rural smallholders now producing under worse conditions for the traditional markets.

1 Introduction

The key issue in development cooperation is how to reduce poverty. During the past decades, several answers to this question have emerged, but none have provided genuinely satisfying conclusions. Due to the wide range of problems developing countries face, however, it is clear that more than one answer is needed.

Over the past decades, the importance of global trade has increased. In 1984 the value of total merchandise world exports was 1,956 bn US\$. It rose to 4,326 bn US\$ in 1994 and further increased to 9,153 bn US\$ in 2004, meaning that the value of world trade increased by nearly 368% during this period (WTO, 2006).

The increase in world trade was recognised as offering new possibilities to third world countries that could help to overcome underdevelopment and poverty. A better integration into world trade could lead to domestic economic growth, which has been proven to be one necessary condition for poverty alleviation (STAMM, p.2, 2004). According to OXFAM (2005), an “increase of Latin America’s, South and East Asia’s and Africa’s share of world trade by just 1% each could provide a chance for 128 m people to find a way out of poverty”.

Therefore a better integration into world trade can be seen as one part of a strategy of successful poverty reduction. But this raises the question of how developing countries and, in particular, the poor population sections can successfully be integrated into international trade.

The increase in world trade is accompanied by changes in the products traded and in production patterns, as well as by an ongoing production sharing that is here defined as the allocation of a manufacturing process in which several countries participate at different stages of the manufacture of a specific good (compare GEREFFI ET AL., p.1 ff., 2003). In former days “these production sharing trade flows were partly based on comparative advantage, but other factors such as the escalation of industrial countries’ trade barriers also contributed to this exchange pattern” (YEATS, p.1, 2001). But over the past few decades, these trade barriers have been deeply reduced due to the introduction of Generalised System of Preferences, the establishment of free trade arrangements, and agreements within the World Trade Organisation (WTO).

The changing framework conditions offer new possibilities for trade, and new forms of production sharing appear. Today, many firms do not integrate all steps of production and processing in-house, neither in terms of location nor with regard to ownership. Moreover, the different stages from production to processing to marketing are today often located in several geographical regions of the world, with each nation performing tasks in which it has comparative advantages and the single stages of the production process being linked through

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different relationships. To display their comparative advantages and increase their share in world trade, developing countries need adequate production and trading capacities.

In the 1990s, the concept of value-added chains arose, describing the new global organisation of industries. It received increased attention from and organisations working in the field of development cooperation and research as an instrument to analyse the new forms of international trade. In German development cooperation, the value chain approach was picked up not to explain the course of international trade but as a concept for technical development projects. These projects focus, on the basis of the value chain approach, specifically on the support of production and trading capacities that are needed to improve the integration of poor population sections into value chains.

1.1 Problem

With regard to one particular population section of developing countries, however, namely smallholders in rural areas, the assumption that improved integration of a country into world trade systems leads to economic growth, and thus to a reduction of their poverty, cannot be generally affirmed. Therefore it is important to consider who participates in and benefits from better integration. "It is by no means unimportant in which way, with which products and with the inclusion of which actors a greater integration occurs" (STAMM, p.5, 2004).

The present challenge for development cooperation is to analyse how smallholders can benefit from value chain integration and to promote integration possibilities that allow smallholders not only to supply raw materials but to participate more in the adding of value and/or realisation of additional benefits, e.g. a more secure income source. This could provide a real opportunity to improve their economic situation.

At present, the focus in value chain analysis is still mainly placed on international value chains; however, value chains exist within national market as well. Smallholders can be integrated into both the value chains of domestic markets of developing countries or those of export markets to developed countries. The latter offer smallholders potentially greater, although as yet unproven, benefits, but also place higher demands on them in terms of product quality and supply. Furthermore, the integration of smallholders into both kinds of value chains can occur at different levels of the value chain in question. Here again, smallholders are confronted with different kinds of constraints to fulfil product quality and supply requirements of the markets that generally increase with higher integration into the value chain.

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The question thus arises as to which value chains are more likely to integrate smallholders and provide them with better opportunities, either in the area of export markets or in domestic markets.

At the same time, a critical analysis of the experiences and examples of value chain approaches shows that multinational corporations also benefit greatly from well-established value chains (HUMPHREY AND SCHMITZ, 2002). They reduce transaction costs and secure a constant supply of high-quality products. From a pro-poor growth point of view, this fact becomes critical if international value chains are organised only in a way to increase benefits to corporations and retailers. This risk has to be kept in mind while evaluating value chains.

1.2 Objective

This study focuses its attention on the case of value chains of chilli in Ghana. As value chain research at present mainly considers international value chains, the study is based on the assumption that integration into international value chains offers higher benefits for smallholders and that these chains have higher entry barriers. The objective of this study is to analyse if this assumption can be upheld in the case of value chains of chilli in Ghana. Therefore the central question of this study is whether a value chain focusing on national markets or one based on export markets provides smallholders with better opportunities to participate and profit and in which chain entry barriers to integration are higher. To answer this question, two concrete hypotheses were formulated. The first one is that integration into international value chains offer additional benefits. Benefits are defined as higher income, diversification of income sources, more reliable income, better cash flow and upgrading possibilities. The second hypothesis is that entry barriers are higher in the case of international value chains. Entry barriers are taken to mean initial supplier qualifications, product quality, product quantity, frequent supply, production costs and distance to the purchaser.

A second more general question that is raised in this study is whether the promotion of the integration of the poorer population, such as smallholders, into the value chains is a useful instrument for the promotion of large-scale pro-poor growth at all. The counterstatement is that, at least with respect to international value chains, the position of only a very limited number of smallholders can be improved and value chains predominantly strengthen the position of multinational corporations and retailers.

The analysis of and response to these two questions will be based on the case study of value chains of chilli in Ghana. A detailed analysis of the different chains will lead to a comparison

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of the chains, which will allow conclusions to be drawn concerning the benefits and integration barriers for smallholders depending on of the kind of value chain.

The entire analysis will lead to an assessment of the large-scale impact of value chain promotion, which in turn makes possible an evaluation of the value chain approach as an instrument for development cooperation in the context of pro-poor growth strategies.

The study is divided into two parts. The first section encompasses a review of the relevant literature, and the second part shows the findings of the field survey.

The first part begins in Chapter Two with an overview of the study area and the methodological approach of the study. It is followed in Chapter Three by explanations of the theoretical background of the value chain approach as it is found in literature and the implementation of this approach in development cooperation projects. After giving an overview of the development of value chains in Chapter 3.1, a definition of the term value chain as it is understood in this study is given in Chapter 3.2. The implementation of the value chain approach in German development cooperation projects is then explained in Chapter 3.3. The literature review ends in Chapter 3.4 with a description of the different dimensions of a value chain and explanations of particularly important aspects of the approach.

With Chapter Four, the second section, comprising the findings of the field survey undertaken by the author, begins. In Chapter 4.1, introductory information about Ghana in general and the agricultural sector in particular is provided. This is followed in Chapter 4.2 by an overview of the institutional framework conditions of the chilli sector. In Chapter 4.3, the national market for chilli and the value chains of chilli supplying this market are described. A description of the international chilli market and the Ghanaian chains supplying it is found in the following Chapter 4.4. The results of these analyses are presented in Chapter 5. It starts in Chapter 5.1 with a comparison of the different chains, which leads to an assessment of the benefits and integration barriers for smallholders in Chapter 5.2. Finally, conclusions about the impact of different chains on the situation of smallholders and the overall impact of value chain promotion on pro-poor growth are made in Chapter 6.

2 Procedure and Methods

2.1 Study Area

The study was conducted in six regions of Ghana: Western Region, Central Region, Greater Accra Region, Eastern Region and Brong Ahafo Region (see Figure One). In this study, the first five regions are combined under the term Southern Region. The comparison in Chapter Five is made between smallholders in the Brong Ahafo Region supplying the national market and smallholders in the Southern Region who supply the international market. In the Brong Ahafo Region, the study focuses on the areas within one day's travel from Sunyani, and in the Southern Region the areas covered in the field survey are those within one day's travel from Accra.

A summary of the agro-ecological conditions in both regions of the field survey is given in Table 1. The main difference that needs to be mentioned is the use of irrigation systems, which is very common in the Southern Region but is only seldom found in the Brong Ahafo Region.

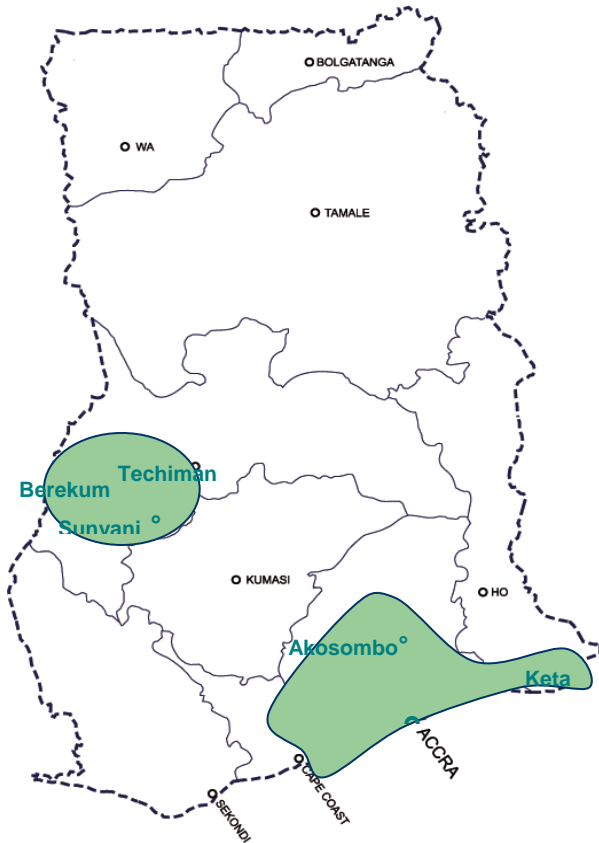
Table 1: Agro-ecological conditions in the Southern Region of Ghana and in the Brong Ahafo Region

	Brong Ahafo Region	Central Region exemplarily for the Southern Region
Climate	tropical zone	dry equatorial to moist semi-equatorial zone
Rainfall	1000 mm in the northern parts to 1400 mm in the southern parts	1000 mm along the coast to about 2000 mm in the interior
Temperature	23.9°C	between 24 ⁰ C and 30 ⁰ C
Vegetation	moist semi-deciduous forest, in the southern and south-eastern parts; savannah woodland, in the northern and north-eastern parts.	savannah with grassland and few trees at the coast; semi-deciduous forest in the inland areas
Agricultural production	<u>Cash crops</u> : cocoa, cashew, coffee, rubber and tobacco. <u>Food crops</u> : maize, cassava, plantain, yam, cocoyam, rice and tomatoes.	salt mining and fishing along the coast (40-45 per cent of Ghana's total fish landings); oil palm, cocoa, citrus and pineapple
Agricultural occupation	66.4%	54.8%

Source: Ministry of Local Government and Rural Development, 2006

Figure one shows a map of Ghana. The areas marked in green are those of the field survey.

Figure 1: Area of the field survey



Source: GTZ (2005)

2.2 Study design

The theoretical background of this study is the value chain approach. The analysis of this approach is based on a review of the relevant literature carried out at the beginning of this study. The literature used consists mainly of secondary literature but includes primary sources as well.

The empirical data is based on a field survey that was carried out from July to September 2005 in the respective regions mentioned above. During the field survey, several interviews were carried out. They form the basis for the second part of this study. All descriptions from Chapter 4.2 onwards reflect the answers from the conducted interviews, conversations and discussions with key stakeholders as well as the author's own observations.

2 PROCEDURE AND METHODS

The questionnaire for the interviews was prepared prior to the field survey in accordance with the outline of the study. To adapt the questionnaire to the situation on-site and test its applicability and clarity, pre-tests with three smallholders, two wholesalers and one retailer were carried out.

Different partly-structured questionnaires were used for the interviews of the different actor groups in the chain. One questionnaire for the two smallholder groups – national and international suppliers – one for the traders, exporters, wholesalers and retailers, and one for processors. All questionnaires were prepared in English.

The questionnaire for the smallholders in national value chains consisted of 29 questions; the one for smallholders in international chains included 30 questions. Both questionnaires were divided into three parts. The first part aimed to collect general data about chilli production, the second part was about marketing issues and the third part covered questions about framework conditions.

The questionnaire for the wholesalers and retailers in traditional markets consisted of 22 questions, and exporters were asked 21 questions. Both questionnaires were divided into two parts, the first covering general personal information and the second including the questions about chilli marketing.

The questionnaire for the registered processors of chilli powder included 25 questions. The first part of the questionnaire was about general business information and purchasing, the second part about processing and marketing. All questionnaires are found in the annex.

Themes for key persons varied according to the information needed.

The sample size of persons interviewed differed in accordance with their function in the chain. As focus was set on smallholders, this group has the highest sample size. Retailers and wholesalers have a high sample size, too. Altogether, seven different markets were visited in the Brong Ahafo Region. Therefore they account for a high share of interviewed persons, too. Where smallholders were found at the market, they were interviewed only to complete the picture; their answers are not reflected in the analysis of the general situation of smallholders. Exporters were not easy to contact and to convince to take time for an interview; therefore they account only for a small share of interviewed persons. Only two processors supplying non-traditional markets were interviewed, as no others existed in the area of the field survey. Since other processors such as traditional powder processors and Shito processors do not play a prominent role in this study, only a few of them were interviewed to get a complete picture

of the sector. An overview of the sample sizes of the different groups and other key persons is given in Table 2.

Table 2: Overview of interviewed persons

Interviewees	n	Themes with key persons	n	Additional interviewees	n
Smallholders fresh chilli chain	9	Institutions of the export sector	3	Regional Ministries of Food and Agriculture	4
Smallholders dry chilli chain	8	Institutions of the whole sector	3	Extension officers	12
Smallholders export chain	10	Development cooperation organisations	2	Market information centres	1
Trad. powder processors	3	Ministry of Food and Agriculture	1	Supermarket owners	2
Non-trad. powder processors	2	Shito processors	4	Development cooperation organisations	5
Wholesalers fresh/dry chilli	7				
Retailers fresh/dry chilli	10				
Exporters	4				

Source: own compilation, n= number of persons

The interviewed smallholders from national as well as from international chains were chosen with assistance of the Ministry of Food and Agriculture in the respective study areas. Criteria for the selection of smallholders were that they be traditional smallholders and that they have at least five years of experience as chilli producers. Although not all of the interviewed smallholders were speaking as individuals – some acted as spokespersons for the entire group of smallholders in the respective village – for reasons of simplification the interviewees will consistently be counted as one smallholder in the following text.

Traders on the national market were persons chosen at random from the group of wholesalers and retailers found in national markets. The only criterion was that wholesaling/retailing chilli be their main business. For exporter interviews, the export companies were chosen which were registered at the Ghanaian Export Promotion Council with the highest amount of chilli exports.

2 PROCEDURE AND METHODS

Traditional processors were randomly chosen; for powder processors supplying the non-traditional market, the only two working in Brong Ahafo Region to date were interviewed.

Additionally, key persons of the chilli sector were interviewed. These are the following:

- head of the Regional Task Force for Chilli Pepper of the regional Ministry of Food and Agriculture in the Brong Ahafo Region;
- head of the section for the “Promotion of vegetable exports” of the Ghanaian Export Promotion Council;
- steering committee of the Ghanaian Assorted Foodstuff Exporters Association;
- head of the Ghanaian Association of Vegetable Exporters;
- desk officer of the Ghanaian Board of Standards;
- desk officer of the Ghanaian Food and Drug Board;
- head of the section for “Breeding of local vegetables” of the Ghanaian Crop Research Institute;
- head of the section “Promotion of vegetables for export” of USAID;
- desk officer of the Opportunities Industrialization Centers Ghana (OIC Ghana).

The author carried out all interviews. Extension officers of the Ministry of Food and Agriculture accompanied the author to the villages where smallholders producing chilli were located. They were present when some of the interviews were carried out. When necessary, an extension officer of the Ministry of Food and Agriculture or the Ghanaian student who assisted the author during the field survey acted as an interpreter into the respective local language during the interviews. The presence of an extension officer does not seem to have affected the openness of the smallholders interviewed, and their answers are still considered to be reliable. Only with regard to economic data must a lack of information be noted. Not all smallholders were aware of different production costs and measurements. Nevertheless, the statements that some smallholders were able to make can be viewed as accurate. Still, the results presented in Chapter Five are restricted in their general validity.

A descriptive statistical analysis of the recorded data, using percentage shares, weighted and non-weighted averages as well as standard deviations, was possible and appropriate to analyse and compare the different chains. Particularly with regard to profit distribution, these statistical parameters were employed. As the sample size of the single groups was not very high, MS Excel was an adequate software program for the analysis.

3 Value chains as an instrument of development cooperation

3.1 Development of value chains

As mentioned in the introduction framework, conditions for international trade have changed tremendously over the past decades and are still changing. Agreements on trade, as signed in the WTO or between individual countries, generally result in a reduction of trade barriers which offer new possibilities for international trade – not only in the form of an increase in the product variety and quantity traded internationally, but also in the differentiated organisation of production processes. “As the market expands it becomes profitable to employ workers and to allow each of them to specialise”(KAPLINSKI, R.; MORRIS, M., p.9, 2001). This statement expresses that expanding markets offer firms the possibility to change from “in – house” production, where the whole production process is undertaken from a single firm at one location, to a subdivision of different steps of the production process to other locations or even other firms. Therefore the decline in trade barriers led to a specialisation process where single activities of a production process are undertaken where comparative advantages exist. „A country (or firm or individual) is said to have a comparative advantage in the production of a good (say cloth) if it can produce those at a lower opportunity cost than another country. The opportunity cost of cloth production is defined as the amount of another product „that must be given up in order to produce one more unit of cloth“ (SURANOVIC, 2006).

The international subdivision of a production process leads to a „fragmentation“ (ARNDT AND KIERZKOWSKI, 2001 as cited in GEREFFI ET AL., p. 1, 2003) of production that goes along with new forms of coordination and organisation of it.

These various developments pose a challenge for developing countries and development cooperation. The question is how to be integrated successfully into world trade and take advantage from the new forms of production sharing. „This is a particular problem for poor producers and poor countries that seem to have experienced more of the downside than the upside of globalisation over the past two decades“(KAPLINSKI, R.; MORRIS, M., p.18, 2001).

Along with the changes of world trade came approaches about how to analyse the changes and new theories on what the determining factors for the development of international trade and production sharing are. In this context the rise of different approaches of value chain research can be observed. „Global value chain research and policy work examine the different ways in which global production and distribution systems are integrated and the possibilities

of firms in developing countries to enhance their position in global markets“ (GEREFFI ET AL., p.1, 2003).

In literature different theoretical approaches are found in the value chain research that go back even to 1920th where the term “*Wirtschaftsformationen*” (economic formations) was used in German and Dutch geography to “describe the cooperation between agricultural production and the services that support it” (STAMM, A., p.10, 2004). In the late 1960th A.O. Hirschmann developed his *Strategy of Economic Development* which was based on the reciprocal influence between different industrial activities. The following *filiere concept from the 1960th*, developed by French economists can be seen as a direct predecessor of the currently discussed value chain approach (STAMM, A., 2004). It “describes the flow of physical input and services in the production of a final product (a good or a service)” (RODUNER, p.7, 2004). Then in the 1980^s the modern value chain analysis (VCA) was developed by Porter as “an instrument for identifying the value of each step of the production” (RODUNER, p.7, 2004). However his analysis was very restricted as it only considered the level of firms. He defined that a “value chain disaggregates a firm into its strategically relevant activities in order to understand the behaviour of costs and the existing and potential sources of differentiation.” (PORTER, M., 1985 as cited in STAMM, p.11, 2004).

The two main important representatives of value chain analysis are than found in the last two decades. GEREFFI came up with his concept of *Global Commodity Chains* (GCC) in the 1990^s and Henderson et al. developed a *Global Production Networks* approach in 2000/01.

Gereffis Global Commodity Chains “consists of sets of interorganizational networks clustered around one commodity or product, linking households, enterprises, and states to one another within the world-economy. These networks are situation specific, socially constructed, and locally integrated, underscoring the social embedded ness of economic organisation. Specific processes or segments within a commodity chain can be represented as boxes or nodes, linked together in networks. Each successive node within a commodity chain involves the acquisition and/or organisation of inputs (e.g., raw materials or semi finished products), labour power (and its provisioning), transportation, distribution (via markets or transfers), and consumption“ (GEREFFI AND KORZENIEWICZ, P.13, 1994).

Even Gereffi defines four different dimensions of GCC, that are the input-output dimension, the territorial dimension, the institutional framework and the governance structure, he concentrated almost solely on the research of the latter and didn't take the other aspects further into account. In regards to governance structures he could make interesting results. “By explicitly focusing on the coordination of globally dispersed, but linked, production

systems, Gereffi has shown that many chains are characterised by a dominant party, or sometimes parties, who determine the overall character of the chain“(KAPLINSKI, R.; MORRIS, M., p.8, 2001). More executions on the governance structure and the other dimensions defined by Gereffi are given in Chapter 3.4.

Henderson meanwhile pursues with his Global Production Networks (GPN) a more comprehensive analysis (HENDERSON ET AL., 2001) and understands his approach as a “direct refinement of the GCC” (STAMM, A., p.14, 2004). Henderson stresses that all dimensions defined by Gereffi need to be considered. Therefore the GPN perspective directs attention to:

- “– the networks of firms involved in ..., design, production and marketing of a given product and how these are organised globally and regionally;
- the distribution of corporate power within those networks and changes therein;
 - the institutions that influence firm strategy in the particular locations absorbed into the production chain;
 - the implications of all of these for technological upgrading, value – adding and capturing, economic prosperity etc. for the various firms and societies absorbed into the chains
- “(HENDERSON ET AL., 2001).

Summarising, the objectives of all international value chain research are the analysis of the course of the international production sharing and its determinants. STAMM, (p.8, 2004) explains as one concrete mission of value chain research of the last two decades the “contribution towards explaining unequal development and continuing underdevelopment under conditions of globalisation”. He further executes that “the aim is to distinguish between development-compatible and development –adverse forms of world market integration and to draw up policy recommendations for the governments of developing countries” (STAMM, A., p.8, 2004).

3.2 Definition of the term value chain

As it is shown above different approaches in the value chain research exist with different definitions of the term value chain. Therefore a definition of the term as it is understood in this study is given in the following.

