Value Chains for Rural and Regional Development: The Case of Cotton, Wheat, Fruit and Vegetable Value Chains in the Lower Reaches of the Amu Darya River, Uzbekistan

Von der Wirtschaftswissenschaftlichen Fakultät

der Gottfried Wilhelm Leibniz Universität Hannover

zur Erlangung des akademischen Grades

Doktorin der Wirtschaftswissenschaften

– Doctor rerum politicarum –

genehmigte Dissertation

von

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geboren am 12.07.1978 in Urgench (Uzbekistan)

2008

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Tag der Promotion : 13.03.2008

Zusammenfassung

Usbekistan ist ein Agrarland, dessen Ökonomie stark von landwirtschaftlicher Produktion auf bewässerten Feldern und der Agrarindustrie abhängig ist. Der größte Teil der Industrieproduktion ist auf die Landwirtschaft, insbesondere den Baumwollsektor, ausgerichtet. Die usbekische Regierung hat weit reichende Agrarreformen eingeführt, einschließlich der Privatisierung von landwirtschaftlichen Betrieben, einer Liberalisierung des Handels sowie der Entwicklung von Dienstleistungen zur Unterstützung der Landwirte und zusätzlicher Verarbeitungskapazitäten. Weitere Verbesserungen im landwirtschaftlichen Sektor und in der weiter verarbeitenden Agrarindustrie sind nichtsdestotrotz notwendig. Die Verarbeitungskapazitäten sind in ganz Usbekistan nicht vollständig ausgelastet, und das Land ist bezüglich des Devisenzuflusses weiterhin vor allem vom Baumwollfaserexport abhängig, obgleich sich das Exportmuster heutzutage langsam ändert und z.B. Gasexporte einschließt. Die Erfahrung vieler Länder hat gezeigt, dass bei einer hohen Abhängigkeit vom Rohstoffexport und wenig verarbeiteten Agrarerzeugnissen - infolge von instabilen Weltmarktnachfragen und –preisen – ein erhöhtes Risiko einer Finanzkrise besteht. Demgegenüber stellt der Export landwirtschaftlicher Produkte mit einer höheren Wertschöpfung Möglichkeiten für eine geographisch dekonzentrierte und nachhaltige Entwicklung dar.

Zweck der vorliegenden Forschungsarbeit ist es daher, durch Erfassung und Abbildung der Wertschöpfungsketten von Baumwolle, Weizen, Obst und Gemüse ein umfassendes Bild des gegenwärtigen Status Quo und der voraussichtlichen Entwicklung der Agrarindustrie in der Region Khorezm in Usbekistan zu zeichnen. Die grundlegenden Forschungsziele umfassten vor allem die Quantifizierung des wirtschaftlichen Entwicklungspotentials der Agraindustrie, sich weiterzuentwickeln und zu erhöter Wohlfahrt des Staates, der Menschen und der Umwelt beizutragen. Diese Studie stellt die erste Analyse dieser Art in der Region dar, die zeigt, welche Sektoren der Agrarindustrie das größte Potenzial haben, in welchen Bereichen Hindernisse für Wachstum, Entwicklung und Modernisierung liegen und was für einen Einfluss Reformen innerhalb der Wertschöpfungskette hätten. Um den Zielsetzungen der vorliegenden Forschungsarbeit zu entsprechen, wurde sowohl der Wertschöpfungskettenansatz verwendet, der Institutionen-, Funktions- und Finanzanalysen sowie ökonomische und vergleichende Untersuchungen einschloss, als auch ein Benchmarking von Leistungsindikatoren der Wertschöpfungsketten mit vergleichbaren Länder. Um die Auswirkung von Reformen abzuleiten, wurden verschiedene Szenarien simuliert und deren Ergebnisse analysiert. Dies ermöglichte die Entwicklung von Politikempfehlungen.

Die Baumwoll-Wertschöpfungskette (BWK) spielt eine wichtige Rolle in der regionalen Wirtschaft von Khorezm. Im Jahr 2005 erzielte die BWK 16 Prozent des regionalen BIP und nahezu 100 Prozent der Gesamtexporteinnahmen von Khorezm. Es konnte zudem eine Wertschöpfung von 79 Millionen USD erwirtschaftet werden und beinhaltete marktorientierte Produktionszielsetzungen. Die Gesamtmenge der Subventionen, die in die BWK einflossen, war etwas kleiner als die gesamten Steuern, die dem Staat aus der BWK zuflossen. Die Ergebnisse dieser Forschungsarbeit zeigen, dass der Baumwollsektor der Regierung einen ökonomischen Nettogewinn eingebracht hat – wenn auch in einem geringeren Ausmaß als erwartet.

Die Weizen-Wertschöpfungskette (WWK) dient hauptsächlich der Ernährungssicherung und wird durch den Staat weniger kontrolliert als die BWK. Die vorliegende Arbeit zeigt, dass der Beitrag der WWK zur wirtschaftlichen Leistung der Region Khorezm bezogen auf den Beitrag zum regionalen BIP im Vergleich zur BWK eher moderat ist. Die Subventionen, die in die WWK flossen, übertrafen die Steuereinnahmen, was zeigt, dass die WWK generell wenig profitabel ist.

Die Forschungsergebnisse zeigen zudem, dass die Wertschöpfungsketten für Obst und Gemüse, die während der Sowjetära sehr gut entwickelt waren, in den letzten Jahren an komparativem Vorteil verloren haben. Zurzeit sind diese Ketten weit weniger entwickelt als früher. Heutzutage lassen sich die Wertschöpfungsketten durch kurze Landwirt-Markt-Verbindungen, eine schwach entwickelte verarbeitende Industrie und den Mangel an Ressourcen charaktersisieren.

Die Ergebnisse der vorliegenden Arbeit zeigen auch, dass die weiter verarbeitende Agrarindustrie ein großes Potenzial hat, sich aber weiter entwickeln muss, insbesondere durch die Nutzenmaximierung vorhandener Kapazitäten.. Die meisten Probleme innerhalb der Wertschöpfungsketten enstehen aufgrund von Informationsasymmetrien, Mangel an vertikaler Koordination und unausgeglichener Verhandlungsstärke der Akteure innerhalb der Wertschöpfungskette. Aufgrund weitreichender Marktbeschränkungen und bürokratischer Barrieren wird die vorhandene Produktionsmittelausstattung von Khorezm nicht effizient genutzt, weshalb die derzeitige Leistungsfähigkeit geringer ist im Vergleich zu anderen Ländern. Ein Anstieg in der lokalen Weiterverarbeitung von Baumwollfasern und der Export von Textilprodukten mit entsprechend höherer Wertschöpfung würden zwei Folgen für Khorezm haben: Erstens würden sich die Exporteinnahmen nahezu um das zweifache auf die Summe von rund 165 Millionen USD verdoppeln. Zweitens zeigen die Ergebnisse, dass das Niveau der derzeitigen Exporteinnahmen aufrecht erhalten werden kann, sogar mit weniger Rohbaumwollherstellung, einer Verringerung der Anbauflächen von Baumwolle und

letztendlich reduzierten negativen Auswirkungen auf die Umwelt. Die Senkung von Transaktionskosten, eine Förderung enger Beziehungen unter den Teilnehmern der Wertschöpfungsketten, die Modernisierung von Technologien und die Etablierung leistungsfähiger institutioneller Rahmenbedingungen könnten die Landwirtschaft sowie die Agrarindustrie zu Trägern eines dauerhaften, breit aufgestellten und ökologisch nachhaltigen Wachstums in der Region machen.

Schlüsselwörter: Wertschöpfungskettenanalyse, Baumwollsektor, ländliche/regionale Entwicklung, Usbekistan

Abstract

Uzbekistan is an agrarian country, with an economy heavily dependent on agricultural production from irrigated arable land and the agro-processing industry. Most of the industrial production is agriculture-oriented, including the production of cotton harvesters and other agricultural machinery, ginning and textile equipment, chemical fertilizers and pesticides. The government of Uzbekistan has introduced wide-ranging agricultural reforms, including farm privatization, trade liberalization, and development of agricultural support services and processing capacities. Despite the achieved progress since independence, there remains significant room for further improvement in the agricultural sector and agro-processing industry. The processing capacities throughout Uzbekistan are underutilized, and the country continues to depend on the export of cotton fibre for currency inflow, albeit nowadays the export pattern is changing slowly to include export of gas for example. The experience from many countries has shown that a high dependence on the export of raw minerals and slightly processed agricultural products has exposed these countries to a higher risk of a financial crisis owing to unstable world market demands and prices. In contrast, the export of agriculture-based products with higher value-added, presents possibilities for a geographically de-concentrated development, including population groups affected by poverty.

The purpose of this research has, therefore, been to provide a comprehensive picture of the current status and development prospective of the agro-processing industry in the Khorezm region of Uzbekistan, by capturing and mapping the value chains of cotton, wheat, fruits and vegetables. The primary research objectives included the quantification of the economic potential of the agro-processing industry to develop further and contribute to increased welfare of the state, people, and environment. This study presents the first analysis of this kind in the region to demonstrate which sectors of the agro-processing industry have the greatest potential; what are the obstacles and barriers to growth, development and upgrade; and what would the impact of reforms in value chains bring. To meet the research objectives, the value chain approach was employed, which included institutional, functional, financial, economic and comparative analyses as well as benchmarking of performance indicators of the value chains with counterparts from other countries. To assess the impact of reforms, various scenarios were simulated and analyzed, thus allowing policy recommendations to be developed.

The cotton value chain (CVC) has played an important role in the regional economy of Khorezm. In 2005, it contributed as much as 16 percent to the regional GDP, earned virtually 99 percent of the total export revenues of Khorezm, created value added worth USD 79

million, and had market-oriented production objectives. The total amount of subsidies provided to the CVC were slightly less than all the taxes accrued by the state from the CVC. Results from this work showed the cotton sector brought net economic gain to the government, albeit to a lesser extent than previously believed.

The wheat value chain (WVC) was primarily to achieve food security objectives and has been less controlled by the state than the CVC. This work demonstrated its contribution to economic performance of the Khorezm region was moderate compared to the CVC in terms of contribution to the regional GDP. Subsidies provided to the WVC exceeded the taxes accrued, indicating thus the in general low profitable character of the WVC.

Results from this work found that the fruit and vegetable value chains, very well developed during the FSU era, have lost comparative advantage in recent years. At present, these chains are far less developed than previously with very short farmer to market links, a weakly developed processing industry and lack of resources.

The findings of this work also showed that the agro-processing industry has great potential but needs to be developed further and especially by maximizing its existing capacities. Most problems within the value chains have originated from the asymmetry of information, lack of vertical coordination and imbalanced bargaining power of the actors involved in the value chains. Due to a wide range of market constraints and administrative barriers, the present resource endowment of Khorezm is not used effectively and, as a consequence, the present performance is lower than in other countries, despite opportunities to improve. An increased local processing of cotton fibre and export of textile products with higher value added would bring about two outcomes for Khorezm. The results from this study found that export revenue would increase by as much as two times, to as much as USD 164.6 million. The results also demonstrated that the actual export revenue level could be maintained, even with less raw cotton production, decreased cotton area and, ultimately, less impact on environment. The streamlining of flows in the value chains, reducing transaction costs, constructing a close relationship among participants of the chains, upgrading technologies, and setting the efficient institutional framework, could all make agriculture and the agro-processing industry vehicles for permanent, broad-based, and environmentally sustainable growth in the region.

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List of abbreviations

BDS –   Business Development Services
CA –   Central Asia
CEEP –   Centre for Effective Economic Policy, Tashkent, Uzbekistan
CER –   Centre for Economic Research, Tashkent, Uzbekistan
CIF –   Cost, Insurance, Freight
CIS –   Commonwealth of Independent States
CLL –   Company with Limited Liabilities
cm –   centimetre
CVC –   Cotton Value Chain
GTZ –   Deutsche Gesellschaft für Technische Zusammenarbeit GmbH
EU –   European Union
F&VVC –   Fruit and Vegetable Value Chains
FAO –   Food and Agricultural Organization of the United Nations
FBC –   Foreign Business Company, an enterprise entirely owned by foreign
              companies, but undertaking its operations inside Uzbekistan
FDI –   Foreign Direct Investments
FSU –   Former Soviet Union
GCC –   Global Commodity Chain
GDP –   Gross Domestic Product
GIS –   Geographic Information System
GM –   Genetically Modified
GoU –   Government of Uzbekistan
GP –   Gross Profit
gr -   gram
ha –   hectare
HVI –   High Volume Instrument, classification system for cotton fibre
ICAC –   International Cotton Advisory Committee
ITC –   International Trade Centre
JSC –   Joint Stock Company
JV –   Joint Venture, an enterprise based on a partnership with a foreign country
kg –   kilogram
km –   kilometre
mln –   million
Mt –   Metric tons
MTP –   Machine Tractor Park

NP –	Net Profit
OblStat –	Regional Division of the Ministry for Macroeconomics and Statistics in Khorezm
OblVodKhoz –	Regional Division of the Ministry for Agriculture and Water Resources Management in Khorezm
PC –	Private Company, an enterprise without state involvement
RATES –	Regional Agricultural Trade Expansion Support Program (in Nairobi, Kenya)
RayVodKhoz –	Rayon branch of the Agriculture and Water Management Office
r.m. –	running meter (unit of measurement for cotton fabrics)
SES –	Sanitary Epidemiological Station
SFTC –	State Foreign Trade Company
SJSC –	State Joint Stock Company, an organizational structure for half privatised, half government owned enterprises
SPP –	State Procurement Price
UNDP –	United Nations Development Programme
UNESCAP –	United Nations Economic and Social Commission for Asia and the Pacific
UNESCO –	United Nations Educational, Scientific and Cultural Organization
USD –	United States Dollar
USDA –	United States Department of Agriculture
UzCE –	Uzbek Commodity Exchange
UZS –	Uzbek Soum, national currency of Uzbekistan
VA –	Value Added
VAT –	Value Added Tax
VCA –	Value Chain Analysis
WB –	World Bank
WTO –	World Trade Organization
WUA –	Water Users Association
WVC –	Wheat Value Chain
WWI –	World War I
WWII –	World War II
ZEF –	Centre for Development Research

1   Introduction

This thesis aims to provide comprehensive insight into the current status and development prospective of the agricultural and agro-processing sectors in the Khorezm region of Uzbekistan. These sectors are considered to possess the greatest potential to contribute to rural and regional development; welfare of the state, people, and environment. The study applied a value chain approach, embracing depicting and mapping of the value chain for cotton, wheat, fruits and vegetables and their subsequent financial and economic analyses. This chapter describes the background; states the research problem; presents the objectives and main hypotheses; and finally outlines the structure of the thesis.

1.1   Background and statement of the problem

Uzbekistan gained independence from the Former Soviet Union (FSU) in 1991. Since then the country has started the reformation process and has witnessed various regimes, from liberal to more protectionist. In the aftermath of independence the country adhered to a liberal import regime, which helped to prevent social tensions. Next, industrialisation came into view as a potential force to decrease the dependence on cotton and other raw materials for the hard currency inflow and to support emerging local production sectors. The stability of the former was altered in the light of price fluctuations in the world, while the latter could become a basis for the following export-oriented reforms, overall economic improvement and export diversification. The export-promotion strategy in Uzbekistan is based on local labour-intensive industrial sectors, among which the agriculture based industry (agro-processing sectors like textile and food processing) have high export potential for the country.

The development of the agricultural sector has been slow; yet the Asian Development Bank stated that agricultural growth will be a primary determinant of living standards over the coming period. "It can be expected to translate into widespread income increases if land reforms and changes in the state procurement system proceed as planned and if the business environment for small enterprise development in the agriculture sector improves…" (ADB, 2004).

Reflecting this, the Government of Uzbekistan (GoU) has stressed the centrality of agriculture in its development vision and announced wide-ranging agricultural reforms, including farm privatisation, trade liberalisation, development of agricultural support services and processing capacities. According to President Karimov, "…In the entire chain of economic reforms, the chief principal significance is attached to the task of transformation

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of the agrarian sector. This is because of the dominance of rural inhabitants in the population structure, because of the agro-industrial character of the economy, and because of the role that the agriculture can play in resolving our vitally important problems. It is precisely the agrarian culture that now holds significant reserves. By tapping these reserves, one can not only improve the supply of food for people and raw materials for industry, but also insure the prosperity of the rural populace. The village is the most important source of national income; it produces the main (export) item for earning hard currency. But, most important, the village is that unit in the economy that can enable the entire republic to achieve prosperity and wellbeing. If the peasant is well off, the entire republic will be rich. It must be admitted that today we live at the expense of the village" (Karimov, 1993.)

Experience from developing countries shows that nations specializing in exports of primary commodities are vulnerable to the fluctuations in the world markets. High dependence on the export of raw minerals and slightly processed agricultural products exposes the country to the risk of financial crisis stemming from unstable international demands and prices. For example, loss to Uzbekistan from low cotton prices in the world in 1998-2001 amounted to USD 1.5 billion (Washington conference, 2002). In the light of such vulnerabilities, a shift from the primary commodity exports to the export of the value added products and the removal of trade barriers with the aim of facilitating trade became an important part of recent reform package.

The major criteria in making decisions on whether to pursue the liberalisation processes or not should be based on economic development and the ability of the government to undertake efficient economic policy, including its timely adjustment, the degree of consideration of the interests including the private sector, and the coordination of their efforts in the process of implementing economic reform. It is very important to take these criteria into account at the present stage of development and reform of the national economy of Uzbekistan. The key objectives of recent reforms have become: increasing the potential role of exports in ensuring economic growth sustainability; increasing contribution of small and private businesses; and, deepening the liberalisation processes and efficient growth of government support for priority sectors (Chepel and Katanova, 2004). Rapid development progress of countries and regions of the last decades worldwide has been accompanied by an expansion of exports. Building up a diversified export and industrial structure has been necessary in the newly industrialising countries and has been dependent on access to large, diversified markets and the economies of scale and the competitive effects that were thereby possible (Stamm, 2004).

As the trade regime becomes more liberalised and Uzbekistan shifts towards export orientation, production with the greatest comparative advantage should be developed the most. With regards to comparative advantages the agricultural sector has most priority as it is the sector with the highest value added and the largest number of employed (CER, 2003). With plenty of raw resources, cheap labour and energy resources and on a condition of upgrading of production technologies, Uzbekistan has the opportunity to compete at an international level. Cotton is produced in Uzbekistan in quantities that would allow for an increase in local textile production using locally sourced raw materials, while maintaining the country's export of cotton fibre. Likewise, half of the amount of vegetables and fruits produced annually is sufficient to cover the respective domestic requirements of the country, thus leaving plenty of room for increasing marketing opportunities of vegetables and fruits, fresh, processed or dry.

Development of textile and food processing industries is expected to increase value added to the raw materials that are already abundant in Uzbekistan, and extending the value chains of the agro-commodities. According to the Asian Development Bank (ADB), "The government and the private sector have shown substantial interest in the last years in reviving the light (textile) industry. The motivation for this is partly attributed to the realization that the cotton-textile industry offers unique opportunities for increased employment, poverty reduction, rural development, and increased income in arid and semi-arid lands. Cotton is one of the few cash crops suitable for marginal land" (ADB, 2004).

The development of the agro-processing sector and extension of the value chains in Uzbekistan may bring benefits to the country as a whole by gaining revenues from exports of higher value added goods and to the local producers as well, if value added is allocated fairly. Empirical observations show that poverty reduction/rural development strategies "…*must be based on appropriately high rates of growth and the resulting possibilities for the poor to engage in economic activities (promoting opportunities) as well as on rising government income with which to provide public goods*" (Stamm, 2004). At present, there is a need to target broad-based economic growth and at the same time to improve access of the poor to the productive capital (Stamm, 2004). Up to 70 percent of Uzbekistan's poor live in rural areas and the leading cause of poverty is reduced income due to heavy state involvement, particularly in the cotton sector, which has undermined farmers' incentives and led to high dependence on the state for input supply, credit, processing, and marketing.

Uzbekistan may have intensive agricultural production sites, however the effort to combine geographic benefits with a processing system have not been substantially developed. In transition economies in general, the networking between agricultural producers and

processors and other institutions is weak and inefficient. A lack of properly functioning markets has resulted in inefficiency in the agricultural marketing and agro-processing industries (Korea Rural Economic Institute, 2005).

With the changes and the efforts of the government to restructure and develop the agricultural sector, it is likely that the value chain of agro commodities will be modified and more actors be included, such as textile companies for the cotton sector, processing plants and marketing agents for wheat and vegetables. However, further work is required to identify and develop the most promising agricultural value added sub sectors and to tackle the current development targets. The question remains of what the agricultural producers are going to gain: will they be better or worse off with the development of the value chains?

The development and upgrading of the value chains is an important agenda for the government, companies and other institutions. Expanding local processing of agricultural products can become a rural development strategy. Value-added processing sectors may hold significant income and risk diversification benefits for the stakeholders across the value chain. Supporters of value-added production state that value-added agro-processing can create the potential for higher profit margins for producers and expanded opportunities for rural communities in processing and marketing of products, as well as stimulating growth and expansion of rural businesses (Cowan, 2002). *The export of value-added-intensive agriculture-based products opens possibilities for a geographically de-concentrated development that also directly includes population groups affected by poverty* (Stamm, 2004). Entry into higher value markets (also global markets) requires an understanding of the requirements and dynamic forces within the value chain (Baker, 2006).

1.2   Objectives and research questions

The objective of the study is threefold. First, the research aims to provide comprehensive insight into the current development status and the role of the agricultural and agro-processing sectors in the Khorezm region, as an example for Uzbekistan. The focus on this particular region reflects the interests of the ZEF/UNESCO Uzbekistan project. Second, it analyses the value chain of the main crops, namely cotton, wheat, fruits and vegetables. Third, it looks at the potential of these value chains for rural/regional development, and, based on the outcome, describes some of the respective policy implications. The study also describes the role of export in Uzbekistan's economy, opportunities for increase in volume and export revenues, improvement of its structure, and, eventually, population income growth due to liberalisation of foreign economic activity.

The presented study achieves the following:

- Provides maps of the value chains, including the involved actors, their functions and relationships (*governance, integration, coordination, cooperation, flow charts*);

- Provides an analysis of the value chains (*functional, institutional, financial, economic and comparative analyses, benchmarking*);

- Identifies weaknesses and barriers to growth and to upgrading the value chains (*barriers to entry, benchmarking, process and product upgrading*);

- Quantifies the impact of reforms on the value chains and on rural/regional economy

The main hypotheses of the presented study are summarised as follows:

- The development of the agro-processing sector and extension of the value chains in the region is feasible and may bring benefits to the region/country

- The well developed and simplified cotton value chain have the potential to raise the income of local producers (farmers)

- The available resource endowment in the region can be used more effectively and it is possible to generate higher export revenues with the given resources in the cotton value chain, if more cotton fibre is processed inside the region into products with higher value added

- It is possible to maintain the present export revenues from the cotton value chain with less raw cotton production and, thus, making the environment more sustainable and healthier

- Wheat, second target crop in the country after cotton, is an inferior product in terms of quality, subsidisation and land use; wheat imports are economically efficient and feasible (compared for example to the land use for alternative crops)

1.3   Structure of the thesis

The thesis consists of nine chapters. Following this introduction, **Chapter 2** deals with the theoretical and analytical framework used in the research. This chapter first introduces the main concepts based on contemporary theory on the value chains and Institutional Economics. After describing the significance of the value chain approach and the methodology for undertaking value chain analysis, the chapter presents the conceptual framework on which the study was based.

Chapter 3 sets the ground for empirical investigation by describing the study site, as well as data collection approaches and methods. **Chapters 4, 5 and 6** are devoted to the description and analyses of the value chain of cotton, wheat, fruits and vegetables, respectively. These

chapters review the business environment in which the chains are functioning, with the focus on the governing structure, the direct and indirect (service providers) actors of the chains. In **chapter 7**, a comparative analysis of the value chains at the macro and micro levels, as well as benchmarking, is presented. **Chapter 8** looks at potential policy simulations for the cotton and wheat value chains. Finally, the conclusions of the study and policy implications are described in **chapter 9**. This chapter provides a few policy guidelines in terms of legal, institutional and operational requirements for further upgrading of the mentioned value chains with the aim of increasing rural and regional development.

2   Theoretical and analytical framework

This chapter deals with literature review in order to provide the necessary context for the current study. The context builds on the theoretical approaches followed by the literature on commodity/the value chains, institutional economics, regional economics for development and also theory on financial and economic analyses. It is necessary to shed some light on a number of concepts and definitions that are used throughout the study. Important concepts presented in this chapter include notions as value chain, value added, value chain analysis, vertical integration/coordination, transaction costs, upgrading strategies and benchmarking, among others.

2.1   Literature review

Most of the recent literature on Value Chain Analysis (VCA) may be summarised as elaborated for theoretical grounds and prepared as reports of various development and other projects. So, VCA is used in the world both by practitioners and scientists, researchers. Below are described, firstly, the theoretical guidelines, handbooks which were basically used in developing the conceptual framework of the present study; and, secondly, reports with sector specific value chains, as found relevant to the present study.

Kaplinsky and Morris (2002) have developed a research tool, a methodological handbook, with clear methodology on undertaking value chain analysis from the beginning to the end. In general this handbook: (1) explains important definitions, sets some theoretical background on the value chains and value chain analysis; (2) distinguishes /points out two clearly distinct uses of VCA – as a heuristic device and as analytical tool; (3) describes the importance of VCA from the point of view of systemic competitiveness, efficient production, globalization trends, the ways how small and medium scale enterprises could fit into global value chains and benefit from globalization; (4) outlines barriers to entry in the value chains, governance or levers of power – the key elements for successful value chains; (5) and, finally, innovation and upgrading are discussed as possible strategies for developing successful value chains.

McCormick and Schmitz (2001) have written a "Manual for Value Chain Research on Homeworkers in the Garment Industry", a more focused, practical oriented paper. It focuses on garment value chain analysis with a special attention on homeworkers. In Part 1, concepts and issues on homeworkers and their types; the value chains and their types are presented; as well as gender analysis in the framework of VCA is highlighted. Part 2 gives methodology on undertaking VCA from stating the initial research question, mapping, drawing, collecting data, identifying relationships via: questionnaires, conducting interviews; and to economic

analysis, such as cost breakdown, assessing advantages and risks; and, finally, some gender analysis issues. Part 3 describes practical guidelines for "making an impact", in other words how to help the homeworkers, how to spread best practice, how to develop and apply participatory approach and collective actions for successful value chains.

FAO (2006a, b, and c) has developed a set of modules on applying commodity chain analysis in practical research. These modules represent the full strategic plan on how to undertake commodity chain analysis. They differentiate and describe conceptual framework for functional, financial and economic analyses of commodity chains; and give practical guidelines on not only how and where to start VCA, but also on how to complete it and how to use the results for comparing and applying most promising economic policies.

GTZ has worked extensively on the issues of the value chains and VCA, albeit, with more practically oriented applications. "ValueLinks" Manual (2007), for example, represents the reference book for value links methodology. This manual is intended for use by development projects or by public agencies promoting specific agribusiness. The methodology is not aimed at specific products, but is oriented on integration of the poor in economic activities. The manual and seminars by GTZ are an important instrument for sharing know-how and increasing knowledge and participation of the broader audience in development programmes. Other papers by GTZ (Stamm, 2004 and Merlin, 2004) focus on the use of the value chain approach in development cooperation and agricultural activities. *Merlin* (2004) has conducted a research on the institutions and organizations worldwide working with the value chain approach. She has compiled a list of such institutions and, most importantly, their websites, so that the list is ready for use by researchers and practitioners in the value chains.

Swinnen (Swinnen and Vandeplas, 2006) has extensively worked on such issues of commodity chains as contracting, competition and rent distribution in agrifood chains. He focused mainly on transition countries of Europe and Central Asia. These countries followed different transition patterns and Swinnen described peculiarities of development and the dynamics of vertical coordination in agrifood chains (Swinnen, 2005). The issues of vertical coordination in agrifood chains of transition countries of FSU were also raised by *White and Gorton* (2004).

Gibbon (2003) in his paper "Commodities, Donors, Value Chain Analysis and Upgrading" argues that donor interventions in the area of agro-commodities remain both feasible and of critical economic importance. He stresses that for successful donor interventions it is needed to adopt a political economy perspective rather than just traditional economic analysis; and international trade has to be analysed through global value chain approach.

In the last years much research has been conducted and many papers produced on VCA, both as theoretical and methodological guidelines, and also focusing on many sectoral/product specific examples of the (global) value chains. This worldwide value chain research has made VCA a useful tool, an approach to gain a comprehensive view on sectors and the value chains. However, not much was written on how and who should apply the results of VCA. With this regards *Schmitz* (2005) has elaborated a way on how VCA could provide useful information for policy makers at all levels (national and local) in order to make balanced economic and social decisions, especially in countries which are trying to upgrade their industrial sector and the value chains in particular. An extensive paper by *Schmitz* "VCA for Policy-Makers and Practitioners" is a useful, practical guidebook, is "… targeted toward policy makers and planners at different levels of government, business associations and trade unions and other institutions responsible for developing strategies for enterprise development and local economic development".

The value chain approach has been widely used by economists and other researchers in order to describe sector specific value chains, such as: (1) for agro-commodities or agrifood chains – in general (Fitter and Kaplinsky, 2001; White and Gorton, 2004, 2005); for coffee and cocoa global value chains (Kaplinsky, 2004); for global cotton value chain and in different countries (Larsen, 2007; RATES, 2003a, 2003b, 2005a, 2005b; Shweih, 2006; Badiane et al., 2002); for wheat-flour-bread chain (Swinnen, 1998); for horticultural global value chain (A. Barrientos and S. Barrientos, 2002); (2) for other commodities of industrial production, and specifically, such value chains, which are relevant to the present study, as – garment value chains (Baden, 2002); global, US and EU clothing value chains/clothing sector (Gibbon, 2001; Hutson et al., 2005; Commission of the European Communities, 2002); and global apparel value chain (Gereffi and Memedovic, 2003; Gereffi, 1999).

2.2 The Value Chain approach

2.2.1 Defining the chains

For some decades now "there have been systematic attempts in English-, German-, and French-speaking schools of thought to describe and analyse the vertical integration and disintegration of production and distribution processes" (Roduner, 2005). Many terms have appeared since then conceptualizing production systems and describing marketing, supply, commodity and the value chains. Various approaches and methodologies have been developed to conduct research and to analyse commodity chains with their inter-connected structures of economic activities.

The concept of a value chain and the way it is used seems to have changed over time. Some value chain experts consider that the basic idea started within the business-managerial framework in the 1950s with Leontief's input-output models, and in 1960s with regional economics, where the emphasis was made on industrial linkages and understanding of the dynamics of spatial economies and the contributing factors to regional lags and imbalances (FIAS, 2007). Others prefer to trace the origin of value chain analysis to Wallerstein's (1974) World Systems Theory (Raikes et al., 2000). In the mid 1980s the concept of the value chain was followed by Porter (1985, 1990), when he used it to describe how an individual enterprise would be able to create a competitive advantage and "value" by breaking down its value-adding activities. Most of the recent value chain concepts, like the global commodity chains, product chains, or the value chains, have evolved within the economic-developmental framework.

The commonly accepted definition of a chain, be it commodity chain or value chain, was stated by Kaplinsky and Morris (2002): "The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use". Under this definition the chain can be seen as "incorporating production, exchange, distribution and consumption <…> of a given product or service" (Kaplinsky, 1998). In such a definition production is only one of a number of value added activities. The chain can also be defined as "a sequence of organizations that are involved in consecutive production activities" (Roduner, 2005). Thus, no matter which definition is applied by contemporary value chain scholars, all definitions of value chain embrace all stages of production to consumption of a particular product: "from gate to plate" or "from cradle to grave".

Table 2.1 Value Chains vs. Production Network

Name	Definition	Metrics	Other names
1) Value Chain	• the sequence of productive (i.e., value-added) activities leading to and supporting end use	• The bundles of activities that various actors do, or do not, engage in	• supply chain • commodity chain • production chain • activities chain • product pipeline
2) Production Network	• a set of inter-firm relationships that bind a group of firms into a larger economic unit	• The character and extent of inter-firm relationships	• value network • supply-base

Source: Sturgeon, 2001

"Analysis that takes the entire chain of productive activities into account has been variously referred to as value chain, commodity chain, activities chain, production network, value network, and input-output analysis" (Sturgeon, 2001). All these approaches present common aspects and can be associated to some extent (Table 2.1).

One of the prominent recent contributors to the value chain analytical approach is Gary Gereffi (Duke University), who has written extensively on global commodity chains. Gereffi (1994a, b) has defined the value chains as having four basic dimensions:

- *an input-output structure* with the flows of raw materials, intermediate goods and finished products as well as knowledge linked together in the process of value creation;

- *a map of the geographic concentration* or dispersion of production and marketing networks, comprised of a chain actors;

- *a governance structure*, understood as authority and power relationships that determine how financial, material, and human resources are distributed within a chain;

- *an institutional framework* that provides the national and international context for the interaction of chain segments

2.2.2 Types of the value chains

Different types of the value chains can be recognized based on the number of processing stages, spatial relationship of economic activities and the structure of involved participants of the chains.

Sturgeon (2001) has made an attempt to classify the value chains according to organizational scale and to spatial scale. Notions of supply chain, value thread, value chain or production network, all fall under *organizational scale*; the global commodity chain or international production networks fit into categorization under *spatial scale* (for chain definitions see Table 2.2).

Another classification of the value chains based on the type of the value chain governance was suggested by Gereffi et al. (2005). According to the type of governance, or how certain parameters and conditions within the chain are set, the following types of the value chains were described: *chains ruled by markets* (costs of finding and changing to new partners are low for all participants of the chain); *modular value chains* (the suppliers manufacture products according to customer's specifications and the detailed instructions but maintain full responsibility for competencies surrounding process technology); *relational value chains*

(relationships among the value chain actors are built-up over time or are based on dispersed family and social groups); *captive value chains* (small suppliers are dependent on larger buyers, monitoring and control by lead firms); and *hierarchy structured value chains* (vertical integration, close managerial control from managers to subordinates).

In a much broader sense of governance, the value chains can be classified into *buyer-driven chains*, characterized by labour-intensive industries and relevant to developing countries; into *producer-driven chains*, characterized by capital and technology intensive industries and where producers take responsibility for assisting the efficiency of both their suppliers and their customers. All the concepts of chains - commodity chains, product chains, or the value chains - are used as alternatives and somewhat equivalent terms in the literature.

Table 2.2 Definitions on chains

Supply chains: a generic label for input-output structure of value added activities, beginning with raw materials and ending with the finished product
Input-output structures: the set of products and services linked together in a sequence of value-adding economic activities[1]
National value chain: a chain in which all stages of the working and selling of a good takes place within one country[2]
Global value chain: This is the sequence of activities required to make a product. It can refer to all activities from conception of a product to its consumption or to some of them, for example from producer to retailer. A value chain is 'global' when activities are carried out in different countries[3]
The French filieres: a loosely-knit set of studies, mainly in French, which used the idea of a chain (or filiere) of activities as a method to study primary agricultural export commodities such as rubber, coffee and cocoa. This approach was seen as a neutral, value-free technique applied to analyzing existing marketing chains for agricultural commodities. It was used to describe the flow of physical inputs and services in the production of a final product (a good or a service)[4]
International production networks: studies focusing on the international production networks in multinational corporations which act as global networks[5]
Global Commodity Chain: a chain including a whole range of related activities involved in the

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[1] McCormick and Schmitz, 2001
[2] McCormick and Schmitz, 2001
[3] McCormick and Schmitz, 2001
[4] Kaplinsky and Morris, 2002
[5] Borrus et al., 2000

design, production, and marketing of a product[6]. The primary focus of the Global Commodity Chain is to analyse the international trading system and the increasing economic integration of international production and marketing chains. GCC highlighted the power relations which are embedded in value chain analyses. GCC consists of series of cross organizational networks grouped around a good or a product. They link households, firms, and countries within the global economy. These networks are situation specific, social constructs, anchored in each local context[7]

Source: own compilation

2.2.3 The concept of value added

One of the central points or concepts in value chain analysis is the one of value added (VA). In a broad sense, applicable not only to value chain analysis, but to any analytical work in the sphere of economic growth and development, the value added refers to the creation of wealth[8], the contribution of the particular production process, or particular chain, to the growth of the economy (FAO, 2006b). In macroeconomics, value added also refers to the contributions of the factors of production, such as land, labour and capital goods to raising value of a product and corresponds to the incomes received by the owners of these factors. Production factors provide "services" which raise the unit price of a product relative to the cost per unit of intermediate goods utilized in the production process.

Value added is not just an element of income, it also represents the distribution of that income amongst the four fundamental agents of the national economy: households (the recipients of the return to labour and social payments), financial institutions (interest charges), government administration (taxes), and non-financial enterprises (gross or net profit and non-budgetary funds). Value added is also partly redistributed back to the capital invested into the production process (and thus into the creation of value) in the form of depreciation.

Value added measures the increase in wealth for the nation as a whole, as represented by the sum of remuneration to labour, interest charges and taxes in addition to the net margin of the producers. From a more focused point of view value added represents the worth that has been added to a product or a service at each stage of production or distribution. An economic agent can calculate the value added as a difference between the full value of the output and the value of the purchased inputs (McCormick and Schmitz, 2001).

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[6] Gereffi, 1994a
[7] FAO, 2006
[8] In this notion value added is more or less GDP scaled down to a particular chain or sector

Another way of calculating value added lies in summing up the wages, profits and natural resource rents relevant for a particular product or a chain. In this respect, value added is not merely an element of wealth, but it also shows the distribution of that wealth among the main participants of the national economy: households (the recipients of the return to labour), financial institutions (interest charges), government administration (taxes), and non-financial enterprises (gross or net profit) as shown by the following formula (FAO, 2006b):

VA = personnel remuneration + taxes + profit + depreciation + interest charges

2.3 The role of Value Chain Analysis

Value chain analysis is important both conceptually and practically (McCormick and Schmitz, 2001), or in other words it can be used as a heuristic device – a *descriptive tool*, framework for the generation of data, as well as *analytical tool*. Value chain analysis can present a sound background for *benchmarking* and comparison of particular value chains performance against performance of the value chains in other regions and countries; and thus can provide insight on the areas of intervention and *upgrading* with the aim of value chains development.