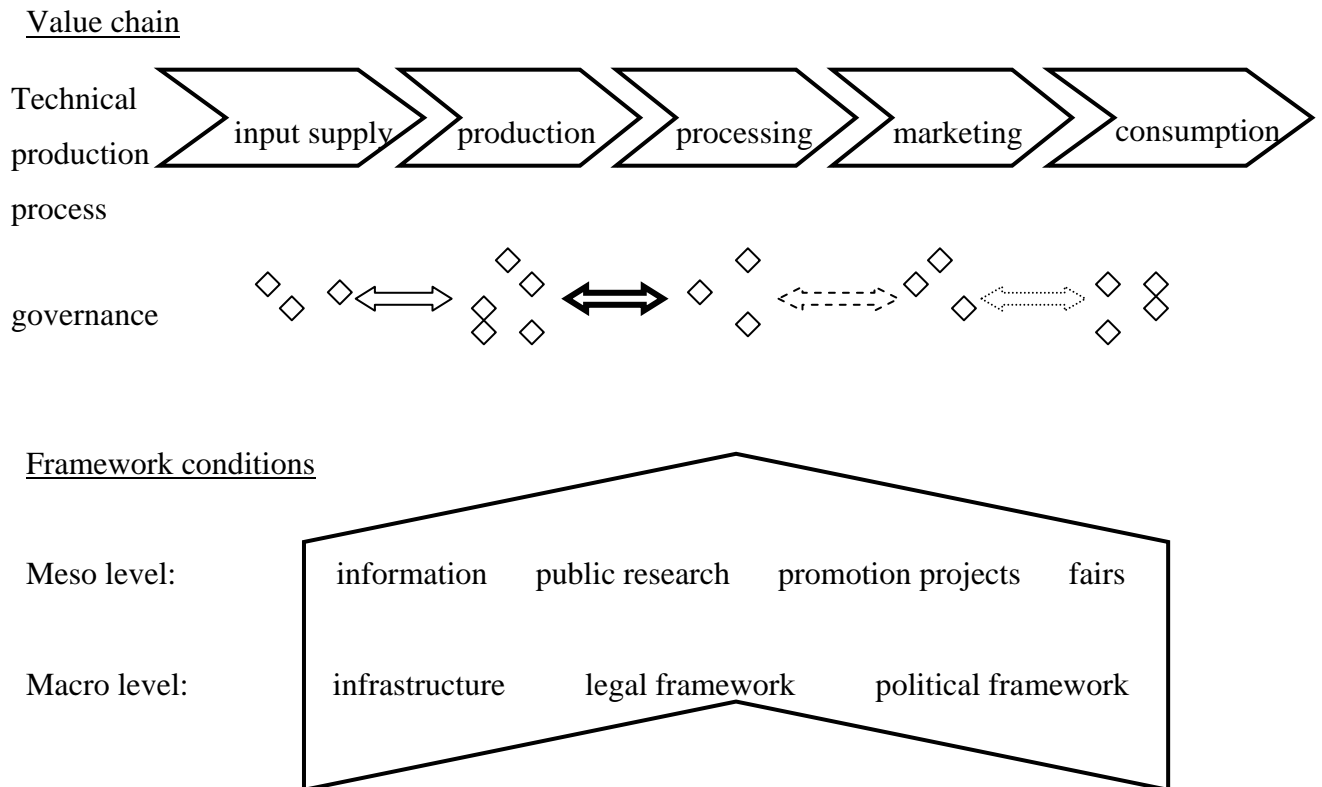
A value chain consists of all stages of a technical production process as well as of the interaction between these stages. The production process starts at the stage of input supply, than covers production, processing and marketing and ends with the consumption of a certain

product. It can be seen as the hard skill of a value chain. According to Gereffi, (1994) besides the technical structure, also the actors of a value chain as well as the input-output, and the territorial structure define a value chain.

The second part of a value chain, the interactions between the single stages, are the relationships and contractual linkages that not only determine the way the goods are traded between the different stages but are decisive for the overall character of the chain. The linkages between the stages lead to the so called governance structure of a chain that can be seen as the soft skill of it. A detailed explanation of the technical and governance structure is given in Chapter 3.4.

This definition of a value chain covers the inner core of a value chain but additionally the institutional framework and other aspects, e.g. legal framework, need to be considered in value chain analysis, too. A visual overview of relevant aspects of a value chain is given in Figure two below.

Figure 2: Components of a value chain and framework conditions



Source: adapted from GTZ, 2004 a

3.3 The application of the value chain approach in German development cooperation

At present, numerous development – research studies that are related to the value chain approach can be found but still, concrete results or recommendations on the question how the value chain approach can be used by development cooperation are not given.

Nevertheless, German development cooperation recently started to implement technical projects and programmes based on this approach. Insofar as they are based on concrete problem analysis, and carried out with close monitoring these programs can have an important experimental function for German and perhaps international development cooperation (STAMM, A., p.8, 2004).

The leading German organisation in the application of the value chain approach is the Corporation for Technical Cooperation (GTZ). There, the value chain approach was picked up with the aim to “link small rural producers to formal markets, both domestic and international” (SPRINGER-HEINZE, 2004). Although the interest on value chains began to rise in the global context it is stressed by German development cooperation that value chains that have potentials for pro poor growth also exist on the national level. With that the GTZ , in difference to general value chain research, considers both kinds of chains, national and international, to see where the best chances for poor population sections exist and how to come up with concrete projects for them.

The technical programmes and projects based on the value chain approach are linked to different thematic fields of working of the GTZ. Also at present the value chain approach is not a consistent methodical approach within the GTZ and different fields of working focus on different aspects of a value chain they all have at least one common ground: the focus is set on a sector perspective (ALBERT, ET AL., 2003).

This study is related to the field of working “Agriculture trade promotion”. Relevant activities of value chain projects and programmes in this area are:

- analysis of the potential competitiveness of certain agricultural products
- analysis of the respective subsector
- identification and linking-up of actors in the subsector
- support and extension with coordination of activities and the setting up of services
- support of public institutions and organisations (ALBERT, ET AL., 2003).

The first two points can be summarised as situation analysis whereas the last three points cover the practical activities of projects and programmes. The situation analysis as well as the implementation of concrete activities is undertaken in several steps. These are the selection of

a chain, chain analysis, development of strategies and implementation of them and monitoring and evaluation of the supported value chain (SPRINGER-HEINZE, A., 2005).

The first step is the selection of a value chain for which both a certain region has comparative advantages and real market demand is given. For the latter, an analysis of the market of a certain product is necessary, to get hints about the preferred products of a certain product group for which comparative advantages exist and about the future market potential of these products. Information about the market should result in an assessment on which concrete value chain the support of development cooperation further focuses in the respective country. Only if market potential exists the support of a value chain can be successful.

The second step is then the analysis of the respective value chain. This covers the analysis of the five dimensions mentioned above, technical structure, involved actors, territorial structure, input output structure and governance structure as well as of the institutional framework and other important framework conditions for the specific sub sector.

Having a comprehensive overview about the value chain and the respective subsector it is then in a third step the challenge of development co-operation to transform this knowledge in a technical development program. To identify the relevant points of intervention for a support of integration into trade that benefits poor population sections, an assessment of constraints and opportunities and the identification of upgrading possibilities is necessary. Through that key intervention areas and actions can be defined, and a strategy can be developed and implemented (SPRINGER-HEINZE, A., 2005). Therewith, the GTZ breaks down the previous value chain research to particular situations to come up with results for a strategy that best suits to this situation.

Finally a monitoring and evaluation system needs to be installed to assess the impacts of the programmes and evaluate its effects towards the support of poor population sections.

This approach of technical programmes includes some aspects that are new for German development cooperation and therefore shall be stressed out here.

First, setting a focus on the market is a new aspect. The task of development cooperation here changes from supporting producers in their original production to supporting the adoption of production to existing and developing market requirements. With that problems of the rural population are not longer tackled through only increasing their own efficiency but through increasing the market orientation of production.

This change of perspective goes along with a change of action. Taking the value chain approach as the base of technical programmes, the GTZ does no longer focus on only one specific group, namely the producers, but takes the whole chain into account. This change is

based on the assumption, that the functioning of a whole chain needs to be guaranteed, to make sure that the integrated poor population sections benefit from it. To improve the situation of poor population sections not only their way of acting needs to be improved and supported but also support of other stages of a chain as well as of framework conditions is needed. However as it can be assumed that producers are usually the weakest part of a chain the most interest of development cooperation will still focus on them.

In the at hand case study of value chains of chilli in Ghana, the value chain approach of the GTZ was used to assess the benefits of smallholders in regard to the chain they are integrated and to identify entry barriers of the different chains. Even the focus of the analysis is not set on general strength and weaknesses of the chain to come to a strategy for technical development programmes, conclusions about necessary points of intervention can be derived from it.

3.4 Dimensions of a value chain

All together, a value chain comprises five dimensions. As mentioned in Chapter 3.2 these are the technical structure, the actors in a chain, the territorial, the input output and the governance structure. The analysis of these structures will give answers to a set of questions:

How runs the production process, who participates at which stage, where do the different stages take place, how are they linked, who has which benefits, etc. They are needed to find the relevant points of intervention for a successful integration of poor population sections.

In the following the different dimensions of a value chain are explained. As this study focuses on the agricultural sector all executions and examples relate to the agricultural sector and in sectors others than this different situations might be found.

3.4.1 Technical structure and actors

As mentioned above the technical production process can generally be separated into five stages: input supply, primary production, processing, marketing and consumption. On every stage one to several different actors can be found.

The first step of the production process is the input supply. This considers everything from the seeds to the technical equipment that is needed for the production of the concerned product. Actors on these stages can be small to medium or big sized enterprises.

The primary production meaning all activities (sowing, fertilising, harvesting, etc) needed to produce raw material like grain or vegetables follows input supply. Actors at this stage can be

individual small, middle or big sized smallholders as well as enterprises with own out grower schemes or production plants.

If the product isn't market in its raw condition, processing is the next step. Raw materials get transformed to processed products as bread, apple pie, etc. Transformation becomes more and more important as consumers foremost in industrialised countries ask for a high variety of products and prefer more and more already prepared food which can be cooked fast or just needs to be warmed up. Activities like classifying or packing also fall under the category of transformation. These are becoming more and more important, too as the consumer requirements concerning design of a product or quality proof are rising in industrialised as well as in developing countries.

On the processing side several different actors can be found. It depends on the product - amount and quality, complexity of product and production process- if smallholders or other individuals can undertake these activities or if this is done by industrial companies.

The next stage in the process is trade and marketing. The processed products have to be transferred to the places of demand and distributed and sold there. Marketing can be done directly by the producers or processors, but the higher the amount and quality of the traded goods the higher are the requirements about marketing. In such cases logistic companies, food corporations and supermarket chains are mainly found on this stage.

The last stage is consumption of a good. Even though the consumer does neither participate in the production process nor add value to the product, he is part of the chain as in most cases the consumer is the driving power of the whole process. Therefore consumer demand is the determining factor for the kind, amount and quality of a product. For quite a wide range of products, which are not substantial for living, the consumer's esteem of a certain product determines the possible price of it and therefore the potential value adding to the net product within a chain.

The above described technical structure is the classical one but it is not static. In some cases additional stages appear, e.g. collection in the honey production or stages are left out, e.g. processing in the case of fresh fruit production and consumption. Activities like washing or sorting are than undertaken at the production or the marketing stage.

Trading activities don't only take place between the stages of processing and consumption but also between production and processing or input supply and production. Nevertheless it is not mentioned as an own stage of the chain there. It is assumed that between these stages trading activities are mostly undertaken by the participants of the respective stages as a pure transfer of goods within the production process without specific marketing activities

3.4.2 Territorial structure

The territorial structure is “understood as the geographic concentration or dispersion of production and marketing” (STAMM, A., p. 13, 2004) and with that gives an overview of the location of the single stages of a value chain. In national value chains all stages take place in the same country but in international chains not only the single stages, but also even the activities within one stage can be widespread around the world. An example for that is the processing of mangoes to mango juice. The processor can be located in Poland while buying his raw materials –mangoes- from Ghana or Peru. Produced in Poland the mango juice can than be sold nationally as well as in other European countries or even overseas.

To know the territorial structure is important for assessing the benefits for individual countries integrated in the chain. Besides that it allows an analysis about why some countries are integrated and others are not. Is it e.g. because of lower producer prices, historical trade patterns or lower tariffs? The comparison between framework conditions of integrated and not integrated countries helps to identify possible entry barriers that need to be overcome for a successful integration into world trade.

3.4.3 Input-output structure and profit distribution

The input output structure is closely related to the technical structure. It can be defined as the “tangible (raw materials, intermediate goods) and intangible (knowledge) flows linked together in the process of value creation”, (STAMM, A., p.13, 2004). The input output structure gives mainly an overview about four aspects: the amount and quality of a good that is needed from one stage of the chain to fulfil the requirements of the following stage, the value that is created on each stage, the profit distribution in a chain and the information flow between the single stages of a chain.

3.4.4 Governance structure

According to Gereffis Global Commodity Chain approach „a governance structure is the authority and power relationships which determine how financial, material, and human resources are distributed within a chain” (GEREFFI, 1994 as cited in HUMPHREY AND SCHMITZ, p.3, 2000). Given that definition the governance structure coordinates a value chain and concretely determines what is to be produced, how, when, how much and often also to which price, (RODUNER, 2004). This definition shows that governance mainly plays a role between

suppliers and purchasers and not so much between input suppliers and producers or purchasers and final consumers. One generally assumes that these linkages are market coordinated.

As different kinds of governance structures exist the question appears under which circumstances which structure arises and what advantages each structure offers (HUMPHREY AND SCHMITZ, 2001). The determining aspects, as defined by GEREFFI ET AL. (2003), are the complexity of transactions, the possibility of codification and the competence level of suppliers. They defined these factors as following:

Complexity of transaction is “the complexity of information and knowledge transfer required to sustain a particular transaction, particularly with respect to product and process specifications” (GEREFFI ET AL., p.6, 2003). It can be assumed that the more specified the final product the more complex is the required information and knowledge transfer. Therefore in the following and in particular in the field survey the term “product complexity” is used. It is understood as the sum of specifications required from the different stages of a value chain to produce a certain good.

The possibility of codification is “the extent to which the information and knowledge necessary for the transactions can be codified and, therefore, transmitted efficiently and without transaction-specific investment between the parties to the transaction” (GEREFFI ET AL., p.6, 2003).

And finally the competence level of the supplier are “the capabilities of actual and potential suppliers in relation to the requirements of the transaction” (GEREFFI ET AL., p.6, 2003).

The interaction between these aspects than determines the governance structure of a chain.

To come to a simplified representation each factor is characterised with only two values, low or high. Table 3 shows the result.

Table 3: Governance structures in value chains

Governance type	Product complexity	Ability to codify information	Supplier capabilities	Degree of explicit coordination and power asymmetry
Market	Low	High	High	low
Modular	High	High	High	
Relational	High	Low	High	
Captive	High	High	Low	
Hierarchy	High	Low	Low	high

Source: GEREFFI ET AL., 2003

The table shows that the value chain coordination lies “within a continuum between pure market relationships and hierarchy” (STAMM, p.24, 2004). General conclusions of the chart are that the higher the product complexity the tighter the relations between the single stages. To profit from a tighter relation but not become determined from a lead firm a high supplier qualification is necessary.

The different forms of governance that establish through the interaction of the different aspects mentioned above are explained in the following.

a) Market coordination:

No specific relations exist between the single stages of the chain so that all transactions are market coordinated. But “market linkages do not have to be completely transitory but can persist over time with repeat transactions. The essential point is that costs of switching to a new partner are low for both parties” (GEREFFI ET AL., p.5, 2003).

b) Modular value chains:

Typically, suppliers in modular value chains “manufacture products according to the detailed instructions of the purchaser, but maintain full responsibility, e.g. for the process technology employed “(STAMM, p.24, 2004). Modular value chains offer suppliers the possibility of a stronger integration from which positive impacts as reliability, transfer of know how and others can be expected without losing the own independence.

c) Relational value chains:

When the ability to codify product specifications is low well qualified suppliers have the chance to enter a relational value chain. In these chains a “mutual dependence occurs that may be regulated through reputation, social and spatial proximity, family and ethnic ties, and the like. It can also be handled through mechanisms that impose costs on the party that breaks a contract. The exchange of complex tacit information is most often accomplished by frequent face-to-face interaction and governed by high levels of explicit coordination, which makes the costs of switching to new partners high” (GEREFFI ET AL., p.5, 2003). Under this governance structure suppliers have the best standing and with that the most benefits compared to the other governance forms.

d) Captive value chains:

Due to a low qualification of suppliers “a great deal of intervention and control on the part of the lead firm is required, encouraging the build-up of transactional dependence as lead firms seek to lock-in suppliers in order to exclude others from reaping the benefits of their efforts. Therefore, the suppliers face significant switching costs and are "captive". Captive suppliers are frequently confined to a narrow range of tasks — for example, mainly engaged in simple assembly — and are dependent on the lead firm for complementary activities such as design, logistics, component purchasing, and process technology upgrading” (GEREFFI ET AL., p.7, 2003). Therefore suppliers lose their independence and have a low standing in captive value chains that limit their benefits from integration into it.

e) Hierarchical value chains:

In these chains lead firms are forced to develop and manufacture products in-house as product specifications cannot be codified and highly competent producers are not found (GEREFFI ET AL., p.7 2003). Therefore no individual suppliers exist.

The different governance structures offer different benefits for the producers. The best form is a relational governance structure as it offers producers the highest level of independence connected with a powerful position in which they can influence the co-ordination of the chain to their own benefits.

Besides the aspects identified by Gereffi, two further aspects that are important for the position of the supplier, need to be taken into account. These are the ratio of purchasers to suppliers and the ratio of demand to supply.

A high ratio of purchasers to suppliers, meaning many purchasers and just a few suppliers, gives suppliers the chance of a better position in the chain and more negotiation power, e.g. about prices as the purchaser depends on the supplier. In market co-ordinated and modular value chains a high ratio could lead to stronger relations than they would usually be found making suppliers benefit more than without these power, e.g. in form of higher income or more reliability of the purchaser.

The same situation is found when the ratio of demand to supply is high. If supply is the scarce resource producers can gain more power. Pre condition for both cases is that the amount of suppliers cannot be increased flexible.

3.5 Upgrading in value chains

In value chain literature upgrading is understood “as the process that enables a firm or any other actor of the chain to take on more value intensive functions in the chain, make itself harder to replace, and thus appropriate a larger share of the generated profits” (STAMM, p.27, 2004). Given this definition upgrading means that individuals, firms or even a whole country improves its original situation through “changes in the nature and mix of activities, both within each linkage in the chain, and in the distribution of intra-chain activities” (KAPLINSKI AND MORRIS, p.38, 2001).

Upgrading can be the pre condition to get integrated in a value chain at all or it becomes necessary to secure the position in or respectively of a chain. Single actors in the chain as well as the whole chain stand in competition with other actors and other chains. If a certain actor or chain doesn't pursue continuous enhancement and adaptation to changing market situations, whereas others do, the actor will loose its position in the chain or respectively the chain will become less competitive and may loose its position at the market.

Value chain literature divides different upgrading possibilities in four categories. According to HUMPHREY AND SCHMITZ (p. 19, 2002) these are process, product, functional and intersectoral upgrading. They are further described in the following Chapter.

3.5.1 Types of upgrading

a) Process upgrading

Process upgrading means that “transformation of inputs into outputs becomes more efficient by re-organising the production system” (HUMPHREY AND SCHMITZ, p.19, 2002). This means the efficiency of production is raised. It can be realised at single stages of the chain as well as in the whole chain.

b) Product upgrading

In product upgrading the products of one to several single stages are improved or even a new product is developed. It results in a “movement into more sophisticated lines of product which can be defined in terms of increased unit values” (HUMPHREY AND SCHMITZ, p.19, 2002).

c) Functional upgrading

Functional upgrading can be realised through the “acquisition of new functions” (HUMPHREY AND SCHMITZ, p.19, 2002). It offers actors or the whole chain the chance to overtake

additional, higher valued functions or give up low value activities. It leads to a change of the mix of activities conducted that increase the value added (KAPLINSKI AND MORRIS, p.38 f., 2001).

d) Intersectoral upgrading

Chain upgrading means that a firm or another actor of a chain “apply the competence acquired in a particular function of a chain to move into a new sector” (HUMPHREY AND SCHMITZ, p.19, 2002). Examples are Taiwanese firms which moved from the manufacture of transistor radios to calculators, to TVs and now to laptops (KAPLINSKI AND MORRIS, p.38, 2001). With that, intersectoral upgrading is the only form of a horizontal move of actors of a specific chains. All other forms of upgrading are realised within the original sector.

Previous results of value chain research posits a hierarchy of upgrading that starts with process upgrading being the most simple form, followed by product upgrading, than moves to functional upgrading and at least intersectoral upgrading as the greatest form of upgrading (KAPLINSKI AND MORRIS, p.39 f., 2001).

3.5.2 Pre-conditions for upgrading

Pre conditions for upgrading are manifold and they can vary from case to case. Value chain research about the determinants of different upgrading possibilities still goes on but nevertheless first results exist. As upgrading is a complex topic that has many facets, a detailed description would go beyond the scope of this paper. Nevertheless some main findings will be explained in the following.

First, learning processes that are available to the single actors of a chain influence upgrading. “As a result of learning processes, firms are able to improve their position in the value chain” (STAMM, p.27, 2004). Learning on the other hand is influenced itself through different aspects. One is the governance structure of a chain. It is affirmed that besides production systems, knowledge systems exist in value chains through which different kinds of know how are transferred between the single stages of a chain (HUMPHREY AND SCHMITZ, 2002). How information flow is organised and how intense it is depends on the interest of the leading party in a chain, which is most times the buyer. It can be assumed that information transferred from a buyer to his suppliers is limited to the amount that favours the buyer (HUMPHREY AND SCHMITZ, 2002). Other aspects relevant for learning processes are availability and access to extension services, further education, market information, etc.

Further pre conditions for upgrading are the strategic intent of a firm and the policy environment (HUMPHREY AND SCHMITZ, 2002) as well as innovation processes (HATAKOY, p.5 f., 2003) and investment needs. The more complex a value chain becomes the more demanding are the needs to realise any kind of upgrading. Therefore from a certain complexity of a value chain onwards, investment possibilities are a crucial factor for realising upgrading chances (HUMPHREY AND SCHMITZ, 2002).

3.5.3 Upgrading as an entry barrier

Upgrading is not only a chance to improve the own position but more than that a necessity to secure the position in or respective of a chain. As actors and chains stand in competition to each other one way of securing the one position is to ensure that competitors don't upgrade better or faster than they themselves. In this context upgrading can be used as setting an entry barrier. Entry barriers are needed to hinder competitors from overtaking the one position or even prevent or at least slow down an integration of new actors in a certain value chain. In some cases entry barriers, which favour certain actors, are already existing (climatic conditions, high investment costs combined with limited access to credits). But if these are not found or are not high enough new barriers needs to be set up if competition is high. Finding ways of upgrading that are not easily adaptable is one possibility.

With regards to the possibilities for poor population sections it can be said that their chances lay mainly in the process and product upgrading that can be reached through technical improvements and better production know how. Their chances to acquire new functions in a chain are limited, nevertheless actions should be undertaken to try to realise this kind of upgrading. Besides individual upgrading, overall upgrading of a chain that leads to higher value final products can have positive impacts for poor population sections, too (compare RODUNER, 2004).

After having described the theoretical framework of the value chain approach the next Chapter covers the second part of this study, the case study of value chains in the chilli sector in Ghana.

4 The case of chilli production in Ghana

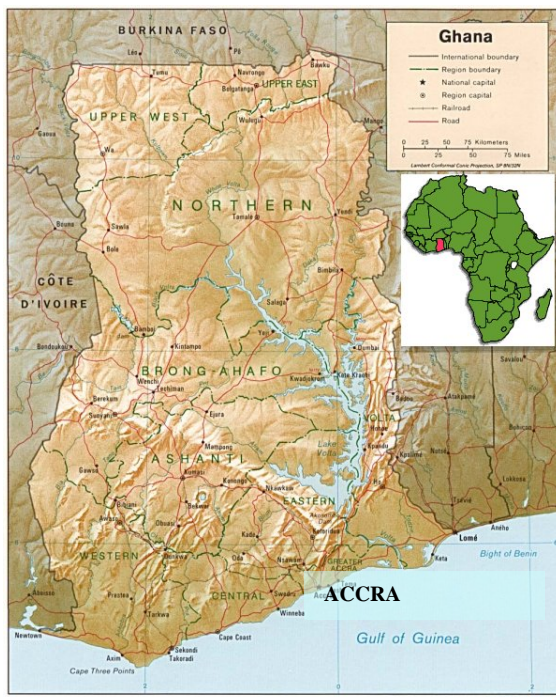
4.1 Country information of Ghana

The following Chapter provides some general information about the natural, social, political and economic conditions in Ghana. In addition information about the agricultural sector is provided. By that the aim is to give an overview of the current general situation of the country that builds the framework for the agricultural sector, the agricultural sector itself and the chilli production within that.

4.1.1 Geography and Climate

Ghana lays in Western Africa at the Gulf of Guinea. Its geographic coordinates are longitude 20 West and latitude 8 North. With a total area of 239,460 km² Ghana has about the size of Great Britain. 8,520 km² of the country are covered with water that is about 3% of the country. The border countries of Ghana are the Ivory Coast in the West, Burkina Faso in the North and Togo in the East (World Fact Book, 2005).

Figure 3: Map of Ghana



Source: Evangelical Lutheran Church in America (ELCA), 2006

Ghana has a warm, humid climate with an annual mean temperature between 26°C and 29°C. Nevertheless climatic conditions across the country are hardly uniform, temperatures are usually high at all times of the year and throughout the whole country. However, it can be generally distinguished between the climate in the northern and the southern part (Library of Congress, 2006).

In the northern part only two distinct seasons occur. The harmattan season and the wet season. Harmattan seasons, having dry, hot days and relatively cool nights lasts from November to late March or April. From than the wet period starts that reaches its peak in late August or September. The average rainfall in the northern regions lays at 1,000 millimetres per year (Library of Congress, 2006).

In the south four seasons occur, that are the major and minor rainy and the major and minor dry season. The major rainy season starts in April and lasts till July. It is followed by the minor dry season that lasts until August. From than onwards to November the minor rainy season occurs followed by the harmattan season that completes the cycle. The annual mean rainfall in the southern regions varies between 1,250 millimetres in the north and 2,150 millimetres in the south. The southern part of the country is characterised by a high humidity that often reaches 95 to 100 % (Library of Congress, 2006).

4.1.2 Sociological context

In 2005, the UN estimated Ghana's population on 21,8 Mill. people (BBC NEWS, 2006). The population of Ghana has a very diverse linguistic and cultural structure. Although or especially because of that, English has become the official language. Nevertheless not all people in Ghana are able to speak or understand English. In particular in rural areas traditional dialects are still very common. Especially there but also in the rest of the country, the "organising principles of the society are still based on locality, family, and clan structures. Chiefs, who may be influential on the national level, were and still are selected from senior members of the lineages that are considered to have been among the founders of the community or ethnic group. Membership in a chiefly lineage still carries some prestige" (Library of Congress, 2006).

An overview about some further key factors of the socio-economic situation of Ghana is given in Table 4.

Table 4: Selected population facts and socio-economic indicators

INDICATORS	
Population (in million)	21,8
Religion	
Christian	63%
Muslim	16%
Indigenous beliefs	21%
Literacy -age 15 and over; read and write:	74.8%
female	67.1%
male	82.7%
Average structure of age	
0-14 years	38%
15-64 years	58.3%
65 years and over	3.7%
Population growth	1.79%
Urban Population	45%
Life expectancy at birth in years	57.24
female	58.66
male	55.86
HIV/AIDS - adult prevalence rate:	3%
Population below 1 US\$/day (1990-2003)	44.8 %
Human development index rating	138 (out of 173)

Sources: UNDP 2005, CIA-Factbook 2005, Worldpress 2005

4.1.3 Political context

Ghana formerly was a British colony that got independent in 1957. For the following 36 years Ghana had several governments that all came into power through military interventions. Only in 1993 a transition from a military to an elected government took place with Jerry John Rawlings as president. He was followed by John A. Kufour who was elected as president in 2000 and got re-elected in 2004 for a second four year term (Library of Congress, 2006).

Since 1987 Ghana is structured into ten administrative regions (compare Figure four) that are again subdivided into several administrative districts. Each region has its own capital that is

headed by a regional secretary. In the districts the District Assembly is the highest political and administrative authority with deliberative, executive, and legislative powers (Wikipedia, 2006).

Figure 4: Map of Ghana's districts



Source: Ghana Commercial Bank, 2006

Ghana also belongs to the sixteen-member Economic Community of West African States (ECOWAS), founded in 1975 with headquarters in Abuja, Nigeria. ECOWAS was founded to achieve “collective self – sufficiency” for member states by means of economic and monetary union creating a single trading bloc (WIKIPEDIA, 2006).

4.1.4 Economic context

“Well endowed with natural resources, Ghana has roughly twice the per capita output of the poorer countries in West Africa. Even so, Ghana remains heavily dependent on international financial and technical assistance and opted for debt relief under the Heavily Indebted Poor Country (HIPC) program in 2002” (WORLDFACT BOOK, 2005).

In the 1980th Ghana followed the advice of international banking institutions such as the World Bank and implemented structural adjustment programmes to reform the economy. Reforms covered in particular the cut of government budgets, privatisation of state

enterprises, devaluation of the currency and rebuilding of industrial infrastructure. Even some positive impacts of these reforms were recognised, many Ghanaians question whether the structural adjustment benefited all Ghanaians or just a few sectors of the economy. This is due to the fact that production had only increased in Ghana's traditionally strong sectors, cocoa and gold, leading to a fall back to the pre-independence economic structure, missing the development of a more broadly based economy. It was further criticised that the focus of the reforms were set on the export market and that salaries remained low. Meanwhile the World Bank stressed out, that the Ghanaian government focused only on projects such as the extension of the airport that only favoured a small group of the population (Library of Congress).

An overview about key economic facts reflecting the economic situation in Ghana is given in Table 5.

Table 5: Economic facts of Ghana

GDP (in million constant 1995 US dollars in 2005)	7,978
Average annual growth in GDP (in %, 1991-2000)	4.0
GDP per capita (2000 in 1995 US \$)	413
Inflation rate (consumer prices) in %:	13
Labor force - by occupation (in %):	
agriculture	60
industry	15
services	25
Unemployment rate (in %):	20
Budget in billion US\$	
revenues	3.216
expenditures	3.506

Sources: INSTITUTE OF STATISTICAL, SOCIAL AND ECONOMIC RESEARCH (ISSER), 2004; EARTHTRENDS COUNTRY PROFILES, 2004, WORLD FACT BOOK, 2005; CIA FACTBOOK, 2006

Even a positive growth rate could be realised in the last two decades, a significant structural change in the economy cannot be recognised. The agricultural sector is still the most

important one, in regard to the occupation of labour force as well as in regard to the GDP (cf. Table 6).

Table 6: GDP by sector

GDP AT 1993 CONSTANT PRICES, 1998 – 2004 IN % OF TOTAL	1998	1999	2000	2001	2002	2003	2004
Agriculture	36.7	36.5	36	35.9	35.9	36.1	36.7
Cocoa production and marketing	3.6	3.4	3.5	3.3	3.27	3.5	4.2
Forestry	3.2	3.3	3.5	3.6	3.58	3.6	3.6
Fishing	5	4.9	4.6	4.5	4.35	4.4	4.3
Industry	25.1	25.2	25.2	24.9	24.9	24.9	25.6
Mining	5.8	5.7	5.6	5.3	5.25	5.2	5.2
Manufacturing	9.1	9.2	9.2	9.1	9.15	9.1	9.0
Services	29	29	29.7	29.9	30	29.8	29.5
Wholesale/Retail Trade	6.7	6.8	6.8	7	6.96	7.0	6.9
Government Services	10.8	10.7	11.0	11.0	11.00	10.8	10.7
Indirect Taxes	9.2	9.2	9.2	9.3	9.27	9.1	9.1

Source: ISSER, 2004

In regard to foreign merchandise trade Ghana still has a negative balance that is even increasing. In 2004 imports accounted for 3.9 bill € whereas exports only accounted for 1.8 bill € leading to a trade deficit of 2.1 bill €. In 2000, a trade deficit of “only” 1.5 bill € was recorded. (EU, 2005)

According to the EU (2005), Ghana’s main trading partners are with regard to imports the EU, (33.1%), followed by Nigeria (12.9%), China (10.1%) and the U.S. (6.8%). With regard to exports the main trading partners are again the EU (49.1%), followed by the U.S. (6.0%) and Japan (4.3%).

Ghana’s export structure is not very diversified and exports heavily rely on agricultural raw materials. In regard to the main trading partner, the EU, primary products account with 84.7% for the vast majority of exports. Their share in exports did even increase by 18% from 2000 to 2004 (EU, 2005).

4.1.5 The agricultural sector

"Ghana's domestic economy continues to revolve around subsistence agriculture" (WORLDFACT BOOK, 2005). As shown above, agriculture is the most important sector in Ghana, accounting for more than one third of the GDP and employing 60% of the labour force. Altogether, "80% of the population depends directly or indirectly on agriculture for their livelihood" (ICRA, p.12, 1996).

The total land of Ghana is 23.9 million ha from which 1.1 million ha are under inland waters. Of Ghana's total land area about 46% is arable land. Permanent crops are cultivated on 60% of the arable land. Irrigated land is only 0,1% of the arable land. Absolute figures are given in Table 7.

Table 7: Land use in Ghana

Land use	in 1000ha
Total land area	22,8
Arable land with permanent crops	6,3
Arable land used otherwise	4,1
Total land area irrigated	11

Source: FAO, 2006

The land use of the total land can be categorised in eight different types. Concrete data about the different land usage is given in Table 8.

Table 8: Categories of land use

Land use	Area (in million ha)	% of Total
Bush fallow and other use	6.0	25
Unimproved pasture	3.6	15
Cultivated tree crops	1.7	7
Cultivated annual crops	1.2	5
Unreserved savanna woodland	7.1	30
Forest reserves	2.6	11
Wildlife reserves	1.2	5
Unreserved closed forest	0.5	2
total	23.9	100

Source: NARSP, 1994 cited in ICRA, 1996.

Agricultural land use is found in the first four categories. Generally all agricultural production is based on the bush fallow or land rotation system which is characterized by the use of few production inputs and encloses the danger of mining the soil and degrading the environment (ICRA, 1996). Table 9 shows how agricultural production splits up according to the product group.

Table 9: Split up of agricultural production in 2003

Product groups	Production in 1000t
Roots and tubers	15,947
Fruits and vegetable	3,416
Cereals	2,041
Oilseeds and nuts	324
Meat	172
Sugar crops	140
Other	23
total	21,033

Source: FAO, 2005

The above shown production data corresponds to consumption habits. According to the FAO (2006), roots, tubers, vegetables and fruits account with distance to the largest share of consumed foodstuff.

The main important food crops are cassava, yam, maize and sorghum, the most important vegetables include garden eggs, tomatoes, okra, onions and chilli pepper, mainly produced for local consumption (ICRA, 1996; FAO, 2005). Root and tuber crops account for 46% of agricultural gross domestic product and cassava for 19% (ICRA, 1996).

Of tree crops cacao remains by far the most important one, followed by oil palm which production has increased during in the last decades. Cattle are the main consumed meat in the Northern Regions of Ghana and therefore held mainly there. Other livestock is poultry, sheep and goats that is kept in virtually all settlements in Ghana (ICRA, 1996).

In regard to foreign trade, agriculture still plays a prominent role. Considering export data agricultural exports amount for about half of the value of all exports. The main export goods in 2004 were cocoa beans with 59,4%, followed by sugar refined (6,7%) and pineapples

(5,8%). Agricultural imports accounted for about 17% of the value of all imports and main import goods were sugar refined, wheat and palm oil (FAO, 2006).

Chilli production falls under the category of fruits and vegetables which is the second important product group. No reliable data about land area under chilli cultivation, total quantity produced or other relevant aspects for assessing the importance of chilli production is existing. Nevertheless according to aggregated data of the FAO (2006), interviews and own observations it can be said that chilli production has a high relevance in Ghana's agriculture sector. More information about the national and international chilli markets is given in Chapters 4.3.1 and 4.4.1 respectively.

4.2 Institutional framework of the chilli sector

There are several institutions and organisations that create the framework conditions for activities in the chilli sector. They consist of support institutions, public service providers and sector associations and are explained in the following.

4.2.1 Support institutions

a) Ministry of Food and Agriculture (MOFA)

The Ministry of Food and Agriculture works on the national as well as on the regional level. The national MOFA is located in Accra; regional offices are located in the regional capitals with offices in every district of the region. In Brong Ahafo Region (BAR), the regional office is located in Sunyani.

“The traditional function of MOFA is to ensure sufficient production of food at reasonable prices for domestic consumption” (OIC GHANA, 2004).

In the chilli sector, MOFA plays a very important role. Its task there is to support market-oriented chilli production with the goal of improving the situation of smallholders. Thus a new program was established in 2004. In cooperation with the German Corporation for Technical Cooperation (GTZ), the “Market Oriented Agricultural Program” was established in which chilli is one of five products to be intensively supported.

The instrument of support of this program is the value chain approach, through which the strengths and weaknesses of chilli chains shall be analysed in accordance with a participatory approach on the regional level. This analysis builds the basis for the identification of focal points for intervention and support activities. Future activities shall generally cover support of

private and public service providers in regard to qualification, technical advice, capacity building, etc. And additionally support of actors of the value chain in particular smallholders in regard to an increase in market power, an upgrading of activities, the introduction of quality standards, etc.

In BAR, the regional MOFA initiated a working group on chilli that deals with the implementation of the value chain approach. A stakeholder workshop with participants from different stages of the chilli chains has already been held to identify strengths and weaknesses in the value chains of chilli in the BAR.

Independently of the new program, the regional MOFA in BAR conducts its own research on the breeding of chilli varieties and drying techniques for chilli. Additionally, for several years now the district offices have been offering extension services to single chilli smallholders or producer associations.

Along with its cooperation with the GTZ in BAR, MOFA works together with other development cooperation agencies as well and with other national institutions active in the chilli sector.

In summary, it can be said that MOFA undertakes a number of activities in the chilli sector that have the potential to provide genuine support to smallholders. Unfortunately, however, activities are currently too selective, as e.g. the ratio of extension officers to smallholders is too small or support is limited to isolated individual initiatives. It is the challenge of the new program to bring together all relevant players in the sector and come up with an overall strategy of support.

b) Organisations of development cooperation

There are mainly three organisations of development cooperation working in the chilli sector, German Corporation for Technical Cooperation (GTZ), the German Development Service (DED), and United States Agency for International Development (USAID).

The GTZ and DED have one common programme in cooperation with MOFA, namely the “Market-Oriented Agriculture Programme – MOAP” already mentioned above. It focuses on the support of the market-oriented production of five products: chilli, pineapple, mango, grasscutter, and aquaculture. Their objective is that “agricultural producers and other actors in the agricultural chain involved in farm production, processing and trade improve their ability to compete in national, regional and international markets” (GTZ, 2004 a). The headquarter of the program is located in MOFA in Accra, and offices are found in Tamale in the Northern

Region, in Sunyani and Techiman in the Brong Ahafo Region (BAR) and in Cape Coast in the Central Region.

The GTZ and the DED activities “link measures of policy advising, institutional strengthening, and local innovation and implementation” (GTZ, 2004 a), but the program does not have its own implementation staff. As it is integrated into the existing structures of MOFA, activities must be part of the regular operational plans and budgets of MOFA.

During the time the field survey was conducted, activities for the chilli sector from the chilli working group in the BAR consisted of the compilation of existing information about the chilli sector in BAR and the planning and execution of the one-day workshop mentioned above. Subsequently, an analysis of the results of the workshop led to the identification of some necessary points of intervention and initial steps towards the elaboration of a strategy for future activities.

The third organisation, USAID, operates a program called “Trade and Investment Program for a Competitive Export Economy (Tipcee)”. As the name suggests, the program focuses on the support of export capacities. Chilli is one of several agricultural goods on which they work.

Additionally, other development cooperation agencies also work in Ghana. Although they do not focus on chilli, their services may still occasionally be available to the chilli sector. One example is Technoserve, a private, non-profit international business development organisation involved in the provision of technical and managerial assistance to small-scale smallholder groups and small-scale entrepreneurs (TECHNOSERVE, 2006).

c) Export Development Investment Fund (EDIF)

The fund was established in 2002 on the initiative of the Ministry of Trade and Industry and the Ministry of Finance, from which the fund gets its most money. The fund is intended to provide financial resources to support the development and promotion of Ghana’s export trade.

In the chilli sector, funds were made available to promote the production of fresh and dry chilli for the international market. Seeds of the export variety of chilli were given to smallholders in some districts of BAR for free and purchase was guaranteed. But the program failed. On the one hand, the necessary funds were not forthcoming when it came time for the dry chilli to be bought; and, on the other hand, the smallholders had no access to the necessary drying equipment, meaning that conventional sun-drying techniques were applied, leading to a reduction of product quality. Smallholders had to sell most of the chilli on the local market.

At the present, EDIF is not conducting any activities in the chilli sector, although plans for the resumption of the project do still exist. But smallholders are now very sceptical.

4.2.2 Public services

a) Ministry of Food and Agriculture

The research and extension services of MOFA mentioned above that are conducted independently of the new cooperation programme with the GTZ and the DED fall into the category of public services.

b) Ghana Standards Board (GSB)

The GSB is the national statutory body responsible for the standardisation and quality assurance of goods and services both for local markets and export. It translates international standards for export products into national standards and additionally develops its own standards for products for the national market. As international standards sometimes undergo changes over the years that necessitate changes in the national standards for export goods, the GSB also tries to establish strong national standards that cover any concern which might arise in the future (e.g. the adding of any artificial colouring).

Information on new and changing notifications – “notices of all proposed government regulations that might significantly affect trade” (GSB Prospect, 2005) – is collected in an enquiry point that was established in 1999. The objective is to have monthly updates that are distributed to the exporters associations in the respective sectors.

In the case of chilli, national standards for fresh and dry chilli as well as for chilli powder and chilli paste exist that at least agree with the European standards.

The GSB is an important institution, particularly for exporters and suppliers of the non-traditional national market. But it currently does not function as smoothly as had been hoped. In particular, the information flow from enquiry points of other countries to the Ghanaian enquiry point and the forwarding of this information does not function well.

c) Food and Drug Board (FDB)

According to a brochure of the FDB from the year 2000, the Food and Drug Law of 1992 established the FDB. It was “enacted to control the manufacture, importation, exportation, distribution, use and advertisement of food, drugs, cosmetics, chemicals substances and medical devices” (FDB BROCHURE, 2000) and stands under the control of the Ministry of

Health. “The FDB aims to implement the appropriate regulatory measures to achieve the highest standards of safety, efficacy and quality for...” (FDB BROCHURE, 2000) the above-mentioned products “to ensure the protection of the consumer” (FDB BROCHURE, 2000).

Therefore, any producer of a good under the authority of the FDB wanting to sell this product in the non-traditional national or international market must register with the FDB. The FDB determines if the producer meets the national and/or international standards and, if he does, provides him with a registration number. Once a producer is registered, three unannounced inspections take place every year to monitor the ongoing fulfilment of the standards.

In the case of export goods, additional certification is needed confirming that the product meets international requirements.

The FDB is a well-established authority that fulfils its tasks and thereby supports production for the international market as well as for the non-traditional national market.

As quality awareness in traditional markets is quite low, it is difficult for the FDB to implement the registration of producers or processors supplying these markets.

d) Ghanaian Export Promotion Council (GEPC)

The GEPC describes itself as the “National Export Trade Support Institution, facilitating the promotion and development of non-traditional export goods” (GEPC BROCHURE, 2004). The brochure further explains that the GEPC was established in 1969 as an agency of the Ministry of Trade and Industry to diversify Ghana’s export basis.

Since 2003, law requires the registration of export companies, and in 2005 there were 3,000 registered companies.

The GEPC describes its strategic areas of focus as the following:

- market access and development;
- product development and supply base expansion support for selected priority products;
- trade information and communication;
- exporter and institutional capacity strengthening, e.g. technical and market advisory services to export firms;
- coordination of export development activities of different stakeholders.

In addition to these tasks, it is responsible for the documentation of export activities. It records all exports of the registered companies to establish a database that provides up-to-date information on all export activities to help monitor the performance of exporters.

e) Crop Research Institute (CRI)

The CRI in its present form was established in 1968 as one of four research institutions of the Council for Scientific and Industry Research. Its objectives are to:

- breed high yielding varieties that
- are resistant and tolerant to biotic and abiotic stresses
- and have good quality characteristics
- to fulfil the requirements of the export markets
- and/or of the national processing industry.

In the case of chilli, the CRI – in cooperation with Ghanaian universities – bred the export varieties MI 2 and Legon 18. Further breeding and testing activities are also conducted. The problems identified by the CRI are, first, that the traditional market gives no incentives to use improved varieties and, second, no public or private organisation exists to duplicate and spread the seeds, a task that the CRI has only limited capacities to perform.

4.2.3 Sector associations

a) Vegetable exporter and producer association of Ghana (VEPAG)

VEPAG is one of 15 product associations established in 1997 on the initiative of the GEPC with the mission of establishing and promoting Ghana as a producer and exporter of quality vegetables. In 2004 it counted 99 members (VEPAG BROCHURE, 2004).

According to its brochure, VEPAG has the following objectives:

- to promote vegetable production for the local and international markets;
- to mobilise resources for the production and export of vegetables;
- to ensure product quality to meet international standards;
- to encourage processing as a means of adding value to products;
- to identify markets for members and provide them with up-to-date market information;
- to serve as a linkage between policy makers and the vegetable industry.

In the chilli sector, VEPAG conducts very few activities. Therefore, other associations such as GAVEX and GAFEA were established to perform necessary functions themselves.

b) Ghanaian Assorted Foodstuff Exporters Association (GAFEA)

“GAFEA was formed in 1989 as a private sector member based organisation that groups and represents the interest of Ghanaian food exporters, particularly in the micro and small scale exporting firms” (GAFEA BROCHURE, 2004). In 2005, the association counted 30 export companies. The association finances itself through membership fees and a small grant from the Ministry for International Affairs. The mission of the association is to “enhance the export performance of individual business enterprises that operate in the food sub sector of non traditional exports” (GAFEA BROCHURE, 2004), and its future vision is to achieve for GAFEA the status of a brand name.

At the present, none of its members export any kind of chilli product, but there is deep interest in dry chilli as an export product. GAFEA wants to introduce dry chilli to their current purchasers. Since it views its purpose in the establishment of linkages between potential buyers and suppliers, other necessary functions, such as funding production improvement and adaptation or practical advice, must be fulfilled by other institutions.

c) Ghanaian Association of Vegetable Exporters (GAVEX)

This association was only established in 2004. Its establishment was the result of a situation in which one chilli exporter did not keep the agreement on export prices and sold his products at lesser prices to win new customers. The main exporters then came together to found an association that deals with problems in the export business. After this particular problem was solved, the association became very weak and sank into meaninglessness.

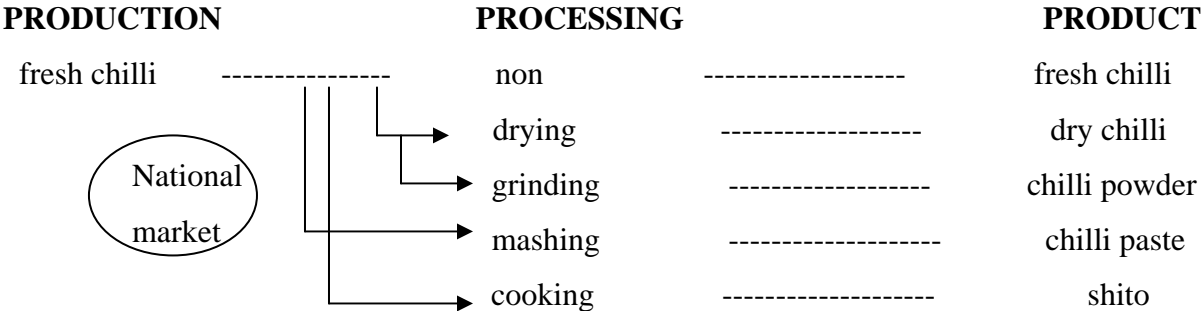
Conclusions:

The overview of the framework conditions shows that institutions and organisations do exist throughout the chilli sector. Different institutions and organisations are found that support the sector or perform necessary regulatory functions. But it can be seen, too that the majority of institutions focus on the export market. In any event, the critical point is not only the existence of organisations and institutions but also the way they actually function. In the case of the chilli sector in Ghana, one problem that has emerged is the lack of cooperation and communication between the single actors in the sector. If this could be improved, some activities might have better chances to truly achieve their assigned targets. One example is the initiative of EDIF, which could have been more successful had other players been included right from the start.

4.3 Value chains in the national market

Now that an introductory overview of the framework conditions of the chilli sector in Ghana has been provided, the analysis of value chains of chilli on the national market follows in this chapter. An overview of the different chilli products for which different chains exist is given in Figure five.

Figure 5: Value chains for chilli products on the national market



Source: Author

4.3.1 The national market

Chilli is a very common agricultural product that, compared to other spices, is used disproportional often in nearly all everyday dishes of Ghanaian cuisine. “The estimated annual demand for vegetables is 66,2 mill € and the demand for chilli is 2,5 mill € Chilli on the average accounts for about 9.6% of total food expenditure countrywide” (GLSS IV, 2000 IN OIC GHANA, 2004). According to the same study, chilli consumption is expected to rise even higher due to increasing population and income.