2.3.1 VCA: a descriptive and an analytical tool

Conceptually, the value chain approach gives a good representation of the process of creating value. A dominant idea here is to "map" the flows of the chain with overall activities of all the actors who contribute to the production, processing, or transformation of products along the chain. A thoroughly demarcated value chain portrays not only all the actors of the chain, but also their relationships, all economic activities carried out at each stage of production, and physical and financial flows along the chain.

Value chain analysis, when used as an analytical tool helps to understand how individual producers, especially from developing countries, can participate and increase their share of the gains from participating in global economy; to understand the policy environment in the boundaries of which a particular value chain operates (McCormick and Schmitz, 2001). By comparing the advantages and disadvantages of firms and countries specializing in certain production sectors or services, value chain analysis can prove or disprove the efficiency of allocation of resources within the domestic economy.

The value chain is an important construct that gives a snapshot of the distribution of costs across an entire production process. Understanding the distribution of returns arising from design, production, marketing, coordination and/or why distribution of resources across a

value chain is disproportionate, immediately signals need for further investigation (Kaplinsky and Morris, 2002).

A value chain approach describes the micro-economy in a more realistic way and captures real economic structures, and is thus useful in guiding development interventions (Meyer-Stamer, 2004). This approach has proven useful for the identification and formulation of development projects and facilitating development strategies for improved agricultural and rural development (Bammann, 2007). At the local level, value chain analysis describes the activities that take place in a business and relates them to an analysis of the competitive strength of the business, which is one way of identifying those activities that are best undertaken by a business and those that are best provided by others ("out sourced") (FAO, 2006a). By applying the value chain approach, actors of the chains gain insight into issues like market access, acquiring production capability, finding leverage points for policy and organizing initiatives, identifying funnels for technical assistance and others (McCormick and Schmitz, 2001).

Value chain analysis was applied in the current research within the framework of economic studies undertaken as background for economic policy analysis at a sectoral level (in particular for the agriculture and agro-processing sectors) with the aim of understanding and quantifying the impact of proposed measures on the agriculture sector.

2.3.2 Upgrading

The practical usefulness of value chain analysis stems from a possibility to understand problems and find ways of improving the situation of the "weaker" links in the chain, i.e., those with low returns or little bargaining power. In other words, value chain analysis helps to find those segments of the value chains which need to be improved or upgraded.

The notion of upgrading, as used in studies on competitiveness, describes a range of activities aimed at manufacturing better products, or increasing production metrics (productivity, efficiency), or moving into more skilled activities (Porter, 1990; Kaplinsky, 2000). According to Kaplinsky and Morris (2002), upgrading is a process of adopting innovation – a process which recognizes relative endowments and the existence of rents.

According to Humphrey and Schmitz (2002), the typology of upgrading distinguishes three main upgrading possibilities: functional; product; and process upgrading. Kaplinsky and Morris (2002) make upgrading a broader notion to include "four trajectories which firms can adopt in pursuing the objective of upgrading". These are presented in Table 2.3.

A value chain approach can assist in understanding the interaction among actors involved in the chain and the scope for local upgrading strategies. One of the main tasks of upgrading is

focused on exploring and employing competitive advantages. A value chain approach can help to formulate or to shape the upgrading strategies by describing and analyzing sources for competitiveness, such as local competitors, infrastructure, customers, inter-firm cooperation and coordination, given industrial policies, and governance structures (Schmitz, 1999). The preferred approach at present (and most specifically in developing countries) for upgrading capabilities of the actors along the chains and thus getting closer to competitive advantages has been to provide Business Development Services (BDS) (Schmitz, 2005). Such BDS include consulting, training, business planning and start-up, funding[9]. However, such services alone do not always have a big say in upgrading, but can contribute considerably if combined with the set up of trading relationships in the chains. This notion goes in line with a central message of value chain research, where buyers (at the end of the chain or as intermediate chain actors) often play a major role in helping producers upstream the chain to upgrade their processes and products (Schmitz, 2005). The algorithm of resorting to upgrading strategies was described by some authors (Gereffi, 1999, Lee and Chen 2000), and flows as follows: it begins with process upgrading, then moves to product upgrading, to functional upgrading and last of all, to chain upgrading.

Table 2.3 Types of upgrading

Process upgrading: increasing the efficiency of internal processes such that these are significantly better than those of rivals, both within individual links in the chain (for example, increased inventory turns, lower scrap), and between the links in the chain (for example, more frequent, smaller and on-time deliveries)
Product upgrading: introducing new products or improving old products faster than rivals. This involves changing new product development processes both within individual links in the value chain and in the relationship between different chain links
Functional upgrading: increasing value added by changing the mix of activities conducted within the firm (for example, taking responsibility for, or outsourcing accounting, logistics and quality functions) or moving the locus of activities to different links in the value chain (for example from manufacturing to design)
Chain upgrading/intersectoral upgrading: moving to a new value chain

Source: adapted from Kaplinsky and Morris, 2002

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[9] See http://www.bds-uk.co.uk/

2.3.3 Benchmarking

Value chain analysis can define competitiveness of a particular value chain and justify the distribution of resources across a value chain via benchmarking against similar operations within and outside the country.

Performance of any value chain can be explained or assessed through activity measurements and performance metrics, and also benchmarking against comparators (FIAS, 2007). Analysis of the cost structure in detail of the most prominent cost drivers (such as high waste rates for example), of underutilized economies of scale, or of underexploited opportunities of using co-products can be identified via benchmarking.

Benchmarking is a process of comparing own performance parameters with the performance parameters of respective businesses or the value chains considered to have leading positions on the international arena. Parameters for benchmarking can include various aspects. Some important benchmark parameters are productivity, cost of production or product quality; on a broader scale these would include critical success factors confronting producers along the chains. Benchmarking of such key chain characteristics facilitates the process of detecting performance gaps and identifying constraints to competitiveness, and also in assigning priorities to constraints that influence performance (FIAS, 2007). Thus, benchmarking is used to: (1) identify gaps in the performance of the value chain of interest; (2) assess the relative importance of these performance gaps; (3) prioritize the most binding constraints; and (4) develop upgrading strategies – targeted action plans.

As described by Kaplinsky and Morris (2002) performance of an individual actor within the chain or performance of the whole value chain can be benchmarked against:

- their own, historic performance
- the performance of firms or chains with similar characteristics
- the performance of firms in the same sector, but not making the same products
- performance of firms in other sectors, but with similar processes

In general, benchmarking is best undertaken by firms producing like-for-like products and services, but this may often not be possible (Kaplinsky and Morris, 2002).

2.4   Methods and approaches to Value Chain Analysis

2.4.1   Mapping commodity/value chain

No matter what approach is used for the chain analysis, be it commodity chain analysis, value chain analysis or global commodity chain, the outset is the same. The analysis of the chain starts with its construction or demarcation, the process of identification of the product flows, the chain actors and type of interaction between the actors.

Demarcating of the chain according to FAO

Suggested methodology envisions the step-by-step approach for developing the value chain. The starting point is the so called chain mapping. To do so the data on all the involved agents, their activities, interactions among each other and flows of the product through the production stages are determined. It is usual to start from the primary activity of agricultural production of the commodity which gives its name to the commodity chain under analysis, and then proceed on the one hand, to follow the product downstream, through various marketing and processing channels to the final market, and on the other hand, to identify, upstream, the principal providers of inputs and services which feed into production. This will ensure that the commodity is followed through its successive transformations.

All the data sufficient for constructing the value chain is then either presented in a functional analysis table or consequently represented in the form of a commodity flow chart. The functional analysis table preferably should include:

- the principal functions in the chain, as well as any activities associated with the supply of inputs which have been included as part of the chain;

- the agents, (or groups of agents) carrying out these functions;

- the products concerned in the chain: i.e. the principal product of the chain, the various forms into which it is transformed throughout the chain.

The commodity flow chart is sometimes an easier way to present the sequence of flows, as well as actors within the chain. The flow chart visually highlights the complexity of the interactions and flows between agents. It can also be a useful tool in achieving clarity in the subsequent stages of analysis, ensuring that no part of the chain is left out.

In the next step this simple commodity chart with the clarified nature of the flows between the different agents can be enriched by the inclusion of more variables, both in physical and in monetary terms. This allows the analyst to assess the relative importance of the different segments or sub-chains of the chain (FAO, 2006a, b, c).

Two types of analysis can be applied to the chain at this descriptive stage: institutional and functional analyses.

Institutional analysis includes capturing of the flows and identification of the agents at work in the existing productive system, analysis of the locations for decisions and collaboration amongst agents; in other words institutional analysis gives a detailed description of all agents (institutions) involved in a particular chain.

Functional analysis demarcates the chain, explains the principal functions in the chain, i.e. the stages of primary production, processing and transport, as well as any activities associated with the supply of inputs which have been included as part of the chain. Functional analysis also helps in identifying of bottlenecks within the chain.

Chain mapping by Kaplinsky and Morris; McCormick and Schmitz

The general ideas in the methodology for constructing the value chain as suggested by these authors are basically the same, except for differing terminology.

Value Chain Analysis, according to this methodology, starts with mapping the chain in question. Mapping the chain means giving a visual representation of the connections between actors and tracing a product flow through an entire channel from the point of product concept to the point of consumption. It is an ideal tool for measuring and quantifying the cost of administrative distortions that hinder competitiveness of products and industries. In its simplest form, the value chain is merely a flow diagram.

The process of chain mapping in turn consists of two stages. The first stage includes drawing an initial map which gives the contours of the chain: the main activities carried out locally, their connections to activities elsewhere, the connections to the final market, some initial indications of size and importance. The initial map after crosschecking is considered a preliminary map of the value chain. In order to draw the preliminary map it is important based on secondary data to properly breakdown and categorize activities associated with the value chain in question.

The second stage consists of elaborating the final map via quantification of key variables, identification of strategic and non-strategic activities, identifying leverage points for action. Such a refined map can be understood as a framework for showing the chain statistics. It might happen that in order to avoid overloading, not one final map, but several maps will be produced, for example one map showing the number of enterprises in each stage and another map giving the average earnings in various parts of the chain (McCormick and Schmitz, 2001).

2.4.2 Analysis of a commodity/value chain

Methods for analyzing the value chain, no matter the terminology and procedures, aim basically at the analyses of the process of value creation and income distribution.

Commodity chain analysis according to FAO

The proposed FAO methodology for analyzing the value chain includes financial analysis and economic analysis based on the actual market prices and on shadow prices.

Financial analysis

Financial analysis is used to determine the monetary value added in the various segments of the chain of interest. If the chain creates a positive value added, then the economic activity in consideration nominally creates wealth. Total VA of the chain represents all value created by all the agents of the chain, or

$$\text{VA}_{\text{chain}} = \Sigma \, \text{VA}_{\text{agents}} \tag{1}$$

Total value added is derived from the so-called consolidated account of the chain, which contains the information on gross outputs on the one hand and intermediate inputs, all traditional (or direct) costs incurred in the production (or activities), taxes paid to the budgetary funds, future investments (represented by depreciation) and payments to the financial institutions (in case of credits) of every agent of the chain on the other hand. In other words, value added may be calculated by taking the difference between output and intermediate inputs or:

$$\text{VA} = \text{personnel remuneration} + \text{taxes} + \text{GP} + \text{interest charges} \tag{2}$$

or

$$\text{VA} = \text{personnel remuneration} + \text{taxes} + (\text{NP} + \text{depreciation})^{10} + \text{interest charges} \tag{3}$$

The key measures from the consolidated account of the chain, which are incorporated in the subsequent analysis are value added, gross profits (GP) and net profits (NP) both for individual agents and on the chain as a whole. Based on the above mentioned measures, financial analysis is then used to identify the financial profitability of activities within the chain, the overall efficiency of the chain, the processes of price determination, and transfers between agents.

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[10] Gross Profit (GP) reduced by depreciation is considered the Net Profit (NP)

The financial profitability of activities in the chain is analysed based on the agents' activities, their economic results in the form of profits or losses, their ability to maintain and replace the equipment and capital, as well as to cover any financial costs at present or in the future. If the information available is only for one year, the analyst is restricted to fairly simple rates of return (RR) defined as a ratio of profits to total production costs:

$$RR = profit / total\ production\ costs \qquad (4)$$

Overall efficiency of the chain is analysed by looking at the value added of the chain, whether it is positive or negative, which agents contributed the most into value added and how income is distributed among them. The concept of economic efficiency of the system (the chain) is complex and should be derived from for example comparing the costs in a domestic chain to the international prices, to the costs in similar chains of other countries, or to other commodity chains in the same country. The technique of *comparative analysis* can be applied at this stage of the research.

Price determination deserves particular attention as it relates to the distribution of value added among the different agents, and also because it is relevant to policy issues linked to the effective functioning of markets and the overall system. This part of analysis can answer the question of what is the distribution of benefits and implicit transfers, who in the chain is most impacted by variations in international prices, and what is the impact of an actual or proposed policy on the chain and its agents.

The analysis of transfers "…Financial analysis gives us measures of the impact of the commodity chain on each agent (operating profits), on growth (overall value added created), on the distribution of income by category of agent and, where relevant, on external exchange, as a result of direct importation of intermediate goods by agents in the chain and/or of commodity exports. From this, and the analytical results of price analysis, economists can shed light on the impact of economic policy by making explicit the transfers between agents…" (FAO, 2006b).

Economic analysis

Economic analysis assigns value to the flows and activities of the actors of the chain as a whole. This involves identifying the boundaries of the chain and the position of the various actors within the chain. Finally, economic analysis includes the development of economic accounts corresponding to their activities. Two types of approaches to economic analysis may be applied in the framework of the chain analysis: the impact *approach – using actual market prices* as used by agents; and, secondly, *the shadow price approach* which uses

computed or "economic" prices, instead of market prices to estimate the economic value of goods and services.

Economic analysis based on actual market prices

Economic analysis based on market prices, which can be "…decomposed into an element of income distribution (returns to a factor of production) and an element of foreign exchange costs…" (FAO, 2006c), provides the basis for further evaluation of economic policies. This type of analysis can be undertaken in three stages: first, the calculation of direct effects; second, the calculation of indirect effects; third, the calculation of total effects.

Direct effects refer to direct distribution of income to institutional sectors or agents by the chain on the whole. They include distributed income (personnel remuneration, taxes, profits, financial charges) and import taxes and custom duties on the imported intermediate inputs of the actors in the chain of interest; and exclude the amount of subsidies or insurance payments received by the chain actors. Direct effects may have an influence on domestic growth, on foreign exchange rate and income distribution.

Indirect effects of the operation of the chain on other agents in the economy (including influence on domestic growth, on foreign exchange rate and income distribution) are measured for each actor of the chain (by ascending the chain of production) and then added up to give the value of all indirect effects.

Total effects of the chain consist of altogether the direct and indirect effects.

Impact assessment

The economic analysis of impact assessment can be undertaken based on the developed criteria. Criteria are used in developing indicators for assessing in an aggregated way the structure of wealth creation, the resources used, the resulting economic costs and benefits and their distribution. Such indicators allow an easy comparison of various policies and commodity chains, and even between countries. Impact assessment can be subdivided into major issues, such as the impact on economic growth; the impact on foreign exchange; the impact on the balance of trade; the impact on income distribution to domestic agents; and the impact on the government budget. In the context of this study impact assessment is used in rather narrow application to value chain analysis.

The main criteria for analyzing the impact on the economic growth include:

a) *The contribution of the particular chain to Gross Domestic Product*. This is reflected by the amount of total value added by the entire chain (shares of the chain actors in total value added can be presented in the form of tables or histograms for a better visual representation);

$$VA_{total} \tag{5}$$

b) *The rate of integration with the economy* is an indicator of the extent to which the chain depends on domestic production, or its degree of linkage with the domestic economy. This indicator is calculated as a ratio of total value added (VA_{total}) generated by the chain to total output value of the same chain (Y):

$$\text{The rate of integration with the economy} = VA_{total} / Y \tag{6}$$

A rate of integration below 50 percent shows an outward-oriented chain (dependent on exports) and thus with little linkage with the rest of the economy and limiting its development impact. As a rule of thumb a chain with a rate of integration of over 70 percent can be considered to have good linkage with national economic activity.

c) *The average capital coefficient* is an indicator of the importance of fixed capital consumed in the creation of value added by the entire chain:

$$\text{Capital coefficient} = \Sigma \text{ Depreciation} / VA_{total} \tag{7}$$

This low capital coefficient, for example, can show that fixed capital is not very important to the chain due to a high use of manual labour, or because most of the equipment is worn out and requires replacement and investments. "It may help to estimate the current weight (gap) of investment and drive to future investment needs in a growth scenario. To use this indicator on a comparative basis requires detailed knowledge of the national economy and the various branches of the chains concerned" (FAO, 2006c).

d) *The ratio of total value added to GDP* measures the importance of the chain in the national economy:

$$\text{Economic importance} = VA_{total} / GDP \tag{8}$$

The main criteria for analyzing the impact on foreign exchange include:

$$\text{Net balance in foreign exchange} = \text{net imports} = Y_{exported} - \text{Imports}_{total} \tag{9}$$

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For a more detailed analysis, the impact on foreign exchange can be studied at three levels (as outlined by FAO):

1) *the impact on the balance of trade* (BT) determines the net balance of goods and services exchanged as a result of the activity of the chain (only expenditures considered (Imports$_{total}$) are those linked to the import of goods and services, including intermediate inputs):

$$BT = Products_{exported} - Import_{total} \qquad (10)$$

2) *the impact on the Balance of Current Account* (BCA) is determined by the difference between the balance of trade and salaries paid to expatriate personal as well as trading profits repatriated to foreign owned companies:

$$BCA = BT - Salaries_{expatriate} - Net\ Trading\ Profits_{foreign\ companies} \qquad (11)$$

3) the *impact on the Balance of Payments* (BP) takes into account financial movements resulting from international grants and loans received by agents in the chain (in practice, because of the short-term nature of policy analysis, this essentially means taking into account interest paid to overseas banks by agents of the chain):

$$BP = BCA - trading\ subsidies_{foreign} - financial\ charges_{foreign} \qquad (12)$$

b) *The Efficiency Ratio of Foreign Exchange Expenditures* shows the total amount of net gain in foreign exchange, per unit of foreign exchange spent in the production process of the chain:

Efficiency of foreign exchange expenditures = Net foreign exchange flow/Imports $_{total}$ = $\qquad (13)$

$$= (Y_{exported} - Imports_{total}) / Imports_{total}$$

A negative efficiency ratio means that the chain is exporting none of its output, or that the portion exported is less than the overall foreign exchange cost of operation of the chain. If the ratio is positive, this indicates gains from foreign exchange spending.

<u>The main criteria for analyzing the impact on income distribution</u> to the actors of the chain include the identification of their shares in the created wealth (value added).

The main criteria for analyzing the impact on the government budget (preferably separately the revenue and expenditure of the government budget and revenues or expenditures of non-government organizations) include:

a) *The impact of the chain flows on the state budget* shows whether the chain is a drain or a support to the government

$$\text{Government budget}_{total} = \text{Taxes}_{total} - \text{Subsidies}_{total} + \text{Profits}_{public\ sector} \qquad (14)$$

b) *The Direct Rate of Taxation/Subsidy* (or the nominal rate of taxation) measures the nominal level of transfer:

$$\text{Direct rate of taxation} = \text{Government budget}_{direct} / \text{VA}_{direct} \qquad (15)$$

c) *The Effective Rate of Taxation/Subsidy* includes indirect transfers between the government and economic agents:

$$\text{Effective rate of taxation} = \text{Government budget}_{total} / \text{VA}_{total} \qquad (16)$$

These two indicators (b and c) measure the tax or subsidy content of the value added created. A positive rate indicates taxation, a negative rate, a subsidy.

d) *Finally, the real government cost coefficient* relates the total government budget to the nominal cost of direct subsidies given:

$$\text{Real government cost coefficient} = \text{Government budget}_{total} / \Sigma \text{ Subsidies}_{direct} \qquad (17)$$

This indicator shows the real impact on the government's finances of each monetary unit given in direct subsidy to actors of the chain. The positive ratio shows that overall the state gains money from all the activities of the chain taken together.

Value chain analysis by Kaplinsky and Morris; McCormick and Schmitz

Value Chain Analysis is undertaken based on the value chain map and the definition and categorization of the chain links according to various production processes and procedures that capture all value adding and non-value adding activities associated with a final product. At this stage of the research each chain link is studied closely, starting with the overall

description and economic, environmental, social settings and ending with the breakdown and identification of all costs and their shares in the total value of the product.

Analysis of the productive efficiency both of the chain as a whole, and of the chain actors involves calculation of value added; total profits, as well as profit shares accrued by the chain actors; distribution of income with respect to the production factors of the chain, including labour, capital.

Value added according to these authors is calculated by subtracting total input costs (bought-in materials, components and services) from the gross output costs – including material costs, depreciation costs of equipment, labour costs, utilities and profit.

Total profit generated throughout the chain is possible to be calculated on the condition that detailed data is available on value chain functioning. Total profit can then be apportioned to the different links in the chain, calculating their *share of total profit*. This will reflect how profit is accrued by different actors of the chain.

Incomes, or returns sustained in different parts of the value chain should be treated carefully. For example with regard to labour, this should take account of formal and informal, full-time and part time, and permanent and occasional employment.

Other types of analysis undertaken within the framework of value chain analysis include: (1) *understanding problems of market access*; (2) *acquiring production capability*; (3) *understanding the distribution of gains* along the chain (determination of the governing structure of the chain will help to understand the distribution of gains among the chain actors); (4) *finding leverage points for policy* and organizing initiatives (understanding the functioning of the chain of interest helps to identify levers where policy could be used to improve the distribution of gains among the chain actors); (5) *identifying funnels for technical assistance* (value chain analysis may provide multilateral and bilateral donor agencies aiming at provision of effective technical assistance to producers in developing countries with the information on how technical assistance may be effectively combined with connectivity).

In general, value chain analysis sheds light on how to deal with particular issues of concern in the chains, such as market access, skills acquisition, labour standards and many others.

2.4.3 Some concepts from Institutional Economics

The value chain approach, a framework used in analysing the operating environment of chains, also borrows from the new institutional economics theoretical paradigm, which

emphasizes on learning and change and recognition that economic agents (households, firms, industries, and even entire economies) learn from change and adjust accordingly.

Transaction costs

In economics and related disciplines, a transaction cost is a cost incurred in making an economic exchange, or all costs associated with marketing of the commodity. The MIT dictionary of economics defines transactions costs as "costs other than the price which are incurred in trading goods and services." According to Milgrom and Roberts (1992), transaction costs together with production costs form the total costs of an economic activity and depend on the way transactions are organized.

Transaction costs generally include those costs associated with:

- *Search and information costs* (looking for a buyer or seller, determining if the required good is available on the market, prices for the good);

- *Bargaining costs* (drawing up and negotiating contracts, making agreements);

- *Enforcement costs* (costs of enforcing the terms of the contracts);

- *Transportation costs* do also fall under the categorization of transaction costs and simply are their most concrete form.

Transaction costs occur both outside and along the value chain and their magnitude depend on many factors, such as infrastructure and logistics, appropriate legislative settings, and access to information. Lack of information and knowledge, a widespread problem of the transition economies, due to the absence of well functioning market institutions (McMillan, 1995; Hobbs et al., 1997), can lead to high transaction costs and aggravate the efforts required to coordinate transactions and to promote closer vertical coordination and cooperation in commodity/value chains. High transactions costs represent perhaps the most important difficulty facing diversification of a particular chain into higher value products.

2.5 Conceptual framework of the present study

A conceptual framework is a relational model, used in research to outline a working plan and possible courses of action; and to present a preferred approach for undertaking this research. In general, a framework is built from a set of concepts linked to a planned or existing system of methods, behaviours, functions, relationships, and objects.

The preferred conceptual framework of the current research on the value chains was developed from the combination of different contemporary approaches to the chain analysis,

namely commodity chain analysis, value chain analysis and global commodity chain. They
all present wide common aspects and could be associated to some extent in the present work.

Data on agents, flows, production processes, functions

↓

Functional analysis (identification of functions along the chain, production stages and
flows)

↓

Institutional analysis (identification and description of agents involved in the chain)

↓

Financial analysis (calculation of value added and efficiency indicators of the agents
and the chain on the whole)

↓

Economic analysis (impact assessment)

↓

Measuring performance, comparative analysis and benchmarking

↓

Policy simulations and Recommendations

Figure 2.1 Sequence of analyses in conceptual framework

(Source: own compilation)

The research on the value chains of agro-commodities in Uzbekistan started with collecting
the existing information on grown crops and their flows to the agro-processing industry,
production stages, inputs and output involved, interaction among the actors (see Figure 2.1).
The data was then streamlined via functional and institutional analyses and incorporated in
various value chain maps (Figure 2.2). The next step was analyzing the value chain from
financial aspect. This included calculations of value added, gross profits and net profits,
transaction costs, both for individual agents and on the chain as the whole. Based on the
afore mentioned indicators, financial profitability of activities within the chain, overall
efficiency of the chain, the processes of price determination and transfers between agents
were identified.

Economic analysis followed financial analysis and involved identifying the boundaries of the
chain and the position of the various actors within the chain; and developing the economic
accounts corresponding to their activities. Economic analysis set a basis for assessment of
impact of the chains on economic growth, on foreign exchange, on the balance of trade, on
income distribution to domestic agents, and on the government budget. Based on the results
of financial and economic analyses, comparative analysis and benchmarking of key

indicators along the value chain was applied to facilitate the formulation of recommendations by determining the obvious performance gaps and identifying assigning priorities to the main constraints to development of the value chains.
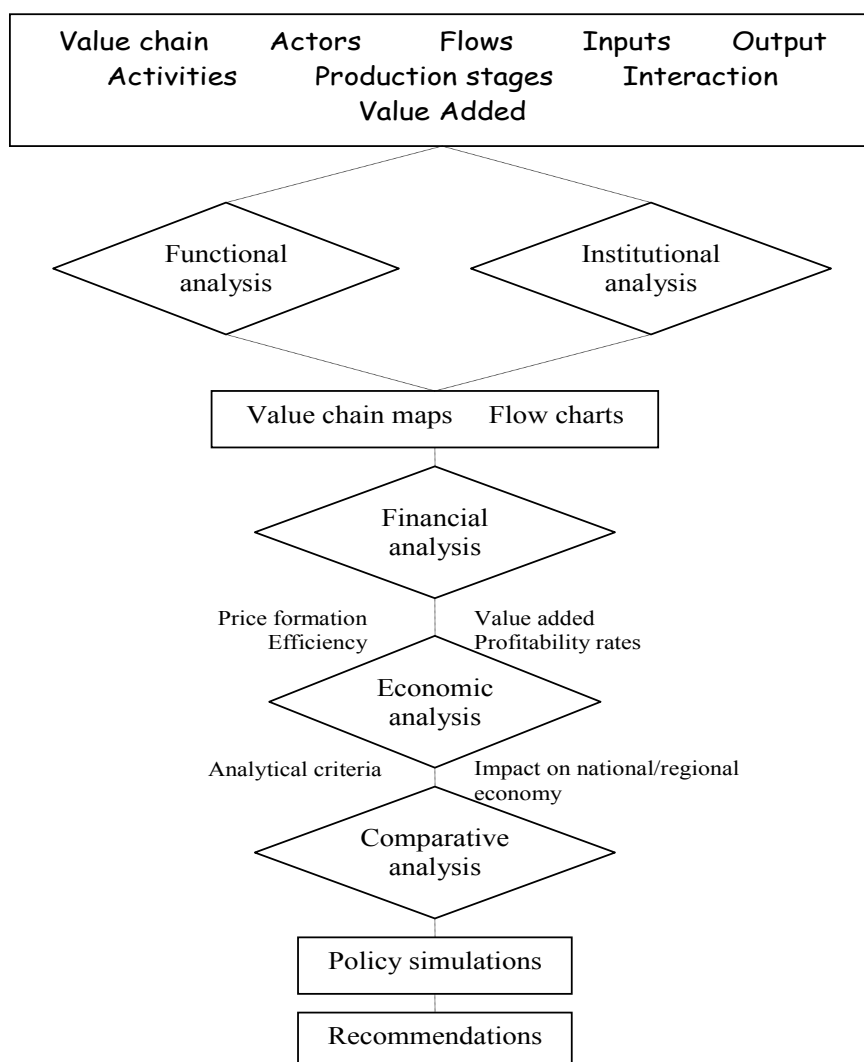
Figure 2.2 Graphical presentation of the conceptual framework

(Source: adapted from FAO, own presentation)

Finally, in addition to pure value chain analysis and based on data generated by value chain analysis, deterministic policy simulation models were set up in order to provide some guidelines for possible strategy formation. It has to be noted that modelling approach used in the current study was based only on the partial equilibrium analysis and the models had a static character. There remains lots of room for improvement and a more detailed modelling approach. Despite these shortcomings, simulation results do give some insight on the potential of value chains' development and the models could be easily used by practitioners and policy makers.

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3 Empirical investigation: Uzbekistan, study site and data

3.1 Country background: Uzbekistan

Uzbekistan is located in the very centre of Eurasia. It is the only country in the region which has borders with all other Central Asian countries of the FSU: Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan; another neighbouring country is Afghanistan. Total territory stands at slightly over 447 thousand square km. Administratively, the country is comprised of 12 regions (oblasts) and the Autonomous Republic of Karakalpakstan in the north-west.

Despite of a low share of cultivated land of about 11 percent, Uzbekistan is nevertheless considered an agrarian country with an economy heavily depending on agricultural production from irrigated arable land (the agrarian sector makes up about one third of country's GDP (CEEP, 2005)) and agriculture based processing industry. Other sectors supporting economy include such industries as gas, electric power, ferrous and nonferrous metallurgy, as well as agriculture-related industries, like machine-building (agricultural machinery), cotton-ginning, textiles, chemicals, canneries and other industries.

Uzbekistan has the advantages of a warm climate and a long growing season, which allows the production of quite a range of crops. The country is the world's fifth largest producer of cotton, and one of the largest producers and exporters of fruits and vegetables in Central Asia. Cotton has traditionally been a priority as a main hard currency earner. Winter wheat became second major crop after independence in 1991 in the framework of the policy of import substitution and self sufficiency in grains. Other crops include basically fodder crops, fruits and vegetables.

Uzbekistan is the most populous of the five Central Asian countries with about 27 million inhabitants in 2006. More than 30 percent of the able-bodied population is engaged in agricultural sector (World Bank, 2005), while the rural population comprises 60 to 70 percent of the total population. The situation in the agrarian sector of the economy determines not only the standard of living of the largest part of the population, but in fact the prosperity of the whole nation.

3.2 Study site: the Khorezm region

The research was conducted in the Khorezm region, a 680 thousand hectares large administrative district located in the lower reaches of the Amu Darya River in Northwest Uzbekistan (41°41′ N latitude, 39°40′ E longitude and altitude 113 m). It is the smallest

administrative region in the country, which borders the southern edge of the ecologically degraded Aral Sea area and which is one of the most problematic areas regarding salinity, irrigation water availability and overall crop performance (Martius et al., 2004). Khorezm is also surrounded by the deserts Karakum and Kizilkum, which determine the arid sharply continental climate as characterized by hot summers with temperatures rising to +45 ^{o}C and cold winters with temperatures falling as low as -20 ^{o}C (Glazirin et al., 1999). The annual evaporation of about 1626 mm exceeds by far the annual long-term average precipitation of 100 mm. Agriculture is only possible with irrigation and only on approximately 40 percent of the entire area of Khorezm. The agro-ecological conditions render Khorezm suitable for the production of annual, warm-season crops such as cotton, variety of vegetables and fruits.
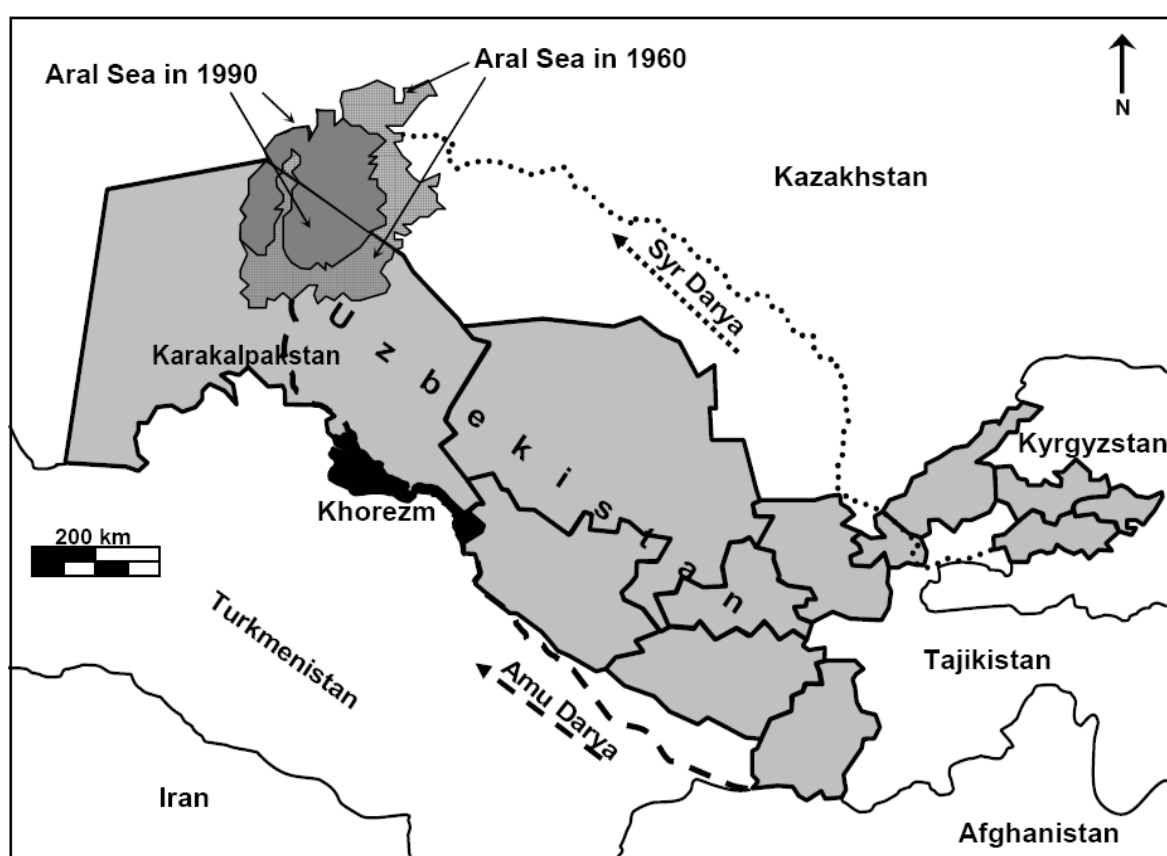
Figure 3.1 Stylized Map of Uzbekistan

(Source: Mueller, 2006)

Despite being a rather small area, (about 1.5 percent of the territory of Uzbekistan), the population density in Khorezm is high with 1.5 million inhabitants or more than 5 percent of the total population of Uzbekistan (in 2005) (Table 3.1).

Table 3.1 Some Khorezm statistics on the country background, 2005

	Khorezm	Uzbekistan	Share
GDP*	0.504	13.95	3.6
Population**	1.5	26.9	5.6
Total area***	680	44740	1.5
Available arable land***	270	4475	6.0
Administrative division****	11	13	
Foreign trade turnover*	0.105	6.613	1.6
Export*	0.089	3.392	2.6
including: cotton fibre export	0.084	0.872	9.6
textiles export	0.001	0.047	2.1
food products export	0.002	0.369	0.5
Import*	0.016	3.221	0.5
Foreign direct investments*	0.006	0.045	13.3

Source: OblStat, WB, UNDP, ITC

* GDP, foreign trade turnover, export and import, foreign direct investment in billion USD

** Population in million people

*** Area total, arable in thousand ha

**** Administrative division: in Uzbekistan 12 regions and Republic of Karakalpakstan; in Khorezm: 11 districts

The Gross Domestic Product (GDP) of Khorezm in 2005 reached about USD 504 million, which was 3.6 percent of the national level (Table 3.1). Foreign trade turnover of Khorezm reached USD 105 million with exports dominating over imports (OblStat, 2005).

The economy in Khorezm is heavily dependent on agriculture with its 45 percent contribution to regional GDP in 2005 (OblStat, 2005). Agriculture is important as a living habitat and source of employment for the prevailing rural population as well as the main provider of raw materials for the subsequent industrial sectors (agro-processing industry).

Branches of the agro-processing industry, like ginning and light (textile) industry and food manufacturing industry are developed on a larger scale compared to other industrial sectors. Next on the scale come power, engineering, construction and chemical industries. Also present, but not broadly developed in Khorezm are wood and petroleum industries, ferrous and non-ferrous metallurgy (OblStat, 2005).

Total available arable land in Khorezm stands at about 270 thousand hectares, of which 222 were cultivated in 2005. The main crops grown in the region in 2005, the year on which the data for this research are based, were cotton (49 percent of total cultivated land); winter wheat (21 percent); forage crops (12 percent); rice (10 percent); and fruits and vegetables (8 percent).

Administratively, Khorezm is divided into 11 districts, all of which were covered by the survey in the present study (Figure 3.2).

Figure 3.2 Administrative map of Khorezm

(Source: GIS lab of ZEF/UNESCO Khorezm Project, 2007)

Agricultural production in Khorezm in 2005 was undertaken by three structures: (1) *shirkats*[11], the large scale state farms; (2) private farms; and (3) *dehqons*[12], the rural households. Since 2005-2006, however, in the framework of privatisation in agriculture *shirkats* were abolished and more private farms established. Thus, private farms have become the main agricultural producers throughout the region with about 196 thousand hectares (OblStat, 2005) in their jurisdiction. Private farms grow basically cotton and most of the wheat, the two state target crops. *Dehqons* possess and cultivate the remaining share of

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[11] Uzbek for a large-scale agricultural cooperative established on a base of *kolkhoz* or *sovkhoz* on a share-holding foundation

[12] *Dehqons are the* rural households in Uzbekistan, involved in agricultural production, mainly for home consumption. Some dehqons are also registered as private farms

arable land; are free from any state orders; and produce the most fruits and vegetables in the region.

3.3 Data

3.3.1 Data collection approaches

Various approaches to data collection exist and have been used in the research depending on characteristic features of target populations and on the variability of major parameters of the study area. The broad scope of this research required three approaches to data collection: census, surveys and case studies.

Census

Census aims at the complete coverage of the area of research and at meeting most of the objectives. However, it involves considerable efforts and is also considered to be limited by the number of variables to be investigated. Based on the number of actors in each value chain, this approach was adequate to apply to the second stage of the value chain – agro-processors (ginneries, wheat mills, etc).

Sample survey

Sample survey investigates a selected group from the basic population of the chain actors. This approach was suitable for both descriptive and analytical purposes and allowed detailed and differentiated investigations. In order to achieve representativeness of the basic population and to be able to generalize the conclusions a certain sampling procedure had to be followed. In the case of this value chain research the use was made of stratified random and purposive sampling procedures.

Case studies

Case studies assume looking only at a few units of the population and aim at more detailed investigations. This approach had the potential to provide a deeper understanding of the current state and mechanisms underlying in the given populations of the value chain actors. Case studies also could considerably enrich the value chain research. They were especially valuable for investigating "how" and "why" questions.

Case studies technique seem also promising for the surveys of the processing stage of the chains, as all ginneries in the cotton chain and all non-private wheat mills were considered to have the same structure, management, socio-economic environment and thus the information obtained from the case studies was valid for the rest of the population.

3.3.2   Data collection methods

A combination of data collection methods were used in this research to generate the required information and to meet the objectives. The main reason for using multiple methods was that this research required a considerable amount of information. Some background information was crucial to put the study into its proper context. This included data on the country's as well as Khorezm province's economy, agricultural sector, the history of agricultural and industry sub-sectors. Key variables of the value chain to be investigated and determined in the research process had both qualitative and quantitative dimensions, and called, again, for multiple methods. Other reasons for using multiple methods had to do with the reliability of available information and the importance of that information to the research; as well as checking the results of different methods against each other. A short overview of the data collection methods used for this study is presented in Table 3.2.

Table 3.2 Summary of survey methods and sample sizes

Survey method	Target group	Sample / Population size
Formal survey: stratified random sampling	Farmers	121/13621*
Formal survey, observation, case studies	Ginneries	10/10
Formal survey, observation, case studies	Textile companies	13/26
Formal survey, observation, case studies	State wheat mills Private wheat mills	4/4 3/n.a.
Formal survey: purposive sampling, observation	Bakeries	7/n.a.
Formal survey: purposive sampling, observation	Vegetable processing plants	7/15
Informal survey, secondary sources	Other institutions involved in the value chains	about 40/n.a.

Source: Own compilation

* total number of farmers, present at the time of conducting field research

n.a. = not available

Secondary sources

Secondary information, be that official statistical reports, unofficial studies and reports, topical and area-specific articles from journals and newspapers and informal conversations with key informants were invaluable for the research. This value chain research started with the official statistics on agriculture and industry sectors, which helped to determine the scope and the actors involved in the value chains, as well as provided with the contact information for the following formal and informal surveys.

Key informants survey / informal survey

An informal survey was conducted to obtain basic and sometimes detailed information about the research topic. Interviews with key informants, people who were considered to have particular knowledge or opinions about the study topic shed some light on how the system under investigation functioned. Key informants were usually identified in a sequential process, beginning with the obvious official types and continuing by asking each interviewee who might provide additional information. However, in some cases more than one key informant had to be interviewed on the same issue, as the information supplied by the key informants was not fully reliable.

Based on the scope of the value chain key informants included: representatives of Khorezm Agriculture and Water Management Offices, representatives of numerous organizations, involved in the value chain: directors, engineers of processing units and farmers. Informal surveys was held also in organizations, providing various services to the actors of the value chain: Machine Tractor Parks, biolaboratories, fuel distributing outlets, fertilizer distributing outlets, mini banks, Farmer and *Dehqon* Associations, Commodity Exchange, as well as in organizations, controlling or monitoring the actors of the value chain: UzStandart Agency, Customs and Tax offices, Joint Stock Company "UzDonMahsulot", State Joint Stock Company "KhorezmPakhtaSanoat", and some others.

Observation

Good insight into the research topic and knowledge could be achieved by observing what people actually do, how they do it, and the setting in which they do it. An observation technique was actually used when visiting the mills, ginneries, textile enterprises and bakeries. It included the tour around these units and looking at the production processes. Observation made it possible to get the feeling of time and effort consuming process of transformation of agricultural raw products into processed goods. Knowledge received from observation would enable to categorize and breakdown the costs along the value chain.

Questionnaire surveys / formal survey

Formal survey involved the use of questionnaires to a selected sample from a certain population of the value chain actors. The important concerns with this method were defining the population and its size, or getting a sample frame and selecting the appropriate representative sample. Of not less importance to the successful questionnaire survey were well designed questionnaires and their pre-testing.

The current research undertook the formal survey method (based on the different sampling procedures) with the main (direct) actors of the value chain. Formal survey method with semi-structured questionnaires was applied to 121 private farms, 10 ginneries; 13 textile companies; 4 non-private (state) wheat mills and 3 private mills, 7 bakeries and 7 vegetable processing plants.

Sampling

As mentioned above the formal survey technique was applied in the current research to the direct actors of the value chain, which were selected based on stratified random (private farms) and purposive sampling procedures (agro-processors).

Private farms, producing agricultural raw products were represented in Khorezm by a large population. Farmers' survey thus required selection of a smaller group of farmers to interview with regards to time and other limitations of the research. Farmers' survey started with obtaining of the sampling frame - a list of all 13621 farms in Khorezm, present at the time of conducting field research.

Table 3.3 Sample of the surveyed farms, 2005

Rayon	Private farms present in 2004-2005	Surveyed farms
Urgench	1294	11
Bogot	1078	12
Gurlan	1619	12
Kushkupir	1624	14
Khazarasp	1792	12
Khonka	1114	12
Khiva	1155	11
Shovot	1673	12
Yangiarik	1036	13
Yangibazar	1236	12
Total	**13621**	**121**

Source: own compilation

The farms in the obtained list then were divided into three subgroups according to their farm size[13]. A sample of total 121 farms then was randomly selected, with about 40 farms in each stratum (Table 3.3).

Private farms in Khorezm do not necessarily follow one unique specialization; in many cases private farms cultivate more than one crop. Thus, survey sample of 121 private farms included: cotton growing farms (99), wheat growing farms (52), and vegetable/fruit growing farms (26).

Agro-processors with state ownership (state shares in joint stock) were all interviewed (total population covered). Other interviewed actors of the chains: private mills, bakeries and vegetable processing plants were selected via a purposive sampling procedure, meaning that these surveyed units were identified by the previous links of the value chain.

3.3.3 Data analysis

Data analysis in the current research was based on approaches described in the conceptual framework in previous chapter. It consisted of some statistical analysis (descriptive statistics) for the bigger survey samples, like farmers for example; functional and institutional analyses when using value chain analysis as a descriptive tool. These types of analyses are outlined in the following three chapters, each being devoted to a separate value chain. Financial and economic analyses conclude each of these three chapters.

Comparative analysis and benchmarking were used in the framework of value chain analysis as analytical tool. These are found in chapter 7, where all separate value chains are compared and benchmarked among each other and against comparators from other countries.

Analysis of the cost structure for different products along the chains was undertaken based on the data obtained through surveys; from such official financial documentation and reports of the chains actors, like balance sheets, statements of accounts. These costs were streamlined into the value chains of various products and their shares analysed.

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[13]stratification of surveyed farms: small farms: 1 – 10 ha, middle farms: 11 – 20 ha, big farms: above 20 ha

4   Empirical investigation: The Cotton Value Chain (CVC)

4.1   Introduction

There are more than 200 different products that can be produced from cotton; it is due to such diversity that cotton became one of the strategic crops for the FSU, with Uzbekistan contributing on average 70 percent to the region's total cotton production. The two main bi-products from cotton are: fibre and seed and each has multiple uses. One ton of raw cotton yields on average 3000 meters of fabric, 100 kg of cotton oil, and 200-250 kg of cotton cake (Ter-Avanesyan, 1973). Cotton fibre is used to produce various yarns, fabrics, medicine wool. Cottonseed is used for the extraction of cottonseed oil, margarine, soap and also cotton cake and husk – an important animal feed. Wastes from the ginneries and oil extracting plants are utilized for spirits, insulating material, paints, varnish. Leaves are the source for organic acids. Stems, besides being a cheap fire-wood, can be used in the preparation of coarse paper varieties and cardboard.

In the end of the 19th century Russia had about 60-70 thousand hectares sown to cotton, mainly in Central Asia. However, the 40-50 thousand tons of cotton produced in this area was not enough for the growing textile industry of Russia. About 170 thousand tons were imported from the Americas, Egypt and Iran. In the years leading up to WWI, and with the rise of the Soviet state, production of cotton was further reduced. In light of such shortages, one of the urgent tasks for the new country was to restore and expand cotton production. In 1922, with Stalin's rise to power, the importance of Soviet cotton production was re-established. Cropping areas were expanded throughout Central Asia by transforming the desert areas in the Aral Sea Basin into artificially irrigated agricultural land for the production of cotton. New methods of cotton cultivation based on the use of chemicals and mineral fertilizers were introduced.

The consequences became evident in the last decades, and they are disastrous (Micklin, 1988; Whish-Wilson, 2002; Glantz, 1999). Despite the ecological, social and economic hardship resulting from monoculture production in the region, cotton remains Uzbekistan's key cash crop and one of the main hard currency earners. However, experience from developing countries shows that nations, specializing in exports of primary commodities, such as cotton fibre are vulnerable to the fluctuations in the world markets (Stamm, 2004). Likewise loss to Uzbekistan from low cotton prices in the world in 1998-2001 amounted to about USD 1.5 billion (Washington conference, 2002). In the light of such experience shift from the primary commodity exports to the export of the value added commodities and the

removal of trade barriers with the aim of facilitating trade became an important part of the recent reform package.

"The (Uzbek) government and the private sector have shown substantial interest in the last several years in reviving light industry. The motivation for this is partly attributed to the realization that the cotton-textile industry offers unique opportunities for increased employment, poverty reduction, rural development and increased incomes in arid and semi-arid lands." (ADB, 2004). However, the reformation process is slow and the results are yet to be seen.

4.2 Cotton-textile sector background

4.2.1 Some history of the cotton-textile sector of Uzbekistan and Khorezm

Uzbekistan

Central Asia in the ancient times had vivid trading relationships with many countries. It was considered the so called "gates" which numerous caravans passed in their route from West to Asia and China and has such been called 'the Silk road'. Cottonseeds were brought to Central Asia (including the territory of Uzbekistan) from far away countries with these caravans. According to historical evidence cotton has been cultivated in Central Asia ever since the 5-6th centuries (Atashev, 1972). Knowledge of the population and favourable climatic conditions along the rivers predetermined success of cotton growing in Central Asia.

In the 16 and 17th centuries, cotton was grown on small plots and, after the process of refinement, was sold to the wholesale traders, who then exported it to Russia (Atashev, 1972). Development of transactions with Russia served for further development of cotton farming, the more so in the period of the Civil War in the States, which used to be the main suppliers of raw cotton to Russia. Cropping areas in Bukhara, Khiva, Kokand increased due to the higher prices for cotton, caused by the cessation of cotton supply to Russia from the States. It also led to attempts of selecting new, better cotton varieties (resembling American cotton varieties), and meeting requirements of the Russian textile industry (Atashev, 1972).

In the process of a long adaptation of the cotton plant to the climatic conditions of Central Asia and owing to cotton breeders many new varieties of cotton were brought into production. For example cotton grown in Khiva was famous for the thin and silky fibre and was traded at higher prices, compared to the Tashkent cotton (Atashev, 1972).

Cotton was traded at the markets or exported in the form of raw cotton (with seeds), cotton fibre, or in bolls. From the region of Khiva, cotton was exported to Russia via the Aral sea and from other parts via the rail road, built in the early 1900s. Central Asia provided cotton

independence to Russia and the development of its textile industry. At that time the whole cotton agro industrial complex was set up: cotton field – cotton ginnery – textile industry (Khidoyatov, 1986).

Area sown to cotton in the pre revolution years expanded ten-fold within somewhat 40 years (Table 4.1); yields increased from 7-8 to about 15 centners[14] per hectare. Before the FSU cotton processing was done basically by hand, or by hand made small equipments. First six ginneries were built in Tashkent in 1881 (Khidoyatov, 1986).

Table 4.1 Area under cotton in pre revolution period of Uzbekistan

Years	Cotton area, thousand ha
1870-1880	40-50
1890	100
1900	220-250
1910	300
1916	555

Source: Khidoyatov, 1986

The post-revolution period of the cotton sector has several distinct phases.

First phase (up to 1930s) includes the land and water reforms, intensification of the machinery and equipment base. Implementation of the new cropping techniques with chiselling, inter-row cultivation and furrow irrigation. In 1928, Uzbekistan reached its pre-revolutionary level of cotton production (Table 4.1).

Second phase (1930s to mid 1940s) is characterized by an increase in cotton yields due to the higher quality of the field works, intense use of fertilizers and new varieties of cotton.

Third phase (1040s to 1950s) marked the use of higher levels of fertilizers, mechanization of all field works; first cotton harvesting machines were introduced. Yields reached 20 centners per hectare.

Pre-independence phase (1953 – 1991) embraced further development of cotton growing technologies, including deeper tillage (to 30 cm deep), pre-planting preparation of soil and use of pesticides and other chemicals. Harvests in the late 50s reached 3.5 million tons of raw cotton.

The high level of dependence on cotton monoculture created problems for independent Uzbekistan, including inadequate attention to other agricultural commodities and dependence on imports of food products – especially grain, overuse of water resources, insufficient crop

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[14] Centner is the unit of measurement of the yields in the FSU and now Uzbekistan, equal to 100 kg

rotation. Environmental problems, such as soil salinization and erosion, downstream pollution, and ultimately the infamous desiccation of the Aral Sea have all been direct consequences of decades of monoculture cotton production (Bloch, 2002).

After-independence phase (1991 – present) started the process of diversification of agriculture, encompassing reduction of the cotton area in favour of winter wheat in the framework of the policy of self sufficiency in food stuffs, reducing state targets for strategic crops and privatising the agricultural sector.

The Khorezm region

Hand made irrigation and drainage channels, built many centuries ago in Khorezm, supported livelihoods of the population and served as the base for the development of irrigated agriculture. Cotton was cultivated among other crops such as wheat and clover and presented a great interest to Russia, which established its protectorate over Khiva in 1883. The whole region was turned into a cotton supply base with the aim to provide Russian textile industries with the required amount of inputs. Area under cotton steadily increased, new varieties were introduced, and attempts were made to develop the cotton ginning industry.

Raw cotton used to be refined by hand at small gins by the farmers. Productivity and quality was not satisfying, so numerous small private ginneries appeared in Khorezm at the end of the 19th – beginning of 20th century (Khudoyberganov, 2004). Five bigger cotton refining plants equipped with American gins were built in Khorezm in the pre-revolutionary period; some oil extracting plants were also established for processing the increased amount of cottonseed (Khudoyberganov, 2004).

The revolution of 1917 had a negative impact on the cotton ginning industry and the newly established textile industry in Khorezm; small private ginneries scattered throughout Khorezm were merged to the cotton refining plants, which were nationalized in 1924 (Atashev, 1972). After some years of stagnation cotton production in Khorezm regained importance again. In 1926, 17 percent of the total arable land was planted with cotton, while in the 1930s this figure reached almost a 66 percent level, mainly at the expense of grain production (Atashev, 1972).

This cotton production pattern continued until WWII, declined in the war years and expanded again from the late 1940s. The amounts of raw cotton grown in Khorezm increased and could no longer be covered by the processing capacities of the existing ginneries.

The other five ginneries of Khorezm were built in the late 1960s – 1970s. All the ginneries underwent reconstruction and modernisation in the 1980s and were turned to State Joint

Stock Companies (half privatised) in 1995 in the framework of the privatisation process in Uzbekistan (based on own ginneries' survey results).

4.2.2 Importance of cotton to the country and the region

Uzbekistan is the fifth largest producer of cotton in the world (approximately 3.5 million tons of raw cotton and 1.2 million tons of cotton fibre produced annually, or roughly 5 percent of the world's total production) and the second largest cotton exporter (around 0.7 – 0.8 million tons of cotton fibre exported annually, or roughly 11 percent of world cotton exports) (Narodnoe Slovo, 2005). According to the World Bank official report, cotton contributes 13 percent of GDP of Uzbekistan and around 25 percent of foreign exchange revenues (World Bank, 2005). This important crop directly accounts for almost 20 percent of rural employment, a figure that rises above 30 percent during harvest time (Mueller, 2006). Water use for cotton accounts for 41 percent of irrigation water in the country and around the same share of all irrigated land (UzReport.com, 2005b). Khorezm is considered one of the most valuable cotton fibre suppliers in Uzbekistan.

Area under cotton in Khorezm in the independence years remained stable at around 100 thousand hectares, or around 50 percent of the total cropping area with a slight increase since 2000 (OblStat, 2005). Raw cotton output ranges from below 300 thousand tons to slightly over 300 thousand tons with the exception of the years of decline: 2000 – 2002 due to drought, 2003 due to crop damage by insect invasion (Figure 4.1).
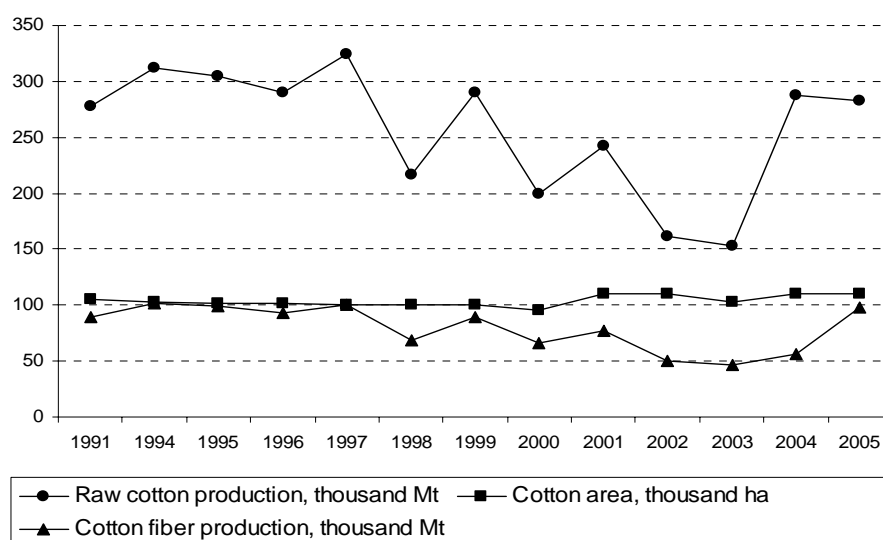
Figure 4.1 Cotton area and total output of the cotton sector in the Khorezm region, 1991-2005

(Source: based on OblStat data)

The average ginning output ratio is in the range of 30-34 percent, depending on the quality of raw cotton. In 2005 ginneries of Khorezm processed around 287 thousand tons of raw cotton harvest of 2004 into 98 thousand tons of cotton fibre[15].

Cotton-textile sector accounts for almost entire export value in the Khorezm region. In 2005 USD 87.7 million were contributed by the cotton-textile sector, or 99 percent of the total export value of the Khorezm region (Table 4.2). Cotton fibre alone contributed 95 percent, with the export of about 76 thousand tons of produced cotton fibre for the total value of USD 84.3 million. Other export items include cotton oil, cottonseed meal and cake, as well as textile industry products, like yarn, fabrics, and ready made garments (Table 4.2).

Table 4.2 Export from the cotton-textile sector in the Khorezm region in 2005

	Products	Value, mln.USD	Share, %
Total export value		88.463	100
Ginning industry	cotton fibre	84.316	95.3
Oil extracting	cotton edible oil	0.840	0.9
	cottonseed meal and cake	0.089	0.1
Textile industry	yarn		
	fabrics		
	garments	2.449	2.8
Total cotton-textile sector export value		87.693	99.1

Source: OblStat, own estimation

4.2.3 Latest reforms in the cotton-textile sector of Uzbekistan

In the last several years the cotton-textile sector of Uzbekistan has become a target for intensive reforms, initiated by the Government and involving both state and private sectors, as well as foreign partners. The reforms focus mainly on the ginning and textile sectors of Uzbekistan.

Cotton and the cotton ginning sector

With the aim of further development of de-monopolization and privatisation of the cotton ginning sector of Uzbekistan, and in order to attract investments (including foreign investments) for equipment and modernisation of ginneries, the Presidential Decree No.2874 from 11.06.2001 on Measures for de-monopolization and enhancement of the management of the cotton ginning industry of Uzbekistan was passed. A Decree of the Cabinet of Ministers No.252 from 12.06.2001 on the Enhancement of the cotton ginning sector management structure followed.

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[15] Due to the nature or seasonality of cotton ginning, cotton fibre produced in the current year is the product of raw cotton harvested the previous year

In the last several years Uzbekistan has not been able to reach its cotton production target for a number of reasons, including poor weather conditions, inadequate production incentives (e.g. prices), and low-quality inputs and deteriorating infrastructure, especially concerning irrigation and drainage network, and above all, the lack of a free market.

Uzbekistan is planning to increase area sown to cotton using faster-maturing varieties (UzReport.com, 2005b). The government has initiated a major program to reform the cotton sector, aimed mainly at improving fibre quality. The reforms are focused on three areas:

Firstly, the replacement of inferior cotton varieties, particularly those with a high micronaire[16], with better varieties. In connection with this, the government established a new State Inspection Service on March 31, 2005, the goal of which is to control production and use of cottonseed. A major stimulus to the development of cottonseed production was provided by the government's Resolution of the Cabinet of Ministers No.604 from 23.12.2004. The Resolution has served as a basis for the Specialized Ginning Mill Seed Preparation Plant Modernisation Program for 2005-2006. Under this program, cottonseed stock preparation is to be centralised at 31 ginneries, equipped with modern sorting and calibrating equipment and seed disinfection facilities to ensure that the seed is protected against disease and pests during the initial phase of plant development.

Secondly, the government is seeking to modernise ginneries by attracting foreign investments. Presently, more than 80 percent of the nation's ginning equipment dates back to the pre-independence period and needs to be replaced.

Thirdly, in December 2002 the government adopted a Decree[17] that allows farmers to sell up to 50 percent of their cotton output either domestically or abroad. However, as of today, there is still no concrete mechanism developed to allow this process to begin, and thus the government keeps a monopoly on cotton marketing (UzReport.com, 2005a and Swinnen, 2005).

A commodity exchange has been set up throughout the country and it is foreseen that farmers will soon have the right to sell their cotton above state quota directly through the exchange.

Marketing of cotton fibre is the major issue of almost all legislation acts, passed in Uzbekistan in the last years. Various decrees on cotton fibre sale regulations include:

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[16] Micronaire is a critical cotton fibre quality, which describes both the maturity and fineness of cotton. It is more influenced by weather than any other fiber characteristic. The end quality of cotton yarn or fabric is partially determined by micronaire
(http://www.cottoninc.com/CottonGrowerArticles/MysteryOfMicronaire/)

[17] This Decree, was not found during the survey albeit mentioned and thus cannot be referred to

- Decree of the Cabinet of Ministers No.240 from 3.06.2003 on Enhancement of payment procedure for the produced and marketed cotton fibre;

- Decree of the Cabinet of Ministers No.447 from 16.10.2003 on Payment procedure for cotton fibre for textile enterprises with foreign investments;

- Decree of the Cabinet of Ministers No.414 from 03.09.2004 on Ratification of the provisions on marketing of cotton fibre and settlement of accounts between the Foreign Trade Companies and regional branches of SJSC "UzPakhtaSanoat";

- Decree of the Cabinet of Ministers No.232 from 19.10.2005 on Measures for further development of marketing procedures of cotton fibre to textile enterprises with foreign investments;

- Decree of the Cabinet of Ministers No.450 from 18.10.2003 on some amendments to the Decree of the Cabinet of Ministers No.240 from 3.06.2003.

Textile sector

Significant growth of foreign investments into the textile sector occurred as a result of the increase in Foreign Direct Investments (FDI) for the establishment of joint ventures in the textile sector (CEEP, 2005). Until 1991, there were only 4 large textile complexes operating throughout the country, but since 1995 the volume of foreign investments attracted by the industry reached USD 800 million, more than 44 projects have been implemented and 36 joint ventures have been established with the partners from Germany, Switzerland, Japan, Turkey, the US and other countries (UzReport.com, 2005a).

At present, support and special favourable and liberalised conditions are being created by the government of Uzbekistan. These conditions include a stable legal framework for economic activities, elimination of excessive external intervention into economic activity, simplification of procedures of licensing, registration and certification, and above all, the wide range of various privileges, preferences and guarantees for joint and foreign enterprises. These conditions are secured by the current legislation, including the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On measures on attraction of investments into the textile industry of the Republic" dated January 27th, 2005. This Resolution approves the State Program on attracting investment into the textile industry for the period of 2005-2008. This program embraces 94 projects, envisaging the attraction of investments in the amount of more than USD 1.22 billion for modernisation, refitting and complete reconstruction of the enterprises, as well as for establishment of new enterprises with a complete production cycle. It is expected that implementation of the given projects will produce a gradual increase in the volume of domestic processing by the most up-to-date

equipment and technologies; up to 50 percent of the total volume of cotton fibre grown domestically.

Under the provision of the specified legislation some advantages for the textile industries, provided that they produce export-oriented products, include:

- simplified taxation;

- exemption from the payment of customs duties (except for customs registration fees) on imports of technological and auxiliary equipment, technological accessories and spare parts for industrial needs;

- up to 20 percent discount on the purchase of cotton fibre.

The implementation of the Program will increase export volume by USD 1.17 billion and create more than 46 thousand new jobs (UzReport.com, 2005a).

The Presidential Decree No. 330 from 21.04.2006 on Measures on financial recovery of enterprises of the textile industry and on improvement of cotton fibre marketing to these enterprises aims at intensive development of the Uzbek textile industry via modernisation and refitting of the textile facilities in the country.

The Regional Program for Modernisation and Technical Refitting of Textile Industry Enterprises for 2006-2008 and the Presidential Decree No. 330 from April, 21 2006 aim at improving the textile facilities in the country and at raising the efficiency of domestic fiber processing. According to the surveyed textile producers in Khorezm the Program and the Presidential Decree: (1) have far reaching goals and the idea that the precious inputs such as cotton fibre, should be used wisely; (2) were issued and are implemented without careful, on the spot investigations, surveys of cotton processing companies; (3) treat cotton fibre processors unevenly: cotton fibre processors operating at ginneries (and thus belonging to the State) are not forced to modernise their equipment and continue receiving inputs and their activities; where as private processors, having comparatively new equipment and producing rather good products had to stop their production lines due to the absence of inputs; (4) hinder competition and the development of market economy.

4.3 The operating environment of the CVC

"... Value chains … do not exist in a vacuum, but within a complex matrix of institutions and supporting industries. At the most basic level, it should be pointed out that the value chains, and every stage and in every location, are sustained by a variety of critical inputs, including human resources, infrastructure, capital equipment, and services…" (Sturgeon, 2001).

The operating environment of the cotton value chain sets the conditions in which the entire chain operates and interacts with other stakeholders. The operating environment includes the chain itself, the governing structure, and other service providing institutions. The cotton value chain as such is complex and involves four sectors of the economy (Figure 4.2):

- Agricultural sector, represented by private farms and *shirkats* (in 2004) growing raw cotton;

- Cotton ginning sector, represented by the State Joint Stock Company (SJSC) "UzPakhtaSanoat" and its regional branches and ginneries processing raw cotton into cotton fibre;

- Light (textile) industry, represented by the SJSC "UzbekEngilSanoat" and various spinning, weaving, knitting, clothing factories of broad range of organizational structure, which further process cotton fibre and cotton linter to the products with higher value added, starting with cotton yarn and all the way to the ready made garments;

- Oil extracting and chemical industries, represented in the cotton chain by oil extracting plants, processing cottonseeds into cotton oil, cotton cake and many other cotton by-products and acid producing plants.

The governing structure consists of the Ministry of Agriculture and Water Resources, Ministry of Finance, Ministry of Economy, Ministry for Foreign Economic Relations, Trade and Development, UzStandart Agency, and Cottonseed Corporation. The latter is in charge of seed selection and distribution to agricultural producers. The governing, or managing structure, is thus responsible for decisions on how many hectares of cotton to plant, how much and what cotton varieties to produce; it defines prices for cotton products and elaborates cotton products' balances; regulates export operations; sets standards for cotton production and processing, as well as cotton quality standards. There is also a wide range of other organizations and institutions involved in the cotton chain which are aimed at facilitating the functioning of the entire chain and at providing various services, including banking, marketing, exchange transactions, transportation, certification and quality control, insurance and other services (Figure 4.2).

Ministry of Agriculture and Water Resources	Ministry of Finance	Ministry for Foreign Economic Relations, Trade and Development	Banks: **"National Bank for Economic Activity of RUzb"** **"Pakhtabank"** **"Asakabank"**
Ministry of Economy	"UzStandart" Agency	Cotton Seed Corporation	

Agricultural Sector	*Cotton Ginning Sector*	*Light Industry Sector*
Farmers Shirkats	"UzPakhtaSanoat" SJSC	"UzbekEngilSanoat" SJSC
	"KhorezmPakhtaSanoat" SJSC	spinning ⎫ SJSC weaving ⎬ JV/FBC knitting ⎪ PC clothing ⎭ CLL
	Ginneries	*Oil extracting industry* --- *Chemical industry*

Cotton Terminal   **Commodity Exchange**

"Sifat" Certification Centre

"Uzinterimpeks" **"Uzprommashimpeks"** **"Uzmarkazimpeks"** State Joint Stock Foreign Trade Companies

"Uzbekinvest" National Export Import Insurance Company

Plants Quarantine Inspection

"UzVneshTrans" State Joint Stock Transport Forwarding Company

"Central Asia Trans" State Joint Stock Company of International Road Freightage

Export

"Uzbekistan Temir Yollari" Rail Road Company

Figure 4.2 "Institutional" Map of the cotton chain, 2005

(Source: own presentation based on survey results)

4.3.1 Agricultural sector

The agricultural sector is the first link in the agricultural commodities' value chains, including cotton. Until 2006, mainly three types of producers: *dehqons* (the rural households), private farms and *shirkats* have been engaged in the agricultural sector of Uzbekistan. While *shirkats* and private farms had to fulfil state target plans for cotton production, rural households were free from state orders and grew any crop they wanted on their small land plots[18], besides raw cotton.

The agricultural sector is closely related to all other stakeholders of the cotton chain. Agricultural producers are assigned certain cotton quotas by the governing structure of the chain and receive bank credit for cotton production at a low interest rate (3 percent annual in 2005) as well as the required inputs such as fertilizers, fuel and seeding material. Agricultural producers interrelate closely with the ginneries, which accept virtually all the produced cotton for further processing.

4.3.2 Cotton ginning sector

The ginning industry takes a rather important role in the cotton chain, representing its intermediate stage. The tasks of the ginning industry in the cotton value chain consist of accepting the seed cotton, processing it into cotton fibre that must meet international standards, and preparing high-quality cotton plant seed stock.

The ginning industry in Uzbekistan is governed by SJSC "UzPakhtaSanoat" (half privatised), established in 2001 in the framework of further deepening of de-monopolization and privatisation trends in the cotton ginning sector. "UzPakhtaSanoat" embraces 172 joint stock companies, 7 companies with limited liabilities and 1 joint venture, all put into operation according to the Presidential Decree No.2874 from 11.06.2001 and the corresponding Decree of the Cabinet of Ministers.

The main responsibilities and tasks of "UzPakhtaSanoat" include:

- Systematic study of the foreign and domestic cotton markets and sales opportunities concerning the production of the most demanded cotton varieties;

- Rendering assistance to the regional branches and ginneries in implementation of market reforms, in production of competitive products, in modernisation and refitting of ginneries, in adoption of new technologies, in mass attraction of investments, including foreign direct investments;

- Assistance in cottonseed stock circulation and update;

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[18] Average size of rural households' land plots was 0.23 hectares in 2005

- Supervision of the quality and quantity of procured raw cotton and produced cotton fibre, fulfilment of all the required standards and norms;

- In cooperation with the Ministry of Economy of Uzbekistan and the regional branches of "UzPakhtaSanoat", elaboration of cotton products balances.

"UzPakhtaSanoat" has its branches in all regions of Uzbekistan (including "KhorezmPakhtaSanoat" in the Khorezm region) and is responsible for a network of ginneries, raw cotton procurement centres, experimental engineering workshops, seed preparation plants, and a range of support facilities. Regional branches are assigned to:

- develop efficient market mechanisms for procurement and processing of raw cotton;

- make contracts for raw cotton procurement with agricultural producers, as well as contracts with State foreign trade companies on marketing of cotton fibre for export and internal markets;

- prepare and supply agricultural producers with high quality cottonseeds of the cotton varieties of high demand on the world cotton markets;

- targeted use of resources, provided by the state Fund for payments to agricultural producers for target crops;

- maintain records of raw cotton procurement, production, shipment, beginning and ending stocks of cotton fibre and other cotton by-products;

- provide ginneries with required logistical support;

- elaborate and forward to "UzPakhtaSanoat" consolidated cotton fibre balances of the given region.

"UzPakhtaSanoat", the ginning industry of Uzbekistan can process approximately 5 million tons of raw cotton annually, operating on a three-shift basis. This industry has approximately 60 thousand items of processing equipment in 128 ginneries operating throughout the country; 10 of which are equipped with roller gins. Average ginning output is rather moderate in the range of 30-34 percent, and the average productivity of ginneries reaches 6 bales of cotton fibre per hour.

In the years of independence Uzbekistan's average annual cotton production floated at the level of 3.4-3.6 million tons, meaning underutilization of the ginning industry capacities. Underutilization of the ginning capacities in the country is also affected by the fact that approximately 75-80 percent of the ginneries currently function with outdated technology (Cotton Outlook 2005). With the aim to improve efficiency, quality and the ginning output ratio, 51 existing ginneries have been modernised and 4 new modern ginneries built. As a

next step in this direction, the Industry Modernisation Program for 2005-2010 was developed, which includes plans for upgrading at least 40 more ginneries, some of which will be moved out of cities.

It is expected that the implementation of this program will result in reduced raw cotton losses (direct loss of around 6 percent of total output) and improved cleaning, and thus in a 0.5 -1.0 percent increase in the ginning output ratio and a 1-2 grade improvement in quality, as well as lowering manufacturing costs by some 10-20 percent (Cotton Outlook 2005). That alone would have amounted to an additional 35 thousand tons of cotton fibre in 2004, approximately USD 35-40 million in export revenues. To reduce such a waste, the modernisation of existing ginneries is estimated to cost USD 50 million, which can be recovered within 18 months (UNDP Uzbekistan, 2006a).

The cotton ginning industry is one area of the country's economy where new investments are needed but have not improved in spite of the government's efforts. Financing for modernisation through credits or investments can only be assured if ginneries are privatised and face competition (UNDP Uzbekistan, 2006a). More reason lies in the government's poor and inadequate policy in guaranteeing the investors' rights. As of today, there are only 2 investors in the ginning industry: one is the Central Asian Seed Company (USA), and the other is Dagris (France). Each of them built a ginning plant and is involved in cottonseed as well as fibre production. Both reportedly had difficulties with the Uzbek government for a long time before they received the right to market their own fibre (Bloch, 2002).

Officially, the Khorezm ginning sector has a designed (projected) capacity of raw cotton processing of around 426 thousand tons and of cotton fibre producing 142 thousand tons (based on own interviews and survey results). However, these capacities have not been utilized fully in the years of independence due to the reduction in area sown to cotton. In 2005 ginneries in Khorezm were working at 45-88 percent of total capacity, making the average capacity utilization of about 70 percent. Approximately 299 thousand tons of raw cotton was processed in Khorezm in the same year, with an output of 98 thousand tons of cotton fibre. The ginning sector in the Khorezm region in 2005 produced cotton products worth UZS 98.6 billion (or about USD 88.5 million[19]). Production costs of the ginning industry comprised about UZS 91 billion (or about USD 81.7 million). Net profit after taxation and other deductions remained in the Khorezm ginning sector in 2005 reached UZS 1.6 billion (or about USD 1.4 million) (based on own survey results).

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[19] given the average exchange rate of 1114.5 UZS/USD in 2005

4.3.3 Light (Textile) industry

The Uzbek light (textile) industry has a deep and rich history. In the times of the Great Silk Road, the most expensive fabrics were produced on the territory of present day Uzbekistan, and were in high demand in many European and Asian countries (Madjidov, 2003). However, modern Uzbekistan did not have a cotton-processing industry until 1920 and started formation of the industry only during the industrialisation period of the former Soviet Union. The very first real industrial garment factory was built in Tashkent in 1924; the knitting sector started its development in the early 1930-40s, and during this period, a number of large textile mills were built and produced 80 million square meters of fabric (Madjidov, 2003). Production of cotton fabric increased by 89 percent between 1940-1960. Having such a growth rate, Uzbekistan could have become a leading textile manufacturer, but it was decided in the 1960s that Uzbekistan would specialize in cotton growing only. Development of the textile industry had been preserved and constructions of plants were stopped. So the idea of turning Uzbekistan into the textile hub of Soviet Union did not materialize (Madjidov, 2003).

The light industry of Uzbekistan seems to be today one of the most promising branches of the national economy and has a special importance for the country. The industry provides a significant share of employment and a considerable volume of production of industrial and consumer goods. The light industry sector is managed by the SJSC "UzbekEngilSanoat", the former Ministry of Textile, which embraces more than 120 textile, clothing and apparel enterprises, as well as porcelain manufacturers, all of either state owned or privately owned structures (Madjidov, 2003). Almost all of these enterprises were privatised and turned into joint stock companies, but the Government still is the main shareholder. "UzbekEngilSanoat" manages all the government shares in these textile mills and has a big influence on all enterprises. However, the Government seeks to continue its privatisation process and offers its shares to foreign investors (Madjidov, 2003). Presently, "UzbekEngilSanoat" is acting on behalf of the Government trying to help textile mills attract foreign investors, obtain hard currency from the Government, and promote industry development. The government's role is shifting from supervisory functions to industry promotion. However, textile mills are also trying to establish business links with foreign investors directly, thereby entering foreign markets (Madjidov, 2003).