Quite a wide range of chilli varieties and different chilli products are found on the Ghanaian market (compare Figure six). According to the statements of different key persons in the sector, in some regions, round fresh chilli in a red state is preferred, whereas in other regions demand is higher for long dry chilli in a red state. Other common products are chilli powder and shito, a kind of sauce, but the market demand for these two products is much lower than that for fresh and dry chilli (chilli powder and shito are commonly produced by the households themselves). Chilli paste is a fifth product, the demand for which lags even behind that for chilli powder and shito. The main imported chilli product is chilli powder, followed

by dry chilli in a much lesser quantity. Concrete data about demand for the single products do not exist, as no organisation or institution collects them. Import data was likewise not available.

Figure 6: Ghanaian chilli products



a) The different types of national markets

OIC International Ghana (2004) distinguishes three different market forms. These are village, rural and large urban markets. Additionally farm gate selling and supermarkets need to be mentioned as two further ways of marketing.

- farm gate selling: Smallholders sell their products directly from the farm gate to wholesalers or processors, who then transport it to common markets or in the latter case to their processing sites. Fresh and dry chilli is sold this way.
- village markets: Almost every small village has a little market at least once a week, where products from nearby farms are sold. “They act as a first assembly point for products from the surrounding area” (OIC GHANA, 2004) which are then taken to the bigger markets. Thus these markets are mainly wholesale markets where only a small quantity and range of products is retailed from smallholders or retailers to consumers. Retailing does not take place in permanent structures, and most products are offered on a tarp on the ground. Chilli products on this market are fresh or dry chilli, depending on the season, and sometimes both.
- rural town markets: These markets are bigger than the village markets and are sometimes held in permanent structures. Depending on the size of the town, they take place daily or only once a week. These markets are retail as well as wholesale markets. Rural town markets are subdivided into retailing and wholesaling sections, with the latter located more at the side of the market. Each section is further divided according

to product groups. Retailing is done on tarps or on little selling tables; wholesalers do not have a stand. Fresh and dry chilli is retailed in the vegetable section, but chilli powder is retailed in the spice sections. Wholesaling of fresh, dry and chilli powder takes place in the same section.

- large urban markets: These are vast markets that take place daily or several days a week in permanent structures. Like the rural town markets, they are both retail and wholesale markets. Wholesalers from several regions come to these markets to buy products from the resident wholesalers and distribute them all over the country and in a smaller quantity also to neighbouring countries, in particular to Ivory Coast. Aside from shito, all chilli products are found on these markets.

According to own observations, different kind of supermarkets are found that can generally be categorised in three types, small, medium and big sized supermarkets. They can be characterised as follows.

- small supermarkets: These are found mainly in smaller towns. For the most part they offer processed foodstuffs that are not found at the markets, such as canned goods, milk, cheese, etc. Most of these goods are imported. When national or regional products exist, e.g. chocolate, they are offered, too. Besides foodstuffs, some household goods are also offered. In Brong Ahafo Region the only chilli products these supermarkets offer are national chilli powder and shito and occasionally chilli paste.
- middle-sized supermarkets: These are found only in bigger towns. They have a wider product range and a multiple versions of one product. Local products are found as well as imported ones. They generally have a refrigerated counter for meat and cheese. The chilli products shito, chilli paste and chilli powder are found there. For the latter, national as well as international products are on sale.
- big-sized supermarkets: These are found only in big cities like Accra and correspond very much to European supermarkets. They have a wide range of products as well as a multiple versions of one product and a refrigerated counter for meat and cheese. Only in these supermarkets are fresh fruits and vegetables also sold. Most of the products are imported, and although national or regional products exist, they are not offered or only in small quantities at less attractive places in the supermarket. The chilli products on sale are imported chilli powder and sometimes national chilli powder, imported dry chilli and national fresh chilli.

b) Packaging for the national markets

At all traditional markets, fresh as well as dry chilli is wholesaled in three different measures: a maxi bag, a mini bag or a bucket. A bucket weighs about 5.0 to 5.5 kg and circa 3.5 buckets fit in one mini bag. A maxi bag is twice as big as a mini bag and thus has a capacity of about seven buckets, weighing on average approximately 37 kg. As weights do not exist at markets, the information of MOFA and traders on weights and volumes are taken for the purpose of this study.

Retailing of chilli is done per bucket, olonka or heap, with the latter two being two different sizes of cans.

Chilli powder is wholesaled per olonka and retailed in different sized plastic bags. Chilli paste is wholesaled and retailed in different sized plastic bags or plastic containers.

In supermarkets, chilli powder is sold in small plastic containers of 195g or 250g or in plastic bags of 125g, 250g or 500g, and paste is sold in 20g packages of aluminium packets. Shito is sold in small, medium or big-sized jars. In the big supermarkets, fresh chilli is sold in ready-packed plastic bags.

Imported chilli powder is sold in typical western style spice jars with sifter lids; dry chilli is sold in the same jars but without sifter lids.

Figure 7: Packaging of chilli



4.3.2 The territorial structure of national value chains

Before describing the single chains, an overview of the territorial structure of the value chains in Brong Ahafo Region (BAR) supplying the national market should be given, starting with the distribution of production locations.

Chilli production is spread throughout BAR with Jaman, Dormaa, Tano, Berekum, Atebubu, Techiman, Kintampo and Wenchi being the main production areas (MOFA, 2005).

The different kinds of processing of fresh chilli do not span the entire region. Chilli drying occurs often but as a rule only in several districts of BAR, where it is traditional embedded. Processing of dry chilli to chilli powder is found only at some rural town and large urban markets or in processing plants, two of which exist in Sunyani. Chilli paste is only produced in Takoradi, the capital of the Western Region and shito production for supermarkets takes place only in the areas around Sunyani and Techiman, as only there supermarkets exist.

Marketing in the form of farm gate selling and on little village markets is common throughout BAR. Remote areas are especially dependent on this way of marketing of their products. Rural town markets are only found in some small to middle-sized towns as Sunyani, Wenchi and Nkoranza. The only two large urban markets are located in Sunyani and Techiman, the latter being the biggest market of the region. From there, wholesalers from across the country take products back to the regions they come from or even distribute them to neighbouring countries.

Middle and big-sized supermarkets do not exist in BAR, and small supermarkets are found mainly in the same towns as the rural town markets.

Chilli is consumed everywhere, with differences occurring in the type of chilli product used. In rural areas either fresh or dry chilli is preferred, and other chilli products are occasionally produced for self-consumption. However, in the urban catchment area, more processed chilli products are also consumed.

In general, it can be said that few if any processed chilli products are bought in rural areas, while further processed products have recently experienced an upsurge in demand in urban areas. Therefore, the marketing of further processed products does not span the whole country but is rather focused on the urban centres in the different regions.

4.3.3 The value chain of fresh chilli

a) Technical structure

-----INPUT SUPPLY ---- PRODUCTION ---- MARKETING ---- CONSUMPTION-----

The value chain of fresh chilli covers four stages: input supply, production, marketing and consumption.

Inputs are primarily fertiliser, pesticides and seeds. According to the Ministry of Food and Agriculture (MOFA, 2005) most smallholders select seeds from their own harvest for the next production cycle. Results of own interviews confirm this. All nine producers stated that they select own seeds for the next production cycle. The technical equipment needed for chilli production consists mainly of buckets and simple implements for soil preparation that need only be bought occasionally.

The production of chilli involves: land preparation; in the best case nursing the seeds and transplanting the plants, or merely sowing the seeds; maintenance in the sense of weed control; fertilisation; pest and disease management; and finally harvesting and packaging.

In BAR, irrigation is seldom possible; production seasons for chilli cultivation, given its resulting reliance on rain, thus correspond to the natural seasons. Generally smallholders undertake two planting cycles a year, having main harvests first in June/July and then again in October/November. But as rainfall has been particularly erratic during the past several years, harvesting peaks vary yearly. A chilli plant can be harvested for about 2-3 months with harvests every 7-10 days, so that on average, harvesting is undertaken about eight times during one cropping period (MOFA, 2005).

Production techniques for chilli are still traditional. The chilli varieties planted are manifold and not certified. As smallholders generally use their own seeds for the next planting and sometimes mix various seeds, no exact variety can be defined. A common differentiation is therefore made simply according to appearance: round and red, round and green, very small and red, long and red, and long and green. The most common “variety” of fresh chilli is the round and red type. Moreover, traditional seeds are used, production and harvesting is not mechanised, and good agricultural practices as defined by MOFA are rarely implemented.

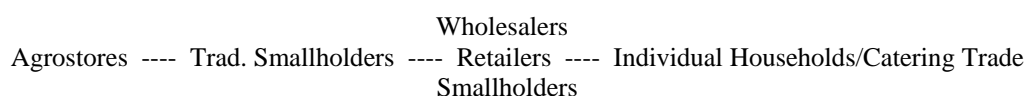
Fresh chilli is only sold at traditional markets. It is thus traded from farm gate or village markets in the vicinity of production locations to rural town markets and from there or directly from the village markets or farm gates to large urban markets. From there, chilli is further distributed.

Fresh chilli of the round and red type is preferred for consumption, since it is the type used in several everyday dishes.

Figure 8: Fields with chilli plants in Brong Ahafo Region



b) Actors in the chain



The inputs for the production of fresh chilli are mainly supplied from small agrochemical stores that can be found in nearly every little town. They offer a wide range of pesticides, fertilisers and other required inputs, like seeds. Depending on the size of the store, it is a one-man operation or one employing several people.

Actors on the production side are mainly traditional smallholders and to a much lesser extent traditional smallholders on middle-sized farms and modern farms. Data about the concrete ratio of the different groups does not exist. As this study focuses on smallholders, and since they are the biggest group of smallholders cultivating chilli, only this group is taken into account for the purposes of this study.

In literature no uniform definition of the term smallholder can be found as it differs from situation to situation and between countries what is actually understood as a smallholder. Nevertheless some common criteria exist. These are: small size of land, that must not be own property, relative high family dependence even some labour might be hired, relative simple production technology, low capacity for e.g. marketing or processing.

In this study, traditional smallholders are defined as smallholders who have no more than 10 acres (that are 4 ha) of land, depend highly on family labour, and for whom farming is their main business. They come from farming families and are socially embedded in their rural communities.

In the following paragraph, smallholders in the value chain of fresh chilli are further described on the basis of the interviews conducted with following categories: personal information and qualification, farming activities, economic situation and other relevant aspects. As no significant differences exist between smallholders producing fresh and smallholders producing dry chilli, the following characterisation is based on the interviews of the interviewed smallholders of both chains and with accounts for both groups. Table 10 presents the results of the conducted interviews in regard to the characterisation of smallholders in the fresh chilli chain.

❖ Smallholders

Producers of fresh chilli for the national market are mainly women. According to MOFA, the ratio of men to women is 1:5. Results of the interviews confirm this, 14 of 17 producers were women. Men as well as women either lack or have only very basic school education (MOFA, 2005) and English is neither spoken nor understood. Their knowledge about farming mainly comes from their families, as 100% of the interviewed smallholders stated, and was supplemented by extension of MOFA. The smallholders interviewed had no access to other service providers. Thus the qualification of smallholders is rather low.

The average farm size of smallholders in BAR is between two and four acres, from which at least half an acre is used for chilli production if chilli is cultivated. Other cultivated crops are e.g. yam, maize and cassava. All produced goods are used for home consumption as well as for marketing, insofar as surpluses exist. But as self-sufficiency is paramount, cultivation plans are designed to meet that need (MOFA, 2005).

According to all interviewed smallholders, no other sources of income exist outside farming, and since work on small scale farms is performed by the whole family, day labourers are hired by only four of the 17 interviewed smallholders and this only occasionally for chilli harvesting.

According to the estimates of the interviewed smallholders, chilli production accounts for six of them for 25%, for eight of them for 50% and for only three for 75% of their income. With a standard deviation of 17.65% chilli production on average accounts for about half of the income (46%) from farming activities and as no other income sources exist it accounts for

half of the whole income of a family. But it needs to be said that although eight of seventeen interviewed smallholders had an overview of key production figures, no exact data can be provided as no documentation is done regarding farming activities, costs and benefits.

Table 10: Characteristics of smallholders producing chilli in BAR

Category	Characteristic	Shaping	Number of answers	Answers in %
Personal information & Qualification	gender	male	3	18
		female	14	82
	English skills	speaking and understanding	0	0
	source of knowledge about chilli production	family	17	100
extension officer		10	58	
other		0	0	
Farming activities	usage of a tractor		0	0
	availability of irrigation		0	0
	usage of hired labour	permanent	0	0
		occasionally	4	24
	usage of own seeds		17	100
	criteria for seed selection	fruits	17	100
		other	0	0
usage of chemical inputs	pesticides	17	100	
	fertiliser	13	76	
Economic situation	income sources	farming	17	100
		other	0	0
	share of income from chilli	25%	6	35
		50%	8	47
		75%	3	18
	possibilities for investment	access to credits	0	0
savings from chilli production		8	47	
savings from family members		12	70	
Other aspects of interest	documentation of farming activities		0	0
	member of a producer association		7	41
	access to other service providers		0	0

Source: Author

Regarding the living conditions, all interviewed smallholders, and generally other smallholders, too, live with their families in little villages or simple settlements in rural communities without electricity or running water and very often with a poor transportation network. Their fields are scattered, meaning that long distances have to be traversed on foot daily. The smallholders rarely have access to bigger markets and therefore depend very much on wholesalers coming to their area to buy their products. For their own consumption, they depend on the products produced in their direct area. Access to credit is non-existent, as all interviewed smallholders stated and children are sent to school sporadically at best. But nevertheless all interviewed smallholders stated that they would have the possibility for at least little investments. Eight of 17 stated that they have savings from chilli production, 12 would have the possibility to borrow money from other family members.

According to surveys of MOFA (2005), producer associations exist in all districts of BAR, but not all smallholders join one. From the interviewed smallholders seven out of 17 were a member of a producer association. Even though farming problems are discussed there, this is not the main function of the associations. Smallholders in producer associations usually produce and market their products individually but help each other in situations of need, in particular with regard to funerals. When a member dies, contributions are collected from the other members and given to the deceased's family. As funerals are very significant events for Ghanaian families, celebrated in time-consuming and costly fashion, the contributions from the members of a producer association play an important role.

Recently, some smallholders have attempted to establish associations that are more production and marketing oriented and focus on common activities in these areas.

Coming to the next stage of the value chain of fresh chilli, i.e. trade, one finds smallholders, wholesalers and retailers as actors.

Smallholders generally sell chilli from their farm gate to wholesalers. Only when smallholders are located close enough to a market, some do take their chilli directly to this market to sell it to retailers or consumers. The latter, selling to consumers, is only found on village markets, but instances of smallholders selling to retailers can be found at rural town and large village markets, too.

Wholesalers in the chain of fresh chilli are solely women. Women sell not only chilli, but also most other products at traditional markets, too. The wholesalers of chilli focus on two variants of the same product, fresh and dry chilli, due to the fact that fresh chilli isn't available throughout the whole year (MOFA, 2005; own observations).

From the interviews with nine wholesalers on nine different markets the following picture of this stage of the value chain appeared. The wholesalers do not have their own vehicles, so they transport the goods from farm gate to the markets by public transport. All wholesalers work individually, and trading companies do not exist. But all wholesalers are members of trader associations. Each bigger market has an association for chilli wholesalers. The head of this association is the “pepper queen”. Indeed, queens exist for the other vegetable groups, too. The status and function of a pepper queen is an expression of traditional hierarchies; she establishes informal market rules that exist alongside the rules given by formal authorities. The pepper queen sets the wholesale price for chilli, for example, and all wholesalers must sell their chilli at that price. Moreover, all wholesalers must give a certain amount of their product to the pepper queen each market day, which the queen then retails herself. But in addition, wholesalers must pay a stand fee per bag and market day to the formal market authorities as well. When a new wholesaler wants to sell chilli at the market, he needs the formal permission of the local authority. But he needs the permission of the pepper queen, too, and must pay an entry fee to her. These examples of the power of the pepper queen show that it is not possible for the formal authorities to implement rules against the will of the queen.

At smaller markets where there are no resident wholesalers and all wholesalers come from other regions, no association exists; but pepper queens are still found, fulfilling the same functions as the ones at the bigger markets.

According to own observations and interviews with twelve retailers on nine markets the following statements can be made.

Retailers at the markets are also exclusively women. Their general level of education is not known, but on the nine markets visited during the field survey, only two of twelve interviewed retailers did speak and understand English. While eight retailers only sold chilli, the other four sold other vegetables such as onions and garden eggs as well.

Retailers are individuals that are not organised in any kind of association. Yet although they operate outside the authority of the chilli queen and are not required to give her a share of their product as tribute, she decides whether new retailers are allowed to do business at the market or not. Retailers sometimes have other sources of income as well, in particular when they retail at weekly markets. Of the twelve interviewed retailers, six stated that they have other income sources, too.

The consumers who buy fresh chilli are either other smallholders who do not grow chilli themselves or members of the non-farming population. Chilli is bought by individuals for home consumption or by the catering trade. Since in BAR fresh chilli can only be bought at traditional markets, all social classes buy it there.

Along with the kinds of actors, the number of actors on the single stages is of interest. Although no concrete figures exist, at the basis of the conducted interviews and own observations the overall trends can at least be shown.

Agrostores are common, and each town contains one or more. But they are not always found in villages.

Smallholders of fresh chilli are numerous, and they are present in all districts in large numbers. But the extension officers in charge of smallholders are much fewer in number, so that the ratio of extension officers to smallholders is very low.

Wholesalers, too, are much fewer in number. They can cover all production areas with only a few persons per area. Therefore the ratio of wholesalers to smallholders is also quite low.

Retailers are more numerous than wholesalers, but not nearly as common as smallholders.

Consumers are naturally quite numerous, so that the bottleneck of the chain is the wholesalers.

c) Governance structure

Agrostores – **market coord.** - Trad. Smallholders – **market coord.** - Wholesalers/ - **market coord.** - Consumers
Retailers

As inputs can be supplied by every agrostore, and agrostores that supply the inputs are not only embedded in the chilli chain, the governance structure between them and smallholders is less interesting than the one between smallholders and traders. In any event, in all chilli chains this governance is market driven. The same situation occurs between traders and final consumers; here again, governance structure in all chains consists of market coordination. Thus the governance structure between the actors of these stages will not receive additional consideration in this analysis.

Looking at the linkages between the producers and traders, governance structure as explained in Chapter 3.4.4 is determined through the factors of supplier qualification, complexity of product and ability to codify the information. Additionally, the ratio of traders to suppliers as well as the ratio of demand to supply is important.

The complexity of fresh chilli is very low. It is a non-processed product, and standards for fresh chilli in traditional markets are low. Deviations from the most preferred red and round type in form of colour or other differences lead to devaluation. This chilli is declared to be lower quality chilli and is bought and sold more cheaply as all interviewed actors of the chain stated.

Ability to codify information is high, and if it were used more effectively, deviations could be greatly reduced. But as traders remain satisfied with the products offered, there is no incentive for them to promote better know-how.

The smallholders' level of qualification as shown in point b) is not very high, but it meets the requirements of the traders and the market. And as the ratio of traders to suppliers is low, traders can choose from whom to take which products and are not dependent on single smallholders.

Due to these circumstances, there is no incentive for traders to have relations stronger than market coordination. The only restriction could be that either demand exceeds supply or that transaction costs for acquiring the product from several suppliers are exceedingly high. The first, relatively scarce supply, exists at the beginning and end of each season. But as chilli is sold in the fresh state and is thus storable for long periods, and since smallholders usually do not have the possibility to sell it elsewhere, wholesalers are still in the more powerful position. At least the better market prices at those times result in better prices for the smallholders, too.

Transaction costs likewise are not a restriction. First, many chilli producers exist; and second, they are located so close to each other that no additional costs arise in case chilli needs to be bought from Smallholder B instead of Smallholder A.

Smallholders, on the other hand, would have an interest in closer relations. In the current situation, they are at the mercy of the wholesalers, since they alone determine whether and when they buy, how much they will purchase and at what price. Rejecting an offer involves the risk of not selling anything if no other wholesaler appears.

The governance structure between smallholders and retailers is market coordination, too. Between wholesalers and retailers the pepper queen regulates relations. Retailers only buy from wholesalers at the market where they sell their goods themselves, and the prices and actors at each market are determined by the informal authority.

d) Input-output structure and profit distribution

To get a comparative overview of the different stages, calculations are made in Cedis and per maxi bag (the common wholesaling measure) and not per acre. For a better understanding, calculations are additionally made according to European standards in kg and Eurasia. For conversion, the rate of exchange of July 7, 2005 is taken. According to Ghanweb it is 1 Cedi per 0,0000925 Eurasia. With regard to the measurement, according to the smallholders, wholesalers and retailers interviewed, one maxi bag is estimated to cover about seven buckets with one bucket weighing between 5.0 and 5.5 kg. Therefore the weight of one maxi bag is estimated to be 36,75 kg.

The costs and revenues of inputs for the agrostores are taken from two interviewed agrostore owners who stated that they usually sell inputs with a mark up of 30%. The information about the inputs needed and the respective prices are taken from the interviewed smallholders. As smallholders in the fresh and in the dry chilli chain need the same amount of inputs and other production costs are the same, too, calculations of required inputs and general production costs are based on the answers of both groups. From the 17 smallholders interviewed, only eight could give an overview of their costs and benefits. None could give detailed information about the division of the costs (e.g. land rent, hired labour, etc.). All eight could only provide estimates of the costs for chemical inputs.

The input costs and the overall production costs shown in Table 11 reflect the average costs of the six smallholders. The standard deviation from average input costs/per bag is 10,400 Cedis (0.96€ bag or 0.03€kg) and from the average production costs the standard deviation is 21,150 Cedis (1.95€ or 0.05€kg).

The revenues of smallholders given in Table 11 are calculated by multiplying the yields per season with the prices for fresh chilli. The average yields are again calculated on the basis of the interviews with smallholders in the fresh and dry chilli chain. The average yields of the 17 interviewed smallholders are ten maxi bags/acre (2.5 acres correspond to one hectare). The standard deviation is 2.7 bags. The average prices are calculated on the basis of the interviews with smallholders exclusively from the fresh chilli chain and with retailers and wholesalers at the markets, supplemented by information from MOFA. Of the nine months when fresh chilli is sold at the markets, three months have relatively high prices, 500,000 Cedi/maxi bag on average (1.26€kg), as chilli is scarce in these months. During the other six months, chilli is abundant and prices are lower, lying on average at 280,000 Cedis/maxi bag (0.70€kg).

Taking into account the different length of the two seasons, the average price is calculated by multiplying the price during the scarce season by a factor of three and the price in the abundant season by a factor of six, adding both and dividing the result by a factor of nine.

Profits are calculated by dividing the costs by the revenues.

Table 11: Profit distribution in the national value chain of fresh chilli

Calculations per maxi bag fresh chilli	Input	Production	Wholesale	Retail	Consumption
Costs in Cedis	41,000	98,300	360,000	467,000	557,000
(Costs in Euro)	(3.80)	(9.00)	(33.30)	(43.20)	(51.50)
Revenues in Cedis	53,300	353,000	467,000	557,000	
(Revenues in Euro)	(4.90)	(32.60)	(43.20)	(51.50)	
Profits in Cedis	12,300	254,700	107,000	90,000	
(Profits in Euro)	(1.10)	(23.60)	(9.90)	(8.30)	
Calculations per kg fresh chilli in Euro	Input	Production	Wholesale	Retail	Consumption
Costs	0.11	0.24	0.91	1.16	1.38
Revenues	0.14	0.89	1.16	1.38	
Profits	0.03	0.65	0.25	0.22	

Source: own calculations

For the next stages, wholesaling and retailing, costs and revenues are taken from the interviews with the wholesalers and retailers, supplemented by information from smallholders and MOFA. All persons interviewed could make statements about costs and revenues.

The costs for wholesalers include purchasing costs as well as transport costs (5,000 Cedis/maxi bag, respectively 0.01€/kg) and stand fees (2,000 Cedis/maxi bag, respectively less than 0.01€/kg); costs for retailers only include purchasing costs as the stand fee is paid per day and not per maxi bag and is so low as to be insignificant. The costs for both trading groups given in Table 11 reflect average costs calculated according to calculations of smallholders revenues, taking into account the seasonality of fresh chilli. The wholesaler's and retailer's average revenues in all months are calculated as above on the basis of seasonally changing prices. The average wholesaler's price for fresh chilli is 600,000 Cedis/maxi bag (1.51 €/kg) in the three months of scarcity and 400,000 Cedis/maxi bag (1.00 €/kg) in the six months of abundance. The average price of retailers is 690,000 Cedis/maxi

bag (1.74 €/kg) in the scarce months and by 490,000 Cedis/maxi bag (1.23 €/maxi bag) in the abundant months.