Prior to independence, there was no private ownership and all textile enterprises were owned by the state. Only after 1991 when Uzbekistan entered the transaction period to shift to a market economy, private ownership was allowed. Private textile enterprises were set up after 1995, since private entrepreneurs accumulated their capital and realized the potential of the

textile industry. By now, there are about a dozen of privately owned textile plants, which are mainly producing cotton yarn and grey and knitted fabrics. However, there are also hundreds of small and medium scale private sewing factories throughout the country. The Government realizes the importance of the textile sector and creates favourable conditions for further development of the sector. The Uzbek government welcomes foreign investors into the textile sector and grants certain privileges and tax incentives.

The textile sector of Uzbekistan now makes up 20 percent of the industrial production, and manufactures 130 thousand tons of yarn, and 500 million meters of fabric. Foreign investment plays an important role in the development of the textile industry. Foreign companies invested USD 550 million during 1995-2001 (Dogonkin, 2005). Most of the investments were directed into modernisation and replacing outdated equipment making the project sizes very large. More changes lie ahead for the Uzbek Light Industry, as it strives to meet the requirements of the domestic market while at the same time exploiting the export potential, by widening the range of goods made available and improving the quality (Dogonkin, 2005). The outcome should be an increase in the volume of raw cotton processed domestically to 50 percent of the annual raw cotton output (Dogonkin, 2005). Previously, the share of the most valuable raw material – raw cotton – as is used in domestic processing was relatively small. The proportion has risen gradually in the recent years, from 13 percent in 1994 to 28 percent in 2004 (Dogonkin, 2005). Today, the enterprises of "UzbekEngilSanoat" process almost 255 thousand tons of cotton fibre annually. Of this volume, 186 thousand tons are processed by enterprises with modern equipment, manufacturing high-quality goods. The balance is used by enterprises that still operate out-of-date equipment, which results in direct losses of high-quality raw materials, considerable labour and energy costs, uncompetitive production and inefficiency (Dogonkin, 2005).

Until now, most of the efforts of the Uzbek government were directed into the manufacturing of high quality yarn. There appears to be a tendency to switch from yarn production into weaving, finishing and ready-made clothing production. These initiatives are expected to raise consumption of raw cotton by a further 230 to 250 thousand tons annually (Dogonkin, 2005). Experts calculated that export of textile products instead of cotton fibre will lead to an increase in currency inflow into the country of two fold (in case of yarn and fabrics exports), and by more than four fold (in case of ready made garments export) (Namozov, 2005).

"Undoubtedly, the fact that Uzbekistan is landlocked increases the costs and risks of exports. This will have a meaningful effect on any future growth. In order to achieve the target of exporting 50 percent of cotton production in the form of textiles, the competitive strength of Uzbekistan must be exploited. The most successful newcomers in the international textile

arena have been those that have built their textile complex around the clothing industry, this being the most labour-intensive part in the textile-manufacturing pipeline and where developing countries are particularly competitive due to low wage costs. Countries that have invested more in textiles than in clothing have consistently shown a lower growth rate in international trade. The Committee recommends that emphasis be placed on quality assurance and that a consolidated export department be formed to create the expertise required in the international textile arena" (Cotton Outlook, 2005).

The textile industry of the Khorezm region is in the stage of restructuring, curtailment of production or reconstruction. Capacities of the spinning, weaving, knitting and clothing factories are underutilized. In 2005, enterprises of the textile industry of Khorezm worked on average at 40 percent of total capacity. The major factors leading to this figure were the lack of the main input: cotton fibre, 89 percent of which was exported (Figure 4.2); insufficient circulating assets of the textile enterprises and the outdated (but functioning) equipment, which caused bans for cotton fibre sale to the enterprises with worn equipment according to The Presidential Decree No. 330 from 21.04.2006 on Measures on financial recovery of enterprises of the textile industry and on improvement of marketing of cotton fibre to these enterprises.

In line with the State Program on attraction of investments into the textile industry for the period of 2005-2008, "UzbekEngilSanoat", the governing structure of the Uzbek textile sector, had elaborated separate programs for the regions of Uzbekistan (including the Khorezm region) (according to figures from the Committee on de-monopolization). According to the program for Khorezm "UzbekEngilSanoat" plans in the period of 2005-2008 to invest (or support investments) USD 63.8 million into reconstruction or enlargement of the most promising textile enterprises of Khorezm. Investments and the subsequent development of the textile industry are supposed to bring USD 65.4 million of export revenues and to employ 2200 people, mostly in the rural areas. The required feasibility studies were carried out and the search for partners, both inside and outside of the country, is under way.

There were also trends towards privatisation of the largest textile enterprises by foreign businesses, as well as attempts to reconstruct the factories so that the whole process of transformation of the cotton fibre into the ready made garments, including the processes of yarn spinning, fabrics weaving is placed in one location.

4.3.4 "Sifat" Certification Centre

Quality control and certification of cotton fibre produced in Uzbekistan is carried out by the Uzbek Centre for Certification of Cotton Fibre "Sifat". It has been operating in Uzbekistan since the late 1990s and has done a lot for the gradual overhauling of the cotton classing system. The regional branches of the "Sifat" Centre were opened in 2001 throughout the country, including the Khorezm region.

Similar to the USDA's quality standards with 5 colour grades and trash grades within the colour grades and 100 percent HVI[20] classing was adopted in 2005, thus making an important step in improving the level of quality assurance (Cotton Outlook, 2005). Under the World Bank project, 35 HVI lines (Swiss make) were installed in all regional branches of "Sifat" Centre (Guitchounts, 2005). The HVI system allows the cotton fibre quality characteristics to be categorised in the following way: by length, strength, length uniformity, elongation, short fibre content, maturity, colour characteristics, such as Rd and +b, trash content and micronaire.

The "Sifat" Centre received accreditation for carrying laboratory analysis of cotton fibre from UzStandart Agency, which regularly practices inspection control of the activities and equipment of "Sifat" Centre and observes compliance of "Sifat" laboratories to the standards and technical conditions valid for Uzbekistan (based on own survey results).

The main goal of the "Sifat" Centre is to guarantee high quality, neutrality and reliability of quality inspection tests of cotton fibre according to the Decree of Cabinet of Ministers from 20.03.1998. The main objective is to conduct certification tests for the compulsory certification of cotton fibre and voluntary certification of cotton linter and absorbent cotton in textile industries. Samples are drawn at the gins for classing purposes. The classification agency, "Sifat", operates along USDA lines and no cotton can be exported without a "Sifat" inspection tag (based on own survey results).

4.3.5 State Foreign Trade Companies

Cotton fibre marketing was previously in the hands of the ginning industry's managing body – "UzPakhtaSanoat". At present, cotton fibre is marketed either via the commodity exchange (to domestic fibre processors) or via three state foreign trade companies (SFTC) (to the export destinations). The three state foreign trade companies, in charge of Uzbek cotton fibre marketing, are: "Uzinterimpeks", "Uzprommashimpeks" and "Uzmarkazimpeks". These companies have the right to elaborate their own marketing strategies based on world market

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[20] High Volume Instrument is a modern computer-based system for cotton fibre classification

prices with the use of modern marketing approaches. For all three, the government has set up the same terms of sale. They determine for themselves, therefore, cotton fibre from which parts of Uzbekistan has to be delivered to which terminals for further quality check and shipment.

Export prices are configured based on the Cotlook A index quotation[21] and its Uzbek component, taking into consideration the fibre quality and date of shipment; discounting for freight or other marketing reasons is also considered.

To assist the local domestic spinning industry, most companies can currently purchase cotton at a 15 percent discount to the export price. In special circumstances, the discount is 20 percent (for yarn used in apparel production destined for export). Sale conditions may vary at any time according to crop development, commitments and market conditions (Cotton Outlook, 2005).

4.3.6 Cotton terminal

The establishment of a network of cotton sale terminals under the management of the Ministry for Foreign Economic Relations, Trade and Development of Uzbekistan, became an important contribution to raising Uzbekistan's cotton rating in the world and improving the terms of its sale to buyers, and to foreign buyers especially. According to the Decree of the Cabinet of Ministers of Republic of Uzbekistan № 240 dated June, 3 2003, On improvement of payment procedures for produced and sold cotton fibre, the shipment of cotton products to consumers is the responsibility of specialized cotton terminals. In 2003, about 22 cotton terminals emerged throughout Uzbekistan, including one in the Khorezm region.

Terminals are aimed at providing comprehensive support to the transhipment and storage processes, and have acquired an infrastructure for dealing promptly with issues relating to the acceptance, storage and shipment of export, import and transit cargoes. At present, international buyers may inspect and approve cotton at the terminals prior to shipment at terminals, whereas previously cotton was inspected at the intermediate ports after being shipped from Uzbekistan. As a result, the time of transactions has been reduced and disagreements and disputes on the quantity and quality of cotton fibre now can be settled at the terminal site. Besides, it is expected that internal cotton fibre consumers will also get a faster and simplified access to cotton fibre, present at terminals via Uzbek Commodity Exchange. The full picture of results of the terminal network set up is yet to be seen; meanwhile it is alleged that domestic and export cotton fibre sales systems were streamlined; direct access of the buyers to cotton fibre opened; procedure of cotton fibre shipment and

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[21] as announced at Liverpool Exchange

marketing simplified and accelerated as the representatives of the Certification Centre "Sifat", Customs office, Plants Quarantine Inspection, Rail road have their representatives at the terminal's site.

4.3.7 Commodity exchange

The Uzbek commodity exchange (UzCE) was founded in 1994; it consists of 12 branches in each region of Uzbekistan and about 1200 brokers are currently its members[22]. The UzCE holds an important role in providing fair access to the national and foreign companies to commodities produced in Uzbekistan. The UzCE aims at widening its marketing network through the establishment of remote trading spots, currently connected to the unified electronic system of exchange transactions. Via this system, the brokers would not only be informed about the operations and commodities to be sold, but also to participate in the transactions. The UzCE deals with a wide range of tradable items, including raw materials, unprocessed and processed agricultural products, as well as the produce of other industries, like ferrous and non ferrous metals, mineral oil and its products; *cotton fibre*[23]; processed cotton products; mineral fertilizers; sugar; wheat flour; and grain.

The Khorezm branch of UzCE is located in Urgench city. It was founded in 1995; however, activities at the Exchange started only a couple of years ago with the Decree of the Cabinet of Ministers 02.02. 2004 No.57. Following this Decree, further implementation of the market mechanisms into realization of highly liquid products and raw materials was issued. Nevertheless, the commodity exchange is now more involved in the economy: it provides inputs and helps in distributing the output of local producers – both agricultural and industrial. The commodity exchange with respect to the cotton value chain serves as a basis for intensification of cotton product turnover locally. It is the only place where domestic textile producers may get their main input – cotton fibre and linter.

4.3.8 Transportation routes

Cotton fibre produced in Uzbekistan is exported to the CIS countries and to countries as far away as Iran and China; other destinations include former Soviet Republics such as Latvia or the Ukraine (Figure 4.3).

The State Joint Stock Transport Forwarding Company "UzVneshTrans" together with the National Export Import Insurance Company "Uzbekinvest", Rail Road Company "Uzbekistan Temir Yollari" and International Road Freightage Company "Central Asia

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[22] http://www.uzex.com/index.php?clan=eng
[23] Cotton fibre is sold only centrally, at the main commodity exchange in Tashkent; Khorezm commodity exchange does not trade cotton or cotton products yet

Trans" are responsible for transportation of the cotton fibre for export. "Uzbekinvest" subcontracts to private operators for the transportation of cotton fibre beyond the Uzbek border, and storage at the ports (Cotton Outlook, 2005).
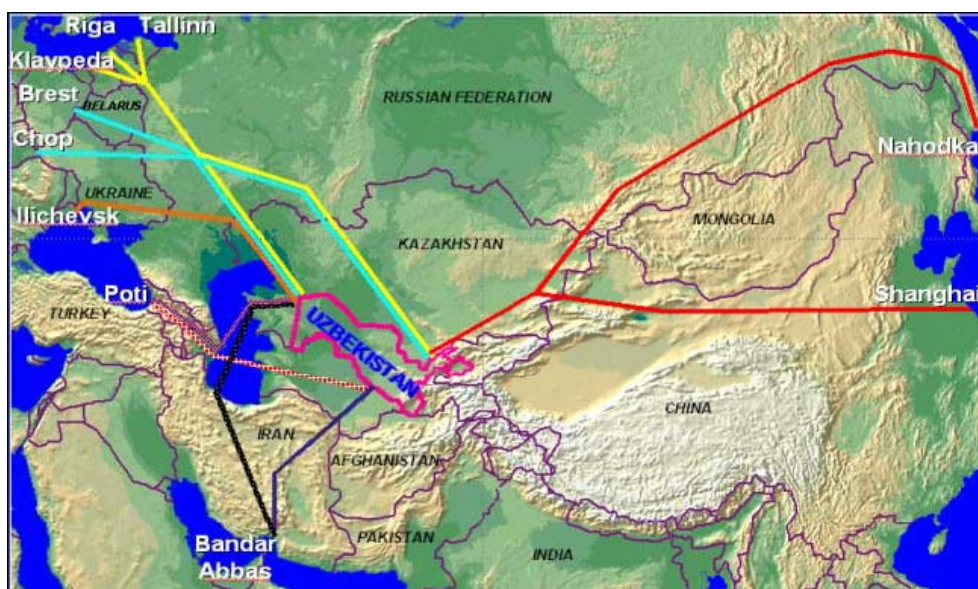
Figure 4.3 Transportation routes of the Uzbek cotton fibre

(Source: Zarganov, 2005)

At present, the bulk of the export and import cargo handled by "UzVneshTrans" company is carried by rail, which means that the main existing railway corridors are used. On the north-west route, which carries cargo to Russian railway stations and the Baltic ports (Riga, Tallinn, Liepãja and Muuga), the transport corridor passing through the Russian Federation and the Baltic countries is used. When travelling west, the "UzVneshTrans" company uses a route passing through the Ukraine, and specifically through the seaport of Ilyichevsk. Following major changes in international cotton fibre trade routes associated with the shift of cotton processing to South-East Asia, cargo traffic flows have been redirected, with the heaviest traffic moving through the southern corridor passing through Iran to the port of Bandar-Abbas (Zarganov, 2005).

4.4   The Cotton Value Chain

According to the methodology on Value Chain research, the value chains are first sketched on the so-called preliminary map, which shows the main actors and their relationships. Following this mapping, the data on the value chain of interest is obtained and key variables are included in the map in terms of input-output flows.

4.4.1 Preliminary Map

Cotton Value Chain in Uzbekistan (Khorezm) resembles the chains of other cotton producing countries. In its simplest form, it consists of cotton growing farms, ginneries or cotton refining plants, textile enterprises, and oil extracting plants – all of which are considered direct actors of the CVC. The flows of cotton products along the chain begin with raw cotton coming from the farmers to the ginneries. Cotton fibre from the ginneries then flows to the textile enterprises and then, to a large extent, is exported. Cottonseed partly flowed back to the farmers as seeding material for the next agricultural season and partly to the oil extracting plant. Cotton oil and cottonseed meal and cake from the oil extracting plant are then purchased by the population or exported to neighbouring countries. Finally, textile products from textile producers are consumed within the region, or exported. The peculiarity of the CVC in Uzbekistan is the presence of the intermediate storage and distribution outlet, the Cotton Terminal (Figure 4.4)
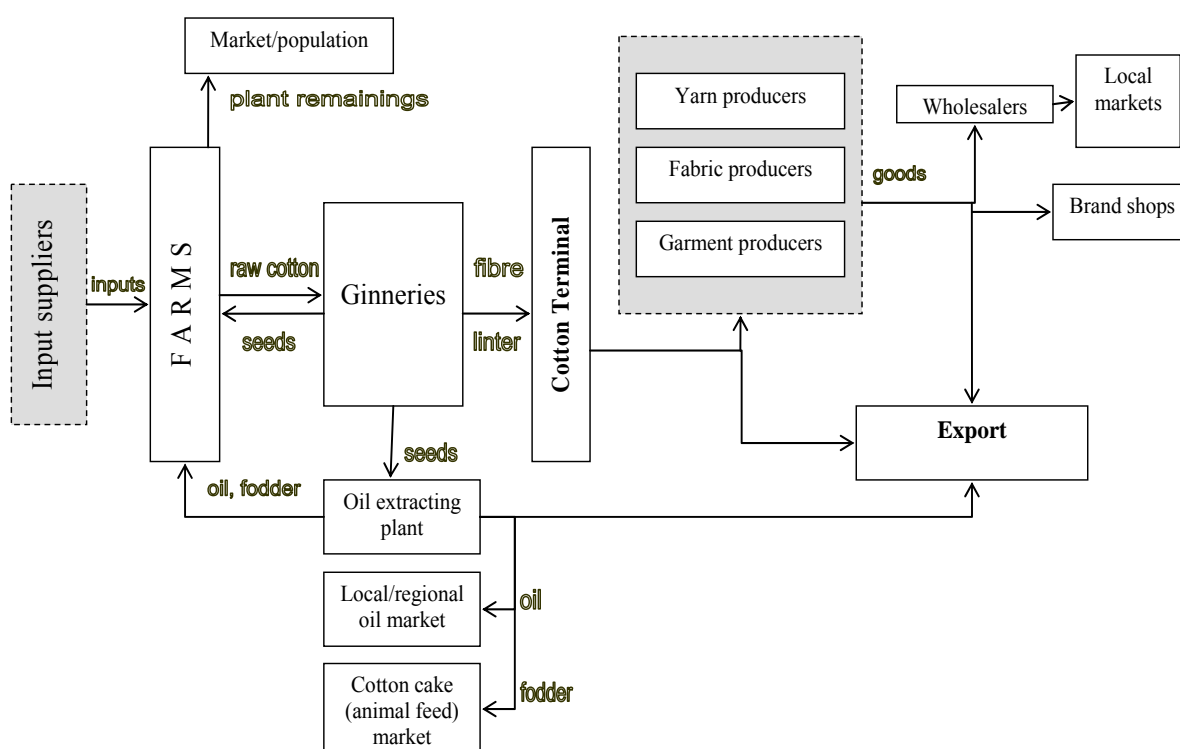
Figure 4.4 Cotton chain preliminary map

(Source: own presentation based on survey results)

4.4.2 Total output value and monetary flows

Based on data collected in the Khorezm region for 2005, the total output of the cotton textile sector amounted to about USD 286 million (Table 4.3, Figure 4.5). The textile industry

contributed the most - 38 percent to the total output value by producing various textile products worth USD 107 million. Output of the ginning industry, the second major contributor to the total output value, included cotton fibre, seeds, linter, mote and wastes, and amounted to USD 94.7 million of output value.

Table 4.3 Output values of the actors of the Cotton Value Chain in Khorezm, 2005

	billion UZS	million USD	Share, %
Agricultural sector	74.6	73.2	25.6
Ginning industry	105.7	94.8	33.2
Textile industry	119.7	107.4	37.6
Oil extracting and chemical industry	11.6	10.4	3.6
Total CVC output value	311.6	285.8	100.0

Source: own survey, based OblStat and OblVodKhoz data

Cotton growing farmers produced raw cotton worth USD 73 million, which made 25 percent of the total output value. And finally, oil extracting and chemical industries produced products worth USD 10 million, making their small contribution of 4 percent to the total output value.
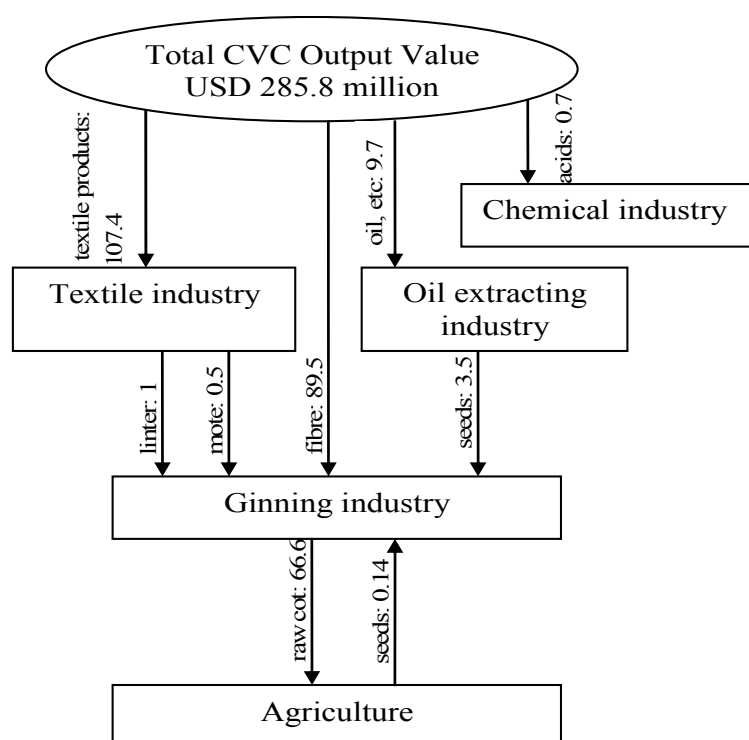
Figure 4.5 CVC output values and monetary flows in 2005, million USD

(Source: own presentation based on survey results)

4.4.3 Cotton input-output flows

The value chain approach used in this study allowed for the tracing of the flow of raw cotton grown by the farmers in Khorezm, all the way to the export of the fibre abroad; or to processing by local textile enterprises and consumption by households (Figure 4.6).

Agricultural producers
287154 tons of raw cotton
Non private sector 175747 tons | Private farms 111407 tons

Home consumption (about 5%)

Seeding material 15669 tons

Procured raw cotton **298819 tons** ← Raw cotton of previous harvest

Ginneries ← 13310 tons

Cottonseed total 152512 tons | Cotton mote 29881 tons | Cotton linter 8071 tons | Cotton fibre 98174 tons

Cottonseed technical 136843 tons

Cotton Terminal — 89% → **Export 75758 tons** — 58% → **Bandar Abbas** ; 29.3% → **Riga → Europe**

Commodity exchange 9106 tons

2006

11% ↓ 2005

Oil extracting plant 128535 tons

Textile companies

Cotton crude oil 21258 tons (18564 cotton edible oil)

579 → **Export**
5343
70%
30%

Cottonseed meal and cake 55407 tons

Free sale

Laundry soap 6333 tons

Drying oil 66 tons

Acids

Industry

Cotton yarn 5667 tons
Cotton wool 7097 tons
Non-woven fabrics 1842 thsnd m^2
Coarse cotton fabrics 5032 thsnd m^2
Cotton fabrics 5714 thsnd m^2
Ready made garments 1. 334 mln USD
Knitted wear 4169 thsnd items

Export 2.3 million USD

Import of other Uzbek cotton fibre. yarn. fabrics

Consumers

Figure 4.6 Cotton chain input-output flows of Khorezm, 2005

(Source: own presentation based on survey results)

Raw cotton is an agricultural commodity that is not consumed in the calendar year it was produced. Before raw cotton, normally harvested in October-November, gets to the ginneries for processing, it should first be pre-dried and pre-cleaned. This takes approximately two months, resulting in ginning in the next calendar year. Therefore, the 287 thousand tons of raw cotton, processed by the ginneries of Khorezm in 2005 were harvested in 2004. This amount of raw cotton, plus some raw cotton left over from the previous harvest, were processed by the ginneries into 98 thousand tons of cotton fibre--including about 8 thousand tons of linter, 30 tons of mote, and 153 thousand tons of cottonseed.

About 13 thousand tons of cotton fibre remained at the ginneries for sale in the following year. The remaining amount of fibre, as well as the linter, was marketed – including 89 percent for export, and 11 percent to local textile producers. Planting cottonseeds flowed back to the farmers and the so called technical seeds flowed to the oil extracting plant for further processing into cotton oil, cottonseed meal and cake, laundry soap and other products. Enterprises of the textile industry of Khorezm produced around 6 thousand tons of cotton yarn, and about 13 million m^2 of cotton fabrics (Figure 4.6).

4.4.4 Actors of CVC and cotton products' value chains

4.4.4.1 *Private farms*

According to the law on private farms, a private farm is an independent enterprise engaged in agricultural production on leased land. A private farm enjoys all rights of a legal entity, based on the joint activities of all its members. A private farm may consist of the enterprises legal head, their spouse, children, parents and other relatives, whose main field of employment is with that enterprise. The existence of private farms is supposed to create a basis for competition in agricultural production, but is subject to certain regulations; for example, a private farm wanting to specialize on livestock may only be established if a family owns at least 30 heads of cattle. In such a case, the land which is leased out may total 0.3 hectare of irrigated land and at least 1 ha of non-irrigated land per head of cattle. The actual size of the plots will differ in different regions of Uzbekistan, rayons (districts), and even within farms as a consequence of the consideration of factors such as soil quality and location. A private farm specializing on the production of grain and cotton will receive at least 10 ha of arable land, while those specializing in gardening, winegrowing, vegetables or other crops will receive a minimum of 1 ha of arable land. The land which is leased out usually belongs to the reserve fund, to state agricultural enterprises (*shirkats*) with insufficient manpower to efficiently tend it, or incapable of drawing profit from it. To obtain such land on terms of lease, candidate farmers must address the formal head of the *shirkat* from which he wishes to receive the land. The private farm will effectively, once established,

be run like a private family farm. The final decision on the creation of a private farm comes from the Khokim[24] of the respective rayon (district) and will usually reflect the conclusions earlier reached upon by a regional committee for the allocation of land. With the Khokim's formal decision to allow the formation of a private farm comes the right to register with the state and to lease. Should it be the case that the Khokim decides against the formation of a private farm, farmers may appeal against this decision in the courts of law. There are further regulations for private farms which consider various matters such as the naming of a farm, activities it may engage in, possible management systems, rights and responsibilities, procedures of reorganization, and matters of liquidation.

The growing number of private farms and partly *shirkats* has been responsible for the increased production of raw cotton in the Khorezm region as in the rest of Uzbekistan. Private farms contributed about 111 thousand tons, or 39 percent to total raw cotton output in the Khorezm region in 2004 (Table 4.4), about 223 thousand tons, or 77 percent in 2005; in 2006 production of raw cotton was completely placed in the hands of private farms due to the fact that all *shirkats* (except a couple of seed breeding *shirkats*) have been abolished as non-profitable agricultural producers in 2006.

Table 4.4 Raw cotton area and output of the Khorezm region, 2004-2005

	Raw cotton area, ha		Raw cotton output, tons	
	2004	2005	2004	2005
Shirkats	66917	24165	175747	60203.2
Private farms	42874	85436	111407	223046.8
Khorezm total	109791	109601	287154	283250

Source: According to OblStat data

Private farms average in size from as little as 1 hectare to more than 100 hectare farms, depending on their specialization, be it gardening or cotton growing.

Cotton farming

Cotton farming is basically the same across the region, no matter the size of the cotton growing private farms. Cotton farming practice consists of the following activities:

1. Leaching
2. Capital levelling (once for three years)
3. Soil preparation (levelling, chiselling)
4. Seeding
5. Katkalak (destroying of crust)
6. Thinning

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[24] Khokim – higher administrative (executive) body in the regions and rayons of Uzbekistan

7. Pesticide application
8. Inter-row cultivation
9. Weeding
10. Irrigation
11. Fertilizer application
12. Punching (cutting of plant growth point)
13. Harvesting
14. Defoliation after 1st pick
15. Removal of cotton plant remainings
16. Pre-treatment and transportation to ginneries

Each cotton farming activity has associated costs, be it machinery costs for mechanized activities, such as levelling, planting, or labour costs for manual cotton farming activities, such as thinning, pesticide application; or input costs, such as seeds, fertilizers, fuel, pesticides (Figures 4.7, 4.8).

Raw cotton value chain

Value chain analysis revealed that raw cotton production in the Khorezm region requires approximately USD 487 per ha, or USD 193 per ton for an ordinary cotton growing farmer, with the average cotton yield of 2.57 tons per ha and the average operating profit[25] of approximately USD 138 per ha (or about 19.9 percent of the fixed state price for raw cotton).

The principal cost components include land preparation activities (10.3 percent); labour costs (20.5 percent), including harvesting (14.7 percent); and fertilizer application (24.4 percent) (refer to Figure 4.7).

Cotton farming activities start as early as January with preparation of soil for the following vegetation season. Preparation of soil in the traditional farm practice in Khorezm includes leaching[26] – a process of washing salts from the surface horizons – and is carried out in February-March; levelling, including capital levelling on the average once in three years; ploughing, chiselling, and seed bed preparation. As suggested by the value chain analysis, soil preparation activities constitute 10.3 percent of the fixed state price for raw cotton paid to the farmers, including 2.2 percent for leaching and 8.1 percent for levelling, ploughing, chiselling (Figure 4.7).

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[25] Operating profit should be distinguished from the net profit; it includes remittances to non-budgetary funds which farmers have to pay. Farmers pay some deductions to non-budgetary funds, like Pension Fund, Road Fund, Education Fund and the Unified Land Tax, the amount of which depends on the cultivated area and soil quality. It was introduced by the Tax Code several years ago in order to simplify taxation of farmers.
[26] Virtually 100 percent of all agricultural lands in Khorezm (Forkutsa, 2006) are saline with salt contents varying among rayons.

Leaching accounts for about 40 percent of the total irrigated water volume used in cotton growing (or 4000 m^3 of total 8600 m^3 per ha). Most of the cotton grown in the country relies on irrigated agriculture where, depending on the availability of water, in June-August farmers irrigate 2 – 6 times per vegetation season. Irrigation costs in the given cotton value chain are taken into account in the form of pumping costs and costs of maintaining the irrigation and drainage channels, as well as Water Users Association (WUA) fees; these non-market values were used as there is currently no price for water in Uzbekistan. Thus, despite the requirement of intense irrigation for growing cotton, irrigation costs account for only a 2 percent share of the fixed state price for raw cotton (Figure 4.7).

Planting activities take place in April-early May. Generally, sowing rates lie in the range of 30 to 90 kg of cottonseed per ha, with the average, most frequently applied rate of 70 kg per ha depending on the quality of cottonseed and weather conditions[27]. Overall, planting accounts for 5.4 percent of the fixed state price for raw cotton, including 4.3 percent of cottonseed cost and 1.1 percent of mechanized planting activities. Farmers get instructions on what cotton variety to plant and thus are supplied with the predetermined cottonseeds usually by the ginneries, which in part are responsible for preparing the cottonseed fund in the region. Most of the time cottonseed provided by the ginneries meets the requirements of farmers in terms of planting material, however, some farmers reported on shortage or poor quality of cottonseed and absence or irregular operation of alternative seed sources, such as commodity exchange or market place. Therefore, in case of additional need in cottonseed, farmers usually resort to the neighbouring farmers growing cotton.

Cotton plant treatment activities during the vegetation season, such as destroying of crust, thinning, weeding and punching, contribute little to the overall production costs, totalling 0.2 percent, 0.8 percent, 1.4 percent and 0.4 percent, respectively.

Cotton crop pests and diseases, which immensely hinder reaching good harvests, continue to be a problem for cotton farmers. Considerable efforts and expenditures should be undertaken in the cotton fields to prevent pests' invasion and diseases during vegetation season. Plant protection activities in Khorezm include pesticide application, which contributes 1.1 percent to the raw cotton value chain and the use of biolaboratory services, which make 0.3 percent of the raw cotton value chain. A rather positive tendency has been noticed in Khorezmian agriculture lately. This is the less use of pesticide and more use of bio methods of plant treatment. One third of surveyed farmers reported on cooperation with biolaboratories and only one fifth on pesticide application. Farmers seem to prefer plant protection with bio

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[27] In unfavourable weather conditions, such as heavy rains for example, farmers have to replant cotton after the first planting is washed away, or destroyed, which leads to higher sowing rates and additional planting expenses to the farmers

methods because it is much cheaper, it is environmentally friendly and it requires no machinery (only cheap labour of biolaboratory staff). Pesticides normally come from the Centre for chemical protection of plants and "good" bugs, involved in bio protection techniques are specially bred at biolaboratories, located in all rayons throughout Khorezm.

Fertilization in traditional cotton farming of Khorezm takes an important part with rather high application rates of various fertilizer types. Fertilizer application is mechanized and carried out 2-4 times in May – August. Fertilization together with cultivation contributes 24.4 percent to the raw cotton value chain, where fertilizers cost share is 20.2 percent and fertilizer application activity share is 4.2 percent. Fertilizers as used by Uzbek farmers seemed not to be of best or reasonable quality[28] (Kienzler et al., 2007) compared to the international quality standards. Certain types of fertilizers were priced higher in Uzbekistan compared to the world market prices and also were hard to purchase[29].

Harvesting activities start with defoliation, the process of spraying of chemicals on cotton plant for drying of leaves and faster ripening of cotton bolls. Ready for harvesting cotton is traditionally hand picked 3-4 times during September – November. And finally after harvesting cotton, plant remainings (stems, leaves, green bolls) are removed from the fields, also using manual labour.

Harvesting is thus the most labour intensive activity in cotton farming, accounting for 14.7 percent of total 20.5 percent of labour costs in the raw cotton value chain, the remaining 5.8 percent covering cotton farming manual activities. Picked cotton is then transported to the ginneries by the own means of the farmers with the following reimbursement of transportation costs by ginneries, where submitted cotton is sorted, checked for quality and pre-treated (dried, pre-cleaned).

Farmers often report on improper quality setting for their cotton, accepting cotton with sharp weight reduction due to factors like high humidity, trash content. All this leads to lower procurement prices and lower income to the farmers.

In the years of independence attempts were made at liberalisation of agriculture, including gradual lowering of state procurement quotas for cotton. By the law farmers may turn in only 30 percent of their cotton harvest to the ginneries, which are State Joint Stock Companies.

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[28] farmers reported for example on diluted fertilizers, or fertilizers mixed with substances like sand
[29] despite the fact that mineral fertilizers are produced in Uzbekistan, it is sometimes hard to find the needed type and the required quantity during the pick agricultural season. Much fertilizers are both legally (via exports) and illegally (via smuggling) taken outside the country
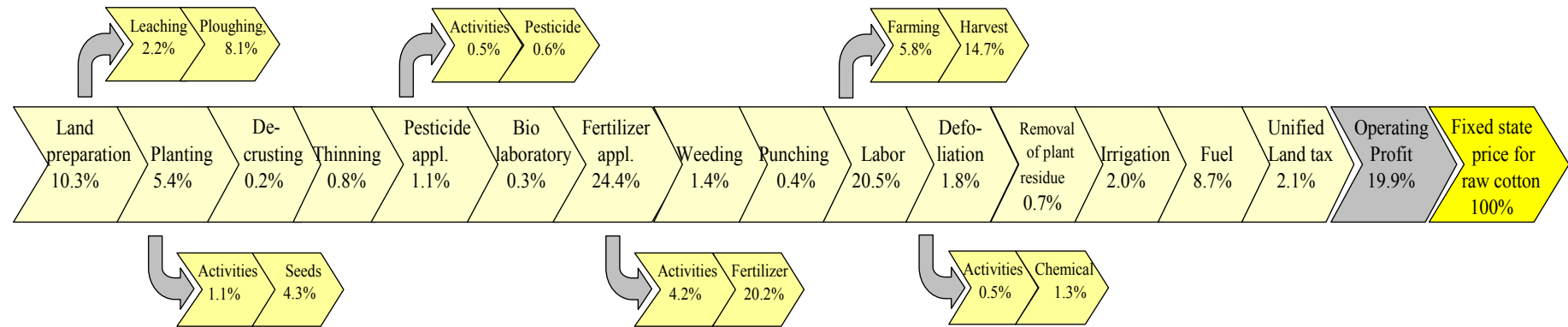
Figure 4.7 Detailed value chain for one ton of raw cotton

(Source: own presentation based on survey results)
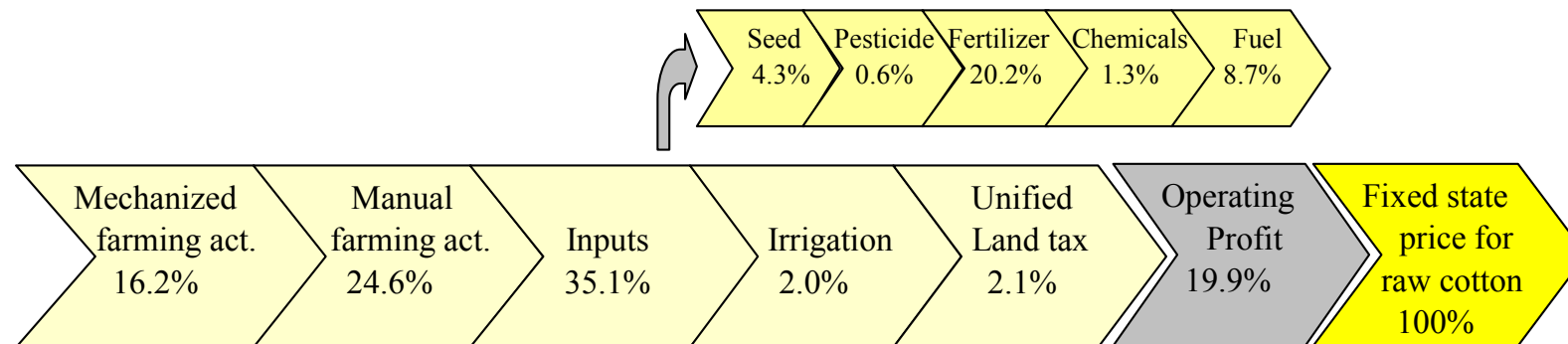
Figure 4.8 General value chain for one ton of raw cotton

(Source: own presentation based on survey results)

In practice, however, there are no other sale opportunities for the farmers, neither through commodity exchange transactions, nor via markets. Nor are most of the farmers aware of their right for lower cotton quotas. Cotton farming is complex, requires many inputs and involves many difficulties and problems (Table 4.5) in every day farmers' life. Despite of all said most of the farmers report on their willingness to continue with cotton growing, as most inputs are subsidised and cotton has many by products (such as cotton edible oil, cotton cake for animal fodder and utilized by the population. Cotton farming also to a certain extent gives income security to the cotton producers, which are primarily risk-averse.

Factors inhibiting development of agriculture and farms

The survey on raw cotton production and private farms included the question on farmers' perception of the factors which prevent, or slow down, their development. Below are the most frequent responses of the farmers on this issue.

1. Nowadays, according to the regulations there is a 30 percent state order on cotton. The remaining 70 percent of the cotton harvest farmers "can" sell at their discretion. However this is not the reality. The whole harvest is withdrawn from the farmers by the ginneries. *Needed: Strict supervision of bringing the regulations and laws into force.*

2. Normative documents, such as laws, regulations and decrees sometimes contradict each other. Various governmental institutions are responsible for elaborating the documents of their jurisdiction, and sometimes fail to look closely at the proceedings from other institutions, which causes discrepancies in the normative documents. This affects badly the farmers, which have to struggle for their rights. *Needed: Stronger, clarified and corresponding normative documents.*

3. Almost all ginneries are half privatised, but half still belonging to the Government (SJSC "UzPakhtaSanoat"). These monopolistic elements set their rules and conditions, set lower prices. To raise incomes of farmers in the cotton sector, the ginning industry has to be privatised, and other marketing opportunities for farmers developed. *Needed: Freedom to farmers in marketing their output and competition among cotton processors.*

4. The laboratories, located at the ginneries and which are totally dependent on the ginneries (ginneries provide working space – offices, salaries for the laboratory workers), are in charge of assigning classes and grades, which subsequently determine the prices for the delivered cotton. *Needed: Independent laboratories,*

which would set the true prices for cotton and not the lower prices in favour of the ginneries.

The farmers' survey provided key information on the understanding of the cotton producer, on the importance, appreciation and the function of cotton growing. Most of the farmers claimed that cotton cultivation was intensive, required various inputs and many difficulties and problems had to be faced (Table 4.5). The problems of cotton farming practices, such as lack of agricultural machinery; irrigation water; poor soil characteristics (salinity and low fertility); improper crop rotation systems and intense control over cotton farming by the state were ranked first by the surveyed farmers. The problems in the legal aspects of cotton farming were ranked the last, which proves that legal training of farmers as well as the awareness of their rights is still very low in Uzbekistan.

However, despite all the complaints farmers usually claimed their readiness to continue with cotton growing since most inputs are subsidised and cotton has various useful by-products such as cotton edible oil, cotton cake for animal fodder, which are utilized by the urban and rural population. Moreover, cotton production provides to a certain extent an income security to the cotton producers, which were primarily risk-averse.

Table 4.5 Summary of barriers to growth in the farmers' raw cotton chain

Issue area	*Barriers to growth*	*Responses from the survey**	*Rank of the group of problems*
Input acquisition	• No freedom to choose among cotton varieties to plant • Cottonseeds are not always of good or appropriate quality • Absence of additional sources of inputs • Commodity exchange is in general not popular with farmers	6	2
	• Poor work of input providers, such as WUA, MTP	9	
	• Delayed and insufficient delivery of inputs	3	
	• High prices for inputs, such as electricity (for irrigation pumps) or fuel	2	
Total		***20***	
Financial	• Lack of circulating assets (financial resources)	2	3
	• The only type of payment for submitted raw cotton is bank	2	

	transfer, no cash for sustaining the families • Delayed payment for the output • No access to farmers to their settlement accounts • Many unforeseen expenditures, obligatory for farmers charity donations	13	
Total		*17*	
Output handling	• Lack of pre treatment (for pre drying of raw cotton) and storing facilities in the fields • Unfair assignment of quality to the submitted raw cotton by ginneries and thus lower profits to farmers • Fixed state prices for raw cotton • Time constraints during harvesting	2 5	5
Total		*7*	
Market	• Lack of input providing organizations, leading to no competition and high prices for inputs • Lack of marketing channels (other than the ginneries)	9 3	4
Total		*12*	
Cotton farming	• Underdeveloped crop rotation systems • Poor soil characteristics • Lack of water for irrigation, or other problems with irrigation • Lack of agricultural machinery • Saline soil • Heavy control over and central planning of farming activities	16 13 20 16 6	1
Total		*71*	
Legislation	• Improper, unfavourable for the farmers contractation terms and conditions • Cumbersome taxation procedure, requiring much time and effort of the farmers • Poor legislative knowledge of farmers • Contradictions among various	3 2	6

	regulations and Decrees, unclear, non-transparent base for farming activities		
Total		*5*	

* in general the surveyed farmers listed more than one barrier to growth

Source: own survey results

4.4.4.2 Ginneries

Cotton when harvested from the field has fibre and seeds. Before cotton can be used in the textile industry, it has to be pre-processed: fibre should be separated from seeds. Separation of fibre from seed by mechanical means is called ginning. Ginning in Uzbekistan and Khorezm is entirely in the hands of half privatised ginneries, the so called State Joint Stock Companies, with 51 percent shares belonging to the state, 7 percent to the workers and the remaining 42 percent put for free sale.

Description of ginneries

Ginneries are self supporting industrial factories with a developed production infrastructure, assigned for processing raw cotton (refining of cotton). Depending on the processing capacities ginneries may also include one or several raw cotton procurement centres, which accept raw cotton from farmers, store it and forward to the ginnery.

There are 11 ginneries in Khorezm, one per every rayon. Half of the ginneries date back to the end of the 19th – beginning of 20th century, the other half was constructed in the Former Soviet Union times. All the ginneries in Khorezm were reconstructed, reequipped around 1970s-1980s, and turned into State Joint Stock Companies in 1995 (Table 4.6).

Ginneries' output besides cotton fibre includes cottonseed, cotton linter, cotton fluff and mote. Depending on the raw cotton quality (sort, class) average products' output ratios are as follows:

- Cotton fibre 30-33 percent
- Cottonseed 50-54 percent
- Linter 3-4 percent
- Cotton fluff 2-3 percent
- Cotton mote 4-6 percent
- Production wastes 4-13 percent

In 2005 ginneries in Khorezm have been working at capacities as low as 45 percent in some ginneries and up to 88 percent in the others, making the average capacity utilization of about 70 percent. Approximately 299 thousand tons of raw cotton was processed in Khorezm with the total output of 98 thousand tons of cotton fibre (Table 4.6).

Total size of the ginneries, including production buildings, raw cotton storage sites range between 19 to 97 ha, leading to high expenditures for maintenance (i.e. repair, heating) of the buildings, auxiliary units. Also high is the land use tax, which depends on the size of occupied territory. Ginneries are ample in their layout, requiring considerable transportation from one section of the gin to another by means of air tubes. This causes even more additional costs in the production process of the ginneries.

Ginneries in 2005 provided full employment to about 4000 people in Khorezm. Due to the location of the ginneries in rural centres, mostly rural population is engaged in processing raw cotton, mitigating to some extent rural unemployment.

The main output of ginneries – cotton fibre – is either exported or used domestically by the enterprises of the local textile industry. In different years ginneries used to export from 60 percent to 99 percent of cotton fibre, leaving from 1 percent to 40 percent for internal consumption. In 2005 export reached 89 percent and the remaining 11 percent was utilized by local spinning, weaving, and clothing factories.

Joint Stock Companies with the state being the main shareholder (including ginneries) are under supervision of the De-monopolization Committee[30] for determining their economic status (whether they are solvent, or belong to the enterprises with high economic risk, or are insolvent). After determining to what group of economic status SJSCs belong to, it is further decided if they will be forced to improve their performance (by for example getting rid of low-circulating assets), receive state subsidy, or declared bankrupt. A set of indicators such as rate of solvency, rate of profitability, wear factor indicator, is used in the analysis of the economic status of SJSCs.

Economic status analysis showed that enterprises of the Khorezm ginning sector belong to the group with low solvency and profitability rates. Virtually all ginneries in Khorezm are characterized as being insolvent and having low profitability rates (Table 4.6).

One factor among many others, contributing to rather poor performance of ginneries in Khorezm, is the worn equipment which dates back to the 1970-80s (or even earlier), and also the buildings, be it production buildings or storage facilities. Wear factor of equipment is calculated as the ratio of depreciation value to the initial cost of equipment.

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[30] Committee on de-monopolization and support of competition and entrepreneurship of Uzbekistan was established in 2005 in the framework of the state program on de-monopolization and privatisation

Table 4.6 Summary statistics for the surveyed ginneries of Khorezm, 2005

	Ginnery	Type of the company, shares in joint stock	Year of establishment	Size	Production	Designed capacity per year	Capacities in 2005	Utilization of capacity	Workers	Av.wear factor -------- eq. wear	Orientation of output	Problems ------------------ status
1	Shovot	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1966 1987 last reconstruction; in 1995 SJSC	Total area 32.06 ha; Production facilities 5.06 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	45000 15000 25000 1500 800 2700	33339 11054 17046 841 477 1791	67 percent	408	39 percent -------- 46 percent	local 10 percent export 90 percent	Worn equipment; High costs of electricity, spare parts; Lack of circulating assets ---------------------- low profitability rate
2	Urgench	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1889 in 1924 nationalized; 1976-80 last reconstruction; 1995 SJSC	Total area 38 ha; Production facilities 23.2 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	40000 13200 19500 1500 1120 200 1840	29963 9902 14471 1420 821 169 1388	75 percent	368	20 percent -------- 9.9 percent	local 1 per export 99 percent	Derivation of assets to low-liquid assets: Product. stock (80 percent) and accounts receivable ---------------------- low profitability rate
3	Yangibozor	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1970 in 1995 half privatised, turned into SJSC	Total area 27 ha; Production facilities 0.6 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	50000 16708	32579 10862 15991 843 854 294 1937	65 percent	452 (40 percent women)	20.4 percent -------- 26 percent	local 40 percent export 60 percent	Derivation of assets to low-liquid assets: Product. stock (83 percent); Late payment for outpu Worn equipment; Lack of circ. assets and spare parts; ---------------------- insolvent, low profitability rate

	Ginnery	Type of the company, shares in joint stock	Year of establishment	Size	Production	Designed capacity per year	Capacities in 2005	Utilization of capacity	Workers	Av.wear factor -------- eq. wear	Orientation of output	Problems ------------------- status
4	Khonka	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1890 in 1925 nationalized; 1959 new workshop built; 1961 last reconstruction	Total area 34 ha; Production facilities 10.2 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	40000 13200	33194 11034 14891 2253 818 654 1721	82 percent	527	19.6 percent -------- 21 percent	local 10 percent export 90 percent	Derivation of assets to low-liquid assets: Product. stock (86 percent); ---------------------- low profitability rate
5	Khazarasp	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1893-95 in 1924 nationalized; in 1925 new workshop; in 1969-75 last reconstr.; in 1995 SJSC	Total area 32.15 ha; Production facilities 18.6 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	35000 11000	30880 9627 13999 1681 954 705 2145	88 percent	418	58 percent ------- 59 percent	local 20 percent export 80 percent	Derivation of assets to low-liquid assets: Product. stock (42 percent) and accounts receivable (16 percent); Worn equipment; Lack of circ. assets ---------------------- low profitability rate
6	Kushkupir	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1976 in 2002 last reconstruction	Total area 22.8 ha; Production facilities 4.82 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	50000 16640 27560 2080 1560 4160	34126 11331 16301 1070 888 365 2125	68 percent	408	35 percent -------- 15 percent	local 15 percent export 85 percent	Derivation of assets to low-liquid assets: Product. stock (70 percent) output stock (23 percent) control over currency; increased burocratic (paper) work; ---------------------- low profitability rate

	Ginnery	Type of the company, shares in joint stock	Year of establishment	Size	Production	Designed capacity per year	Capacities in 2005	Utilization of capacity	Workers	Av.wear factor -------- eq. wear	Orientation of output	Problems ------------------ status
7	Bogot	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1972 built; 1995 turned into SJSC	Total area 97.1 ha; Production facilities 43.2 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	30000 10000	25700 8491 9597 3170 732 465 1482	86 percent	335	34.2 percent -------- 8.2 percent	local 19 percent export 81 percent	Derivation of assets to low-liquid assets: Production stock (80 percent) ---------------------- low profitability rate
8	Gurlen	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1911 in 1926 nationalized; in 1968 rebuilt in 1995 SJSC; in 2002 last reconstruction	Total area 20.7 ha; Production facilities 2.6 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	48500 16606	32523 10641 15407 876 958 756 1775	67 percent	468	99 percent	local 18 percent export 82 percent	Derivation of assets to low-liquid assets: output stock (90 percent) ---------------------- low profitability rate
9	Yangiarik	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1969 in 1977 last reconstruction; in 1994 SJSC	Total area 19.0 ha; Production facilities 13.0 ha	Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	35000 12150	19158 6213 9095 490 520 363 1159	55 percent	287	47 percent -------- 36 percent	local 20 percent export 80 percent	Derivation of assets to low-liquid assets: Product. stock (60 percent); Delayed payment for shipped output ---------------------- low profitability rate
10	Khiva	SJSC: State share –51 percent Workers share –7 percent Free sale – 42 percent	1891 1924 nationalized; in 1995 SJSC		Raw cotton processing, t Cotton fibre, t Cottonseed, t Linter, t Fluff, t Mote, t	53000 17700	23757 7864	45 percent	320		local 10 percent export 90 percent	

Source: own survey results

The average wear factor of equipment in Khorezm ginneries is about 35 percent (thanks to reconstruction works conducted in some ginneries), which is not too low compared to the allowed 50 percent, but still rather high.

Virtually all ginneries have small cotton fibre processing units within their framework, adding to the output of the textile sector. However, the quality of textile products produced at the ginneries is poor and is only used for further consumption within the ginneries (for example uniform for workers, or non-woven fabrics for packing of cotton fibre bales).

Procurement of raw cotton

Since 2001 ginneries have been responsible for cotton procurement and conducting of mutual settlements with cotton producers. In particular ginneries have been responsible for finding cotton producing farmers, preparing and signing contracts with these farmers, and further fulfilment of all contract obligations (payment procedure, terms of delivery).

In the beginning of the year cotton growing farmers get state target plans from the rayon authorities (Khokimiyat). The same information (list of cotton farmers and cotton area assigned to them, as well as expected harvests) is sent to the ginnery of the corresponding rayon. With the given information, the legal expert of the ginnery prepares the contracts and visits cotton growing farmers for signing them.

Ginneries do not have large amounts of financial resources to promptly pay the farmers for the delivered cotton. In order for the ginneries to pay the farmers nevertheless, a special "Fund" was set up and attached to the Ministry of Finance. This fund provides sort of a credit to the ginneries during the cotton picking campaign.

During the harvesting campaign the ginneries send applications for settlement of accounts with farmers to the "Fund" on a 5 days basis; where they state the procured volume of raw cotton. The "Fund" distributes the requested amount of money among the ginneries. After the whole raw cotton harvest is turned to the ginneries, the "Fund" provides 80 percent of the total due payment to farmers[31]. The remaining 20 percent are to be paid after raw cotton is processed by the ginneries and marketed.

Technology of raw cotton store-up applied in the Republic significantly differs from analogous technologies in other countries and consists in that cotton from farmers is accepted to specialized store-up points of gins and is stored on special grounds in the form of bundles with the volume of 350 – 400 tons each, in which cotton is stored until processing. In this process all handling operations with cotton are mechanized. To provide safety of cotton, the

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[31] All payments concerning cotton procurement are carried out in the form of bank transfers only

method of bundle ventilation is actively used and the system of permanent control of raw cotton condition is applied by gin's laboratory.

Raw cotton accepted from farmers at procurement outlets of the ginneries is checked for moisture and trash content. In case of deviations of these indices from the norms, the amount of submitted cotton is reduced according to the given reduction factors. So farmers submit raw cotton at natural weight, and ginneries accept it at conditional weight. After pre-treatment of raw cotton, including its drying and cleaning, conditional weight reduces further due to the melting loss and wastes.

Raw cotton processing

Technology of raw cotton processing is mainly the same as used in other cotton producing countries and consists of drying, decontamination, ginning and cleaning of cotton fibre with its pressing into bales of 210 – 220 kg weight (Figure 4.9), then stocking in storage places until marketing (ginneries, cotton terminal).

Cottonseed undergoes additional separation from the remaining lint and mote. Bald cottonseeds then are subdivided to technical and planting seeds, which then are forwarded further down the chain. Separated from the cottonseeds, lint is also pressed into bales and forwarded to the cotton terminal for marketing.
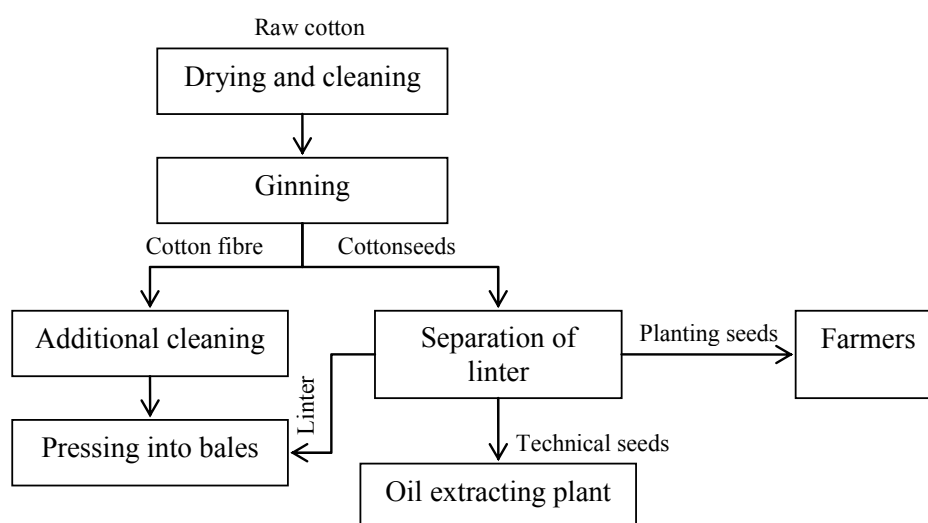
Figure 4.9 Cotton ginning process

(Source: own presentation based on survey results)

Marketing of processed cotton

Ginneries are responsible for processing raw cotton into cotton fibre, cottonseed and other by-products. Their marketing, however, is laid on the regional branches of "UzPakhtaSanoat" together with the State Foreign Trade Companies, which sign bilateral contracts for realization of cotton fibre. According to such contracts Foreign Trade Companies place applications for a certain amount of cotton fibre for export via cotton terminals. Marketing of cotton fibre for domestic processors should be carried out via commodity exchanges at the price, determined based on the Cotlook A index. Lint is also marketed via commodity exchange at prices issued by the Ministry of Finance of Uzbekistan. Cottonseeds (technical) are forwarded to oil extracting plants at prices also issued by the Ministry of Finance of Uzbekistan. Cottonseeds (planting) are forwarded to cotton growing farmers for the use in the next vegetation season.

Cotton fibre value chain

Primary cost of cotton fibre (as it is calculated by the ginneries) is comprised of two sections: raw cotton procurement costs and raw cotton processing costs; these are further disaggregated into activities and input costs. All costs and prices were identified via surveys during the research. In most cases the costs were taken directly from such official accounting documents of ginneries (and other actors of the value chain) like balance sheets, statement of accounts and applied in value chain analysis.

Value chain analysis revealed that raw cotton processing in the ginneries of the Khorezm region requires approximately UZS 97.3 thousand, or about USD 87 per ton of cotton fibre. Processing cost of the ginnery, which includes labour payments, energy and depreciation costs, current repairs, packing and transportation costs for cotton fibre has only a 9 percent share in the total fixed state price for cotton fibre (Figure 4.10).

The cost of raw cotton, coming from the farmers and excluding the cost of by products makes about 63 percent of the fixed state price for cotton fibre.

Ginneries are responsible for the procurement of raw cotton, namely for making contracts with farmers, buying raw cotton, transportation and accumulation of raw cotton at the procurement outlets and finally, for preparing raw cotton for the following ginning in the form of cotton pre-drying and pre-cleaning. All these procurement costs make about a 5 percent share of the fixed state price for cotton fibre.

"Presently more than 80 percent of the ginning equipment dates to Soviet times. Cotton is transported five tons at a time in tractor-pulled buggies. Storage areas may be up to 15 km from the farm, and gins may be 10 km from the storage areas. Huge hills of approximately

300 tons are constructed in storage areas. Because ginning equipment is of poor quality, the hills are necessary to allow the seed to "harden." After maturing, the cotton is transported to a gin where new hills are constructed. Because the handling is so slow, gins could not operate any faster even if they were better equipped" (Abbott, 2002).
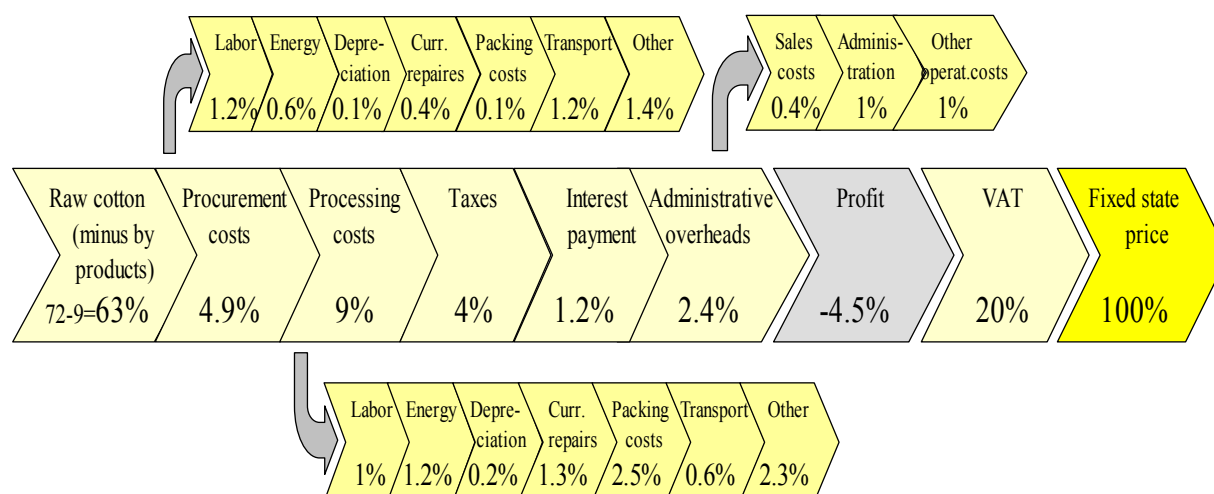
Figure 4.10 Cotton fibre value chain (average for all fibre grades)

(Source: own presentation based on survey results)

The second largest (after raw cotton costs) share of 20 percent comes from the Value Added Tax, which ginneries have to contribute to the state budget. Other taxes and operating costs, including administration and marketing costs, account for about 4 percent and 2.4 percent respectively.

The average profit margin of the ginneries in Khorezm turned to be negative, meaning that production of cotton fibre caused the ginneries a loss of 4.5 percent in 2005[32] (Figure 4.10), or about USD 43 per ton of produced cotton fibre.

In order to get a closer look on profit margins of the ginneries, separate value chains for different cotton fibre grades were developed. The results showed that only processing of first grade fibre would result in profits for the ginneries. Value chain analysis showed that the best fibre (first grade) produced by the ginneries in Khorezm in 2005 would bring producers a 2.4 percent profit margin, or USD 24 per ton. Subsequent grades of cotton fibre would give decreasing profit margins: - 1 percent for the second grade fibre and a sharply decreased margin of – 17 percent for the third grade fibre. Second and third grade fibre would cause ginneries a loss of USD 10 and USD 140 per ton respectively.

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[32] This profit share may change if calculated separately for different classes and types of cotton fibre.

Factors hindering development of the ginning sector

Despite of the modernisation attempts undertaken currently by the Government and the regional state authorities, the ginning sector of the Khorezm region faces some factors, hindering its further development. The process of modernisation of the ginneries is slow and requires much financial inflows. The major issue is the outdated equipment which causes poor ginning compared to international standards. However, in order to improve productivity and quality, new ginning equipment alone will not be sufficient, since gins operating at higher speeds must be accompanied by a streamlining of the whole handling system, from storage in the fields to the way cotton is transported to the gins (Cotton Outlook, 2005).

Other problems encountered by the ginneries of Khorezm are summarised in Table 4.7.

Table 4.7 Summary of barriers to growth in the ginning sector of Khorezm

Issue area	Barriers to growth
Inputs	• shortage in raw cotton supplies. Since independence raw cotton production in Khorezm (as in the rest of Uzbekistan) has dropped in favour of wheat production in the framework of self-sufficiency in foodstuffs; • low quality of raw cotton, resulting from the absence of facilities at private farms for pre-treatment of raw cotton • high costs of electricity, other energy resources
Financial problems	• lack of circulating assets to balance ginneries' liabilities • delayed payment transfers for the output of the ginneries, leading to the lack of circulating assets and indebtedness to the farmers for the raw cotton and to the state budget • heavy tax burden • high costs for cotton terminal services • derivation of assets to low-liquid assets, like production stock and accounts receivable
Equipment	• outdated/worn gins and other equipment and tools • lack and high costs of spare parts to maintain the ginning equipment
Regulations	• full control over currency flows and other issues by regional branches of the State Joint Stock Company "UzPakhtaSanoat" ("KhorezmPakhtaSanoat" in the

	Khorezm region)
	• lack of freedom as ginneries are still half owned by the state and are completely accountable to the regional branches of the State Joint Stock Company "UzPakhtaSanoat"
	• increased paper work: the more stakeholders and the managing structures involved, the more reports and applications have to be filled out.

Source: own survey results

4.4.4.3 Oil extracting industry

A second major cotton by-product is cottonseed, which makes about 51 percent of raw cotton. Cottonseed from ginneries is forwarded to oil extracting plants, where it is processed into cotton oil, soap, cottonseed meal, cakes and hulls, as well as other products. Cottonseed oil is a staple of the Uzbek diet. Per capita oil consumption is estimated at about 15 kg per year. Cottonseed meal, cakes and hulls are supplied to other state agencies, like wheat mills, which combine by-products from flour milling with cottonseed meal, cakes and hulls to produce a compound feed for cattle (USDA, 2005a). Other cottonseed products like soap, drying oil are consumed by population or are utilized by other industries.

Uzbekistan has considerable (corresponding to raw cotton produced in the country) extracting capacities, with about 3.5 million tons of cottonseed processing per year. However, due to the lack of spare parts and inadequate maintenance, processing capacity has declined to about 2 million tons, meaning that currently this industry operates at less than 60 percent of capacity, also due to the lack of oilseeds.

Uzbekistan's extracting and oil extracting industry with all oil extracting plants throughout the country used to be owned and operated by the Joint Stock Association "Uzmaslojirtabakprom", which consisted of the former state extracting, extraction and refining facilities. In the last years, however 4 out of 19 oil extracting plants were privatised and taken over by foreign investors, one being the plant of the Khorezm region.

In 2003 the Urgench oil extracting plant was partly privatised by the foreign investor with 50.2 percent of shares being sold to the Swiss company "FLOIL Ltd." The State reserved 25 percent of joint stock value; and the remaining stocks were distributed among other shareholders. Any foreign investor is obliged to invest into modernisation of processing equipment. New extracting and pressing equipment of German make were installed at Urgench oil extracting plant in the last years.
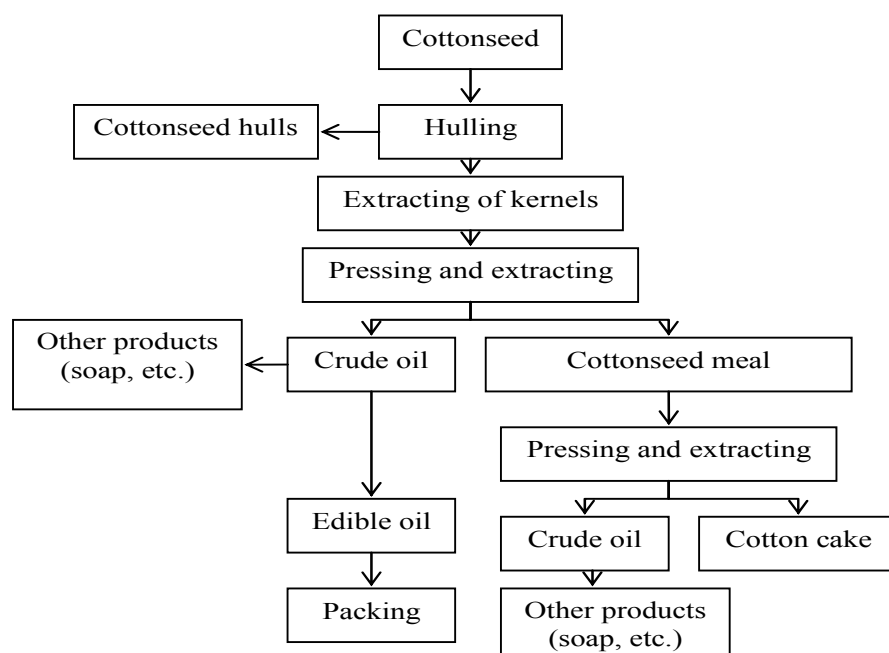
Figure 4.11 Cottonseed oil extracting process

(Source: own presentation based on survey results)

Urgench oil extracting plant is engaged in production of edible cotton oil, laundry soap and other products. The main input – cottonseed – comes from the ginneries. In 2005 the Urgench oil extracting plant processed 128.7 thousand tons of cottonseed, produced 21.3 thousand tons of cotton crude oil, including 18.6 thousand of refined edible oil; and other products. The process of extracting cottonseed oil consists of cottonseed hulling; extracting of cottonseed kernels; pressing and extracting of oil (Figure 4.11).

Cottonseed edible oil value chain

Cottonseed edible oil is one of the major cotton by-products. It is also the main vegetable oil consumed by the local population, which spends a considerable amount of earnings on it. Surprisingly enough, the value chain analysis showed that the main input (cottonseed) contributed only 8 percent to the total producer price for the cotton edible oil (Figure 4.12). Apparently consumers cover the expenses of the oil extracting plant on excise tax and the Value Added Tax, which account for 61.1 percent and 16.7 percent of the total producer price[33] respectively. Processing costs represent a small share of 2.6 percent of the total price. Due to the fact that the main shareholder of the oil extracting plant "Urgench yog" is a foreign company and that the prices are not predetermined by the state, but rather calculated

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[33] Total retail prices as found at the markets are even higher, including the trade margin of retailers.

based on the principle "costs plus profits", a profit margin of 11.5 percent is considerable if compared to the profit margins of other industrial enterprises of the Khorezm region.
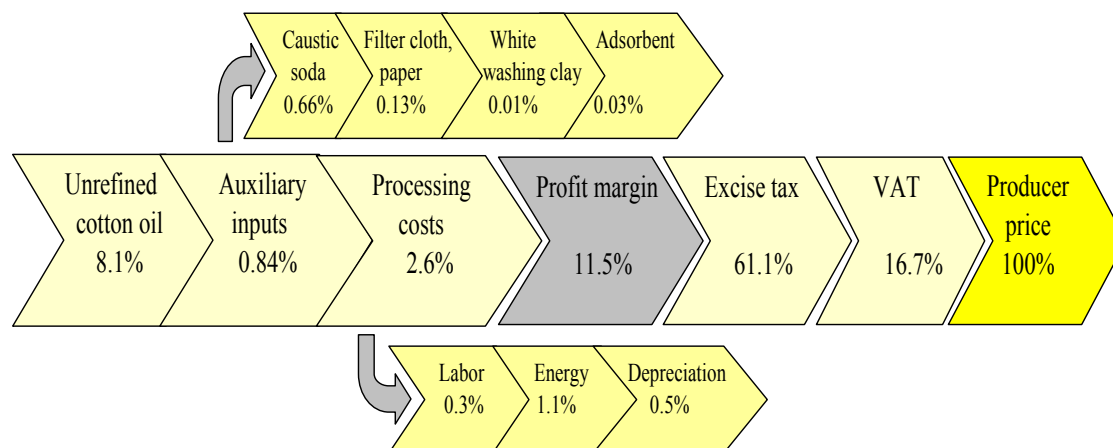
Figure 4.12 Cottonseed edible oil value chain

(Source: own presentation based on survey results)

Laundry soap value chain

Laundry soap is the second major cotton by-product, which is broadly consumed by the population. Processing costs of the oil extracting plant stand at about 5 percent level; direct inputs account for 31 percent. Consumers, as in the case of cotton edible oil, have to cover excise and Value Added Taxes, each contributing 16.6 percent to the total retail price determined by the producer. Profit margin in the case of laundry soap production appeared to be as high as 30 percent (Figure 4.13).
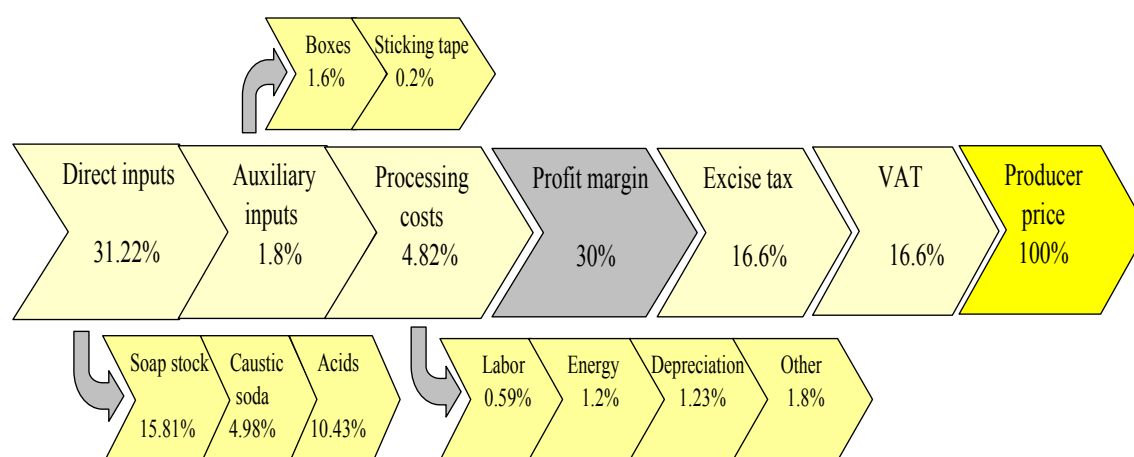
Figure 4.13 Laundry soap value chain

(Source: own presentation based on survey results)

4.4.4.4 Textile companies

The textile industry in Uzbekistan is not as heavily controlled by the state as for example the ginning industry. Various types of organizational structure are allowed in the textile sector. In 2005 there were 26 textile enterprises present in the Khorezm region, some in the form of a joint stock company with Government participation (25 percent of shares), some as joint stock companies with the foreign partners; completely private companies (these were the numerous and small scale textile producers) and completely foreign business company.

In general the textile industry of the Khorezm region is comparatively young. The two joint stock companies with the Government participation in Khorezm were established in the 1980s, but due to the poor economic performance they were proclaimed bankrupt and dissolved in the late 2005. The first joint ventures appeared after independence; however, the majority of the joint ventures as well as the private companies were organized after 2000. At the time of conducting this research, only half or 13 textile enterprises, have been operating in Khorezm (Table 4.8). The total capacity of processing cotton fibre of the textile enterprises in operation was around 20 thousand tons, twice as much as the textile enterprises managed to buy via the commodity exchange[34] (refer to Figure 4.6).

The main output of the textile enterprises of Khorezm are: yarn, coarse cotton woven and non-woven fabrics, ready made garments (basically knitwear), mattress and absorbent cotton (used for medical purposes).

Although the textile industry is considered a powerful source for rural employment, only about 3000 people were employed by the textile industry of Khorezm in 2005.

The domestic market of the textile products is saturated with the low quality textiles from China, or with better quality but higher priced textiles from Turkey. Textile products produced by the local enterprises meet quality standards, are affordable for the local consumers, and are mostly exported to Russia (the knitwear), Turkey (the yarn) and other countries.

Value chain analysis showed that value added by the textile sector in the current situation suggests that it contributes the most to the total value added by the cotton textile sector in the Khorezm region and has lots of opportunity for increasing value added. Promising in this respect seem to be not only the large joint ventures with a complete production cycle, but the more so the small scale private textile enterprises.