Consumers have average costs that correspond to the average prices of retailers and no revenues.

Table 11 shows that smallholders have the highest profits per bag. When smallholders sell not at the farm gate but directly to retailers at the market, the profit even rises by a further 107,000 Cedis/bag (2.67 €/kg), i.e. the wholesale price minus the farm gate price minus transport costs.

The table also reflects the position of the wholesalers. Even though they do not have the highest profits per bag, they do enjoy the highest profits per season. The exact turnover of wholesalers is not known, but the average minimum sales of the interviewed wholesalers lies at two bags/market day. Estimating a minimum of two market days per week and a season of twelve weeks, the minimum turnover is 48 bags a season. To reach the profit of 2,547,000 Cedis (6.41 €/kg) that smallholders have per acre, wholesalers would need to sell only 24 maxi bags. With a turnover of at least 48 bags, their profits would be 5,136,000 Cedis (12.93 €/kg) a season and thereby at least 2,589,000 Cedis (6.52 €/kg) higher than those of smallholders, assuming that the average farming area under chilli production is one acre.

Retailers make lower profits/bag than wholesalers do, and it can be assumed that their turnover is lower as well. To reach the same profits per season as smallholders, they would need to sell 29 maxi bags. It cannot be said with certainty that retailers achieve this turnover; according to the author's own observations, however, at least in the case of retailers at daily markets, it can be assumed that the turnover is higher than 29 maxi bags a season.

e) Conclusions

As the focus is set on smallholders and their integration into value chains, all following conclusions about the different chains in the national market are particularly concerned with the position of smallholders in the chains.

The analysis of the value chain of fresh chilli for the national market shows that individual smallholders are only loosely integrated and their position in the chain is weak. This is due to the above-mentioned aspects of the governance structure, namely the low ratio of traders to suppliers, low ratio of demand to supply, low product complexity, and low qualifications of smallholders.

The loose integration results in a situation in which smallholders do not know when or if wholesalers will come and what prices they will pay, and in which they have no negotiation power on these issues. If wholesalers do not show up on time, product quality is reduced, thereby reducing prices as well. For these reasons, chilli, in particular at times when it is abundant, is not always a reliable income source and regular flow of cash is not guaranteed. The existing situation is favourable for the wholesalers, meaning that they have no incentives to make changes. The improvement of the smallholders' situation is of no interest to them, so it is up to the smallholders to take the initiative.

The future potential of benefits to smallholders depends on the different chances they have to upgrade. Depending on the given situation, process and product upgrading can be identified for them.

Process upgrading could be realised through higher levels of qualification concerning production skills that could lead to higher yields. At present smallholders have a lack of know-how on good agricultural practices, as can be seen in their seed selection practices. Little know-how on seed selection, seed extraction, and the drying and storage of seeds exists on the part of smallholders, which results in a high degree of risk concerning the quality of the planting material. Nevertheless, all smallholders interviewed use their own seeds for the next production cycle. Yields and product quality suffer as a result. Although a more efficient cooperation with other smallholders could lead to process upgrading.

Better qualification could also lead to product upgrading; if higher quality products are produced, income losses from devaluation could be reduced, so that in the end both cases would lead to an increase in income.

Besides this smallholders could strengthen their position in the chain through overcoming the lack of organisation and establishing some arrangements on common marketing activities. As a producer group that spans a certain area they would gain more negotiation power.

To realise these upgrading possibilities smallholders need to be supported. In regard to the problem of seed selection even the possibility of buying seeds is no real alternative as agrostores and market women partly offer only low quality seeds, too. Certified seeds are rarely sold due to a lack in institutions or organisations duplicating certified chilli seeds (MOFA, 2005).

Upgrading possibilities for the whole chain that would improve the situation of smallholders are not evident. As quality awareness is low in traditional markets and not expected to rise, product upgrading of the final product is not to be expected. And as traditional markets are

the main market form in BAR and supply of bigger supermarkets in the South bears some difficulties, the supply of existing higher-value markets is not to be expected either.

In spite of all these problems, smallholders make profits in the chain of fresh chilli that account for a reasonable share (50% on average as described under point b of this chapter) of their income.

4.3.4 The value chain of dry chilli

-----INPUT SUPPLY ---- PRODUCTION ---- MARKETING ---- CONSUMPTION-----

a) Technical structure

The technical structure of this chain includes input supply, production, processing, trade and consumption.

The inputs needed for chilli production are the same ones needed in the fresh chain plus some equipment needed for the drying process. The simpler technique employs only a tarp; for improved processing, equipment to build a raised platform or a solar dryer or a solar dryer itself is required.

According to the extension staff from MOFA and own observations, the cultivation of fresh chilli for drying follows the same agricultural practices as in the fresh chilli chain, but a different variety is grown. The long red variety is best for drying because it dries quickly without rotting or losing colour. In addition, the season for dry chilli differs. As chilli needs to be dried directly after harvesting, the first harvesting peak is in July and August when the start of the minor dry season is expected. Dry chilli then dominates the market until September, and then from the end of October onwards dry chilli is sold until the next production cycle of fresh chilli starts. In the month before the first fresh chilli is sold, dry chilli becomes very scarce and thereby expensive.

Processing fresh into dry chilli can be done in different ways. Stated by staff from MOFA and according to own observations, the most common technique used by smallholders in BAR is open-air sun drying on a black tarp lying on the ground. From the eight interviewed smallholders six used this type of drying. The portable material is placed in the sun and can be taken inside when it rains. Only a few smallholders, two of the eight interviewed smallholders, use a low platform that is raised approximately one meter off the ground. This has the additional advantage of protecting the chilli against dirt and certain kind of insects. The best technique would be a solar dryer that provides the highest quality dry chilli. But

although some attempts were made to introduce dryers to smallholders, this technique could not be implemented successfully. Drying as it is currently performed takes 12-15 days depending on the intensity of the sun. The finished product is packed into sacks of the ordinary market size, mini or maxi bag, and stored on pallets on the floor. According to extension staff from MOFA, chilli can be stored for about 12 months in this manner without any change in quality if it has been dried well and has a moisture content of less than 10%.

The marketing of dry chilli is done in the same way as the marketing of fresh chillies. Since dry chilli can be stored, it is potentially suitable for different marketing strategies. But the situation in practice is that most smallholders are not really aware of this potential or just need the cash, so that they sell even when prices are less advantageous. Moreover, the risks associated with storing dry chilli must also be taken into account. First, the products might rot and thereby lose their value; and second, prices are unstable, meaning one never really knows when prices will be best and whether wholesalers will show up at that time. But, interestingly enough, wholesalers stated that they themselves are not that interested in building up their own stocks either. The risk of products rotting is the same as for them as for smallholders. Therefore, they strictly limit the amounts they buy for their own storage. In consequence, traders store most of the higher-quality dry chilli, while the lower-quality product remains in the hands of the smallholders and with it the risk of reduced profits. Along with quality concerns, financial constraints can also deter traders from purchasing large quantities.

Dry chilli is consumed in many common local dishes. The preferred variety is the very dark red chilli with the pleasant aroma. The quantities consumed differ; in some regions, dry chilli is preferred, whereas elsewhere fresh chilli is favoured. Some consumers do not use dry chilli as such but grind it to powder that is occasionally even further processed to shito.

Figure 9: Drying techniques of chilli



Drying on a tarp



Drying on a raised platform

b) Actors in the value chain of dry chilli



The actors are of the same kind as the actors in the fresh chain, and sometimes they are even the same individuals. Inputs are supplied from the same little agrochemical stores as in the value chain of fresh chilli.

Dry chilli is mainly produced by smallholders that correspond to the characterisation of smallholders given in Chapter Four, and the ratio of male to female producers is also the same. As in the chain of fresh chilli, traditional medium-size smallholders and modern smallholders exist as well, but only to a much lesser extent.

As MOFA staff stated, although the equipment needed for drying is neither expensive nor difficult to obtain, so that smallholders could switch production from one season to another, yet this generally does not occur. From the 17 interviewed smallholders none produced both varieties.

The same smallholders who grow the chilli do the processing of fresh into dry chilli. Extension needed in the processing stage is provided by extension officers from MOFA who, for example, introduced a pre-treatment technique of blanching to the smallholders, that sustains the quality. Research on best drying practices, including the method of solar drying, is conducted by MOFA supported by various development cooperation agencies such as Technoserve. As explained in Chapter 4.2.3, GAFFA has plans to support chilli drying in BAR, too, but no real initiative has been undertaken as yet.

The traders in the chain are again the same as in the fresh chain. According to the interviewed wholesalers they all buy dry chilli when fresh chilli is no longer available. At times when both products are available, some concentrate more on fresh and others more on dry chilli.

The same is true of retailers. As they depend most on the products offered by the wholesalers, they adapt their goods to those being offered by the wholesalers.

The consumers who buy dry chilli are other smallholders who don't grow chilli themselves or who only produce fresh chilli, as well as non-farming population sections. Dry chilli is bought by individuals for home consumption and by the catering trade.

c) Governance structure

Agrostores – **market coord.** - Trad. Smallholders – **market coord.** - Wholesalers/ - **market coord.** - Consumers
Retailers

In terms of the determinants for governance – supplier qualification, ability to codify the information, complexity of product, the ratio of traders to suppliers and the ratio of demand to supply – the situation corresponds very much to the one found in the fresh chilli chain.

The complexity of dry chilli is higher than that of fresh chilli due to the additional stage of drying. But even though consumers prefer deep red chillies with a pleasant aroma, they have no genuinely high quality requirements. Therefore the complexity of dry chilli in traditional markets is still relatively low as compared with imported dry chilli sold in supermarkets.

Ability to codify information is high, and almost every smallholder has received extension on the most important aspects of drying. More problematic than codifying and transferring the information is the implementation of this knowledge by the smallholders, as the example of the failed implementation of solar dryers demonstrates. Yet supplier qualifications are still high enough for the recommended product, and both traders and consumers are generally content with the dry chilli produced. The ratio of traders to suppliers and of demand to supply is the same as in the chain of fresh chilli that is favourable to wholesalers.

These conditions result in the same governance structure that is found in the chain of fresh chilli, namely market coordination. Again, smallholders are in a weaker position than traders and would benefit from closer relationships.

d) Input-output structure and profit distribution

Profit distribution in the dry chilli chain is calculated in accordance with calculations for the fresh chilli chain, taking the respective prices for dry chilli. Costs and revenues at the stage of input supply as well as costs of production for smallholders are the same as in the fresh chilli chain.

According to the smallholders and traders interviewed, as well as information provided by MOFA, 2.5 maxi bags fresh chilli are needed for one maxi bag of dry chilli. The average yields/acre and season are four maxi bags dry chilli, which is equal to ten maxi bags fresh chilli. The average prices stated by the interviewed smallholders and traders are for dry chilli 420,000 Cedis/maxi bag (1.06 €/kg) in the abundant seasons, which last for five months, and 800,000 Cedis/maxi bag (2.01€/kg) in the scarce season, which lasts for another four months.

The average price is then calculated by multiplying the price in the scarce season by a factor of four and the price in abundant season by a factor of five, adding both and dividing the result by a factor of nine.

The costs of wholesalers are calculated on the basis of the revenues of the smallholders in the dry chilli chain. The same additional costs for transport and stand fees appear as in the fresh chilli chain. The wholesaler's and retailer's average revenues in all months are calculated as above on the basis of seasonally changing prices. The average wholesaler's price for dry chilli is 900,000 Cedis/maxi bag (2.27 €/kg) in the four months of scarcity and 500,000 Cedis/maxi bag (1.26 €/kg) in the five months of abundance. The average price for retailers is 945,000 Cedis/maxi bag (2.38 €/kg) in the scarce months and by 560,000 Cedis/maxi bag (1.41 €/kg) in the abundant months.

Consumers have average costs that correspond to the average prices of retailers and no revenues.

Table 12: Profit distribution in the value chain of dry chilli

Calculations per maxi bag of dry chilli	Input	Production	Wholesale	Retail	Consumption
Costs in Cedis	101,000	260,000	596,000	678,000	731,000
(Costs in Euro)	(9.30)	(24.10)	(55.10)	(62.70)	(67.00)
Revenues in Cedis	131,250	589,000	678,000	731,000	
(Revenues in Euro)	(12.10)	(54.50)	(62.70)	(67.60)	
Profits in Cedis	48,125	329,000	82,000	53,000	
(Profits in Euro)	(2.80)	(30.40)	(7.60)	(4.90)	
Calculations per kg fresh chilli in Euro	Input	Production	Wholesale	Retail	Consumption
Costs	0.25	0.65	1.48	1.46	1.81
Revenues	0.32	1.46	1.68	1.81	
Profits	0.07	0.81	0.20	0.15	

Source: own calculations

This table demonstrates that smallholders have the highest profits per bag. When smallholders sell their chilli directly at the market instead of at the farm gate, their profit rises by a further 84,000 Cedis/bag (0.21 €/kg), i.e. the wholesale price minus the farm gate price minus transport costs.

The calculations also reflect the position of the wholesalers. They do not have the highest profits per bag, but assuming a minimum turnover of 48 bags as derived from the answers given in the interviews, their profits of 3,936,000 Cedis (364.00 €) per season are at least 2,620,000 Cedis (242.40 €) higher than those of smallholders. The minimum number of bags they need to sell to reach the same profits as smallholders is 16.

Retailers would need to sell 24 maxi bags to get the same profits per season as smallholders. As no information about the turnover of retailers is available, one can only assume – based on observations of the situation of retailers – that their profits are at least equal to those of smallholders.

e) Conclusions

The analysis of the value chain of dry chilli leads to the same conclusions as for the fresh chilli chain. Although the product is more complex, individual smallholders are only loosely integrated and their position in the chain is weak. This is due to the facts explained in the governance structure.

The problems already stated in the conclusions of the fresh chilli chain appear in the dry chilli chain, too. Lack of know how about good agricultural practices and an unsatisfying marketing situation are augmented by the low quality processing technique. Yields and product quality are thus once again lower than their potential.

Again wholesalers don't have an interest to improve the situation of smallholders so that is up to the smallholders to take the initiative. The future potential of their benefits depends on the different upgrading chances they can realise. These are again process as well as product upgrading and additionally functional upgrading.

Process and product upgrading could be realised in the same way as in the fresh chilli chain and are expected to lead to the same results. Furthermore, improved qualifications on processing issues would result in a further increase in the quality of the final product. Income losses from devaluation could thereby be reduced, and an increase of income could be realised.

Functional upgrading would become possible if smallholders were to organise themselves better with regard to marketing issues. Currently, only individuals go to markets to sell their products at a higher price, and in rural areas smallholders make no arrangements about prices, selling times or quantities. Although their large numbers make it more difficult for them to organise themselves, they could at least try to improve their marketing skills. With dry chilli being a storable good, this might provide a real opportunity to improve their situation.

Upgrading possibilities for the chain as a whole are, as in the case of fresh chilli, not evident. Nevertheless as in the fresh chilli chain smallholders already profit from the production of dry chilli, that at least account for 25% of their income.

4.3.5 The value chain of chilli powder

-----INPUT SUPPLY ---- PRODUCTION ---- PROCESSING ---- MARKETING ---- CONSUMPTION-----

a) Technical structure

The technical structure of the value chain of chilli powder includes the following stages: input supply; cultivation of the long variety of chilli; processing of the chilli (i.e. drying and grinding); packaging; and then trade and consumption. For chilli powder, two different chains exist, the traditional and the modern one.

The traditional value chain of chilli powder is very much the same than the value chain of dry chilli. The difference is that some wholesalers, instead of selling the dry chilli, implement an additional stage of grinding and then sell chilli powder as the final good. But this makes no difference to the situation of smallholders and this chain is thus not further considered here.

The modern chain of chilli powder serves a different clientele from the one found in traditional markets. It utilises improved production and processing techniques and follows different marketing channels than the traditional chain.

Inputs for production differ in the seeds that are used. For “modern” chilli powder production, one of three special varieties is used: MI 2, Legon 18 or Meko Hwarm. The cultivation of chilli is then conducted as in the other chains, but with special regard to good agricultural practices. The good agricultural practices are recommendations from MOFA concerning land preparation, nursery and planting techniques, pest and disease control, harvesting methods and seed selection. Additional recommendations are given on drying techniques.

The first processing step of drying includes the same pre-treatment as in the chain of dry chilli, i.e. blanching the fresh chilli, but the drying process does not take place on tarps on the ground. Either solar dryers or a gas oven – or at least a raised platform – is used. A solar dryer offers the advantages of a high quality product in terms of colour, overall appearance and moisture content. This is due to the fact that the solar dryer is covered and therefore protects the chilli against rain, dirt and insects, and that the solar technique accelerates the drying process, which has the further advantage of raising production capacity.

The gas oven has the same advantages as the solar dryer in comparison with the open-air drying technique. Additionally, it permits a higher quantity at one drying process and functions independently of the sun, which lengthens the possible drying period.

After drying, the chillies are ground in the processor's private mill. To create chilli powder with differing degrees of spiciness, in some cases seeds are added before grinding. The more seeds are added, the spicier the chilli powder becomes. The chilli powder is packaged in small plastic containers or plastic bags of different sizes that are labelled with the brand name of the processor. The packaged chilli powder can be stored up to a year. Chilli powder produced this way differs from the product of the traditional chain in three basic aspects: more intense red colour, better flavour and better packaging, that is more attractive and better suited to preserving freshness.

As this chilli powder is sold in the non traditional market, production and the product must fulfil government requirements. The processing enterprise must be registered with the Food and Drug Board. For registration, several, mainly hygienic standards must be met during processing, relating to such areas as hygienic conditions at the processing plant, wearing gloves while packaging, etc. The product must meet national product standards for chilli powder, including the stipulation that no artificial colouring is added. Once the standards have been met, the Food and Drug Board conducts an initial inspection and then issues a certificate and a registration number to the enterprise. Further unannounced inspections then take place two to three times a year. The registration number functions as a control mechanism for traders and consumers, ensuring that the processor fulfils the governmental requirements. It is found on the label of each package of chilli powder.

Figure 10: Improved chilli powder production



Solar dryer for fresh chilli



Electric mill



New processing plant

As mentioned above, chilli powder of this type is sold in the non-traditional market, in particular to supermarkets in BAR, but also to the catering trade. Customers are supplied not according to fixed contracts but depending on demand. Chilli powder is only delivered when customers have used up their products and place a new order.

“Modern” chilli powder is consumed in the same way as the traditional type.

b) Actors in the value chain of chilli powder

Agrostores ---- Trad. Smallholder ---- Processor ---- Supermarkets ---- Individual households/
Catering trade

In the value chain of chilli powder, actors in the first stage of input supply are the same as in the other chains, little agrochemical stores.

Producers of fresh chilli actually come from the group of smallholders described in Chapter 4.3.3, but they have been able to improve their knowledge of certain agricultural practices and are now better qualified. Processors looking for permanent suppliers contacted them due to the fact that they were familiar to extension officers from MOFA whom the processor had asked for recommendations or because they already had personal relationships with the processor.

The suppliers of the processor, for whom chilli powder production is the main business activity, come from four different communities where they are organised in groups of 20-30 smallholders. They were contacted through MOFA, and MOFA trained them in the implementation of good agricultural practices and the technique of drying using a solar dryer. This training is conducted at the community-owned solar dryer that was also sponsored by MOFA. The dry chilli is not supplied individually by the smallholders of the community; the community collects the needed quantity and sells it directly to the processor. The proceeds are then distributed back to the smallholders that contributed to the delivery.

The suppliers of the second processor, for whom chilli processing is a side business, consist of only three smallholders situated in Techiman. The processor through his soybean processing already knew them. These smallholders did not receive special training from MOFA; the processor himself provided them with some additional know-how regarding production and drying. Drying is done using an improved technique of open-air sun drying, on raised platforms that protect chilli against dirt and insects.

Currently all smallholders produce dry chilli for the local market as well as for the processors.

The processors of chilli powder are both men of about 40 years of age. They are both located in Sunyani. For one, chilli powder production is his main business; the other only began production recently as a side business. His main business activity is the production of soybean powder. A third processor located in Berekum is planning to start chilli powder production soon but as she has not begun engaging in chilli powder production yet, she will not be taken into further account in this study, so that in the following only the processors already active in the business are described.

The processor who is conducting chilli powder production as a side business, attended school for nine years and speaks and understands English very well. He has lived in Sunyani since birth and is married to a woman from Tamale who still works there. A friend who owns a supermarket gave him the idea of producing chilli powder. Since the technical equipment is the same as that used in the processing of soybeans, the production of chilli powder could be taken up quickly without high investment costs. As chilli powder is not produced regularly, no one had to be employed; he performs all the grinding and packaging on his own. His processing plant is a kind of garage close to his house, where the ready product is packaged in plastic bags and stored, too.

Himself conducts the marketing of the chilli powder together with his wife. He supplies the supermarket of his friend in Sunyani and sells his product to restaurants, chop bars, etc. in Sunyani. His wife takes the chilli powder to Tamale to sell it to restaurants, supermarkets, etc. After supermarkets and restaurant that are retailers and first purchasers of chilli powder, the actual consumers are individual households of the non-farming population. They are members of the lower-middle to lower-upper classes that neither want to grind dry chilli themselves nor any longer buy all their products at traditional markets.

This side business processor concentrates on a small market as he lacks the capacity to produce more or to market the products. His activities are limited due to the fact that he does not have enough savings for the investments necessary to expand his production side and was turned down for another loan.

For the second processor chilli powder production is the main business. He attended school for nine years but has a poor command of English. After several experiences trading other products such as garments and jewellery to other African countries in the region, he recognised a gap in the market of conserved chilli products and settled in Sunyani to start the business of chilli processing. He was supported by MOFA in BAR, which trained him in chilli drying and in how to prepare a business plan. The latter is necessary to obtain credit

from the bank. Today, he employs nine people who work as marketing managers, sales boys or production assistants, although not all of them work full time. He buys dry chilli that is then grounded at his processing plant. At times when only fresh chilli is available, he does the drying himself in his own solar dryer or in his gas oven. For packaging, he uses modern variant of little plastic containers.

Himself or one of his sales boys markets his products. He sells his products to supermarkets, chop bars and other businesses in the catering trade, not only in Sunyani but also nearly in all of BAR, and even in other parts of Ghana, such as Accra.

In BAR, consumers of his powder come from the same population section as the ones buying the powder of the first processor. In Accra, his product is sold mainly in small and middle-sized supermarkets and has just entered the big supermarkets supplying the upper class and foreign consumers from industrial countries.

This processor focuses on a bigger market than the first. He wants to compete with imported chilli powder and even has future plans about exporting his powder to other African countries where chilli is not produced.

c) The governance structure of the value chain of chilli powder

Agrostores – **market coord.** - Trad. Smallholders – **modular governance** - Wholesalers/ - **market coord.** - Consumers
Retailers

In the chain of chilli powder, the governance structure between input suppliers and smallholders is the same as above, namely market coordination, but given the differences in some of the determinants for governance between producers and processors and between processors and retailers, a different governance structure is found there. Between retailers and consumers, as always, market coordination exists. As the processor engaging in chilli powder production as a main business is most important, the following remarks focus on the situation found in “his” value chain. It can be assumed that the situation for smallholders supplying the other processor is very similar.

Looking at the determining characteristics, it is found that product complexity is higher than in the case of the other chilli products, since the specifications of the product and the production process are more complex. As explained in the above section on technical structure, the processor is required to maintain different production and processing standards from the smallholders. Nevertheless, the ability to codify necessary information still remains high. Any group of smallholders already producing chilli and who were willing to change at

least part of their production to fulfil the set standards could be chosen. Special initial supplier qualifications were not needed, and improved production and processing skills were acquired through external training only after arrangement with the processors had been already made. As this qualification is needed and only possessed by a certain group of smallholders, the ratio of processor to suppliers is more favourable than in other value chains. The ratio of demand to supply is also more favourable. Although demand for chilli powder is lower than for other chilli products, the quantities produced, and thereby supply, are adapted to it.