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[34] Since 2005-2006 cotton fibre for domestic use by textile producers is marketed only via commodity exchange and on conditions of a 100 percent prepayment and of availability of up to date equipment; both conditions are hard to be fulfilled by the local textile companies, which lack circulating assets and have a very limited scope for fast renovations and refitting

Table 4.8 Summary statistics for the surveyed textile companies of Khorezm, 2005

	Name of the company	Type of the company	Year of establishment	Produced items	Designed capacity per year	Production in 2005 tons, r.m. per year	Utilization of Capacity	Workers	Status	Orientation of output
1	Bagatteks	Joint Stock Company: State share 25 percent Workers share 8.96 percent Free sale 42.04 percent Foreign investor 24 percent	1984 2001 turned into PJSC	Cotton fibre processing, t Yarn, t Coarse/unbleached calico, thousandm^2; Gauze	2000 2300 5569	1500 2176 5352 6218	95 percent	501	Insolvent; bankrupt	local 100 percent
2	Bagat tekstil	JV: Uzbek 40 percent Turkish 60 percent	2003 2005 put in operation	Cotton fibre processing, t Yarn, t	5000 4350	2300 1973	46 percent	340	Operating	Yarn: 20 percent local (Cottonteks JV) 80 percent export (Turkey)
3	Cottonteks	JV: Uzbek Turkish	2005 2006 put into operation	Knitted fabric, t Knitted garments, items	450 900000			100	Newly established	Yarn: own consumption Garments: 100 percent export
4	Khorezm Nurtop	JV: Uzbek (41.2 percent) 37.3 percent Turkish (58.8 percent) 62.7 percent	1992 2002 put into operation	Cotton fibre processing, t Yarn, t	2500(3750) 2200(3800)	878	40 percent	99	Operating; profitable	Yarn: 10 percent local 90 percent export (Turkey)

	Name of the company	Type of the company	Year of establishment	Produced items	Designed capacity per year	Production in 2005 tons, r.m. per year	Utilization of Capacity	Workers	Status	Orientation of output
5	Khuroson	Private firm	1994	Cotton fibre of 5 class and linter processing, t Mattress cotton, t Coarse/unbleached calico, thousandm^2 Sheet wadding, r.m.	1000 600 1000 300000	200 225 1.172 12000	20 percent	45	Temporarily not operating; profitable	60 percent local 40 percent export (Russia)
6	Gurlan	Private Foreign Joint Stock Company	1997 Uzb.JSC; 2005 Foreign JSC	Cotton fibre processing, t Yarn, t Knitted garments, items	2085 1710 5202000	680 558 3596000	33 percent	1200	New owner; enlarging	89 percent local 11 percent export in future - (80 percent export)
7	Kushkupir-Gilam	Private firm	1997	Cotton fibre of 5 class and linter processing, t Mattress cotton, t Yarn, t Carpets, items	2000 2400 350 15000	 581 97	 24 percent 28 percent	95	Operating; profitable	20 percent local 80 percent export (Russia) Carpets local
8	Bunedkor	Private firm	1998	Cotton fibre of 5 class and linter processing, t Mattress cotton, t Absorbent cotton Coarse/unbleached calico, thousand r.m. Towels, items	 360 100 200 300000	 261	72.5 percent	18	Profitable; currently not operating	60 percent local 40 percent export (Russia)
9	Khiva shveynaya	Company with limited liabilities	1964 1994 – JSC 2004 - CLL	Garments; Uniform Mattresses	Items for 80 mln. UZS /year		28 percent	50	Operating; low profitability	100 percent local

	Name of the company	Type of the company	Year of establishment	Produced items	Designed capacity per year	Production in 2005 tons, r.m. per year	Utilization of Capacity	Workers	Status	Orientation of output
10	Khonka ip igiruv fabrikasi	Previously: JV Rus (49 percent) /Uzb (51 percent) Presently: Company with Limited Liabilities	1996 JV 2002 CLL	Cotton fibre processing, t Yarn, t Coarse/unbleached calico, thsnd m^2;	500 400 2000	165 130 679	33 percent	240	low profitability rate	100 percent local
11	Shovotteks	JV: Uzbek (49 percent) 70 percent German (51 percent) 30 percent	2003 2004 put into operation	Knitted garments, items	3360000	182083	6 percent	120	Operating; low profitability rate	20 percent local 80 percent export (Russia)
12	Unixo	JV: Uzbek 70 percent German 30 percent	2003	Cotton fibre processing, t Yarn, t	2760 2400	1017 1291	54 percent	93	Bankrupt; Stopped operation in 2005	Export (Russia and Turkey)
13	Khiva Bogot	Foreign Business Company (Great Britain/Russia)	1992	Cotton fibre (5 class) and Lint processing, t Absorbent cotton, t	4000 2400	1000 600	25 percent	60	low profitability rate	100 percent Export to Russia

Source: own compilation based on survey results

Yarn production and value chain

Six textile enterprises (spinning factories) in Khorezm in 2005 have been producing yarns of two types: native fibre yarn, meaning high quality of the ready made products and entangled yarn. Native fibre yarn is produced at higher costs (equipment is more expensive, the production process itself is longer and more costly), compared to the entangled yarn. The process of yarn production is virtually the same for all producers and consists of scutching, combing, drawing, rolling of cotton fibre, spinning and winding of the yarn (Figure 4.14):
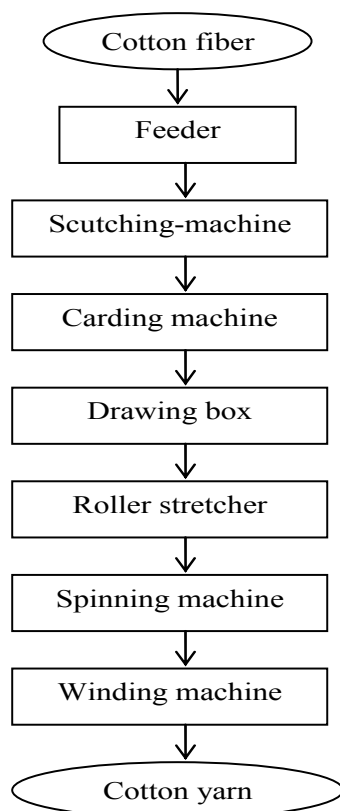
Figure 4.14 Yarn production process

(Source: own presentation based on survey results)

Value chain analysis showed that the producer price for yarn, proclaimed by the spinning factories covers on the average the cost of the cotton fibre of 61.3 percent; processing costs (including energy, labour, depreciation and other costs) of 18 percent; and yet leaves a profit margin of 6.5 percent (Figure 4.15). Labour costs are differentiated between the salaries and the assignments which the workers have to forward to the Social fund. Value Added Tax is transferred to the state budget in the amount of 13.9 percent of the total producer price for the cotton yarn. Cotton yarn is used for production of cotton fabrics. Weaving factories of the

Khorezm region produce cotton fabrics, called coarse unbleached calico[35] and knitted cotton fabrics[36], but in lower quantities.
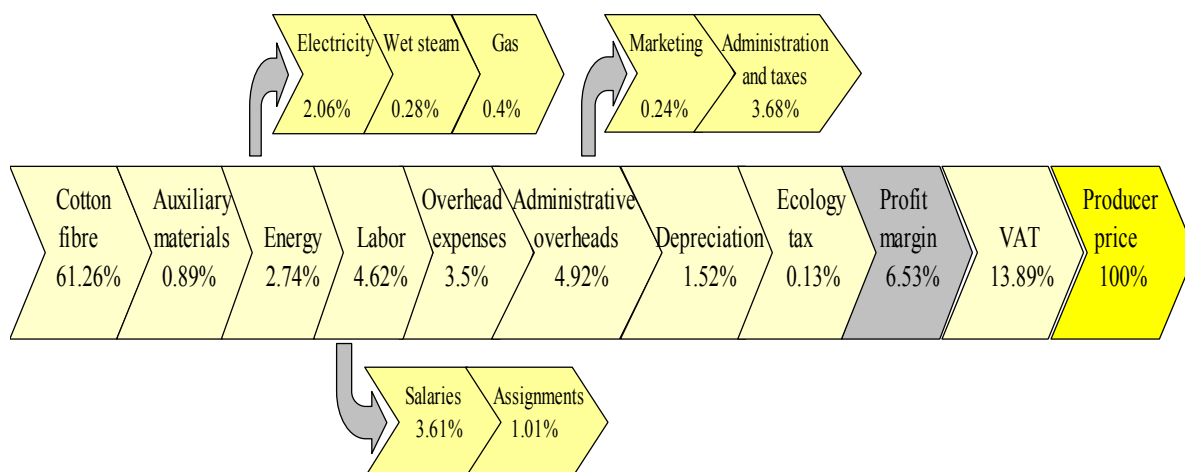
Figure 4.15 Cotton yarn value chain

(Source: own presentation based on survey results)

Cotton fabrics production and value chain

As a case study for weaving factories, the production of coarse unbleached calico was chosen in this study. The production cycle of calico consists of warping, sizing, looming and measuring (Figure 4.16).
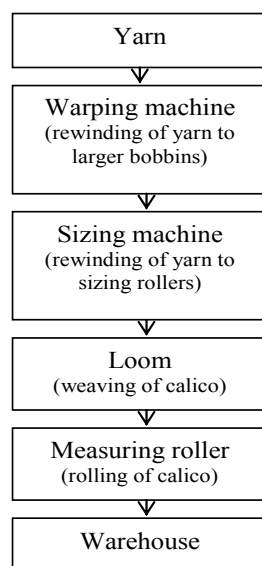
Figure 4.16 Coarse calico weaving process

(Source: own presentation based on survey results)

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[35] Coarse unbleached calico is used by the ginneries as packing material for the bales of cotton fibre, or it can be used to make mattresses and bed-clothing

[36] Used to make knitwear, such as T-shirts for example

The main inputs for calico production (cotton yarn, cotton fibre and linter) contributed about 55 percent to the retail price for calico. Processing costs amounted to 15 percent, including energy, labour, depreciation and other costs, as well as taxes to about 20 percent, including 15 percent for Value Added Tax; and the profit margin retained by the producers was slightly over 9 percent (Figure 4.17).
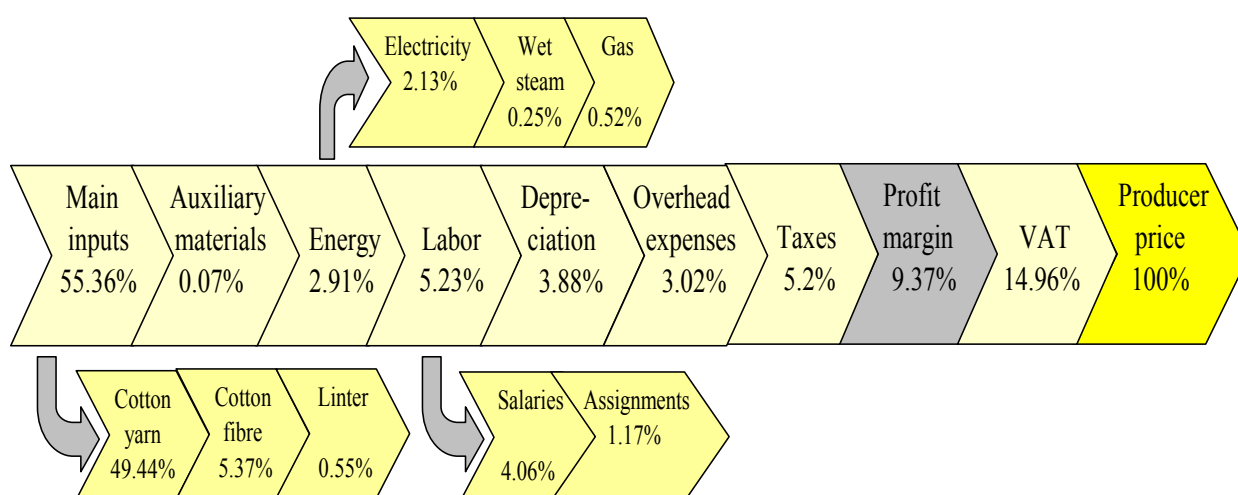
Figure 4.17 Coarse calico value chain

(Source: own presentation based on survey results)

Ready made garments production and value chain

The end product of the cotton value chain (in the sense that it can be directly used by the final consumers) in Khorezm is the knitwear, produced by a number of clothing factories (Figure 4.18).
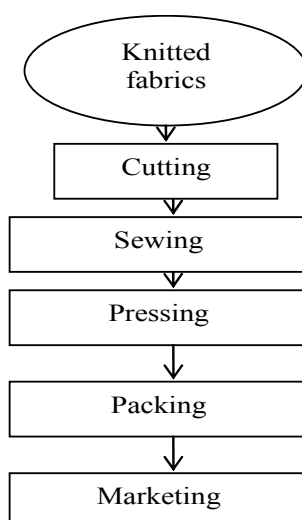
Figure 4.18 Ready made garments production process

(Source: own presentation based on survey results)

The main input – the knitted cotton fabrics – is usually lacking in the region due to low production, so that the factories in 2005 had to import knitted fabrics from other parts of Uzbekistan. The procedure of searching for inputs and making contracts with fabrics producers, however, consumes a lot of time, efforts and money. Other inputs, such as threads, buttons, and elastic bands come from countries like China or Russia via local markets. The ready made garments production process consists of cutting the fabrics, sewing, smoothing (pressing), and packing (Figure 4.18).

Value chain analysis showed that the inputs constitute about 45 percent to the total producer price (Figure 4.19). Processing costs make about 31 percent, including for labour (the major share in the processing costs – 7.15 percent), auxiliary materials (threads, buttons, elastic bands, labels), depreciation and energy costs. The profit margin reached a 7 percent level; the Value Added Tax transferred to the state budget amounted to about 17 percent.
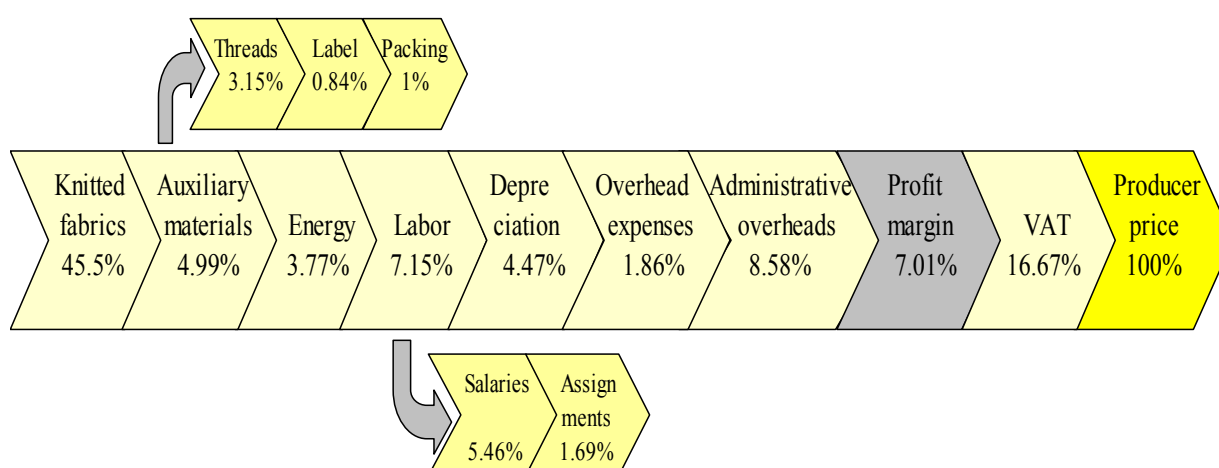
Figure 4.19 Ready made garments value chain

(Source: own presentation based on survey results)

Absorbent cotton production and value chain

There is one enterprise producing absorbent cotton, or medical wool in the Khorezm region. This enterprise is a Foreign Business Company, jointly owned by the British (90 percent of shares) and Russian (10 percent of shares) companies.

Up to now this company has been considered unprofitable or hardly profitable due to the problems associated with acquisition of energy resources: gas and water, which are abruptly supplied to the rural consumers in general. The decision to install a separate gas supplying line and a well to use ground water is aimed at achieving independence from the outside problems.

Equipment of the factory is of foreign make and requires high maintenance costs and rare spare parts.

The company's marketing channel was set up and is entirely managed by the directors. Its output – absorbent cotton – is packed and shipped to Saint Petersburg, Russia via rail road network. In Russia, absorbent cotton undergoes some more processing stages like additional cleaning and combing, and then it is packed in small and appealing packages and forwarded to the end consumers[37].

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      ┌─────────────────┐
     (   Cotton fiber   )
     (      Linter      )
     (      Fluff       )
      └─────────────────┘
              │
              ▼
     ┌─────────────────┐
     │    Cleaners     │
     └─────────────────┘
              │
              ▼
     ┌───────────────────────┐
     │ Wet pressing equipment│
     └───────────────────────┘
              │
              ▼
     ┌─────────────────┐
     │  Boiling tanks  │
     └─────────────────┘
              │
              ▼
     ┌─────────────────┐
     │Squeezing machine│
     └─────────────────┘
              │
              ▼
     ┌──────────────────────────┐
     │ Centrifugal drying machine│
     └──────────────────────────┘
              │
              ▼
     ┌────────────────────┐
     │ Pressing and packing│
     │     equipment      │
     └────────────────────┘
              │
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      ┌─────────────────┐
     (    Absorbent     )
     (     cotton       )
      └─────────────────┘
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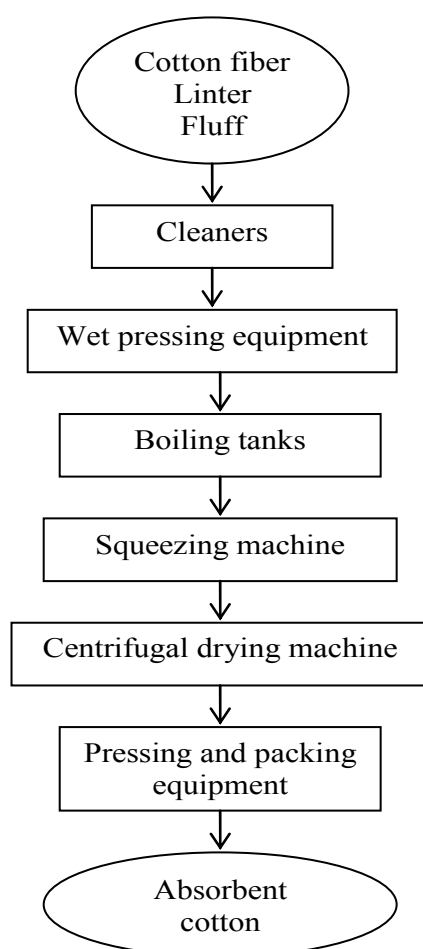
Figure 4.20 Absorbent cotton production process

(Source: own presentation based on survey results)

The main input for absorbent cotton is cotton fibre of the 5th class (cotton of low quality), linter and cotton wastes of the spinning factories, which come from the local ginneries via cotton terminal (in previous years more, presently less quantities), local spinning factories and from small private cotton processors.

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[37] This means that value added is created outside of Uzbekistan

Production process of absorbent cotton consists of cleaning of cotton fibre and linter, wet pressing, boiling, squashing, drying, pressing and packing in 225 kg bales (Figure 4.20).

According to the value chain analysis, the main inputs (cotton fibre of 5 class, cotton waste – linter and fluff, or so called mattress cotton) contribute about 56 percent to the total producer price for absorbent cotton. The second largest cost item is auxiliary materials (chemicals, packing material), amounting to 23 percent of the retail price. Processing costs make about 19 percent and the profit margin accounts for only 2 percent of the producer price in 2005 (Figure 4.21).
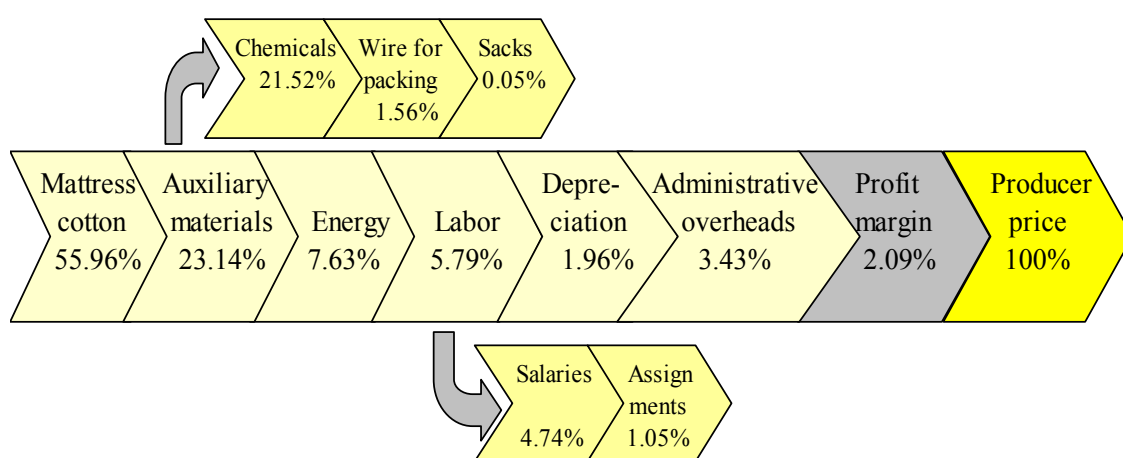
Figure 4.21 Absorbent cotton value chain

(Source: own presentation based on survey results)

Obstacles to development of the textile sector

In general, all producers operating in realm of the textile industry in Khorezm experienced certain problems and obstacles for stable operation and further development. Some producers did not have enough circulating assets to make business run (joint ventures, but mostly local textile companies). Some were not able to settle all amounts due to the credit institutions (usually joint ventures). Some were able to produce, but did not have permission or access to the main input – cotton fibre.

The major problems reported in the survey of textile enterprises are summarised in Table 4.9.

Table 4.9 Summary of barriers to growth in the textile sector of the CVC in Khorezm

Issue area	Barriers to growth
Inputs	• lack of the main inputs basically due to the current regulations on cotton

	• lack of auxiliary inputs such as chemicals • lack of other inputs - energy resources, such as gas and water for the production process • poor quality of the inputs (cotton fibre, lint) for local producers • low qualified workers
Financial problems	• high transaction costs: railroad, customs, certification • forced charity donations by companies for construction works in the region • bank credits, as well as international credits at high interest rate • high inflation rate
Equipment	• worn equipment and tools • lack of spare parts for the imported machinery and equipment
Regulations	• high bureaucratic barriers • strict administrative control, interference in activities of all the enterprises, including joint ventures and foreign business company • in order to show that local authorities fulfil the Decree of the Government, all private cotton fibre processors are forced to change their names: this will prove that all the old processors were abolished according to Decrees and the new ones, more promising, are being established. But this leads to additional (unexpected) expenditure for re-registration, commission fees, etc., and will lead to the loss of clients, and buyers. As a consequence processors will have to find new partners and marketing channels • tax policy (VAT to be paid in the country of export destination increases retail prices and lowers chances of Uzbek goods for competition. VAT shall be eliminated after signing of trade agreements among CIS countries. Export of goods will ease competition) • JV are being set up in the country on a precondition of their bankruptcy (due to the costly international credits) in future. In such cases all equipment stays in Uzbekistan, and foreign investors leave

Source: own survey results

4.4.4.5 Summary of the CVC actors

Based on survey results of the CVC, the oil extracting plant of the Khorezm region received the highest profit margins for its products cotton edible oil and laundry soap. The operating profit of about 20 percent received by farmers could not be considered highest as this was not their final net profit; and there were no opportunities in the current study to calculate the net profit of farmers as such, because farmers barely kept all their accounting records in a good order. Manufacturing of almost all cotton products was profitable (although just barely) for the actors of the CVC. The exception occurred for cotton fibre; however, the loss could be explained by the crude calculation method, which was based on average indices. Cotton fibre produced in Uzbekistan was classified by 5 levels and 21 classes, which also determined the price, indicating that the fibre with the best quality characteristics and the highest price, but the same production costs, would have brought higher profit margins to producers.

Profit margins received by the cotton chain actors from the production of the cotton products in 2004/2005:

Raw cotton   about 20 percent
Cotton fibre   - 4.5 percent
Cotton edible oil   11.5 percent
Laundry soap   30 percent
Cotton yarn   6.5 percent
Cotton coarse fabrics   9.4 percent
Cotton ready made garments   7 percent
Absorbent cotton   2 percent

4.5 Analysis and impact assessment in the cotton chain

Data, both secondary and primary, obtained through value chain analysis did not only help in describing and demarcating the cotton chain, but also provided invaluable information and set the basis for financial and economic analyses of the CVC. Analytical methodology suggested by FAO (for more details refer to Chapter 2) was applied in this section with the aim to assess the scope of the CVC in regional economy; to estimate total value added by the chain and its impact on state budget, balance of payments.

4.5.1 Financial analysis of the CVC

4.5.1.1 CVC value added

Data on wages, profits, depreciation costs, interests paid to financial institutions, taxes and payments to non-budgetary funds, as well as social payments were obtained for individual

actors along the CVC. Financial charges included interests paid by the actors of the chain on credits from local as well as foreign financial institutions, as well as bank service fees. Taxes were comprised of all types of taxes levied in the country, including income tax, VAT, excise tax. These figures were used in calculation of the value added (according to equations (1-3), p.20) both for each sector of the chain (agricultural, ginning, textile, oil extracting and partly chemical) and also for the entire CVC, as shown in Table 4.10.

Table 4.10 Value added creation by the CVC actors in Khorezm in 2005, million USD

	Personnel remuneration	Profit	Depreciation	Financial charges	Taxes	Remittances to non-budgetary funds	Social Payments	Value Added
Agricultural sector	28.9	2.6	0.9	0.3	1.5	2.3	0.0	36.6
Ginning industry	2.0	1.4	0.3	1.8	19.4	4.9	0.0	29.7
Textile industry	0.7	1.0	0.6	2.1	0.3	0.3	0.2	5.3
Oil extracting	0.5	0.8	0.4	0.1	5.5	0.2	0.0	7.5
Chemical Industry	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.2
Total cotton-textile sector	32.3	5.8	2.1	4.3	26.8	7.8	0.2	79.3

Source: own survey results

Total value added created by the cotton chain in 2005 in the Khorezm region alone was estimated at about USD 79 million, with the major contributors represented by the agricultural sector and the ginning industry. Most return to labour in the form of wages and profits took place in the agricultural sector. Most financial charges were accrued by the textile industry, whereas most taxes and payments to non-budgetary funds were levied in the ginning industry. Social payments (financial assistance to employees for weddings or funerals) are non-obligatory expenses of enterprises, which in 2005 were paid basically by the textile industry (Table 4.10).

4.5.1.2 *Profitability of activities in the CVC*

The financial profitability of activities in the cotton chain was analysed based on the CVC actors' activities, their economic results in the form of profits or losses, their ability to maintain and replace the equipment and capital as well as to cover any financial costs at present or in the future. Based on the available data on CVC functioning in 2005, financial analysis of activities along the CVC was restricted to calculation of financial rates of return (according to equation (4), p.20).

Overall efficiency of the CVC (although low), was estimated at 0.02, representing a return of about USD 2 cents per each item spent along the chain on average (Table 4.11).

The oil extracting sector in 2005 showed the highest, albeit also low, profitability rate of about 0.09. As mentioned previously, oil extracting plant was a private company with

foreign partnership and was not highly controlled by the government. The least return, or rather no return at all, was calculated for the chemical industry.

Table 4.11 Efficiency of activities in the CVC in Khorezm, 2005

	Rate of Return
Agricultural sector	0.038
Ginning industry	0.017
Textile industry	0.010
Oil extracting	0.088
Chemical industry	0.001
Total cotton-textile sector	0.022

Source: own survey results

The agricultural sector had a comparatively moderate rate of return of about 0.04; whereas the ginning and the textile industries showed low returns of about 0.02 and 0.01 respectively. Despite of rather high revenues from output sale in these industries, their costs were high as well. The ginning industry had much spending on maintaining the outdated equipment, whereas the textile industry had high interest payments for the credits received domestically or from the foreign financial institutions.

4.5.1.3 *Subsidies to the CVC*

All activities within the CVC in 2004/2005 resulted in surpluses – all the agents received profits, with the agricultural sector accruing the highest profit (Table 4.10). However, on the other hand, the agricultural sector was highly subsidised by the state. Should agricultural producers during this period face the real production costs, including, for example the operation and maintenance costs of the irrigation and drainage systems, water charges, or full costs of the main agricultural inputs with VAT inclusive (Table 4.12), the amount of received profit would be very different. According to the survey results, the total value of subsidies[38] provided to the CVC in Khorezm reached in 2005 about USD 26.3 million, which could be divided into two groups: explicit and implicit subsidies.

Explicit subsidies, as calculated for 2004-2005 for Khorezm, amounted to a total of USD 24.4 million, or USD 229 per cotton hectare. Explicit subsidies included maintenance costs for irrigation and drainage networks; free irrigation water; debt write-offs of the large agricultural producers (*shirkats*); and provision of agricultural inputs like fertilizers and fuel at low prices (VAT exclusive) for producers.

Implicit subsidies to the CVC of Khorezm, according to the survey, amounted to close to USD 2 million and were comprised of preferential credits at low interest rates, which were

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[38] Methodology for calculating subsidies was adapted from the World Bank, 2005

provided by the GoU to agricultural producers for growing state target crops cotton and wheat; difference on cotton oil prices for agricultural producers[39]; and exemption from taxes for some newly created textile enterprises (Table 4.12).

Table 4.12 State subsidies provided to the CVC in Khorezm, 2004/2005

	Billion UZS	Million USD
Explicit subsidies		*24.4*
Irrigation and drainage	19.8	19.4
Water	0.7	0.6
Debt write-off	0.9	0.8
VAT waiver: fertilizers	2.1	2.1
VAT waiver: fuel	1.4	1.4
Implicit subsidies		*2*
Low interest rate credits	0.7	0.7
Cotton oil differential	1.3	1.2
Exemption from taxes	0.0	0.0
Total subsidies to the Cotton-textile sector	26.9	26.3

Source: own survey results, calculations based on the World Bank methodology and indicators (World Bank, 2005)

About 99 percent of all subsidies enjoyed by the entire CVC were directed to agriculture, which thus continues to be highly supported by the state.

4.5.1.4   *The analysis of transfers*

The analysis of transfers within the given value chain provides some insight on the real distribution of income amongst domestic agents by making these transfers explicit. As a result, the impact of economic policy on the behaviour and strategies of different actors and, eventually, future levels of growth can be assessed.

Table 4.13 Composition of the Khorezm CVC value added by factor in 2005

in percent

	Personnel remuneration	Profit	Depreciation	Financial charges	Taxes	Remittances to non-budgetary funds	Social Payments	Total Value Added
Total cotton-textile sector	39.1	7.4	2.7	5.7	35.0	9.9	0.2	100

Source: own survey results

About 40 percent of the value added, created within the cotton value chain in 2005, was redistributed to the households in the form of wages and social payments; about 35 percent was directed to the state in the form of various taxes; and about 10 percent to non-budgetary funds as other deductions; return to capital investments and financial institutions accounted

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[39] Agricultural producers of raw cotton can buy cotton edible oil with 30 percent discount

for about three and six percent respectively; and finally, the profit margins of the producers accounted to slightly over seven percent of the total value added within the CVC (Table 4.13).

It is shown in Table 4.14, the largest contribution to the total value added created by the CVC in Khorezm in 2005 came from agriculture (44 percent), producing raw cotton; the ginning industry created 39 percent of the total CVC value added; subsequent industries, namely textile and oil extraction (plus chemical) industries had low shares of 7 and 10 percent respectively. Because of the high share of value added created by the agricultural sector, and also the ginning sector, it can be concluded that the processing industry in Khorezm was underdeveloped and was underutilizing its given capacities.

Table 4.14 Contribution of the Khorezm CVC actors to value added in percent

	Personnel remuneration	Profit	Depreciation	Financial charges	Taxes	Remittances to non-budgetary funds	Social Payments	Total Value Added
Agricultural sector	89	43	40	6	5	28	0	44
Ginning industry	7	25	14	43	73	64	0	39
Textile industry	2	19	27	49	1	5	99	7
Oil extracting and chemical industries	2	13	18	2	21	3	1	10
Total cotton-textile sector	100	100	100	100	100	100	100	100

Source: own survey results

The highest return to labour, profit, and fixed assets was monitored in the agricultural sector. Yet considerable returns to financial institutions, the government and non-budgetary funds were accrued from the processing sectors of the CVC: the ginning and textile industries. In general the ginning sector was heavily taxed both by the government and non-budgetary funds, and the textile industry provided virtually all the support to private sector – the workers and their households – by undertaking social payments (Table 4.14).

4.5.1.5   *Cotton products' price determination*

Price determination for the products along the chain can shed light on such issues as how effective the markets are in terms of functioning; revenue distribution; capability and responsibility for adjusting of the chain to external changes and low market prices; regulation of prices and other institutional constraints affecting economic activities.

Determination of fixed state prices paid for cotton fibre and raw cotton to farmers is shown in Table 4.15.

Table 4.15 Determination of the state procurement prices

Export price for Uzbek cotton fibre
minus
• **expenses of State Foreign Trade Companies** (transportation, insurance from cotton terminal to the ports, reloading and storage at the ports, CIF terms)
• **expenses of "Sifat" Centre** for certification and weighting of cotton bales
• **expenses of the Customs office** for declaration and other customs duties
• **banking expenses** (guarantees, opening letters of credit)
• **commission fee to "UzVneshTrans" company**
• **profit margin of the Foreign Trade Companies**
Negotiated price for cotton fibre paid by State Foreign Trade Companies to "UzPakhtaSanoat"
minus
• **expenses of "UzPakhtaSanoat"** for transportation and storage of cotton fibre at cotton terminals
• **profit margin of "UzPakhtaSanoat"**
Fixed state price for cotton fibre paid by "UzPakhtaSanoat" to the ginneries
minus
• **expenses of the ginneries** (transportation of raw cotton, processing costs, quality check)
• **profit margin of the ginneries**
Fixed state price for raw cotton paid by the ginneries to cotton farmers

Source: own presentation based on survey results and official regulations

The State Foreign Trade Companies (SFTC) which are in charge of the cotton fibre marketing, export the Uzbek cotton fibre at the export border price. After covering the costs incurred in the export procedure, the trading companies paid to "UzPakhtaSanoat" for the marketed cotton fibre. Should e.g. the export price for the shipped cotton fibre had changed due to unforeseen circumstances, or due to fluctuations at the world cotton market, the difference between the stated (the fixed state price for cotton fibre) and the real price (derived from the world market price) would be accredited to SFTC, irrespective if this would be a surplus or a loss. Hence these structures bore most of the risk in the CVC.

The export price for Uzbek cotton fibre was determined by the SFTC according to the instructions provided by the GoU. Since 2003, this consisted of the average of the Cotlook A- Index and its Uzbek component one day prior to shipment. The negotiated price for the Uzbek cotton fibre paid to "UzPakhtaSanoat" was determined by the SFTC, while taking into account the expenses of all the stakeholders of the CVC (Table 4.15).

Table 4.16 A numerical example of procurement price determination for 2004/2005

	thousand UZS	USD*	Share, %
Export price for Uzbek cotton fibre	1240	1113	100
minus			
export transaction expenses of the Foreign Trade Companies	23	21	1.9
certification expenses	14	13	1.2
customs declaration expenses	1.9	1.7	0.2
banking expenses	5	4	0.4
commission fee to "UzVneshTrans" company	25	22	2.0
profit margin of the Foreign Trade Companies	37	33	3.0
Negotiated price for cotton fiber paid by Foreign Trade Companies to "UzPakhtaSanoat"	1134	1018	91.4
minus			
expenses and profit margin of "UzPakhtaSanoat"	9	8	0.7
expenses of "KhorezmPakhtaSanoat"	13	11	1.0
profit margin of "KhorezmPakhtaSanoat"	33	30	2.7
Fixed state price for cotton fibre paid by "UzPakhtaSanoat" to the ginneries	1079	968	87.0
minus			
expenses of the ginneries	234	210	18.9
profit margin of the ginneries	24	21	1.9
Fixed state price for 3.125 tons of raw cotton**	821	737	66.2
Fixed state price for 1 ton of raw cotton	263	236	
Official state price for 1 ton of raw cotton in 2004***	250	224	

* At the time of the survey, 1 USD equalled 1114.5 UZS

**1 ton of cotton fibre is produced of approximately 3 tons of raw cotton, given the average output ratio in Uzbekistan of 32 percent

*** average price for the best quality cotton

Source: own survey results

To compare the prices received by the cotton farmers for their raw cotton[40] in 2004, a numerical example was analysed based on the data from the cotton sector of the Khorezm region of Uzbekistan (Table 4.16). The output showed that the export revenue from cotton fibre were needed and used by the CVC stakeholders to cover all the costs, incurred along the cotton chain. The largest share of the revenue was used to cover the ginning costs and

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[40] in this example of determination of prices paid to the farmers, cotton seeds are not considered, as seeds represent low share in total return to farmers and seeds are not exported

also the costs associated with the export, including transportation on CIF terms[41], insurance. Moreover, the analyses revealed that as long as all the costs along the CVC needed to be covered by the respective actors of the chain and when demanding also their profit margins to be met, there were limited possibilities left to have paid producers higher prices for their raw cotton.

The statements that Uzbek farmers enjoyed only one third of the world market price for their output (World Bank 2005 and International Crisis Group, 2005) did not hold true in the given example of price determination. Instead, it was calculated that in 2004, farmers received slightly more than 66 percent of the world market price for cotton fibre. About 9 percent of the export revenues were redistributed to the service providing actors of the CVC: the State Foreign Trade Companies, certification centre, customs, financial institutions, and transportation network. The ginning monopolist absorbed a quite large share of the cotton revenue (with 4.4 percent for the administrative structure and about 20 percent for the producing units, the ginneries) (Table 4.16).

Summary

In general, financial analysis showed that the cotton value chain in Khorezm in 2005 created high total value added (as high as USD 79 million vs. USD 286 million of total CVC output value). The major contributing factors to the total value added were: (1) wages and salaries paid along the chain; (2) taxes. The major contributing actors were: (1) the agricultural sector, providing highest amount of wages, profits and depreciation costs; (2) the ginning sector, providing highest amount of taxes, financial charges and remittances to non-budgetary funds.

Subsidies provided to the CVC by the state in Khorezm in 2005 stood at USD 26 million, 99 percent of which were directed to the agricultural sector.

Profitability of activities along the CVC was quite low, as shown by the rate of return of only 0.02.

The cotton growing farmers in Khorezm (as in the rest of Uzbekistan) received about 66 percent of the export border price for the Uzbek cotton fibre. This figure was lower than in other cotton producing countries (more details on this in Chapter 7.2). However, on the other hand, it was twice higher than generally postulated[42].

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[41] Cost, Insurance, Freight – terms of delivery to the destination ports of Uzbek cotton fibre (Bandar Abbas in Iran or Riga in Latvia)
[42] For example, Environmental Justice Foundation web site http://www.ejfoundation.org/page148.html, accessed in January, 2007

4.5.2 Economic analysis (at market prices)

Economic analysis was used to evaluate the importance of a given value chain and to illuminate issues of interest at a national level. Such analysis lays the basis for the evaluation of economic policies. Economic analysis described in the following subchapter looked at the CVC in terms of its importance and integration with national/regional economy; its impact on balance of payments; and impact on the state budget.

4.5.2.1 *Impact on economic growth*

Impact on economic growth of the Khorezm region of Uzbekistan was measured and analysed based on various indicators such as contribution and economic importance of the CVC to GDP, the rate of integration of the chain with the rest of economy, and the average capital coefficient.

Contribution to GDP and economic importance of the CVC

In 2005, the CVC of the Khorezm region created value added of a total of USD 79.3 million, compared to the total GDP of Khorezm in the respective year, which amounted to USD 504 million (Table 4.17). Thus, the contribution of the CVC to GDP (equation (8), p.23) was slightly over 15 percent.

The share of value added created by the CVC to GDP of Khorezm was about 15 percent (and mostly contributed by agriculture). This proves once more the existing room and scope for improving the domestic industries, processing cotton and cotton by-products in the region. Uzbekistan (Khorezm) remains an agrarian country heavily depending on agriculture or primary processing industries (like ginning).

Table 4.17 Economic importance of the CVC in Khorezm, 2005

	GDP	Total Value Added	Contribution, %
Billion UZS	562.00	84.90	15.1
Million USD	504.26	79.28	15.7

Source: own survey results, based on data from OblStat

The rate of integration with the economy

The rate of integration with the entire economy shows the extent to which the CVC depended on domestic production, or its degree of linkage with the domestic economy. This indicator was calculated as a ratio of total value added by the chain to the total output value generated by the same chain (according to equation (6), p.23).

Table 4.18 Integration of the CVC with the rest of the economy in Khorezm, 2005

	Total output of CVC	Total Value Added	The rate of integration
Billion UZS	311.6	84.9	0.27
Million USD	285.8	79.3	0.28

Source: own survey results

The CVC in Khorezm in 2005 was characterized by a low rate of about 27 percent (2005) of integration with the economy (Table 4.18). Value added created by the CVC and which was redistributed back to the domestic actors (factors of production: labour, capital, technology, government) constituted less than one third of the total output value. Hence, there is room for increasing value added inside the country and thus for improving integration with the economy. A rate below 50 percent showed an outward-oriented chain (dependent on exports) and thus little linkage with the rest of the economy limiting its development impact.

The average capital coefficient

The average capital coefficient (equation (7), p.23) shows the importance of fixed capital consumed in the creation of value added by the entire CVC.

The low capital coefficient of less than one percent suggested that fixed capital was not very important to CVC, owing to the intensive use of manual labour, or that most of the equipment was worn out (ginneries) and required replacement and investments in processing industrial sectors of the chain (Table 4.19).

Table 4.19 Consumption of fixed capital by the CVC in Khorezm, 2005

	Total Depreciation	Total Value Added	Capital coefficient
Billion UZS	2.3	84.9	0.03
Million USD	2.1	79.3	0.03

Source: own survey results

4.5.2.2 *Impact on foreign exchange*

The impact on foreign exchange was analysed on the basis of the net balance in foreign exchange, expressed in the efficiency ratio of foreign exchange expenditures.

Net balance in foreign exchange

The net balance in foreign exchange, or balance of trade, measured the contribution of the CVC to the balance of payments in the Khorezm region (according to equation (9), p.23).

Table 4.20 The CVC net balance in foreign exchange in Khorezm, 2005

	Export value, million USD	Import value, million USD	Net balance in foreign exchange/ Balance of Trade, million USD	Share of export in total foreign trade turnover, %	Share of import in total foreign trade turnover, %
CVC	97.6	2.1	95.5	98	2
Khorezm total	88.5	16.1	72.3	85	15
Share of CVC in total Khorezm	110	13			

Source: own survey results, based on data from OblStat

The impact of the CVC on foreign exchange revenues of the Khorezm region was considerable: 99 percent of total export revenues in 2005 came from the CVC, whereas at the same time imports of the CVC amounted to about 13 percent of the total import value into Khorezm. In general, the CVC had a great impact on the Balance of Trade (trade surplus) and earned virtually all foreign exchange in the region (Table 4.20).

The Efficiency Ratio of Foreign Exchange Expenditures

This criteria showed the total amount of net gain in foreign exchange, per unit of foreign exchange spent in the production process of the chain (according to equation (13), p.24). The ratio of efficiency of foreign exchange expenditures of CVC in the Khorezm region in 2005 stood at 41.4.

The positive sign of this ratio indicated the net profit in foreign exchange per each unit of foreign exchange spent. The ratio of 41 indicates that each USD spent on imports by the CVC brought about USD 41 cents of net profit, a rather high ratio if compared to for example the average interest rate on commercial banks credits in Khorezm in 2005 of about 16-17 percent.

4.5.2.3 Impact on the state budget

The main criteria for analyzing the impact on the government budget were coefficients of the chain flows into the state budget; the Direct Rate of Taxation/Subsidy; the Effective Rate of Taxation/Subsidy; and the real government cost coefficient.

Flows to the state budget

The flows of the CVC into the state budget showed whether the chain was a drain or a support to the government (according to equation (14), p.25).

Table 4.21 The CVC flows to the state budget of Khorezm, 2005

	Taxes total	Subsidies total	Profits public sector	Government budget
Billion UZS	29.7	26.9	8.6	11.4
Million USD	26.8	26.3	7.9	8.4

Source: own survey results, based on data from OblStat

Given the total amount of taxes levied in Khorezm in 2005 of about USD 57 million (based on data from OblStat) and the CVC accrued taxes of the total value of USD 26.8 million, the contribution of the CVC to the Government budget revenues in 2005 was about 45 percent. At the same time the state provided subsidies to the actors of the CVC in the amount of about USD 26.4 million. Profits of the public sector (consisting of remittances to non-budgetary funds and social payments to the employees along the CVC) reached USD 8.6 million. Thus, the government actually received support of USD 8.3 million from the cotton chain in 2005 (Table 4.21).

The Direct Rate of Taxation/Subsidy

The indicator of direct rate of taxation measured the nominal level of transfer that the government received from economic agents (according to equation (15), p.25). This indicator also showed the nominal tax content of the value added created by the CVC.

Table 4.22 Direct rate of taxation of the CVC in Khorezm, 2005

	Taxes total	Value Added Direct	Total Value Added	Import taxes and customs duties	Direct rate of taxation
Billion UZS	29.7	112.4	84.9	27.5	0.26
Million USD	26.8	103.9	79.3	24.7	0.26

Source: own survey results

A rate of 0.26 indicated that in 2005 about 26 percent of the value, created by the CVC, was nominally captured by the state, or that the state absorbed USD 26 cents per each dollar of value created by the entire CVC (Table 4.22).

The Effective Rate of Taxation/Subsidy

The effective rate of taxation (or the real rate of taxation) included indirect transfers between the government and economic agents (calculated base on equation (16), p.25). This indicator measured the real tax or subsidy content of the value added created, and showed the real value of transfers settled in the national/regional budget.

Table 4.23 Effective rate of taxation of the CVC in Khorezm, 2005

	Government budget total	Total Value Added	Effective rate of taxation
Billion UZS	11.4	84.9	0.13
Million USD	8.4	79.3	0.11

Source: own survey results

A rate of 0.11 means that about 11 percent of the value created by the CVC in Khorezm in 2005 was in fact captured by the government. This positive sign of the coefficient indicated taxation, a negative sign would have indicated a subsidy oriented government policies (Table 4.23).

The real government cost coefficient

The real government cost coefficient related the total government budget to the nominal cost of direct subsidies provided to the agents of the CVC (according to equation (17), p.25). This indicator showed the real impact on the government's finances of each monetary unit spent on direct subsidy to the CVC.

The positive cost coefficient showed that overall, the state gained revenues from all the activities of the cotton chain in 2005. Sort to say, the state earned USD 32 cents per each "invested" dollar in the CVC (Table 4.24).

Table 4.24 Impact of subsidies to the CVC on the government finances in Khorezm, 2005

	Government budget total	Subsidies $_{total}$	Real Government cost coefficient
Billion UZS	11.4	26.9	0.42
Million USD	8.4	26.3	0.32

Source: own survey results

Summary

In general, economic analysis showed that the CVC in Khorezm in 2005 although accounting to virtually entire export revenues and supporting the positive Balance of Trade in the region, nevertheless contributed only about 16 percent to the regional GDP.

The low rate of integration with the rest of economy (0.28) shows that the CVC is an outward oriented chain, which exports most of intermediate products (cotton fibre for example) and thus prevents local processing industries from further development.

The low capital coefficient indicates that most of equipment and tools of the actors along the chain is worn out (with low depreciation costs) and requires replacement and upgrading of production/processing capacities.

Analysis of the flows between the CVC and the state (subsidies on the one hand and taxes and other payments on the other) showed that the CVC created positive flows to the state budget and thus supported it. So, overall the state gained revenues from the cotton value chain, although to a less extent as generally suggested.

4.5.3 Transaction costs analysis

In economics and related disciplines, a transaction cost is a cost incurred in making an economic exchange (for more details refer to Chapter 2.3.3). Transaction costs were assessed in this study not only to look at the "marketing efficiency" of the actors involved in the cotton value chain, but most importantly to see if these costs could be reduced. Transaction costs as calculated here represent all the costs associated with marketing of the commodities along the CVC.

At the farmers' level transaction costs were hard to be traced and estimated, as not many farmers kept track (or even were aware) of such expenses. The main costs of marketing of raw cotton (concluding contracts, transportation costs) were covered by the ginneries (were reimbursed to the farmers in other cases). Transaction costs of acquiring inputs were impossible to estimate, and in any case would represent a negligible share of total costs, as most of the numerous input distributing outlets are scattered through the region and are more or less close to the farmers dislocation.

Transaction costs incurred in 2005 by the ginning sector of Khorezm included first of all costs of procurement of raw cotton from farmers (including maintenance of the procurement outlets) and also sales costs[43] and other operational costs[44] as stated in official reports of the ginneries. At a per unit basis, transaction costs contributed around USD 68 per produced ton of cotton fibre, or about 6.3 percent of the fixed state price paid to the ginneries (refer to Figure 4.10, p. 79). The total value of transaction costs of the ginning sector stood at USD 5.7 million (Table 4.25).

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[43] Sales costs include costs incurred in marketing, advertisement and maintenance of the sales department of an enterprise
[44]Operational costs include costs associated with doing transactions, like finding and selection of buyers, preparing, concluding and enforcing agreements/contracts. In some cases such costs can also include costs for capacity building of the staff, and contingency expenses

Table 4.25 Transaction costs along the CVC in Khorezm, 2005

	Transaction costs, million USD	Output value, million USD	Share, %
Raw cotton farming	n/a	73.2	
Ginning industry	5.7	94.8	6.0
Textiles industry	2.4	107.4	2.3
Oil extracting industry	1.1	9.7	10.9
Chemical industry	0.1	0.7	9.5
Total CVC	9.2	285.8	3.2

Source: based on data from OblStat and own survey results

This governing body of the ginning sector incurred in total USD 1.7 million of transaction costs, which were included in the sale price for fibre and thus covered by the following segment of the CVC, the textile producers[45]. This governing body deals with transactions, which otherwise could be undertaken by the ginneries themselves (like previously) and probably at less expenses. So the question if the present structure of the ginning segment of the CVC is efficient in terms of finding buyers, marketing and making transactions at lowest possible costs remains open. As seen from Table 4.25, the ginning sector was second (after oil extracting and chemical industries) least efficient in terms of transaction costs per unit of output.

The transaction costs of the textile sector of the CVC were not as high as in the ginning sector (Table 4.25), partly explained by a large share of idle production capacities (there was not much produced to be largely marketed) and partly because of low resources of textile producers to invest in advertisement or in marketing research in order to improve efficiency and cost structure of transactions. One way or the other, textile producers had the lowest transaction costs per unit of output, at the same time contributing more (37 percent vs. 33 percent) to the total output of the cotton value chain than compared to the ginning industry.

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[45] In order to cover transaction costs "KhorezmPakhtaSanoat" charged local textile producers 0.5 percent of total transaction value; and 1.7 percent from the international buyers

5   Empirical investigation: The Wheat Value Chain (WVC)

5.1   Introduction

Uzbekistan

Wheat is a comparatively new crop for Uzbekistan. Previous to independence almost all wheat and wheat products (basically wheat flour) were imported to Uzbekistan from other parts of the FSU. Some wheat was grown in the pre independence period and at times before the invasion by Soviets. However, it became widespread in the Uzbek fields only around 1993-1994, in the framework of the national program on self-sufficiency in foods.

Expansion of wheat production in the given circumstances of Uzbekistan presented a problem, and involved considerable efforts both from the government and from agricultural producers. Wheat is considered to be a second strategic crop (after cotton) and its production has been subject to extensive state control.

The government has pursued its program on self-sufficiency in foods via fixing state orders, as well as providing subsidies, and credits for production of the state target crops. It has used its control over the large collective farms to issue directives to shift a part of production from cotton and other crops to grain. One of the major obstacles in increasing wheat production was the lack of knowledge and experience of agricultural producers in growing a variety of crops, and especially – wheat. Agricultural experts were deployed to provide the know-how required to make the intended crop shift.

Families in Uzbekistan traditionally are large, and decline in the standards of living in the after-independence years made bread the main staple for Uzbek families. In case the prices for bread were increased dramatically, social unrest would have been inevitable. Thus, in order to keep the prices for bread products low and to cover the corresponding demand within the country the government in the late 1990's imposed a ban on export of wheat and wheat products (flour and bread).

One way or another, Uzbekistan succeeded in rapidly increasing grain production. At the expense of some crops, mainly forage crops, area under wheat in the years of independence increased three-fold, wheat output increased about six-fold from one million tons in 1992 to six million tons in 2005 (Figure 5.1), and finally, Uzbek farmers managed to increase wheat yields from 1.5 in 1992 to the average of 4.1 tons per hectare in 2005.

Presently it is alleged that Uzbekistan produces enough wheat to satisfy almost all local requirements. Imports of wheat went substantially down in the last years (Figure 5.1).

However local wheat is not distinguishable for its quality and nutrition characteristics, so wheat flour and in part wheat of better quality are still imported from the neighbouring countries, especially Kazakhstan. Though wheat and wheat products in Uzbekistan are banned for exports, the government continues exports of small amounts of wheat (Figure 5.1) from year to year in the form of humanitarian aid, for example to neighbouring Afghanistan.
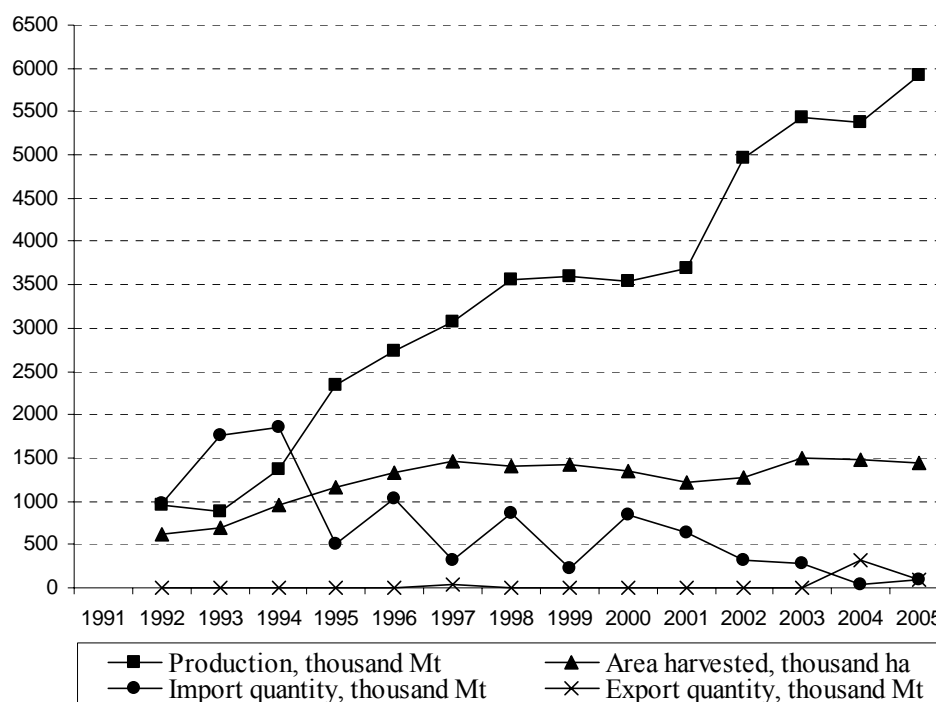
Figure 5.1 Wheat area, production and trade in Uzbekistan in 1991-2005

(Source: FAOSTAT agricultural database)

Khorezm

Agricultural trends of the independence period have been similar in all regions of Uzbekistan, including the Khorezm region. However, the remote location of the Khorezm region from the country's industrial centres makes agriculture even of uttermost importance. Area under wheat, as well as wheat output in Khorezm has been increased annually, wheat yields increased from 1.6 in 1994 to about 4.3 tons per hectare in 2005. Wheat area in 2005 reached 47.3 thousand hectares, or 21 percent of the total cropped area of the same year. Total wheat output in 2005 was about 204.7 thousand tons (Table 5.1, p. 125).

Wheat produced in Khorezm is mainly of the third class. Moderate quality of the local wheat, as well as wheat's insufficient amounts to cover the corresponding requirements of the local population, led to the imports of wheat and wheat products (flour, pasta) from other regions

of Uzbekistan and neighbouring countries, mainly Kazakhstan, famous for its high quality wheat flour. Approximately 52.2 thousand tons of wheat[46] and about 2 thousand tons of wheat flour[47] were imported to the Khorezm region in 2005 (refer to Figure 5.4, p. 124).

5.2 The operating environment of the wheat chain

The operating environment of the wheat value chain provides the necessary framework for the entire chain to operate and interact with other stakeholders. It includes the chain itself, or the direct actors of the chain, the governing structure, and other service providing institutions. The wheat value chain in Uzbekistan involves basically three sectors of the economy (Figure 5.2):

- agricultural sector, which was represented in 2004 by *shirkats* and private farms growing wheat including for state order, as well as *dehqons*, growing wheat for home consumption;

- flour milling / cereal / feed compound industry represented by the Joint Stock Company (JSC) "UzDonMahsulot"; large state mills and the numerous small scale private mills, processing wheat into flour;

- food industry represented in the wheat chain by bakeries, state as well as private ones; and pasta producers

Management and governance of the wheat value chain is carried out by the following institutions, each in its sphere of jurisdiction: the Ministry of Agriculture and Water Resources; Ministry of Finance; Ministry of Economy; "UzStandart" Agency; State Bread Inspection, attached to the Cabinet of Ministers of Uzbekistan; and Grain Management Office, attached to the Ministry of Finance. This structure on the whole is responsible for decisions on how many hectares of wheat to plant, quantities and varieties to produce; it defines prices for wheat and wheat products and elaborates wheat products balances; regulates import operations; sets standards for wheat production and processing, as well as wheat products quality standards.

Other organizations and institutions involved in the wheat chain – banks, commodity exchange and Rail Road Company "Uzbekistan Temir Yollari"– are involved in activities aimed at facilitating the functioning of the entire chain and at providing various services, including banking, marketing, exchange transactions, transportation (Figure 5.2).

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[46] this figure was approximately calculated during the research, as the exact official data was not available
[47] according to Khorezm Commodity exchange, which puts on auction sales flour, imported to the Khorezm region
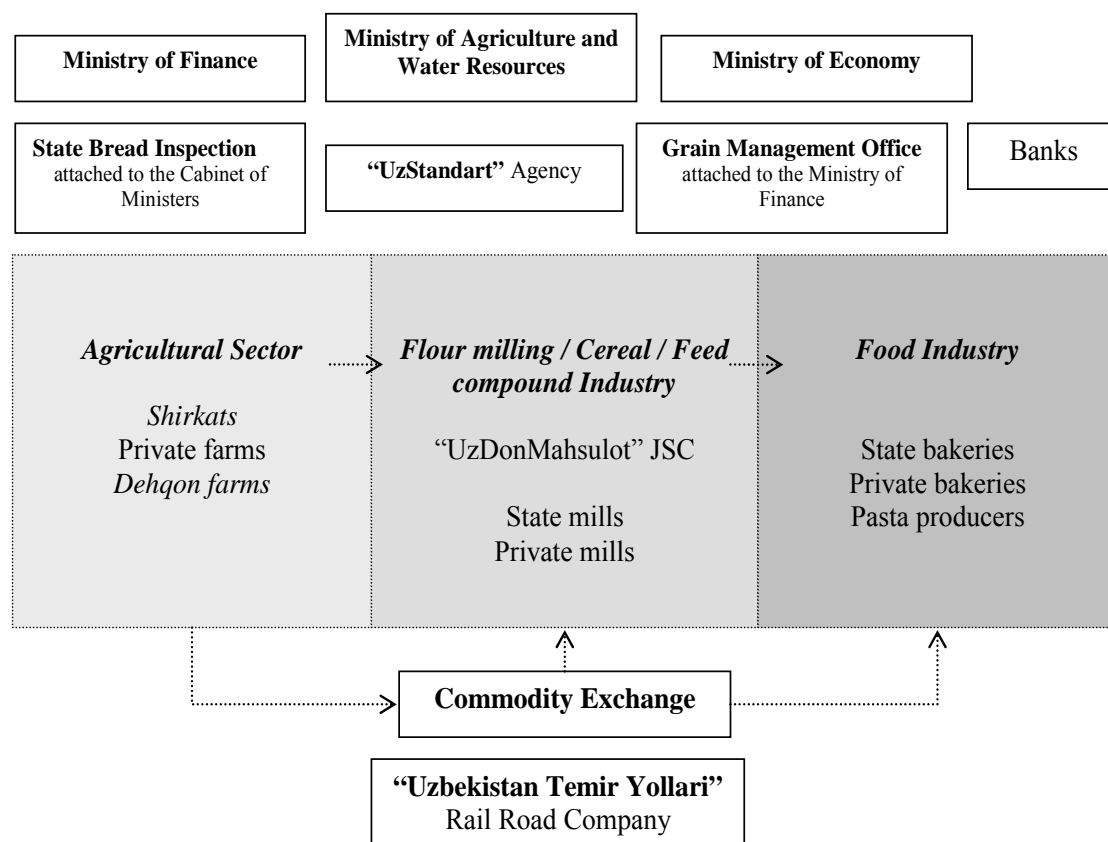
Figure 5.2 "Institutional" Map of the wheat chain

(Source: own presentation based on survey results)

5.2.1 The flour milling industry

The flour milling industry, which includes also cereal/compound feed industry, holds an intermediate stage in the wheat value chain of Uzbekistan. The part played in the wheat chain by this industry consists of accepting wheat from agricultural producers; processing it into wheat flour and compound animal husbandry feed; preparing high-quality wheat seed stock; and the Wheat State Reserve Fund.

The milling industry in Uzbekistan is governed by "UzDonMahsulot" JSC. Until 2004 "UzDonMahsulot" used to be the so-called State Joint Stock Company with the government being the major stock holder (51 percent). In 2004, based on the Decree of the Cabinet of Ministers No.376 from August 6, 2004, state participation was officially lowered to 25-26 percent and the company was renamed into a Joint Stock Company.

"UzDonMahsulot" is responsible for:

- supervision of purchasing, distribution and storage of grain, including seeding grain, and for the state reserve fund;

- production of and supply of various sectors of economy with high quality flour, cereals, fodder, as well as bread and pasta products;

- improving cooperation between agricultural producers and the flour milling industry regarding proper agreements, settlement of accounts, quality control;

- provision of technical support and attraction of foreign direct investments to the mills and other organizations belonging to "UzDonMahsulot" in the processes of refitting and modernisation;

- provision of informative services and trainings to the staff of the mills

"UzDonMahsulot", together with the Ministry of Finance, Ministry of Agriculture and Water Resources decide on how much of wheat should be produced in every region of Uzbekistan, as well as how much of wheat flour and bread products. They also set the prices for wheat, wheat flour and bread products.

A total of 44 mills and other enterprises belonging to "UzDonMahsulot" are in charge of concluding contracts with agricultural producers on grain supply, preparing (purchasing), storing and processing of grain in all the regions of Uzbekistan. Despite that the state had reduced its share in joint stock of the mills, the mills in Khorezm for example still reported on the 51 percent of the state share in 2005.

5.2.2 "UzStandart" agency

"UzStandart" agency is an independent self-sustained organization, consisting of two sub-organizations: (1) Centre for Testing and Certification and (2) Centre for Standardization and Metrology Management.

Standardization in general and as stated in the Law of Uzbekistan on Standardization, is aimed at: protection of consumers' and state's rights for safety of the products, processes and services; provision of complementarity and substitution of the products; improvement of the quality and competitiveness of the products; assistance in sustainable use of resources; provision of the consumers with full and reliable information on the classification and quality commodities.

Certification of the products and services implies confirmation of the compliance of the products to specified requirements. Certification is also aimed at the protection of consumers from the unfair producers (sellers, executors), at provision of the competitiveness of the products at the world markets, and at the confirmation of the quality parameters of the

products to the ones declared by the producer. Certification can be both obligatory and voluntary.

`"UzStandart" agency together with State Bread Inspection and Sanitary Epidemiological Station is involved in quality control of the wheat, and wheat products – flour, bread. It issues Certificates of Compliance to the mills' products.

Standards in the wheat chain are elaborated and ratified by the Ministry of Agriculture and Water Resources, approved and implemented by the resolutions of "UzStandart Agency", State Bread Inspection and Grain Management Office.

5.2.3 Commodity exchange

The role of commodity exchange in the wheat value chain consists of intensifying wheat and wheat products turnover and of providing access to flour for the private bakeries and pasta producers. The main wheat products, sold via commodity exchange are wheat flour and pasta.

On the other hand, commodity exchange has to provide marketing services to the agricultural producers as well. Allegedly private farmers may sell their wheat output via commodity exchange. However, at the time of conducting this research such cases were still scarce. Also allegedly, farmers and *dehqon*s may acquire inputs for their agricultural production. However, so far not many farmers or *dehqon*s addressed commodity exchange to buy inputs, such as fertilizers or fuel. Very few farmers tried to sell their output through commodity exchange. The reason for moderate participation of farmers and *dehqon*s lies in the poor advertisement and the lack of access of agricultural producers to internet to follow or participate in commodity exchange transactions. Another reason lies in the dispersion of farms in Khorezm, which makes it difficult for some producers to come to the city centre to visit the commodity exchange.

5.3 The Wheat Value Chain

Institutional and functional analyses, conducted at the initial stage of the research on the wheat value chain, provided an overview and the required information on actors, their functions and the flows within the wheat chain. The corresponding data was elaborated in a preliminary map of the wheat value chain and also into an input-output flow map.

5.3.1 Preliminary map

Wheat has to go through a sequence of transformations before it reaches final consumers: wheat – wheat flour – wheat products (bread, pasta, fodder for animals). In other words, the

wheat chain embraces the whole agro industrial sector. It starts with agricultural producers and flows to the flour milling/cereal/feed compound industry either directly from agricultural producers or through the grain preparing stations, which are scattered throughout the region and which usually belong to the corresponding mills. In fact, as the survey showed agricultural producers prefer to submit their quota wheat to the grain preparing points for the reason of simplicity and lower costs of transportation. Then the produced flour is forwarded to the food (bread and pasta producing) industry, and finally reaches consumers. Wheat or wheat products may also find their consumers via commodity exchange (for grain and flour), or via private traders (for flour, bread, pasta), or directly via local markets (Figure 5.3).
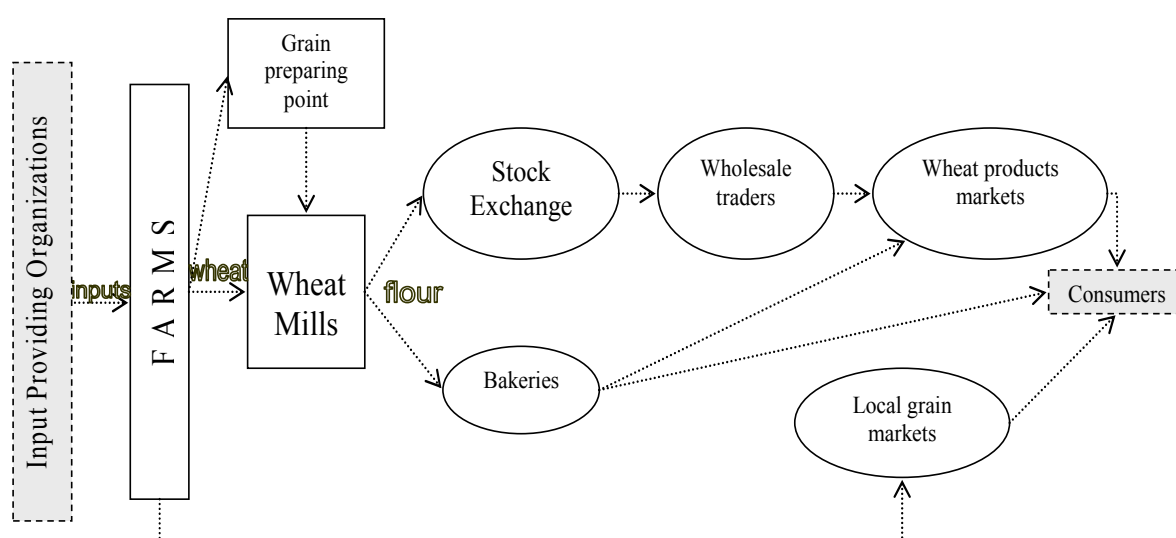
Figure 5.3 Preliminary map of the WVC

(Source: own presentation based on survey results)

5.3.2 Wheat input-output flow map

In 2005 agricultural producers of the Khorezm region harvested about 205 thousand tons of wheat. Half of the wheat produced by *shirkats* and private farms was delivered to the government: directly to the state mills or via grain preparing stations. The remaining half and all the wheat output of *dehqons* was either sold at the markets, home consumed (private mills), or stored as seeding material for the next vegetation season (Figure 5.4).

At present private farms are becoming major producers of wheat in Uzbekistan. In Khorezm they produced about 50 percent of the total wheat output in 2005. Due to the fact that at the time of conducting this research the state quota for wheat was set at a 50 percent level of the total wheat output of agricultural producers other than *dehqons*, the wheat chain formed two

branches: one for the state quota wheat, including the state mills and pasta and bread producers, affiliated at these state mills; and the other branch being for the above state quota wheat, which included private mills, pasta producers and bakeries (Figure 5.4). The state mills of the Khorezm region received and processed about 117 thousand tons of wheat, 65 thousand tons of which came from the locally grown wheat (half of the output of *shirkats* and private farms) and 52 thousand tons were imported from other regions of Uzbekistan.
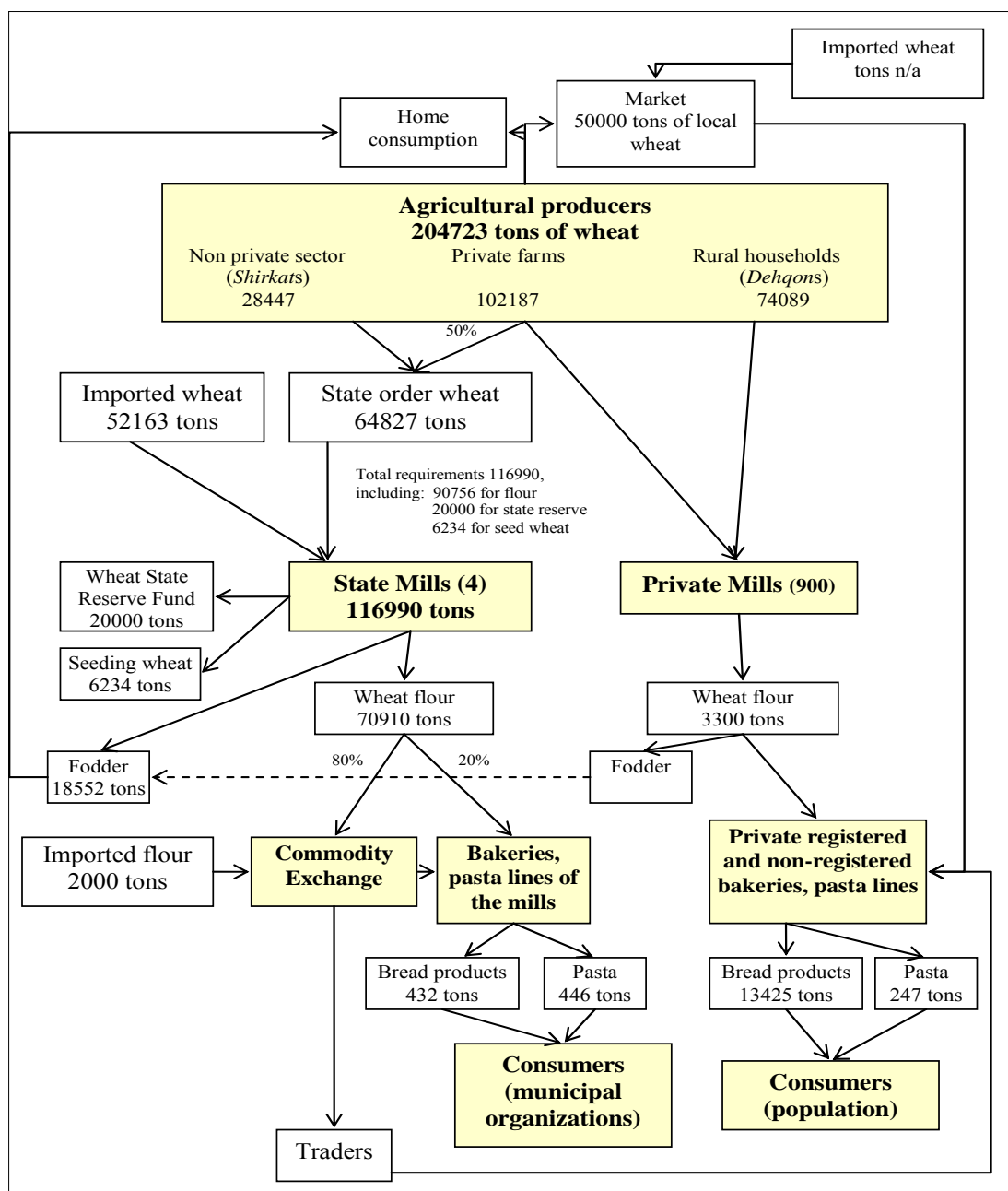
Figure 5.4 Official statistics on the WVC input-output flows in Khorezm, 2005

(Source: own presentation based on survey results)

Bread products and pasta, produced by the state mills, formed part of the state order system. According to this system, the state mills as well as the large bakeries had to produce a certain amount of bread and pasta for supporting the so-called budget (municipal) organizations, such like hospitals, schools, kindergartens. The unreported output of the private mills and private bakeries, pasta producers was transferred basically to the general population via local markets, home consumption or barter sale.

According to official statistics, total wheat available in Khorezm (locally produced and imported), remaining after supporting the Wheat State Reserve Fund, which in 2005 was determined at a level of 20 thousand tons of wheat, and a seeding wheat fund, could have provided population of Khorezm with about 173 thousand tons[48] of wheat flour. This amount of wheat flour basically covered the requirements of the local population, which was calculated at about 144 thousand tons according to official requirement norms. However, these official requirement figures seemed to be low compared to for example wheat consumption stated at FAOSTAT. Thus due to higher actual wheat (flour) demands of the local population and partly due to insufficient quality of locally produced flour and other products, there were some official and unofficial imports of wheat and wheat products (mainly flour and pasta). However, total output volumes (statistically reported and not reported) within the WVC appeared much higher. VCA allowed for approximation of the total output values of the WVC of Khorezm.

5.3.3 The wheat chain output values and monetary flows

The wheat chain in Khorezm produced in 2005 products of a total officially reported value of about USD 47 million (Table 5.1, Figure 5.5). The major contributor was the agricultural sector with its 59 percent share.

Table 5.1 Total WVC "official" output volumes and values in Khorezm, 2005*

	thousand tons	billion UZS	million USD	share, %
Agricultural sector	204.7	31.0	27.8	59.2
Flour milling/cereal	74.2	14.9	13.4	28.5
Feed industry	18.6	2.2	2.0	4.3
Baking industry	13.9	3.9	3.5	7.5
Pasta industry	0.7	0.3	0.2	0.5
Total output value		52.3	47.0	100.0 *

without home made flour, bread and pasta

Source: OblStat, own estimation

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[48] (204723 tons of total wheat output + 52163 imported wheat – 20000 tons to state reserve fund – 6234 tons to seeding wheat fund) * 0.75 = 172989 tons of flour, given the average wheat:flour output ratio of 75 percent

The milling (together with feed compound) industry contributed 32.8 percent and food industry (baking and pasta) had the smallest share of 8.1 percent. The low shares of the processing actors of the chain (mills, bakeries and pasta producers) in the official output values can be explained by the fact that about two thirds of all the wheat grown in the region was free of state control (Figure 5.4) and thus home consumed by the local population.

Table 5.2 Total WVC "real" output volumes and values in Khorezm, 2005*

	thousand tons	billion UZS	million USD	share, %
Agricultural sector	231	30.9	27.7	22
Flour	173	36.2	32.4	25
Wheat barn (fodder)	43	5.2	4.7	4
Bread	177	50.5	45.3	36
Pasta	50	19.2	17.3	14
Total output value		142.0	127.5	100

* including home made flour, bread and pasta

Source: OblStat, own estimation
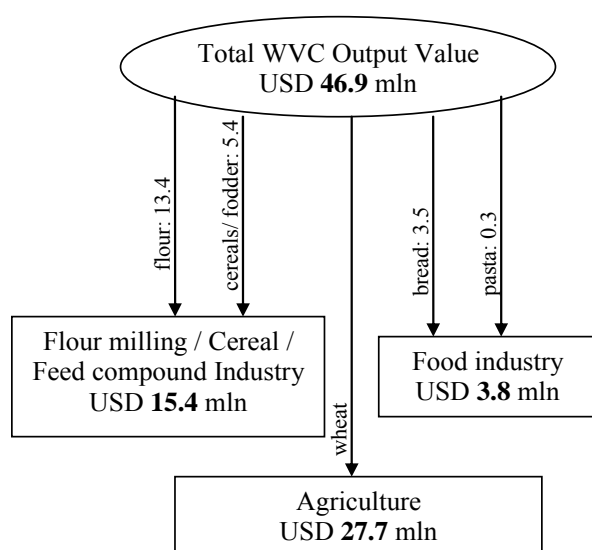
Figure 5.5 The Khorezm WVC "official" monetary flows, 2005

Source: own estimation based on OblStat data and own survey

Wheat free from state quota was produced partly by the private farms and *dehqons*. This "free" wheat was processed by local households[49] for the following home consumption: home made bread[50] and pasta. These figures, both in physical and monetary terms, were not officially measured and reported, however, the analysis of WVC shed some light on the

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[49] The term local households embraces *dehqon*s and private farmers (rural households), and also urban households

[50] It is assumed in this research that about 70 percent of flour is consumed by households for home made bread and the remaining 30 percent for home made pasta

habits of the local population and thus allowed for estimation of the real output values. Table 5.2 shows total output values of the wheat chain including home made processing and production.