These facts lead to a modular governance structure that is favourable to the position of the smallholders. Suppliers cannot be found on the free market, but some were supported that now possess the competence to produce independently according to the requirements of the processor so that the buyers' need for direct monitoring and control remains low. In this situation, it would be possible to have fixed contracts between suppliers and the processor or at least between the supplying communities and the processor. But because chilli powder is a relatively new product on the non-traditional market, demand is still low, so that no guarantee for a certain purchase can be given. Therefore fixed contracts do not exist either between the processor and suppliers or between retailers and the processor.

Between the processor and retailers relationship stronger than market coordination exists. At present the processor contacts mainly retailers to whom he has some kind of personal relationship. His distribution channels reflect his network of personal relationships.

d) Input-output structure and profit distribution

To obtain comparable figures, calculations are again done per maxi bag. As smallholders supplying the processor could not be interviewed, all calculations are based on the information of the processor. For the input stage, the same average data is used as in the chains of fresh and dry chilli, and for the production stage the same average costs are used. It is assumed that no additional costs arise, because initial seeds as well as solar dryers were sponsored and other additional costs do not occur. The benefits of the smallholders correspond to the uniform price stated by the processor. Reliable statements about yields could not be obtained, so that the non-weighted average of the yields reached with traditional production and the yields reached with improved production is taken. As the processor performs processing and marketing to retailers, both steps are covered under the processing stage. The costs and revenues correspond to the details given by the processor. Prices in the retailing stage are those found in small and middle-sized supermarkets and are constant.

Inputs needed for production are again sold with a mark-up of 30%. From the given inputs, an output of 19 maxi bags of fresh chilli is estimated, which corresponds to 7.6 maxi bags of dry chilli, as the ratio of fresh to dry is 2.5:1. Therefore production costs/bag dry chilli amount to 137,000 Cedis (0.35 €/kg). With a price/maxi bag dry chilli of 595,000 Cedis (1.50 €/kg), the profit is 458,000 Cedis/maxi bag of dry chilli (1.15 €/kg).

From one maxi bag of dry chilli, the processor gets 132 plastic containers of 250g each. The turnover of the processor fluctuates, but the potential maximum, given sufficient demand, is a turnover rate of 1000 bottles a day. The costs for the processor cover costs for buying dry chilli as well as for transport, wages, credit, production, packaging and marketing. According to the processor all these costs sum up to about 1,782,000 Cedis/maxi bag dry chilli (3.99 €/kg). Revenues are 1,980,000 Cedis/maxi bag (4.99 €/kg), and the profit is thus 198,000 Cedis/maxi bag (0.50 €/kg). Retailers' costs are limited to buying chilli; since the additional costs of shop maintenance are fixed, they are not considered here. The costs/plastic container are 15,000 Cedis (5.60 €/kg), which calculates 1,980,000 Cedis per maxi bag (183.20 €). Revenues/plastic container are 2,000 Cedis (0.76 €/kg), which makes 264,000 Cedis/ maxi bag (24.40 €). The consumer pays 17,000 Cedis/plastic container (6.40 €/kg), which equals 2,244,000 Cedis/maxi bag (207.60 €). All figures are summarised in Table 13.

Table 13: Profit distribution in the value chain of chilli powder

Calculations per maxi bag dry chilli	Input	Production	Processor	Retail	Consumption
Costs in Cedis	53,000	137,000	1,782,000	1,980,000	2,244,000
(Costs in Euro)	(4.90)	(12.70)	(164.80)	(183.20)	(207.60)
Revenues in Cedis	69,000	595,000	1,980,000	2,244,000	
(Revenues in Euro)	(6.40)	(55.00)	(183.20)	(207.60)	
Profits in Cedis	16,000	458,000	198,000	264,000	
(Profits in Euro)	(1.50)	(42.30)	(18.40)	(24.40)	
Calculations per kg fresh chilli in Euro	Input	Production	Wholesale	Retail	Consumption
Costs	0.13	0.35	4.48	4.99	5.65
Revenues	0.17	1.50	4.99	5.65	
Profits	0.04	1.15	0.51	0.66	

Source: own calculations

The table shows that smallholders have the highest profits per bag. However, the calculations also show that smallholders make a profit per acre and season of 3,481,000 Cedis (322 €). The processor would need to sell 2,321 plastic containers in six months (one season) to make the same profit. It cannot be determined if this amount has been reached yet. Retailers would need to sell only 1,740 plastic containers in half a year to make the same profits as smallholders.

e) Conclusions

The analysis of the value chain of improved chilli powder shows a better integration of smallholders into this chain as compared with the previously analysed chains. This is due to the facts explained in the section on governance structure, namely the relatively high ratio of processors/traders to suppliers, relatively high ratio of demand to supply, relatively high product complexity that is nevertheless not too high for smallholders to respond to it, high ability to codify information and improved qualification of the smallholders.

With the improvement of their initial qualifications of production as well as of processing skills, product and process upgrading of the smallholders have already been realised. This success could only be achieved through the prevailing favourable framework conditions. Opportunities for training of the processor as well as of the smallholders were provided by MOFA along with the necessary equipment such as seeds and solar dryers. The only costs for smallholders, and therefore the only risk, were opportunity costs that arise from cultivating part of their farming area with the new variety instead of cultivating it with the common chilli varieties that are sold in the traditional markets. But the risk that opportunity costs might exceed profits was reduced due to the fact that many smallholders in one community grew the new variety for the processor, meaning each individual needed to designate only a small part of the overall farming area for this purpose and could continue to produce chilli for the traditional market, too.

The conditions of this chain resulted in better integration of smallholders into the chain, which provides them with several advantages. Income from chilli production for the processor is more reliable and predictable, since at least some kind of arrangements is made. The same is true of cash flow. As production for the national market can still continue, the processor offers an additional income source. Also, functional upgrading was achieved through the common marketing activities within the respective community.

The improvements already reached can be expanded even further, and, moreover, opportunities do exist to contribute to a further upgrading of the whole chain.

The first possibility is that demand for chilli powder will rise, raising the demand for dry chilli so that a higher quantity can be supplied. This would lead to higher profits and to the cultivation of chilli for the processor becoming a secure source of income. Second, the whole chain could go through a product upgrading whereby the final product sees an increase in value per unit that might affect the smallholders positively, too, in terms of increased prices for dry chilli.

Participating in the upgrading of the whole chain is a challenge for the smallholders. An expansion of powder production offers the processor either the possibility to have fixed contracts with suppliers to secure on-time delivery of the needed quantity and quality of dried chilli or the possibility to extend the group of smallholders that supply him. In this case, it is up to the already qualified smallholders to come up with ways to secure their position.

4.3.6 The value chain of chilli paste

For the sake of completeness, the value chain of chilli paste should be mentioned, although very little information is available about it. It is currently of very minor significance for the market in BAR, and in the other regions of the country as well, since demand for paste is quite low compared with demand for the other products, even chilli powder.

The quantity of chilli paste sold internationally is higher, and given that both chains are identical aside from packaging and customers, remarks on the value chain of chilli paste are only found in Chapter 4.4.3. Reference to the national market is there given where necessary.

4.3.7 The value chain of Shito

Shito is an important product in Ghana. It is a certain kind of sauce that consists of oil, onion, sardines, salt, tomatoes and chilli powder. But as in the case of the traditional chain for chilli powder, the production of shito has no consequences for the situation of smallholders. The stages of this chain are identical to the stages of the value chain of dry chilli. Then two additional steps, grinding and preparing the sauce, are added, or powder may be bought separately, leaving the preparation of the sauce as the only additional step. The only possible impact on smallholders is the same as in the traditional chain of chilli powder. If shito producers put pressure on retailers or wholesalers to have better or more unique chilli products, the wholesalers might transfer the pressure to the smallholders with some kind of sanctions or incentive measures.

Just to complete the overview of chilli products, it should be explained that shito is generally bought in non-traditional markets. It has no major importance for the market, however,

because most people prepare it on their own at home. Individual women in their household prepare Shito for the market. Customers for shito are mainly students who cannot prepare it on their own during their studies.

4.3.8 Conclusions for the national market

The situation on the local market shows that as incentives are given possibilities to improve production skills exist. And that through improved production skills a tighter integration of smallholders into value chains, that offer smallholders more benefits, can be realised.

This is a positive statement. But negative aspects appear as well. To mention are the following: as the qualification of smallholders doesn't play the foremost role but personal relationships decide some smallholders have better chances than others do. As the market is not transparent even not all smallholders do know about the possibility to upgrade activities. Therefore no fair competition exists and one can assume that the more remote smallholders are, the less intensive is there contact to MOFA through which all activities are coordinated and the more these smallholders become marginalized. The other negative aspect is the passive role smallholders take over. The example of chilli powder shows that it would be hard for smallholders to enter the non-traditional market with their products on their own as several standards need to be fulfilled and investment costs arises. Therefore they can hardly push initiatives themselves but depend on initiatives from others. At least no example can be found in the chilli sector were smallholders introduced successful initiatives.

Another negative aspect is that the more complex the products and the markets are, the more specialised are the activities on the single stages of the chain and the less does one actor undertake more than one activity in the chain. In the value chain for chilli powder specification is not yet as high as in other product chains so that smallholders as well as the processor still undertakes more than one function in the chain. Specification has advantages but it has the disadvantage of narrowing the spectrum of possible activities and becoming more dependent to others. The advantages and disadvantages for smallholders need to be weighed up from case to case. Do they have more benefits from undertaking several production steps and therefore supply a less quality concerned market with a lower quality good or lay the most benefits in the specification on only one production activity. In the case of chilli powder specification isn't so far reaching that disadvantages appear from it.

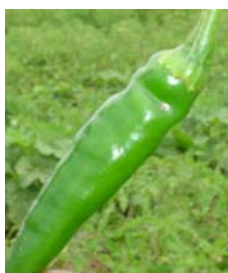
4.4 Value chains for the international market

Following the remarks on value chains supplying the national market, a detailed analysis of value chains supplying the international market is undertaken in this chapter. Again, the analysis starts at the end of the chain with the market, and therefore an overview of the situation of the international market for chilli is given first. For an overview of the different chilli products for which different chains exist see Figures eleven and twelve.

Figure 11: Ghanaian value chains of chilli for the international market



Figure 12: Ghanaian chilli products on the international market



Fresh chilli in the green state



Chilli paste

4.4.1 The international market

Various chilli products are traded internationally, but as Ghana only has a considerable share in the world trade of fresh chilli, only international trade for that product is considered in the following.

World demand for fresh chilli can only be estimated. Qualified data for exact calculations are missing, because national consumption is not recorded in all countries.

Data about the chilli trade exists, but they are of limited value. On the one hand, informal cross-border trade cannot be measured; and on the other hand, not all countries record their imports and exports. Deficiencies in customs coding systems also exist.

The data of all following remarks is taken from TradeMap, a statistical database supplied by the International Trade Centre of UNCTAD and the WTO. All figures given are for the year 2003.

All traded products are categorised in an international system of two- to six-digit HS codes. Chilli that belongs to the genus capsicum falls under HS 070960, which covers “pepper of the genus capsicum or pimenta, fresh or chilled”. Thus data on chilli alone are not available, and the following figures all include data for the genus pimenta as well.

According to the data of USAID, world trade in chilli is estimated at about 1,606,960 t that correspond to a value of 2,355,086 US\$. The main exporters according to value are the Netherlands, Spain and Mexico. The top three account for 76% of the value of world exports. According to quantity, the top three are the same but in a different order. Mexico exports the highest quantity, followed by Spain and the Netherlands. All together they account for 83% of the traded quantity world-wide. Ghana’s exports in this HS code are 508 t with a value of 825,000 US\$. This puts Ghana in 41st place worldwide; their share of the world trade in chilli is 0.03%.

The main importers according to the traded value are the United States, Germany and the UK. The top three account for about 56% of the value of all chilli imports. According to the quantity imported France is on the first place followed by Germany and the United States. They account for 51% of the quantity traded world-wide. For Ghana no imports of fresh chilli are recorded. (Compare Table 14)

Table 14: Import countries of fresh chilli

	Quantity in t	Price in US\$/unit	Value in US\$ thousand	Share in world imports
World	1,606,960	1,466	2,355,086	
United States	426,166	1,468	625,692	26
Germany	269,954	1,790	483,110	20
UK	99,805	2,236	223,164	9
France	115,587	1,365	157,828	6

Source: Trademap, 2005

Ghana mainly exports fresh chilli to the UK (89%) and to a much lesser extent to markets in the Netherlands and Italy (4% each) and Austria (3%). (Compare Table 15) These trade figures show that Ghana still depends very much on the UK, as the main important trading partner for chilli products and they demonstrate that Ghana has not diversified its trade patterns for chilli. Even though France and Germany are also big importers of fresh chilli in Europe, Ghana does not export chilli to those countries.

Table 15: Main importing countries of fresh chilli from Ghana

Importers	Quantity in t	Price in US\$/unit	Value in US\$ thousand	Share in Ghana's` exports
Total	508	1,624	825	100
UK	465	1,572	731	89
Netherlands	15	2,133	32	4
Italy	14	2,214	3	4
Austria	11	2,273	25	3

Source: Trademap, 2005

Other important exporters to Ghana's main trading partner, the UK, are Spain, France, Belgium and Germany from the EU and Israel, the Dominican Republic, Jordan, Turkey and Egypt from outside the EU. Ghana is in 12th place out of 25 exporters supplying the UK and in 7th place out of 17 when the EU is counted as only one supplier.

The relevance of chilli as an export product can be concluded from the data given about overall export activities of Ghana that are shown in Table 16. The sum of products of HS 07 (vegetables, roots and tubers) are according to the value on place 10 of a range of 90 two digits export groups. They account for 1,3% of the value of all exported products. About half of the value comes from products under HS 0709 (vegetables fresh or chilled) that include chilli. And out of this 7,08% of the value comes from HS 070960 (peppers of the genus capsicum or pimenta, fresh or chilled). That is an export value of 825,000 US\$. With that the export value of fresh chilli accounts for 3,4% of the export value of all products exported under HS Code 07 and it accounts for 0,05% of the export value of all exports of Ghana. This shows that the importance of fresh chilli as an export good is not high at all compared to the overall export activities.

The trend from 1999 - 2003 shows that the importance of Ghana's chilli exports is even shrinking. The annual growth in value as well as in quantity decreased by 9% respectively 8% between 1999 and 2003 while at the same time the annual growth of value of world imports of these products increased by 10% and the annual growth of quantity even laid at 22%. All data about Ghana are estimated from reports from respective importing countries as Ghana didn't report data itself.

Table 16: Importance of fresh chilli as an export good

Product (HS Code)	Value in 2003 in US\$ thousands	Annual growth in quantity 1999-2003 in %	Ranking in world exports
All products	1,731,770	3	108
Vegetables, roots and tubers (07)	22,638	8	64
Vegetables fresh or chilled (0709)	11,651	9	35
Peppers fresh or chilled (070960)	825	-8	41

Source: Trademap, 2005

4.4.2 The value chain of fresh chilli for the international market

-----INPUT SUPPLY ---- PRODUCTION ---- MARKETING ---- CONSUMPTION-----

a) Technical structure

The value chain of fresh chilli for the international market includes four different stages: input supply, production, marketing and consumption.

The inputs needed are the same as those used for chilli production for the national market in terms of pesticides and fertiliser, but seeds differ. For chilli production for the international market, certified seeds of the varieties MI 2 or Legon 18 are required. As stated by most producers in the southern region use MOFA irrigation systems, occasionally, some technical equipment is needed for maintaining the system, and whenever production is initiated or expanded, equipment is needed to install an irrigation system.

Production tasks include the original activities of production as well as harvesting and packaging. Production follows good agricultural practices and various irrigation systems are employed. Wherever possible, groundwater is used. Either water is taken from springs in buckets and spread over the field by hand, or a groundwater pump is installed and water is distributed over the fields by sprinklers or drip irrigation. For the first variant, wells are built at regular intervals on the fields to avoid long walking distances. If groundwater is not available, water from nearby rivers or lakes is used. Distribution techniques are then the same as in groundwater systems. (Compare Figure 13). The ready chilli fruits are harvested in a

green state with a little knife and packaged in cardboard boxes that hold 5.5 kg of fresh chillies.

Figure 13: Irrigation techniques



Groundwater founts



Sprinklers



Water pump

Thanks to the existence of irrigation systems, chilli production does not depend solely on natural rainfall and can be conducted almost year-round. Nevertheless, according to MOFA nearly all smallholders designate two production seasons of two to three months each – where chilli is harvested about every ten days – which very often correspond to the natural production seasons. All interviewed smallholders stated to designate two production seasons. Some smallholders who have particularly good access to water produce counter cyclically to the harvest in seasons when chilli is normally scarce. They are especially found in the Volta Region. Their situation is further described under point c) of this chapter. The different production seasons of the smallholders guarantee the exporters a year-round supply of fresh chilli.

Marketing of the fresh chilli includes trade from production sites to the exporters and then from the exporters to importers overseas as well as trade within the importing country. Trade from the production sites to the exporters is conducted by farm gate selling according to weekly oral agreements concerning delivery date, delivery quantity and prices. Exporters either bring or leave in advance the necessary export boxes, which are packed by the chilli producers and then transported by the exporter to his company for a quality inspection and weighing. The exporters take day trips to a certain region in a pick-up truck whenever chilli is to be exported, given the necessity of exporting chilli the day it is harvested as cooling possibilities neither exist at the exporter's plant nor at the airport.

The boxes with chilli are finally taken to the airport, where they are stacked in containers that are transported by plane to Europe. In the importing country, according to the exporters

interviewed, fresh chilli is distributed at wholesale markets and is subsequently retailed to the final consumer. No further processing takes place.

The exported chilli is consumed as an ingredient in various dishes.

Figure 14: Fields with chilli plants in the southern regions of Ghana



b) Territorial structure

Inputs are sold in the villages and towns in the respective production area. Production areas for fresh chilli for the international market are located exclusively in the southern regions of Ghana, namely in the Volta Region, Eastern Region, Greater Accra and Central Region and in areas within one day's travel of Accra. This is due to the fact that fresh chilli spoils quickly and is therefore best exported on the day it is harvested.

Trade is done directly from these regions to Accra, where the international airport is located. As fresh chilli can only be exported by plane Accra offers the only export possibility, which explains why production areas must be located close to Accra. From Accra, the chilli is exported to Europe, mainly to the UK and to a much lesser extent to the Netherlands, Italy and Austria. There it is further distributed to the final consumers.

c) Actors in the value chain

Agrostores ---- Trad. Smallholders ---- Export Companies ---- Wholesaler/Retailer ---- Individual households/
Catering trade

Input suppliers are, as in the other chains, agrochemical stores. They supply the smallholders with the necessary pesticides and fertilisers and, if necessary, with seeds, too. Other smallholders select seeds for the next production cycle from their own plants or purchase them from neighbours or friends. From the ten interviewed smallholders two buy their seeds only at agrostores, four only use their own seeds, only one uses own seeds and additionally

buys seeds from the agrostore and three use own seeds and additionally buy seeds from neighbours or friends.

Producers of chilli for the export market are traditional smallholders, traditional smallholders on middle-sized farms or non-traditional smallholders who only recently entered the business. Again, no official data exist for the ratio of the different groups, but judging by impressions gathered during the field survey and information from MOFA and stakeholders in the chain, it can be assumed that smallholders on small sized farms are in the majority. All ten interviewed smallholders belong to this group. The other groups therefore receive no further consideration here. An overview about the characteristics of smallholders supplying the export market is given in Table 17. Differences to smallholders supplying the national market are further described below.

As opposed to the chains supplying the national market, the producers of chilli for the export market are solely men. The average size of farmland cultivated with chilli for the international market is one acre. From the ten interviewed smallholders eight cultivated one acre and two cultivated half an acre. All interviewed smallholders started with chilli production for the national market and currently supply both markets.

The production systems of these smallholders are still traditional, but, at least in the case of chilli production for the international market, improved production techniques correspond to what is understood as good agricultural practices (compare Chapter 4.3.5) are implemented. All ten interviewed smallholders got advice from MOFA about good agricultural practice and implemented this advice, e.g. in regard to seed collection.

Very often a tractor is hired for ploughing, and workers are employed for harvesting. From the ten interviewed smallholders six hire a tractor and all ten employ daily works for harvesting. In three cases hired workers perform even maintenance.

Chilli production for the international market accounts for 25% of the farming income of seven respondents and for 50% of the farming income of two of the ten; only one stated a 75% share of farming income from chillis.

Whereas overall living conditions correspond to those of smallholders supplying the national market, transport links are better, which is what gave them the opportunity to supply the international market in the first place. One unusual quality of some smallholders is the possession of a mobile phone. This is due to the fact that a mobile phone simplifies the communication with the exporter.

Table 17: Characteristics of smallholders producing chilli for the export market

Category	Characteristic	Shaping	Number of answers	Answers in %
Personal information & Qualification	gender	male	10	100
		female	0	0
	English skills	speaking and understanding	0	0
	source of knowledge about chilli production	family	10	100
extension officer		8	80	
other		0	0	
Farming activities	usage of a tractor		6	60
	availability of irrigation		10	100
	usage of hired labour	permanent	0	0
		occasionally	10	24
	usage of seeds	own seeds only	4	40
		own seeds and buying from agrostore	1	10
		own seeds and buying from neighbours/friends	3	30
		buying from agrostore only	1	10
	criteria for seed selection	fruits	0	0
	usage of chemical inputs	plants	10	100
pesticides		10	100	
	fertilizer	10	100	
Economic situation	income sources	farming	10	100
		other	0	0
	share of income from export chilli	25%	7	70
		50%	2	20
		75%	1	10
	possibilities for investment	access to credits	0	0
		savings from chilli production	5	50
		savings from family members	3	30
		savings from chilli and from other family members	2	20
	supplied markets	only export market	0	0
export and national market		10	100	
Other aspects of interest	documentation of farming activities		3	30
	member of a producer association		3	30
	access to other service providers		1	10

Source: Author

One producer group that actually belongs to the category of smallholders should be discussed separately. Due to their unique geographical situation, they stand out from other smallholders. The unusual quality of this producer group is that they live on a spit of land that lies between the Atlantic Ocean and a large lagoon in the Volta Region in the south-east of Ghana. Given the very limited amount of land on the spit, the favourable weather conditions and the irrigation possibilities, farming is very intense there. The farmland is divided into plots (with five plots equalling one acre) on which smallholders grow various vegetables in a well-planned production cycle. Typical vegetables are okra, tomatoes, onions, garden eggs and chilli.

According to interviews with four producer associations and two single smallholders in the Volta Region, producers of chilli for export are mainly men, too. Their school education is no better than that of other smallholders, but they are exceptionally highly-skilled vegetable producers. The size of their farms ranges from three to six acres, of which about a third to a half is used to produce chilli for the international market. Chilli is produced for the national market as well. Production follows good agricultural practices; tractors are not used, but irrigation is carried out, mostly in the form of sprinklers, and labourers are hired for harvesting. The production of chilli for the international market is conducted in the minor season when prices are higher.

The favourable conditions on the spit offer possibilities for farming systems that go beyond self-sufficiency, so that intense production is carried out year-round with a high market orientation. The smallholders do not engage in side business activities.

Another unusual quality in this region is the high frequency of well-organised producer associations. Altogether there are 26 organisations joined in one umbrella organisation. They have been operation for many years and were established with the goal of conducting joint marketing of the products and gaining better access to credit. Some associations already perform these tasks and have plans to buy the needed inputs jointly in the future in order to obtain a volume discount. The fact that the producer associations function so well is partially due to the financial support they receive from the districts.

Due to the comparative advantage of better production conditions, smallholders in the Volta Region enjoy relatively good living conditions compared with other traditional smallholders. This advantage is reinforced by the very good transport links in this area.

In the next stage in the chain, marketing, the actors are small companies located in Accra, with a high proportion of Asian businesses. 91 companies exporting chilli were registered

with the GEPC in 2003. They are mainly family businesses with only one to several employees. They export chilli in a package with other Asian vegetables. The exporters of chilli are organised in the Ghanaian Association of Vegetable Exporters described in Chapter 4.2.3, but export activities are undertaken individually. When exporters first entered the business, they came in touch with suppliers either through MOFA or through their own personal contacts. They identified their requirements, and when necessary MOFA officers supported smallholders with some technical training. Each exporter now has one to several regions in which several smallholders supply him. Different exporters work in the same regions, and smallholders supply more than one exporter.

Overseas independent brokers take the vegetable packages from the airport to wholesale markets where they are bought from wholesalers or retailers who further distribute them. Consumers are mainly individual households of Asian communities as well as the Asian catering trade.

d) Input output structure and profit distribution

In the interest of obtaining comparable figures, calculations are done per 5.5-kg export box. All calculations reflect non-weighted averages. The information about the inputs needed and the respective prices as well as about the yields and production costs are taken from the interviewed smallholders. From the ten interviewed smallholders all knew how much chilli they harvest per season but only eight could give an overview about their production costs. Information about the prices are then from smallholders and exporters. All could make statements about this. Calculations about the marketing stage couldn't be done because the exporters did not provide information about costs and profits. Some stated that profits fluctuate and sometimes disappear entirely. But since they sell chilli in a package with other vegetables, they would need to sell even if this results in losses. Others said that profits are quite good. Calculations for the marketing and consumption stages that take place overseas cannot be performed, as no data are available for them.

The input costs and the overall production costs shown in Table 18 reflect the average costs of the six smallholders. The inputs needed for production are again sold with a mark-up of 30%. From the given inputs, an average output of 200 boxes of fresh chilli/acre is recorded for one season, with one box weighing 5.5 kg. The standard deviation of the average is 20 boxes. Production costs include costs for seeds, inputs, land, land preparation and wages. The

standard deviation from average input costs given in Table 18 is 3,230 Cedis/ box (0.05 € kg).

Neither the costs nor profits of the exporter are known, but the average revenues from one box are according to the four interviewed exporters 38,000 Cedis (0.10 €/kg). The minimum average costs per box for the exporter are 25,000 Cedis (0.06 €/kg). Without considering costs for transport, packaging or the fixed costs of running the business, the average maximum profit for the exporter is thus 13,000/box (0.04 €/kg).

Table 18: Profit distribution in the international value chain of fresh chilli

<u>Calculations per 5.5 kilo Box fresh chilli</u>	Input	Production	Wholesale
Costs in Cedis	2,300	12,500	25,000
(Costs in Euro)	(0.21)	(1.16)	(2.31)
Revenues in Cedis	2,990	25,000	38,000
(Revenues in Euro)	(0.28)	(2.31)	(3.52)
Profits in Cedis	690	12,500	13,000
(Profits in Euro)	(0.07)	(1.15)	(1.21)
<u>Calculations per kg fresh chilli in Euro</u>	Input	Production	Wholesale
Costs	0.04	0.21	0.42
Revenues	0.05	0.42	0.64
Profits	0.01	0.21	0.22

Source: own calculations

These calculations show that if all costs for the exporter were taken into account, the highest profits are found in the production stage. But it must be kept in mind that although the profits/box of the exporter is lower, his overall profits are assumed to be higher given his higher turnover.

e) governance

Agrostores – **market coord.** - Trad. Smallholders – **modular governance** - Wholesalers/ - **market coord.** - Consumers
Retailers

Considering the five aspects relevant to the governance structure – product complexity, ability to codify information, suppliers’ qualification, the ratio of exporters to suppliers and the ratio of demand to supply – the following situation results.

The governance structure between input suppliers and smallholders is again market coordination, and, as in the other chains, market coordination is the governance structure between traders and consumers. More interesting is the governance structure between smallholders and exporters.

The product complexity of fresh chilli for the international market is higher than that of fresh chilli for the national market, as some particular specifications of the product and the production process exist, e.g. certain variety, unique looking fruits, etc. Nevertheless, the ability to codify necessary information remains high, so that any smallholder who can afford to invest in chilli production and is located within one day’s travel of Accra can theoretically supply chilli exporters. The required knowledge of production standards can be provided by other smallholders already supplying exporters and trained by extension officers from MOFA. The fact that exporters grow the other vegetables they export on their own farms but have outsourced chilli production due to a lack of the necessary know-how and experiences could lead one to construe that a relational governance structure between suppliers and exporters must exist. But, to the smallholders’ disadvantage, product complexity is not high enough and the ability to codify information is too high. The latter in particular leads to a situation in which the improved qualification of an original small group of smallholders can be acquired by other smallholders relatively easily, so that the group of smallholders increases in size and the ratio of exporters to smallholders decreases. This also applies to the ratio of demand to supply. Nevertheless, the ratios are better than in the traditional market, and since exporters receive orders for fixed quantities from abroad, at least some kind of arrangement is necessary for them to secure the supply. Due to these facts, a modular governance structure exists between suppliers and exporters.

e) Conclusions

The analysis of the value chain of fresh chilli for the international market shows again that product complexity plays an important role. In this chain the more complex product leads to a

situation were smallholders have stronger relationships to their buyers than on the traditional market but nevertheless remain in a weak position. This is in particular due to the fact of the high ability to codify information.

Integration into the value chain of fresh chilli for the international market bears the risk that surpluses will remain with the smallholders as supply occasionally exceeds demand. These surpluses can hardly be sold at the national market as demand for the export variety is only very low at the national market and with that prices are very low, too. With that the revenues necessary to cover production costs would be reduced.

But even given this risk and the relative weakness of the smallholders' position, integration into the value chain of fresh chilli for the international market has some positive aspects for them that outweigh the negative aspects. The weekly oral agreements offer smallholders more reliable and predictable income and cash flow, and since they can still produce for the national market as well, they have been able to diversify their sources of income. Furthermore, they have been able to achieve product and process upgrading to a certain extent through the improvement of their production skills.

The prospects for smallholders in the future do not appear as auspicious. One possibility would be that smallholders achieve further upgrading on their own. This can be process upgrading due to even more improved production techniques or intersectoral upgrading due to the supply of not only fresh chilli but also other export vegetables, too. No movement in this direction can be discerned at present in the production stage, and it is doubtful whether exporters would have an interest in intersectoral upgrading.

Upgrading possibilities for the chain as a whole that would benefit smallholders are likewise not to be expected. None of the exporters stated ambitions to enter new markets either in the form of exporting to other countries or in the form of exporting higher-valued products.

Finally, mention should be made of the smallholders in the Volta Region, whose situation is a bit different. As they are some of the only ones producing in the minor season, they have better arrangements with the exporters and gain the best prices. The fact that they all live in one small area is also advantageous. It is easier for them to be well organised and come up with common marketing strategies. All these facts give them at least some additional negotiation power.

4.4.3 The value chain of chilli paste

As the processor of the paste is the only interviewed person in this chain and information provided by him does not cover all details of the chain, and since the other actors in this chain are not the same ones operating in the other chains, the following description can only give a general overview of this chain. While it serves to complete the picture of the existing chains supplying the international market, the available data allows no detailed conclusions about the impact on smallholders. For the same reason, no profit calculation could be performed.

a) Technical structure

-----INPUT SUPPLY ---- PRODUCTION ---- PROCESSING ---- MARKETING ---- CONSUMPTION-----

The technical structure of the value chain of chilli paste for the international market is the same as the one of the chain for the national market, except that the product is traded elsewhere and it is packaged in different containers.

The single stages are input supply, cultivation of the chilli, processing of fresh chilli into paste, packaging, marketing and consumption.

Inputs are the same – pesticides and fertilisers – as in the other chains. Certified seeds of the variety MI 2 or Legon 18 are used. Additionally, equipment for building or maintaining irrigation systems is needed at least on occasion.

Production consists of the same activities as in the chain of fresh chilli for the export market, except that chilli is harvested in the ripe red state.

Processing and packaging of the fresh chilli is done mechanically at the processing plant. The packages for the national market are small aluminium packet with a capacity of 20g of chilli paste; for the international market, the paste is packaged in small plastic containers of 125g each.

80% of the produced quantity is sold overseas, and only 20% is sold in the national market. Marketing is done via the internet directly from the processor to the customer or through already existing marketing channels. In the local market, the paste is marketed directly from the processor to small and middle-sized supermarkets.

Paste is consumed as a sauce for several dishes or added to prepared sauces.

b) Territorial structure

The processor is the key individual in this chain. He is located in Takoradi, which lies in the south-west of Ghana; he operates in Takoradi because he exports the paste by ship and an international port is located in Takoradi. As fresh chilli used for the paste must be processed soon after harvesting, producers need to be located within one day's travel of the processor. Therefore they are found only in the southern part of Ghana. Some are located in the Volta Region, but most of them reside in the Western Region. Input suppliers are located in villages and towns near the production sites. As mentioned above, processing takes place at the processing plant in Takoradi. In the local market, supermarkets in all regions are supplied to promote the product. Internationally, the paste is mainly exported to Norway and in lesser quantities to the US and UK.

c) Actors

Agrostores ---- Outgrowers ---- Processor ---- Wholesaler/Retailer ---- Individual households/Catering trade

Input suppliers are again agrochemical stores. Producers are mainly out growers as well as some smallholders from the Volta Region who are described in Chapter 4.4.2. No further information is available about the out growers as they couldn't be interviewed personally. The processor prefers out grower schemes to buying from individual smallholders, as he wants to meet HACCP standards (an additional quality certification). He must therefore conduct his own monitoring and ensure retrace ability in order to guarantee a high-quality product to his customers. This can be achieved most efficiently with out grower schemes. Since the smallholders in the Volta Region are very well qualified, he also purchases their products.

The processor is a man of 45 years who is very well educated and speaks English fluently. Through his travels in Europe, he recognised a demand for chilli paste and registered his processing company with the FDB in 1995. Three years were needed for product design, and production then began in 1998. His processing company employs about thirty people when chilli paste is being produced; production is not done constantly, however, but only several times a year. Customers abroad come mainly from African communities; in the local market, customers generally buy chilli paste in small to middle-sized supermarkets.

d) Governance

Market coordination exists between input suppliers and producers and between the processor and customers as well.

The governance structure between producers and the processor is stronger. Product complexity is relatively high, and given that the ability to codify information is high and producers are well qualified, the structure is more than modular. As the processor is responsible for maintaining standards, he has to assume certain monitoring and control functions. He therefore buys only small amounts of chilli from individual smallholders, preferring out grower schemes in which producers depend on him. These facts lead to the assumption that a captive governance structure exists.

e) Conclusion

According to the little information available, only general conclusions in the form of assumptions can be made.

In out grower schemes, the integration into the chain is high. In cases where out growers are smallholders who formerly supplied the national market, it can be assumed that the impact of this integration on them has been positive, due to factors such as a higher qualification, higher profits and more reliable income and cash flow. But it is not known what risks the integration involves and how high opportunity costs are. In any event, since the raw materials for chilli paste for the national and the international market come from the same out growers, this chain provides no points of reference to determine which chain – national or international – benefits smallholders more.

5 Discussion of the results

After the detailed analysis of the different chains in Chapter four the results of it will be discussed in this chapter. It starts with a comparison of the chains according to the structure in which the chains are described above followed by executions about the meaning of the stated differences in regard to the hypothesis of the study.

The national market is not homogeneously so that it is not considered as one in the comparison but the three main important chains of fresh chilli, dry chilli, and modern chilli powder are taken into account individually. As chilli paste does not account for a high export quantity and existing information about this chain are not very detailed only the value chain of fresh chilli is considered for the international market.

5.1 Comparison of the chains

5.1.1 Comparison of the market situation

The market situation is important for an assessment of the significance of the market for chilli production and the future potential of chilli chains in the respective market. The key information required relates to demand, demand trend and product coverage. For a wider market assessment, which cannot be undertaken here, additional factors such as substitute goods, supply potential of competitors, etc. would be also necessary.

Table 19: Comparison between the national and the international market

	NATIONAL MARKET			INTERNATIONAL MARKET	
	Fresh chilli	Dry chilli	Chilli powder	World	UK
Demand	Not known by quantity			1,6 Mio. t	99,000 t
	high	high	low		
Demand trend	stable to rising	stable to rising	potential to rise	rising	rising

Source: own compilation, data from Trademap, 2005

Even concrete figures do not exist for the national market, it can be assumed that demand for chilli products in the national market exceeds the exported quantity of Ghana by far. For the single products on the national market, demand differs, as shown in Table 19. Even though concrete figures are again missing, it can be stated that chilli powder has the lowest demand at the present. With regard to the future potential of markets, it can be assumed that the demand in traditional national markets is stable to rising. This is due to an expected further increase in population, but also because consumption habits change and a certain share of demand can be expected to shift to the higher-quality and more processed products found in the non-traditional national market. The demand for non-traditional chilli powder can thus be expected to rise. In addition, this product has the potential to replace imported chilli powder. A positive demand trend can be discerned in the international market as well. With an annual growth of 10% in the years 1999 to 2003 (TradeMap 2003) and an initial demand of 1.6 Mio. t, the demand trend internationally and in the UK might even exceed the domestic potential for demand growth. The extent to which Ghana can profit from this increase still needs to be considered, however.

The product coverage that is supplied by Ghanaian producers is, at 5:2 products, higher in the national market.

5.1.2 Comparison of the technical structure

A comparison of the technical structure provides an initial overview of the single chains; this provides the basis for a comparison in regard to the concrete benefits for smallholders.

Table 20 gives an overview of the different stages and the activities within the stages. It shows that while for fresh and dry chilli only traditional value chains exist, a non-traditional chain has been established for chilli powder, in which an improvement of activities in the single stages has been realised. Nonetheless, there is still room for further improvement. The international market also includes improved activities in the single stages, such as better organisation of delivery. In the direct comparison between fresh chilli for the national and for the export market, the latter is the more sophisticated chain. But taking into account all chains in the national market, we find an equal level of sophistication in the chilli powder chain.

Table 20: Comparison of the technical structure of the different value chains

	NATIONAL CHAINS			INTERNATIONAL CHAINS
	Fresh chilli	Dry chilli	Chilli powder	Fresh chilli
Consumption	Traditional product of low – middle quality	Traditional product of low to middle quality	Higher quality product of improved chilli varieties	High quality products of improved chilli varieties
Marketing	Traditional markets with little planning and organisation	Traditional markets with little planning and organisation	Non-traditional markets, more planned and organised	Traditional market channels but supply of non traditional markets, well planned and organised
Processing	None	Traditional to little improved	Improved	None
Production	Traditional	Traditional	Improved according to good agricultural practices	Improved according to good agricultural practices, use of irrigation
Input supply	Local varieties	Local varieties	Improved varieties	Improved varieties

Source: own compilation

5.1.3 Comparison of the territorial structure

With regard to the initial question of the study, it is important to know where producers and purchasers are located to see if the distance between them is a possible entry barrier for integration into the respective chain, or if other problems may arise from distances between actors on the single stages, e.g. limited access to inputs. Therefore a comparison of the locations where actors potentially suitable for integration are found with the location of actors that are integrated into a chain is of interest. In Table 21, locations are divided into two categories: “A” (potentially suitable locations), and “I” (currently integrated locations).

Table 21: Comparison of the territorial structure of the different chains

		NATIONAL CHAINS			INTERNATIONAL CHAINS
		Fresh chilli	Dry chilli	Chilli powder	Fresh chilli
Inputs	A	In all towns and villages close to production sides			In all towns and villages close to production sides
	I				
Production	A	All BAR		All BAR	All BAR and all Southern Regions
	I			Areas close to Sunyani	Southern regions in a one day trip from Accra
Processing	A	None	All BAR	All BAR	None
	I			Sunyani	
Marketing	A	All BAR			World
	I				UK, Netherlands, Italy and Austria
Consumption	A	All BAR			World
	I	All BAR		Urban areas in BAR	UK, Netherlands, Italy and Austria

Source: own compilation

A difference between available and integrated locations only appears in two chains, chilli powder for the national and fresh chilli for the international market. In the chain of chilli powder, the difference appears at the production, processing and consumption stage; in the chain of fresh chilli it appears at the production, marketing and consumption stage. In the chain of fresh and dry chilli for the national market, distance to purchaser and distance to market are not important as the denseness of purchasers and traditional markets is very high.

These facts show that in the national market, at least for one chain, as well as in the international market, location in terms of distances to the purchaser does play a role. From the remarks made in Chapter 4.3.5, it can be concluded that, in the case of chilli powder, the maximum distance to the purchaser is determined by personal relationships. The suppliers of the processor were chosen due to the fact that personal relationships existed. If stronger relationships with more distant suppliers had existed, it can be assumed that they would supply the processor instead. Perishability of the product doesn't play a role as it is supplied in the dry state.

In the case of fresh chilli for the international market, distance to the purchaser as such is in fact important, as fresh chilli spoils quickly and needs to be exported the day it is harvested due to a lack of cooling facilities. But in this chain, the suppliers in the possible areas were than initially chosen according to the criterion of personal relationships.

5.1.4 Comparison of the actors

A comparison of the actors provides information about the various characteristics of the actors integrated into the different chains and of the number of actors in the single stages and as a whole.

Table 22: Comparison of the actors of the different value chains

	NATIONAL MARKET			INTERNATIONAL MARKET
	Fresh chilli	Dry Chilli	Chilli Powder	Fresh Chilli
Gender of producer	female			male
Level of education (MOFA information)	no to basic school education			no to basic school education
Supplier qualification	traditional skills	little improved drying skills	implementation of “good agricultural practice”	implementation of “good agricultural practice”
Size of farm (MOFA information)	1-4 acres			1-4 acres
Farm area grown with chilli	1 acre			1 acre
Workers for chilli production	sometimes daily labourers			daily labourers
Market orientation¹	low		rising	rising
Number of supplied markets	one		two	two
Non farming activities	none			none
General living conditions	low			low
Investment possibilities	yes			yes
Importance of chilli production²	high		high	high
Main problems	-availability of high quality seeds -low production skills -fluctuating demand and prices -changing weather conditions		-little demand -changing weather conditions	- decreasing ratio of exporters to suppliers

Source: own compilation

¹ for indicators of market orientation, the aspects considered were documentation of farming activities and knowledge about costs and revenues.

² % share of income is taken as the indicator of the importance of chilli production

These are important facts for conclusions about suppliers’ qualification, supplier’s position in a chain and integration possibilities, and if these are existing in a large scale or only for some smallholders. As the focus here is on smallholders, who account for the majority of chilli

smallholders in all chains, the following comparison only concerns smallholders. Table 22 summarises the results of the analysis of Chapter Four. It provides a comparison of the smallholders of the different chains on the basis of the interviews conducted. Where other sources are taken, this is mentioned in the table.

Table 22 shows that differences between national and export chains appear in six out of thirteen characteristics, that are gender, suppliers qualification, employed workers, market orientation, number of chilli products and problems.

For only one of this six characteristics the final market that is supplied is decisive for the different shaping, namely gender. This situation is found in other cases as well. Men mainly grow export goods whereas women are responsible for production for the national market.

The difference in the category of workers on chilli production is a difference that generally exists between the south and the north. Smallholders in the south supplying solely the national market hire daily labourers as well.

In the other categories – farming skills, market orientation, supplied chilli markets and problems – differences don't only exist between national and international chains but between the different national chains as well.

Differences in farming skills can be explained by differences in the final product of the respective chain. Since chilli powder and fresh chilli for the export market are more complex products, skills to supply these products must be improved. The same appears in the chain of dry chilli, but as quality awareness in traditional markets is not as high, the requirements to improve supplier qualifications are not as high, either. This correlation explains also the differences in the category problems. In the case of chilli powder and fresh chilli for the export market chilli producers have already managed to overcome problems in the production stage that smallholders in the value chains of fresh and dry chilli still face. Different marketing problems appear due to the different governance structures in the chain.

Indeed, market orientation depends on the final market that is supplied but can be increased through integration into export chains as well as through integration into chains supplying the non-traditional national market. The same occurs in the category of chilli markets supplied. Non-traditional markets as well as export markets offer smallholders the opportunity to supply an additional market.

It can be summarised from this comparison that differences exist between smallholders of the different chains, but that not all of them have been always been present; some arose with the integration of a certain chain. However, the change in structure is not mainly determined by

the final market that is supplied, but by the interaction of the final product and the final market.

Looking than at the number of actors in the single stages and the kind of actors involved in single stages, the following picture appears.

Smallholders in national chains are integrated into more stages of the chain than in the international chain. But it also must be taken into account that in the international market, only one chain exists and that this only has a very limited number of stages. Due to the same reason, supplemented by the fact that demand on the export market is less than on the national market fewer smallholders are integrated in the export market.

Figure 15 gives an overview of the relations. The differences in the ratio of purchasers to suppliers is shown through the symbols >, <. The symbol = stands for same persons at both stages.

Figure 15: Actors of the different value chains

PRODUCTION		PROCESSING		MARKETING	MARKET
fresh chilli smallholders		non >>>		fresh chilli wholesalers < retailers = smallholders	traditional
fresh chilli smallholders	=	drying smallholders	>>>	dry chilli wholesalers > retailers = smallholders	traditional
fresh chilli smallholders =		drying smallholders	>>>	grinding wholesaler = wholesaler < retailer	traditional
smallholders =		smallholders	>	processor = processor	non-traditional national
fresh chilli smallholders		non >>		fresh chilli export companies	non-traditional international

Source: own depiction

Figure 15 shows that the ratio of buyers to suppliers is most favourable in the value chain of chilli powder. This fact is reflected in the governance structure of this chain, which in comparison with the governance structure of the other chains is the most favourable to smallholders. The situation can be partially explained by the complexity of the final product. It is high in the value chain of chilli powder for the non-traditional market, so that a relatively high supplier qualification is required that only few smallholders possess to date. On the other hand, it must be taken into account that this chain is relatively new and has only just begun to be established in the market and become further developed. If it is successful, the ratio of buyers to smallholders may become less favourable for smallholders here as well.

5.1.5 Comparison of the governance structure

The governance structure gives information about the position of the smallholders in the chain and the relations between smallholders and purchasers and thus allows an assessment of the possibilities smallholders have to influence their position and the benefits that can be expected for smallholders according to the type of governance structure.

Table 23: Comparison of the governance structure of the different value chains

	NATIONAL MARKET			INTERNATIONAL MARKET
	Fresh chilli	Dry chilli	Chilli powder	Fresh chilli
Complexity of the product	1	2	4	3
Ability to codify information	4	4	3	4
Supplier capabilities	2	2	3 - 4	4
Ratio purchaser : supplier	1	1	4	3
Ratio of demand: supply	1	1	4	3
Governance structure	market coordination	market coordination	modular	modular
Impacts	NONE	none	-more reliable and predictable income and cash flow -diverse upgrading possibilities	-more reliable and predictable income and cash flow -diverse upgrading possibilities

Legend: 1= low; 4= high; 2 and 3 = grading between 1 to 4
4 in the case of suppliers' qualifications means well adapted to the complexity of the product.

Source: own compilation

Table 23 shows the different distinctions in the chains leading to a certain governance structure. The comparison of the governance structure is restricted to the governance structure that is of interest for the smallholders. These are the relations between the producers and the traders (in both the chain of fresh chilli and the chain of dry chilli) or between the producers and the processor who is simultaneously the trader for the processed product (chain of chilli powder).

The conclusion to be drawn from this table is the same as what other comparisons have already shown: Differences appear between national and export chains but between the different chains at the national market as well. The determining factor is not the supplied final market, but the interaction of final market and final product. With the rise of complexity of the final product, which can then be supplied to non-traditional markets, the possibility for stronger integration appears (compare explanations under the point governance structure at the analysis of the single chains). How it is then realised depends on other factors like the ratio of purchasers to suppliers, the ability to codify information, etc.

Stronger integration offers smallholder more benefits. In the case of chilli powder, as well as that of fresh chilli for the international market, smallholders have been able to improve their skills, the reliability of income and cash flow have increased and diverse upgrading possibilities exist.

5.1.6 Comparison of the profits

In this paragraph, the profits that smallholders realise in the different chains are compared to determine which chains offer the most benefits to smallholders with regard to income. A comparative overview according to the calculations done under the points profit distribution in the respective chapters is given in Table 24. For a better comparison all calculations are made per acre and on the basis of fresh chilli.

The calculations show that production costs are highest for the international market and are the same for all products for the national market. But prices are lowest in the international chain and highest in the chain of fresh chilli for the national market. Prices in the other two chains for the national market are lower than the latter price. With regard to prices, two aspects need to be explained. The first surprising feature is the very low price in the export market. Nevertheless, smallholders produce for the export market. One explanation is that they can hardly sell the export variety in the national market because demand for this variety is negligible and prices are even lower. When smallholders initially switched part of their

production to supply the export market despite the lower prices there, several factors may have played a role. At least for the group of smallholders interviewed, it can be assumed that they had a low market orientation and no calculations of the costs and profits of different chilli production systems were made. The switch to export production may have had a trial-and-error character rather than being the result of a well-calculated economic decision. And even though prices are lower, smallholders could still realise financial and even other benefits so that incentives for export production do exist even at low prices.

Table 24: Comparison of the benefits of smallholders in regard to the value chain

	NATIONAL MARKET			INTERNATIONAL MARKET
	Fresh chilli	Dry chilli	Dry chilli for chilli powder	Fresh chilli
Costs/acre in Cedis	1,040,000	1,040,000	1,040,000	2,500,000
in Euro	96.20	96.20	96.20	231.30
Prices/bag fresh chilli in Cedis				
	353,000	235,000	238,000	175,000
in Euro	32.60	21.70	22.00	16.20
Yields in maxi bags/ acre	10 (est. 367kg)	10 (est. 367 kg)	10 (est. 367 kg)	29 (est. 1065 kg)
Revenues/acre in Cedis	3,530,000	2,350,000	2,380,000	5,075,000
in Euro	326.50	217.00	220,20	469.40
Profits/acre in Cedis	2,490,000	1,310,000	1,340,000	2,575,000
in Euro	230.30	120.80	124.00	238.10

Source: own calculations

The second surprising price is that of dry chilli being sold in the non-traditional market. One might have assumed that dry chilli is sold for 2.5 times the price of fresh chilli because the ratio of fresh to dry chilli is 2.5:1. But the markets do not reflect this ratio in the prices, so that processing of fresh to dry chilli is actually a money-losing business compared to selling chilli in the fresh state, as yields are not higher than in the chain of fresh chilli. As information about prices are reliable, the explanation that can be given for this situation is the lack of information transfer and traditional established production areas. Therefore one finds regions where mainly fresh chilli is produced and regions where mainly dry chilli is produced. In both

areas, the other chilli product could be produced but this does not occur. The production habits are reflected in consumption habits, too. Awareness of the loss is virtually non-existent. All eight interviewed smallholders producing dry chilli were not aware of this gap or did not view it as a problem that needs to be changed. Therefore, there are no incentives to change production or to do something about the prices. Prices for dry chilli in the non-traditional chain are equally low, because they are oriented towards the general prices of dry chilli.

Looking at the yields, the best results can conversely be found in production for the international market. They are more than twice as high as yields in the chain of fresh or dry chilli.

The stated yields and prices lead to profits that are highest in the chain of fresh chilli for the international market, followed by the chain of fresh chilli for the national market and then by the chain of chilli powder. The chain of dry chilli is the least profitable.

But it needs to be considered that production costs and yields in the chain of chilli powder are not known. The data taken in the above calculation reflects the information of the two other chains of the national market. But due to improved production skills and the usage of improved seeds it can be assumed that production costs as well as yields rose. Therefore additional calculations are carried out to show two other scenarios that might be more realistic.

Table 25 shows the first possible scenario. It reflects the situation of smallholders if production costs as well as yields in the chilli powder chain would be the average production costs and average yields of the two other national chains and the export chain.

Table 25: Average profits in the value chain of chilli powder

	Cedis	Euro
Costs/acre	1,770,000	163.70
Prices/bag fresh chilli	238,000	22.00
Yields in bag/acre: 19,5		
Revenues/acre	4,641,000	429.30
Profits/acre	2,871,000	265.60

Source: own calculations

In this case, smallholders integrated into the chain of chilli powder would already have the highest profits of all. Even with yields one bag lower, their profit would remain higher than in the export chain of fresh chilli.

In the second scenario it is assumed that smallholders in the chilli powder chain have the same production costs and the same yields as smallholders in the export chain as in both chains improved skills and usage of improved seeds are implemented. Table 26 shows the result.

Table 26: Profits in the value chain of chilli powder at higher production costs

	Cedis	Euro
Costs/acre	2,500,000	231.30
Prices/bag fresh chilli	238,000	22.00
Yields in bags/acre: 29		
Revenues/acre	6,902,000	638.40
Profits/acre	4,402,000	407.10

Source: own calculations

These deviating calculations allow the assumptions that profits for smallholders in the chain of chilli powder are at least as high as for smallholders in the international value chain of fresh chilli.

It can finally be concluded that financial benefits for smallholders are not inevitably higher in the international market than in the national market. The chain of chilli powder shows that integration into national chains may even result in higher financial benefits. A comparison of the two chains of fresh chilli yields a similar result. Although a higher average profit is calculated for the international chain, the relatively small difference between the profits in both chains allows one to assume that fluctuating market prices at times lead to smallholders in the national value chain making as good or even higher profits.

5.2 Results of the hypothesis

In the following the results of the comparison are taken to review the hypothesis and come to the final conclusions.

5.2.1 Benefits for smallholders

The first hypothesis was that the international chain offers additional benefits to smallholders.

Benefits were characterised as

- higher income
- diversification of income sources
- more reliable income
- flow of cash money
- upgrading

A comparison of the value chains with regard to benefits for smallholders clearly demonstrates two things that already appeared in the above general comparison of the analysed value chains. Important differences that influence the benefits to smallholders always exist between the national and the export value chain of fresh chilli, but they also always exist between the national chain of fresh chilli and the one for chilli powder as well. This shows that it cannot be generally stated that integration into a value chain for the international market offers more benefits. Higher benefits for smallholders depend more on the strength of integration, which is itself determined by different factors. In the chilli sector of Ghana, the strongest integration is found in the international chain of fresh chilli as well as in the national chain of chilli powder. The latter even offers a stronger integration at present and with that offers smallholders the most benefits. The following statements can be made about the individual benefits.

Higher income cannot generally be reached through the integration into the value chain of the international market. The average income in the international chain is in fact higher than in the corresponding chain of fresh chilli for the national market, but it is reached through higher yields and not through better prices. As prices fluctuate, at times when they are high in the national market and low in the international market, smallholders might than gain more profits from production for the national market. Moreover, the value chain of chilli powder can be assumed to already offer higher profits.

Diversification of income can also be reached in chains for the national as well as in chains for the international market. The value chain of chilli powder and the value chain of fresh chilli for the international market offer smallholders the possibility to supply two different chilli markets.

Benefits in the form of a more reliable income source play a role in the national and the international market. The stronger integration into the value chain of chilli powder and of fresh chilli for the international market leads to a higher reliability of income from chilli production. The same situation appears for cash flow. In all cases, purchasers pay in cash, but as the selling of products is more secure in the chain of chilli powder and the chain of fresh chilli for the international market, cash flow is more regular and predictable in these chains. In both cases benefits are higher in the value chain of chilli powder.

Regarding upgrading possibilities it can be stated that all chains offer smallholders the chance to upgrade. But the possibilities to take advantage of this chance differ. In the chain of chilli powder and the chain of fresh chilli for the international market, upgrading was required and supported by the purchasers. Without that pressure from the market side, smallholders lack the incentive and the intensive support to exploit the existing possibilities. Future upgrading possibilities are estimated to be best in the value chain of chilli powder.

5.2.2. Entry barriers

The second hypothesis concerning entry barriers was that entry barriers to integration into the international chain are higher. As entry barriers the following were defined:

- product quality
- product quantity
- frequent supply
- initial qualification
- distance to market
- production costs

Comparing the value chain of fresh chilli for the international market with the corresponding chain of fresh chilli for the national market, one finds that entry barriers are indeed higher. But with respect to all value chains in the national market, this does not apply across the board. Entry barriers depend on the requirements of the purchaser on the one hand and, on the other hand, on what one could call product specifications. Both vary not only between the national and the international market but between the single chains for the national market, too. In fact, the requirements and product specifications in the value chain of chilli powder and the international value chain are very similar; therefore entry barriers for these two chains are similar as well and generally higher than for the two other national chains. Comparing

these two chains the entry barriers are highest at the chain for chilli powder. Assessing the barriers one by one, one encounters the following situation.

Product quality can be an entry barrier to integration into the value chain of fresh chilli for the international market as well as in the case of the chain of chilli powder. In both cases, the product quality required by the purchaser is higher than the quality usually produced. In the international chain, suppliers' ability to adapt their production to the higher requirements is high but in the chilli powder chain the needed qualification is harder to acquire. Product quality is thus at present an entry barrier only in the latter case, but even there it is not the most important one.

Product quantity is not an entry barrier at all. None of the chains require a minimum supply beyond the capacity of smallholders.

The same applies to frequent supply. Since in the international enough smallholders supply the purchasers and transaction costs to procure products from several suppliers are low, no frequent supply is required. In the chilli powder chain enough suppliers exist as well as demand is not very high at present. Therefore frequent supply is not an entry barrier.

Initial qualification is also not an entry barrier. The analyses showed that smallholders integrated into the international value chain and into the value chain of chilli powder were no better qualified than others were when they became integrated into the chains. Improved skills were acquired through the integration itself.

Distance to market or, to be precise, distance to the purchaser is an entry barrier, in particular in the international chain. This is due to the fact that fresh chilli is exported, which spoils quickly. In the value chain of chilli powder, market distance is an entry barrier, but not the most important one. Along with distance, transport links are also a factor. Again, this is more important for the international chain as purchasers there must visit several suppliers every day. In the chain of chilli powder, the dry chilli can be supplied in bulk at irregular intervals so that even limited transport links would be possible although not favourable.

Production costs for the international market are higher, and they are assumed to be higher for the chain of chilli powder as well. But as all smallholders claimed to have investment possibilities and none of the smallholders mentioned the higher costs as a problem, it is not seen as an entry barrier here.

Besides the entry barriers that were assumed in the hypothesis, an additional and important entry barrier appeared during the field survey: personal relationships. They cover relations between suppliers and purchasers, suppliers and extension officers and among suppliers themselves. All initial business relationships in the international chain and the chain of chilli

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powder developed on the basis of personal contacts. Only smallholders who were well known by the respective extension officer, the exporter himself or the processor of chilli powder were initially invited to be integrated in the chain. In the international chain, the spread of suppliers then occurred on the basis of personal relationships between the first suppliers and other suppliers. In cases like the chilli sector in Ghana, where markets are not transparent and information is only spread through personal relationships, they become extraordinarily important. Therefore they can be seen as the main entry barrier to integration into newly emerging chains.

6 Conclusions

This study was based on two questions. The first question as to whether integration into international value chains offers more benefits for smallholders has already been answered. The case study of the chilli sector in Ghana shows that integration into international value chains may offer additional benefits compared to national value chains, but that the same benefits can also be reached through integration into improved national value chains. The main reason for this, as shown in the case study, is the tight interaction between the type of final product and the final market that is supplied and the possible benefits for smallholders. Final market is not understood here as the difference between national and export markets but as the difference in the final retail market, which can be traditional markets, direct wholesaling to the catering trade, or non-traditional markets such as supermarkets, which differ in their standards as well. In the case of fresh chilli for export as well as in the case of chilli powder, one finds a complex and relatively high-quality product supplemented by a retail market with higher standards. Through this interaction, additional benefits can be realised. As chilli powder is even more complex and the final retail market has a higher standard, benefits are higher in that chain.

Along with this finding, the governance structure also plays a prominent role. The more complex the final product and the higher the standard of the final markets, the higher the requirements for the individual stages in the chain become and the higher the initial need is for governance that goes beyond market coordination. But only when suppliers are well qualified can they attain a strong position in the chain through which additional benefits can then be realised.

With regard to barriers to integration, it has already been stated that barriers exist primarily in the international chain and the chain of chilli powder, with the latter having the highest benefits. Here again, product complexity plays an important role. The more complex the product, the higher the required supplier qualifications are. And the higher the required qualification, the more difficult it becomes for smallholders to adopt these qualifications. Therefore the chain of chilli powder has the highest entry barriers, since it is the most complex product. In this case, personal relationships play an even more prominent role. But this is due to special circumstances that are not generally applicable.

Higher entry barriers can be a chance and a hindrance: a chance to secure the benefits for those who are already integrated and a hindrance to participate and achieve potential benefits for those who are not yet integrated. In the case study, the entry barriers of the international chain are not high enough to hinder other smallholders being integrated. The already

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integrated smallholders must thus be aware of the competition to prevent erosion of their benefits. Meanwhile, the entry barriers of the chilli powder chain are relatively high at present so that the already integrated smallholders are in a relatively secure position.

These findings lead to the following conclusions. As it is shown that for one and the same product entry barriers are higher in the export market and entry barriers rise with the complexity of the final product, but that possible benefits for smallholders also rise with product complexity, it can be concluded that the national market offers smallholders more benefits than the export market.

In general terms, this is buttressed by the fact that increasing world trade that is assessed as a new chance for developing countries has yet to have a positive impact on sub-Saharan Africa. Even though new trading possibilities have emerged, Africa still remains primarily a raw material exporter and has managed, with few exceptions, to diversify neither its range of export products nor its export destinations.

Nevertheless, or precisely because of this, the second question of this study – whether the promotion of the integration of the poorer population, such as smallholders, into the value chains is a useful instrument at all in development cooperation to promote large-scale pro-poor growth – must be answered in the affirmative.

With the assumption that international trade is a chance for pro-poor growth and that trade is conducted to a large extent through value chains, it becomes necessary for development cooperation to take up the value chain approach to secure the positive impact on poor population sections.

Beyond this, the case study shows that the value chain approach, albeit developed to explain the course of international value chains, can well be employed to explain the development of national value chains. Even though observers and actors today stress the importance of international trade, the adaptation of the value chain approach to national concerns, as is currently the case in German development cooperation, becomes increasingly important as well. It can be criticised that current value chain research focuses solely on the international market and disregards the potential of the national markets. The implementation of the value chain approach in development cooperation fills this gap. With rising quality awareness and the establishment of high-standard retail markets in developing countries, well-structured and effective working value chains are needed in their national markets, too. The support of existing and newly emerging value chains can have several positive impacts on pro-poor growth. One is that know-how transfer and technical support help to establish value chains that function effectively and have high-quality final products. Secondly, with the knowledge

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of how value chains need to be structured to have positive impacts on poor population sections, value chain development can be supported in a very targeted way to ensure that poor population sections really realise the possible benefits. A third point that also came up in the case study is that given appropriate incentives, smallholders do have the ability to improve their production skills and become integrated into more highly valued chains. The example of chilli powder shows that supporting this value chain and supporting the integration of smallholders have a positive outcome that can be further increased. This value chain has the chance to supply the high-quality market inside Ghana and replace imports. For this to occur, a high number of qualified suppliers are required. This offers a chance for many rural smallholders currently producing under worse conditions for traditional markets.

This shows that intervention points for development cooperation do exist. The main problems that emerged during the field study were missing incentives combined with the lack of organisation between the single actors in the sector who indeed want to take the initiative, along with insufficient support services at all stages. Development cooperation can play an active role in overcoming these problems and supporting new value chains that integrate a large number of traditional smallholders and thereby promote pro-poor growth. Besides supporting an improvement of the framework conditions, development cooperation can push for the improvement of producers' qualification and thus reduce the necessary investments of processors and buyers, internationally as well, so that Ghanaian producers can become more attractive. The case of the international value chain of fresh chilli verifies this. Asian exporters came to Ghana and outsourced chilli production from their own plants as Ghanaian producers were able to offer good basic knowledge that could be adapted to the needs of the exporters without high investments.

Keeping this entire in mind, what prospects can be discerned for the chilli sector in Ghana?

The results show that development cooperation should not concentrate on certain markets but rather on certain products. An assessment needs to be made as to which products are complex enough to call for stronger governance offering upgrading possibilities for smallholders, but not so complex that smallholders might not be able to fulfil the requirements or that governance structures affect smallholders negatively by making them overly dependent. From the range of identified products, the ones for which the highest market potential can be expected should than be supported.

In the case study of Ghana, products with a high market potential are found in the international as well as in the national market. For the latter, demand for high-quality products in the growing urban areas can be expected to increase. Particularly in the southern regions

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where supermarkets now sell imported chilli products, national producers have a chance to replace these with their own products. But at present, entry barriers still exist for national value chains in this market. The particular challenge is not only to secure uniform high quality but also to adapt the product design to the market requirements of these markets.

In the case of the international market, it would be worthwhile to undertake a market survey to determine for which other chilli products Ghana has comparative advantages and/or which other international markets for fresh chilli Ghana might be able to supply. As an initial export infrastructure already exists, it would be beneficial to further utilise it.

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Annex

Annex 1: Questionnaire for chilli producers

Date:

Interview Number:

A Chilli production

1. Name of the producer, sex and age:
2. District:
3. What kind of chili products do you produce?
 - 3.1 fresh chilli, specify variety:
 - 3.2 dry chilli, specify variety:
 - 3.3 both, specify variety:
 - 3.4 other, please specify:
4. Which markets do you supply?
 - 4.1 national market
 - 4.2 export market
 - 4.3 export and national market (please specify which market is more important)
5. How did you learn about chilli cultivation?
 - 5.1 family
 - 5.2 extension/training (please specify from whom)
 - 5.3 school education/apprenticeship
 - 5.4 learning by doing
 - 5.5 other (please specify)
6. How often do you harvest in one season (frequency in days per season and length of the season)?

ANNEX

7. How much do you harvest per season (in maxi bags. respectively 5.5 kg boxes/season)?
8. Where do you get your seeds from?
 - 8.1 from own plants (please specify how you choose them)
 - 8.2 buy the seeds (please specify from where and what the prices are)
9. Do you use any other inputs (chemical inputs, tractors, hired labor, irrigation, etc.)?
 - 9.1 yes (please specify which, how much and where you buy them)
 - 9.2 no
10. How much do you pay for the amount of inputs you need in one harvest (please specify in regard to the different inputs)?
11. Do you do any kind of documentation in regard to farming activities (pesticide usage, amount of chilli harvested, etc.)?
 - 11.1 yes (please specify):
 - 11.2 no
12. What are your overall production costs or chilli (calculated per acre and season)?
13. What are your revenues from chilli (calculated per acre and season)?

B Marketing of chilli products

1. Where do you sell your products?
 - 1.1 from farm gate to wholesalers/exporters.
 - 1.2 other (please specify)
2. Which requirements do wholesalers/exporters have?
 - 2.1 certain variety (please specify)
 - 2.2 frequent supply
 - 2.3 minimum supply of x boxes

- 2.4 other

- 3. How did you first come in contact with the wholesaler/exporter?
 - 3.1 through other family members
 - 3.2 through neighbours
 - 3.3 exporter contacted me
 - 3.4 other

- 4. When are the seasons for chilli?
 - 4.1 scarce season:
 - 4.2 abundant season:

- 5. What are prices in the scarce season (per maxi bag and bucket, respectively per 5.5 kg box)?

- 6. What are prices in the abundant season (per maxi bag and bucket, respectively per 5.5 kg box)?

- 7. Who is setting this price, how are you informed about it?

- 8. How do you transport your chilli from the fields to your farm and what does it cost?

- 9. Is chilli graded according to the quality?
 - 9.1 yes (please specify how and the differences in prices)
 - 9.2 no

- 10. How much of your income comes from chilli production?
 - 10.1 nearly all
 - 10.2 three quarter
 - 10.3 half of the income
 - 10.4 one quarter
 - 10.5 less than one quarter

- 11. Do you have other income sources than farming?
 - 11.1 yes (please specify)

11.2 no

12. Do you have the possibility to invest in the chilli production?

12.1 yes (please specify from which financial resources)

12.2 no

C Framework conditions

1. Are you a member of a producer organisation?

1.1 yes (please specify their function)

1.2 no (please specify why not)

2. Are there any service provider in your environment from which you can have any kind of support?

2.1 yes (please specify from whom and which kind of support)

2.2 no

3. Did you ever participate in an extension program?

3.1 yes (please specify when and which)

3.2 no

4. What are your biggest problems concerning chilli production?

4.1 production problems (please specify)

4.2 marketing problems (please specify)

4.3 other issues (please specify)

5. What are your benefits from supplying the export market?

5.1 higher income

5.2 diversification of income sources

5.3 more reliable income

5.4 more regular cash flow

5.5 other (please specify)

Annex 2: Questionnaire for chilli producers

Date:

Interview Number:

A General situation

1. Name, sex and age:
2. District:
3. What kind of chili products do you sell?
 - 3.1 Fresh chilli, specify variety:
 - 3.2 Dry chilli, specify variety:
 - 3.3 Both, specify variety:
 - 3.4 Other, please specify:
4. Do you sell products other than chilli?
5. Do you have other income sources as well?
6. Are you a member of a trader association?
 - 6.1 yes (please specify their function)
 - 6.2 no (please specify why not)

B Chilli marketing

1. Where do you get your products from (please name the districts, too)?
 - 1.1 single smallholders at their farmgate
 - 1.2 single smallholders at the market
 - 1.3 wholesalers at the market
 - 1.4 other
2. Do you always buy from the same suppliers?
 - 2.1 yes (please specify kind of contract)

ANNEX

- 2.2 no (please specify why not)

3. Do you have special requirements?
 - 3.1 variety
 - 3.2 frequent supply
 - 3.3 minimum supply of x boxes
 - 3.4 other (please specify)

4. Do you weigh the chilli?
 - 4.1 yes
 - 4.2 (no, please specify why not)

5. Do you have storage possibilities?
 - 5.1 yes
 - 5.2 no

6. When are the seasons for chilli?
 - 6.1 scarce season:
 - 6.2 abundant season:

7. What are purchasing and selling prices in the scarce season (per bucket and maxi bag, respectively 5.5 kg box)?
 - 7.1 purchasing prices
 - 7.2 selling prices

8. What are the purchasing and selling prices in the abundant season (per bucket and maxi bag, respectively 5.5kg box)?
 - 8.1 purchasing prices
 - 8.2 selling prices

9. How many buckets are one maxi bag?

ANNEX

10. How often do you buy and sell chilli?

11. How much chilli do you sell per day?

12. Where and to whom do you sell chilli?

12.1 only on this market to

12.2 on other markets to

12.3 other

13. How do you transport the chilli to the place of selling and what does it cost?

14. Do you have to pay stand fee or taxes?

14.1 yes

14.2 no

15. What is your profit margin per bucket or maxi bag, respectively 5.5kg box?

16. Is chilli graded according to the quality?

16.1 yes (please specify how and the differences in prices)

16.2 no

Annex 3: Questionnaire for chilli processors

Date:

Interview number:

A Business information and purchase

1. Name, sex, age and school education

2. What products do you process?
 - 2.1 dry chilli
 - 2.2 chilli powder
 - 2.3 other

3. How did you come into this business?

4. Do you have other income sources?
 - 4.1 yes (please specify)
 - 4.2 no

5. Do you have employees ?
 - 5.1 yes
 - 5.2 no

6. Are you a member of a processor or any similar association?
 - 6.1 yes
 - 6.2 no

7. Where do you get your raw materials from (please name district, too)?
 - 7.1 single smallholders at their farmgate
 - 7.2 other

ANNEX

8. Do you always buy from the same suppliers?
 - 8.1 yes
 - 8.2 no

9. How did you come first in contact with your suppliers?

10. Do you have special requirements for your suppliers?
 - 10.1 yes, please specify
 - 10.2 no

11. How much do you pay per bucket/maxi bag?

B Marketing and processing

1. How (use of technology, input: output relation) do you process the raw material?

2. Do you weigh your products?
 - 2.1 yes
 - 2.2 no

3. How do you do the packaging (kind of packaging)?

4. Do governmental requirements exist?
 - 4.1 yes (please specify)
 - 4.2 no

5. To whom do you sell your products (please specify region)?

6. What are the prices per unit chilli powder?

ANNEX

7. What are the consumer preferences, are there special requirements?
 - 7.1 yes (please specify)
 - 7.2 no

8. What is your profit margin per unit chilli powder?

9. How much do you buy and per week?

10. Do you have storage possibilities?
 - 10.1 yes
 - 10.2 no

11. Do you have possibilities to invest in the processing?
 - 11.1 yes (please specify)
 - 11.2 no

12. Do you get any kind of support?
 - 12.1 yes (please specify)
 - 12.2 no

13. What would you mention as your biggest problems in processing?