The real total wheat chain output in Khorezm in 2005 (if taking into account home consumption and production of wheat and wheat products) totalled USD 127.5 million (Table 5.2). And as expected from the processing sector (due to higher output prices), the major share came from bread and pasta production.

5.3.4 Actors of the wheat chain

5.3.4.1 *Agricultural producers*

Wheat is the second, after cotton, state strategic crop in Uzbekistan. Two types (of the existing three until 2006) of agricultural producers, namely *shirkat*s and private farms, have been obliged to plant the predetermined by the government area with wheat. In 2005 wheat in Khorezm was planted basically by 21 *shirkat*s and 1085 private farms. These structures together produced about 130 thousand tons of wheat, or 64 percent of the total wheat output of Khorezm in 2005 (Table 5.3).

The remaining output of wheat in that year, or about 74 thousand tons, came from 208 thousand *dehqon*s, exempted from any state orders and growing all crops suitable for given climatic condition (except cotton) and mainly for self consumption.

Table 5.3 Wheat area and output in Khorezm, 2005

	Wheat area, thousand ha	Wheat output, thousand tons	Average yield, tons per ha
Shirkats	7.4	28.4	3.8
Private farms	24.8	101.8	4.1
Dehqons	15.1	74.5	4.9
Total	47.3	204.7	4.3

Source: According to OblStat data

Wheat farming

Cultivation of wheat in Khorezm, as well as other crops in general, is based on irrigated agriculture and usually on the conventional agricultural practices. In the Khorezm region of Uzbekistan mainly winter wheat is grown in order to use agricultural lands after wheat harvest for other crops, which require short vegetation season (such like some vegetables or rice). Wheat farming basically can be broken into 10 categories of activities:

1. Soil leaching

2. Soil preparation (levelling, chiselling)
3. Seeding
4. Pesticide application
5. Cultivation
6. Fertilizer application
7. Weeding
8. Irrigation
9. Harvesting
10. Pre-treatment and transportation to the mills

Each wheat farming activity had associated costs, be it machinery costs for mechanized activities, such as levelling, planting, harvesting or be it input costs, such as seeds, fertilizers, fuel, pesticides (Figures 5.6 and 5.7).

Average officially reported wheat yield in Khorezm in 2005 was about 4.3 tons per hectare (Table 5.3). Private agricultural producers (farmers and *dehqons*) showed better yields compared to the non-private producers (*shirkats*). Average wheat yield of the surveyed farmers reached about 3.6 tons per hectare.

The majority of the surveyed wheat growing farmers confirmed that they would prefer to continue growing wheat due to (1) profitability of this crop; (2) suitability of this crop to the given agricultural conditions; (3) and because wheat was the main source of cash inflow to the farm and the main staple of their diet.

Wheat seeds came to private farmers mainly from the state mills (76 percent of responses); seeds could also be purchased at local markets (8 percent of responses); or could be home produced (from the previous wheat harvest). Rural households (*dehqons*) got wheat seeds only from the market or from own stocks. The additional sources for wheat seeds, reported during the survey, included neighbours, growing wheat or commodity exchange.

Farmers' wheat value chain

Value chain analysis revealed that wheat production in the Khorezm region requires approximately USD 296 per ha, or USD 90 per ton for a wheat growing farmer with the average yield in the range of 3 to 4 tons per ha. The average operating profit to be received by the farmers depended on the destination of produced wheat.
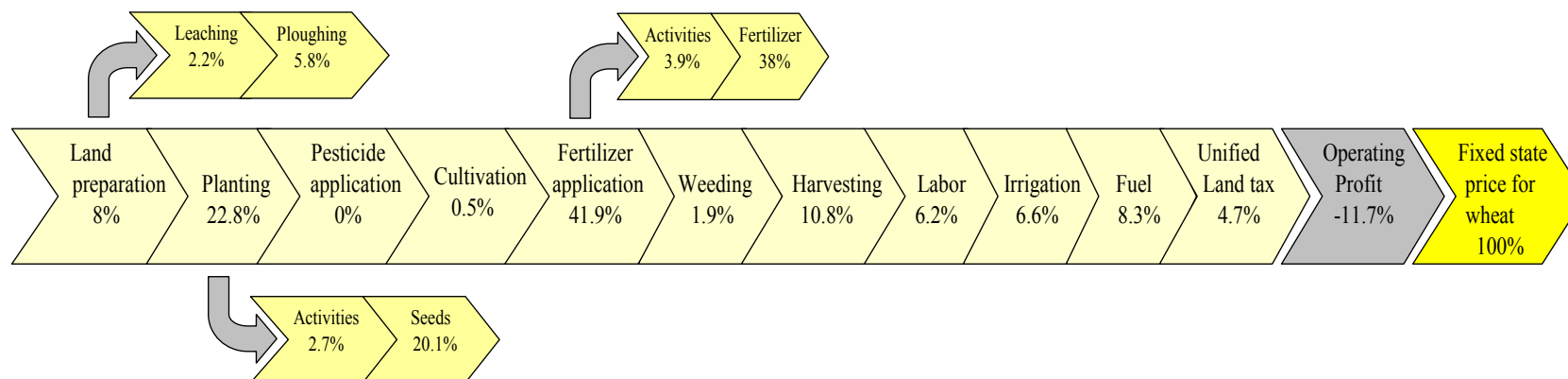
Figure 5.6 Farmers' wheat value chain for state quota wheat (variables on a per ton basis)

(Source: own presentation based on survey results)
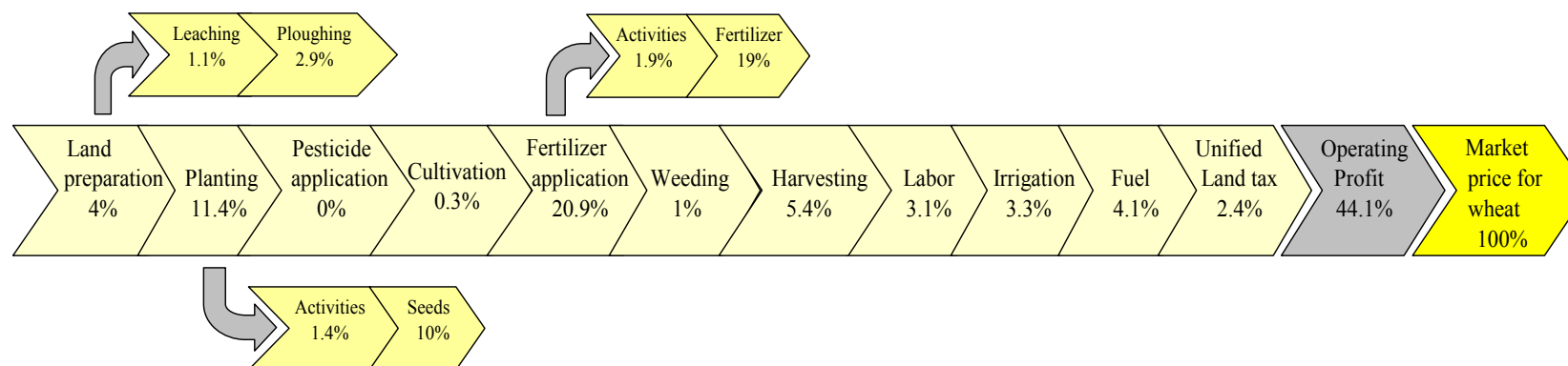
Figure 5.7 Farmers' wheat value chain for marketed wheat (variables on a per ton basis)

(Source: own presentation based on survey results)

Revenue and profits remaining for producers from the state quota wheat were much lower than profits from the free market wheat because prices offered by the market were as much as two fold higher on average. Surveyed farmers in 2005 made a loss of about USD 2 per ha from wheat sold to the government or 11.7 percent of the fixed state price for wheat (Figure 5.6), but could have received approximately USD 293 per ha from wheat sold otherwise (at the market, to neighbours), which would have constituted 44 percent of the sale price for wheat (Figure 5.7). Under the circumstances of the year 2005 when farmers had to submit half of their harvest to the government and only the remaining half could be sold at the markets, the average profit from growing wheat was estimated at USD 146 per ha, or about USD 40 per ton.

The principal cost components include (1) planting activities – 22.8 and 11.4 percent of the state procurement and market price for wheat, respectively; (2) fertilizer application – 41.9 and 20.9 percent; and (3) harvesting, which absorbs about 11 percent of the state procurement price or 5.4 percent of market price for wheat (refer to Figures 5.6 and 5.7).

In general, wheat farming practices from planting to harvesting are mechanized and require little manual labour, which accounted for 6.2 percent in case of the state quota wheat or 3.1 percent in case of wheat free from state order. Direct inputs other than manual labour are the main cost items in the wheat value chain.

Factors inhibiting development of wheat growing farms

The main factors inhibiting development of private farms in general are described in Chapter 4. However, in contrast to the cotton growing farms, farmers producing wheat did not report any problems with output sale to the state mills. In general, the quality as well as the prices for the state quota wheat appeared to be determined under more fair conditions, compared to the raw cotton.

Nevertheless, agricultural producers still reported on the problems they had to face, including: improper crop rotation; lack of agricultural machinery/high cost applied by MTP; poor soil characteristics (salinity, low bonity); water scarcity; payment structure for the output (bank transfers for the state quota wheat); and delayed payment (for submitted state quota wheat).

5.3.4.2 *The flour milling/Cereal/Feed compound industry*

First stage processing in the wheat chain was represented by the flour-milling industry. In the Khorezm region there were four large state (half privatised) mills (one being under construction at the time of conducting research) and numerous registered and non-registered private mills of much lower capacities compared to the state mills.

Description of the mills

History and classification. Originally, half privatised mills were designed as the so-called distribution points (outlets) of wheat flour, meaning that wheat or wheat flour, accumulated in these points, came from other republics of the FSU for further distribution within the region. Around 1980s, mills with flour producing lines were constructed within these distribution points. After gaining independence, state mills were half privatised in 1995 (Table 5.4). Since then the mills throughout Uzbekistan were the branches of the Joint Stock Company "UzDonMahsulot", holding 25 percent of the mills' shares. The remaining shares were distributed partly among private shareholders, partly stayed in the joint ownership of the mills' workers. Half privatised mills were the main constituents of the flour-milling industry.

Private mills emerged in the last decade, after rural population got the capacity to grow wheat and produce wheat flour. The number of small scale private mills throughout Khorezm was estimated at about 900 units. Most of them were set up to provide own households with wheat flour. Others were organized by private entrepreneurs for providing milling services to the neighbours. However, about 30 percent (or 276 mills) of private mills did not operate in 2005 mainly due to the indebtedness to the electricity supplying organization, which deliberately cut off electricity supply. Small scale private mills were equipped with the small Chinese flour milling lines. Given the official output of private mills of 3.3 thousand tons of wheat flour in 2005 and the number of private mills in operation in 2005, the approximate annual capacity of an average private mill in 2005 was about 5.5 tons of flour.

There was hardly any official data on the output of non-registered private mills: they were not accountable to any organizations, and flour at these mills was produced and consumed by rural households.

Mills' output. The main output of the mills was wheat flour (mainly of moderate quality), produced from the state procured wheat. Besides, some private farmers and rural householders were processing their wheat at these large mills: they brought wheat and had it processed at the mills upon a certain service fee. Mills could also produce fodder for cattle, poultry and fish from the wheat barn and other crops' remainings (ground rice, cotton cake). However, most of the wheat barn was plainly sold to the customers, due to the lack of other fodder ingredients. There were usually bread baking and pasta lines at the mills' sites. In addition, upon request, the mills also could produce manna croup (semolina). Large mills were also responsible for the preparation of the wheat seeds for the following vegetation period and supporting the Wheat State Reserve Fund, which in 2005 was set at 20 thousand tons.

Large mills produced 71 thousand tons of wheat flour in 2005, contributing 96 percent to the total flour-milling industry output, manufactured both from local and imported wheat. Registered private mills contribution reached about 4 percent.

Mills' capacities. Half privatised mills had total full designed processing capacities of 630 tons of wheat flour per day. However, these mills were underutilizing their flour production capacities: producing about 350 tons of flour per day, or utilizing only about 55 percent of their capacities. This was due to, firstly, the limits set by "UzDonMahsulot" and, secondly, to the aged equipment at most of the mills.

Table 5.4 Description of the state (half privatised) mills

	Khonka mill	Shovot mill	Bogot mill	Khorezm mill
History	1986 – mill constructed, since 1995 – joint stock company	1950s – distribution point of wheat flour, 1986 – mill constructed, since 1995 – joint stock company	1970s – distribution point of wheat flour, 1994 – mill constructed, since 1995 – joint stock company	Under construction, Partly operating
Share in the output	61%	23%	9%	2%
Mills' products	Flour, fodder, pasta, bread, semolina	Flour, pasta, bread	Flour, bread	Flour
Mills' flour producing capacities	full – 350, present – 200 tons/day	full – 200, present – 100 tons/day	full – 37, present – 22 tons/day	full – 40, present – n/a
Mills' total flour output in 2005	45158 tons	17080 tons	6929 tons	1743 tons
Input** requirements in 2005	65450 tons	22000 tons	10000 tons	2300 tons
Input sources	30 percent Khorezm wheat, 70 percent imported from other parts of Uzbekistan***	Shovot, Kushkupir, Gurlen rayons of Khorezm, some imported wheat****	Bogot and Khazarasp rayons of Khorezm region	Urgench rayon of Khorezm region

Output discharge	Commodity exchange – 36765.6 tons, remaining to the bakeries	Commodity exchange – 12110.4 tons, bakeries	Commodity exchange – 5049.8 tons bakeries	Commodity exchange – 1549.7 bakeries
Flour production	Wheat washing	Wet cleaning	Wet cleaning	Wet cleaning

* the remaining 4 percent was contributed by the private, registered mills

** total wheat requirement included wheat for state reserve fund and for seeding wheat fund

*** imported wheat came from other regions of Uzbekistan: Surhandarya, Syrdarya, Djizzak and Kashkadarya

**** in case local wheat was not enough to continue running the production line (which usually took place around April-May) some additional 5000 tons of wheat could be imported by Shovot mill from other regions of Uzbekistan

Source: own presentation based survey results

Input sources. Wheat was delivered to the mills mainly by the private farmers from the neighbourhood and in cases of the larger mills from other parts of Uzbekistan. Farmers turned in a certain share of their wheat output, fixed in the contracts with the mills. Every year Agriculture and Water Management Office on district level, RayVodKhoz, provided the mill with the list of neighbouring farmers which grew wheat with the expected harvests. Based on this information the mills' lawyers visited farmers and signed the future contracts for the 50 percent of the up coming wheat harvest. The mills were also responsible for the delivery of the wheat to the mills' sites and bear all the transportation costs.

It could happen that the mills do not have enough resources to pay the farmers[51] for the large amounts of wheat during the harvesting period. A specialized state fund[52] was assigned exactly for the purpose of supporting the mills during the harvest time, when all the farmers started turning in their wheat. Later in the year (from every flour sale transaction), the mills transferred 67 percent of the revenue (share valid for 2005) to the mentioned fund for reimbursement of the earlier credits. The remaining 33 percent was thus left to the mills for covering their expenses. Revenue from sale of other mills' products stayed at the disposal of the mills. The share of the revenues, assigned to the mills depended on the decision by the joint stock company and the Ministry of Finance and used to be larger in the preceding years. The share was supposed to be just enough for the mills to cover their production and administrative costs.

Mills' output discharge. Wheat flour, produced by the large mills, previously used to be sold directly to the bakeries and wholesale traders. However, in February 2005 a Decree "On

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[51] According to the contractual agreements, farmers should be paid within 7 days, however in reality it takes longer, mills may not have enough resources
[52] "Settlement Fund for State Target Agricultural Production under the Ministry of Finance"

realization of the wheat flour via commodity exchange" was issued by the Ministry of Economics, in collaboration with the State Committee on Administration of the State Property and Entrepreneurship Support, Ministry of Finance, JSC "UzDonMahsulot" and the Commodity exchange of Uzbekistan. According to this Decree since March, 2005 about 80 percent of the mills' produced flour was sold via commodity exchange. A total of about 56 thousand tons of local wheat flour was sold through commodity exchange in 2005. Output discharge via commodity exchange was appealing to the mills because it suggested higher prices for their output (up to 10 percent increase in output price compared to the state fixed price), leaving room for competition, enhancing the turnovers and reducing accounts receivable from the buyers, and eliminating the traditional relative/acquaintance based transactions. The rest of the locally produced wheat flour was sold to the private bakeries and State Bread-baking Centres directly, upon the commission from Khokimiyat, the higher administrative body of the region. There were no marketing departments at most of the mills because of there was no need to look for alternative marketing channels.

Wheat flour production at the state (half privatised) mills

Flour production process in all the mills was basically the same, the only difference noticed was how the wheat was cleaned. In some mills wheat was washed and then dried to the required humidity level. In other mills (with newer equipment) wheat was not washed, but wet cleaned (steamed). The cycle of wheat processing started with preliminary cleaning and weighing of wheat from the storehouse (Figure 5.8).

Preliminary cleaning allowed separating wheat from wastes[53]. Then wheat was forwarded to the grain tanks. Wheat from different sources and sometimes of different qualities was stored in these grain tanks separately. In order to forward wheat to the production line in predetermined proportions and to get the flour of homogeneous structure, wheat of various classes was mixed in the mixing lines attached to the tanks. The mixture was then cleaned from the metal, dirt particles, and stones.

The light particles and dust were flown out by the air separator. At the next stage wheat went through the scouring machine and again through the air separator. Purified from the foreign substances wheat was then moistened and additionally cleaned from dust. Finally, moistened to a certain humidity level (14-15 percent) and completely purified wheat was crushed and

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[53] Wastes are distinguished by three categories:

- wastes of the first category, which can be further used in flour production (broken kernels)
- wastes of the second category, which are used in fodder production
- wastes of the third category, which are to be destroyed (stones, dust)

sifted. The ready flour was enriched with vitamins and packed in 45 kg sacks. Sacks with ready made flour were stored in the storehouse waiting for the consumers, but usually not for long.

Storehouse – preliminary cleaning
Scales – weighing
Grain tanks – separated storages for wheat
Mixing line
Cleaner from the metal and dirt particles
Stone cleaner
Concentrator for separation of dust
Scouring machine for dry treatment of wheat
Air separator
Humidifying chamber for wheat tempering
Air separator for additional cleaning from dust
Grain crushing rolls
Sieve purifier
Flour enriching equipment
45-kg dosage
Packing and stitching of packs
Packed flour storehouse

Consumers

Figure 5.8 Flour producing line of the state mills

(Source: own presentation based on survey results)

The wheat flour value chain of the state (half privatised) mills

According to the value chain analysis, average primary cost of producing 1st or 2nd grade flour in 2005 constituted about 88 percent of the fixed state price for wheat flour, or USD 154 per ton (Figure 5.9). Main inputs represented the biggest share of 79.6 percent, or USD 138 per ton, including wheat (77.7 percent); sacks for packing the output (1.7 percent); labels (0.1 percent) and yarn for stitching packed sacks (0.1 percent). Processing costs of the mills stood at 8.7 percent of the fixed state price, which was worth about USD 15 per ton of flour. Labour and energy costs had moderate shares of 3.6 and 1.7 percent respectively.

Taking into account that the mills had to pay VAT of 20 percent from the fixed state price for wheat flour, little or no opportunity was left for the mills to cover their production costs, not even mentioning the profits. Wheat flour value chain showed that the mills which were partly owned by the government usually have been making losses. Such a loss of the mills in Khorezm in 2005 totalled 8.3 percent, or USD 14 per ton of produced wheat flour. At the

same time private mills (registered or non-registered) managed to balance their production with a very narrow profit margin. Mills managed to maintain production of flour and to meet the break even from the profits they received from for example producing fodder or subsequent wheat products like bread or pasta. Fodder and pasta were not priced at fixed state level and could be sold so that a certain profit margin was planned in financial accounts of the mills and was included in the sale prices.
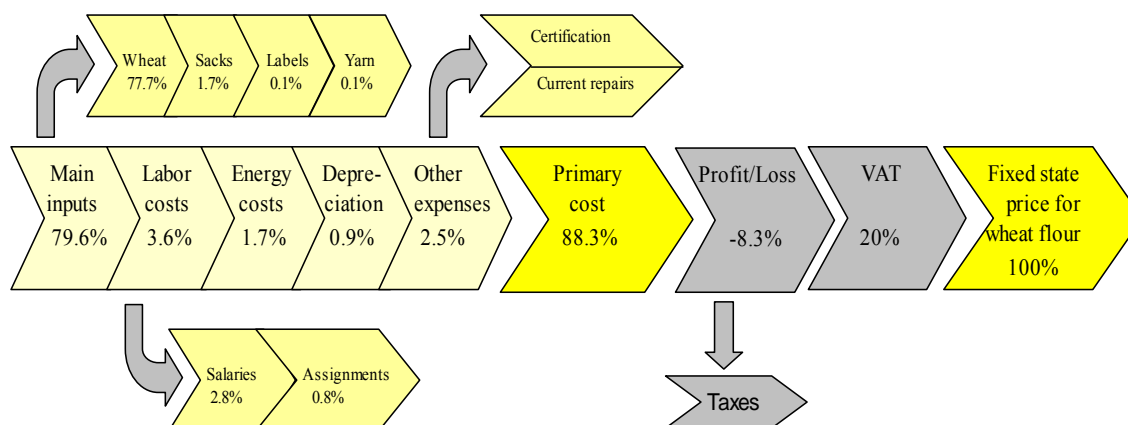
Figure 5.9 Wheat flour value chain

(Source: own presentation based on survey results)

5.3.4.3 *Bakeries*

The follower of the flour-milling industry within the wheat chain is the baking industry. The baking industry in the Khorezm region was represented by the bakeries belonging to the mills; two large baking centres; private registered and private non-registered bakeries, scattered throughout Khorezm. The main task of the baking industry consisted of processing wheat flour into final wheat products, such as bread and confectionery and of providing local organizations and population with these products.

Description of the baking facilities

Bread baking centres of the Khorezm region were "Urgench Non" baking centre, located in Urgench city and baking centre, located in Urgench rayon. These centres were built many years ago, at the time of FSU and as all other industrial units belonged to the government. They were assigned to provide the population with bread products. At the time of conducting this research these baking centres were no longer officially owned and managed by the state, they were transformed into either organization with limited liabilities, or Joint Stock Company.

Inputs for the baking centres were provided basically by the large state mills. The shares of the large mills in input provision could vary, depending on the decision of the local government, which specified how much of flour and bread had to be produced (calculations are based on the size of population). Local government also made baking centres responsible for providing municipal organizations, maintained by the government budget[54], with bread and bread products. About 95 percent of the output of baking centres in 2005 was forwarded to such organizations. The remaining 5 percent was sold through retail shops. Bread baking centres could thus be considered still state owned enterprises with very little freedom and low profits.

Because of constant competition with numerous private bakeries, baking centres had to watch the quality of the products. There were specialized laboratories at the centres, which constantly controlled the quality of flour, as well as of bread. So all bread products were certified, and were considered by the consumers as bread products of rather high quality (in terms of taste and nutrition parameters).

Private bakeries in Khorezm functioned both on a registered and a non-registered basis. Non-registered bakeries were merely local households, which baked bread for home consumption, for neighbours for example for some service fee, or for stochastic sale at the market. Private bakeries utilized both locally produced and imported wheat flour. Private bakeries, specializing on production and marketing of bread offered a greater variety of bread products and usually of better quality compared to the baking centres.

The bread value chain

As identified by value chain analysis, the average cost structure of bread, produced by the baking industry of the Khorezm region was as follows: the main inputs had the biggest share of 61 percent, including wheat flour (54.5 percent), yeast (about 4 percent), baking powder (2.2 percent) and vegetable oil and salt (less than 1 percent each). Other direct and indirect costs of baking bread like labour, energy or depreciation made 6.2, 2.5 and 6.5 percent respectively.

VAT constituted 15 percent of the producer price for bread. Producer price was set by the producer within a certain range, so that not to exceed the upper limit fixed by the state[55]. Thus the profit margin of the bakeries remained rather low, at about a five percent share. Besides, this profit margin was also used to cover other than VAT taxes (Figure 5.10).

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[54] such organizations like kindergartens, some hospitals, military base or boarding schools
[55] the government fixes the price for bread products in the framework of the "social stability" policy in order to keep social unrest of the population low; bread is the main (in some cases the only) staple food of the local population…
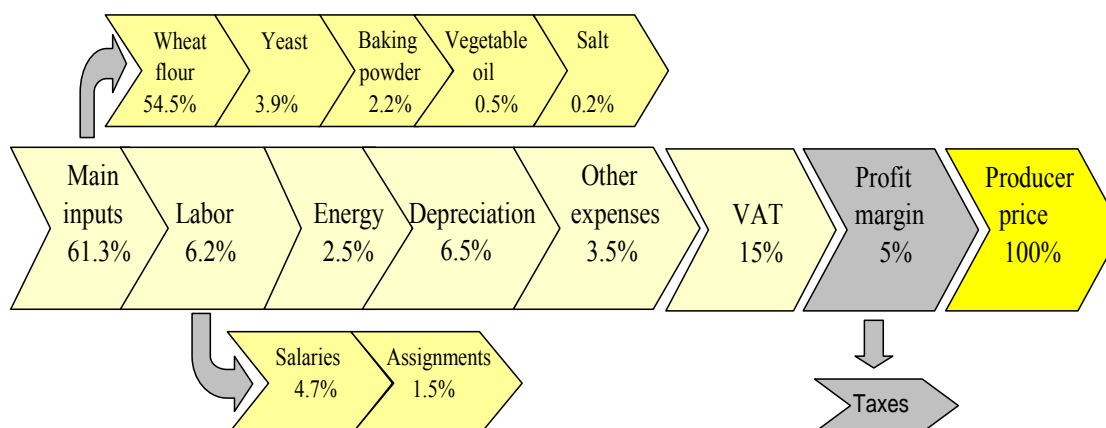
Figure 5.10 Bread value chain

(Source: own presentation based on survey results)

5.3.4.4   The value chains of other products of the WVC

Bread and pastry were the main, but not the only products produced from the wheat flour. Other products of the wheat chain were pasta, also produced from wheat flour and fodder, produced from the main wheat by-product – wheat barn.

 Pasta production and value chain

Population of Khorezm consumed both imported and locally produced pasta products. Although the quality of the imported pasta was somewhat higher than of the local ones[56], lower prices for the latter made local pasta popular with the majority of inhabitants of the Khorezm region. Also home made pasta products were very popular and widely consumed in the Uzbek families. Production process of pasta was not complex (Figure 5.11).
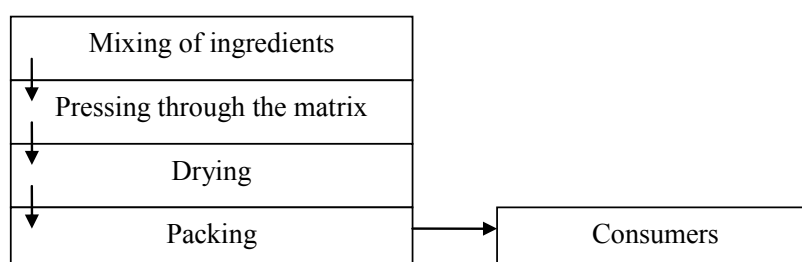
Figure 5.11 Pasta producing line

(Source: own presentation based on survey results)

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[56] moderate quality of the local wheat (mainly of third class) leads to rather poor quality of local flour (low gluten content for example) and thus to moderate quality of the final products, such as pasta

It consisted of mixing of the required ingredients, pressing the dough through the so-called matrix of the desired shape and length. The ready but wet pasta products were then dried and packed.
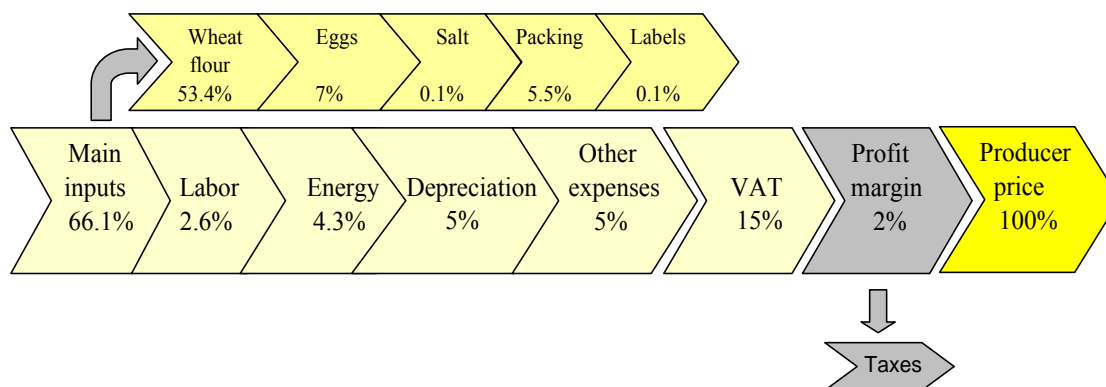
Figure 5.12 Pasta value chain

(Source: own presentation based on survey results)

Value chain analysis of pasta products showed that two thirds of the producer price for pasta came from the main inputs like wheat flour (53.4 percent); eggs or egg powder (7 percent); packing (5.5 percent); salt and labels (0.1 percent each). Energy costs, depreciation and other expenses incurred in the production process accounted for about 5 percent each. Pasta production on industrial scale usually was not labour intensive; it constituted roughly 2.6 percent of the total price for pasta (Figure 5.12).

Fodder production

Fodder producing lines of the large mills could produce a variety of fodder: for cattle, poultry, or fish. Besides the wheat barn and wheat wastes, supplied by the flour producing lines, fodder lines utilized other ingredients, such as rice meal from the rice-hulling plants; cotton cake from the cotton refining plants and limestone. Other nutritious elements could be added upon the request from the customers. The ingredients were mixed according to the type of fodder and the recipe from the laboratory. Then the mixture was grinded and forwarded to the granulating equipment. After cooling, the ready fodder was passed to the fodder store house until shipment to the buyers (Figure 5.13). Despite of the unmet demands of the animal breeders in Khorezm only half of the fodder production capacity was loaded due to insufficient input supply. Rural population usually purchased plain wheat barn or wheat wastes from the mills to feed their cattle.
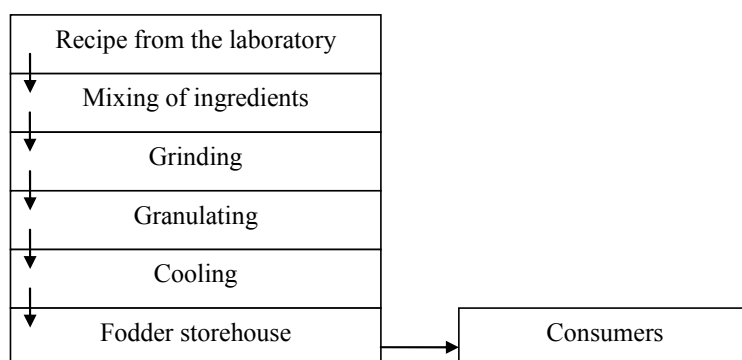
Figure 5.13 Fodder producing line

(Source: own presentation based on survey results)

5.3.4.5   *Barriers to growth in the WVC*

The major problems reported in the WVC survey are summarised in Table 5.5.

Table 5.5 Summary of barriers to growth in the WVC in Khorezm

Issue area	*Barriers to growth*
Inputs	• lack of the main inputs into the WVC – wheat, flour • high costs for imported wheat and flour • low quality of local wheat and flour
Financial problems	• forced charity donations by companies for construction works in the region • lack of circulating assets
Production stage	• worn equipment and tools • lack of spare parts for the imported machinery and equipment • insufficient capital assets
Regulations	• strict administrative control, interference in activities by the governing structure of the WVC fixed state prices for wheat/flour/bread

Source: own survey results

It has been shown by some studies in the ZEF/UNESCO Khorezm project (Kienzler et al., 2007) that wheat grown in Khorezm is of rather low quality compared to international standards. For example local wheat has low protein content and thus all the products prepared from such wheat (wheat flour, bread, pasta, animal feed) do also lag behind in quality.

Under the present wheat state procurement system farmers do not really have incentives to grow, or invest into better quality wheat. They try to produce more quantity, paying little attention to the quality because the more they produce the more stays at their disposal after fulfilling state order and the more they can sell at the market and get more cash for their output.

Local wheat production can be improved via: (1) introducing better wheat varieties; (2) creating incentives for the farmers to increase wheat quality through price differential for better quality wheat, or through educational or awareness programs of wheat/wheat products' quality; (3) improving on-field agricultural practices, like better irrigation scheduling, or fertilization.

Under such a reform package the whole wheat value chain would not get affected, the milling industry would not curtail, and at the same time consumers would receive better quality products starting from wheat and to bread and pasta products

5.4 Analysis and impact assessment in the wheat chain

Analysis and impact assessment was possible for the "official" wheat chain. It was undertaken based on the available secondary and primary data, obtained through value chain research. FAO analytical methodology, including financial and economic analyses of the WVC, was applied.

5.4.1 Financial analysis of the WVC

Financial analysis of the WVC estimated the amount of value added and looked at profitability of activities of the actors of the chain separately, as well as on a whole. Provision of subsidies and transfers among the actors were also analysed.

5.4.1.1 WVC value added

Total value added was derived from the so-called consolidated accounts of the chain, which contained the information on gross outputs on the one hand and intermediate inputs; all costs incurred in the production (or activities); taxes paid to the budgetary funds or remittances transferred to the non-budgetary funds; future investments (represented by depreciation); and payments to the financial institutions (in case of credits) of every agent of the chain on the other hand. The WVC in Khorezm in 2005 nominally created wealth, as can be seen from the positive value added accrued in the referenced year (Table 5.6).

Table 5.6 Creation of value added by the WVC actors in Khorezm in 2005, million USD

	Personnel remuneration	Profit	Depreciation	Financial charges	Taxes	Remittances to non-budgetary funds	Social Payments	Value Added
Agricultural sector	1.22	0.38	0.38	1.67	0.14	0.01	0.00	3.79
Flour milling/Cereal/Feed compound industry	0.76	0.35	0.31	0.17	0.23	0.18	0.12	2.12
Food industry	0.07	0.07	0.10	n/a	0.14	n/a	n/a	0.37
Total Wheat Value Chain	2.04	0.81	0.80	1.84	0.50	0.19	0.12	6.29

Source: own survey results

Total value added worth of USD 6.3 million was created, with the major share coming from the agricultural sector. Primary producers (wheat growing farms) contributed as much as USD 3.8 million to the total value added. The flour milling industry was the second largest contributor in value added creation with its share of slightly over USD 2 million. The food industry, comprised in the WVC of the bakeries and pasta producers, had the least share of less than USD 0.5 million. And this was due to the decreasing flows of wheat/wheat products along the chain: less than half of wheat was forwarded to the flour milling industry (the remaining part was home consumed and thus no official records on value added available); wheat flour was also only partly transferred to the food industry (the other part again being consumed by the households). Thus, total value added, and the more so value added by the processing (private) sectors of the WVC could have been underestimated because most of wheat and part of wheat flour were home consumed and no value added parameters were recorded or estimated.

Analysis of the impact of the WVC on each agent, as measured by the amount of profit they made, showed that the agricultural sector ranked first – its profit from growing wheat totalled USD 0.4 million. This important agent of the chain also provided the highest return to labour (most wages being paid in agriculture) as well as the highest return to fixed assets (most transfers for depreciation) and to financial institutions (most interest payments on credits along the WVC came also from agriculture). At the same time the flour milling industry not only contributed the most to the state budget (most taxes paid), but also contributed to the non-budgetary funds[57] (Table 5.6).

5.4.1.2 *Profitability of activities in the WVC*

The financial profitability of activities in the wheat chain was analysed based on the actors' activities and their economic results (profits or losses). Based on the available data on the WVC in 2005, financial analysis of activities along the chain was restricted to estimation of

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[57] here again we talk only on the "official" impact of the WVC on its agents, which could be underestimated due to the reasons, described above

rates of return. Overall efficiency of the wheat chain, although low, was estimated at about 0.03, representing a return of about USD 3 cents per each item spent along the chain on average (Table 5.7). Agricultural sector in 2005 showed the highest, albeit also low, profitability rate of about 0.04. The flour milling/cereal/feed compound and the subsequent food industry showed low returns of about USD 2 cents on incurred production costs each.

Table 5.7. Efficiency of activities in the WVC in Khorezm, 2005

	Rate of return
Agricultural sector	0.037
Flour milling/Cereal/Feed compound industry	0.021
Food industry	0.024
Total Wheat Value Chain	0.027

Source: own survey results

5.4.1.3 *Subsidies to the WVC*

As is the case with the cotton value chain, the agricultural sector within the wheat value chain was also highly subsidised by the state, albeit the amount of subsidies was smaller given that the production of wheat stands on a much lower level compared to cotton[58]. According to value chain analysis total amount of subsidies, provided by the state to the wheat growing agricultural producers in 2005, was in the range of about USD 9 million.

Table 5.8 Subsidies provided to the WVC in Khorezm in 2005

	Billion UZS	Million USD
Explicit subsidies		*8.94*
Irrigation and drainage	8.54	7.66
Water	0.19	0.17
Debt write-off	0.23	0.21
VAT waiver: fertilizers	0.75	0.67
VAT waiver: fuel	0.26	0.23
Implicit subsidies		*0.03*
Interest rate credits	0.03	0.03
Total subsidies to the Wheat Value Chain	10.00	8.97

Source: own survey results

Explicit subsidies included maintenance costs of the irrigation and drainage systems; provision of water for irrigation on a free of charge basis; coverage of the debts of *shirkats* (the large scale collective farms); and provision of the main inputs such as fertilizers and fuel at a reduced price (excluding VAT). Explicit subsidies virtually made the whole lump sum of the provided subsidies worth USD 8.9 million. Implicit subsidies to the WVC covered the

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[58] in Khorezm cotton covers about 50 percent of the arable area and wheat about 21 percent

difference in interest rates for the credits provided by the state in comparison to the credits, offered by other financial institutions (commercial banks) (Table 5.8).

5.4.1.4   *The analysis of transfers*

About one third of the value added created within the WVC in 2005 was redistributed to the households in the form of wages and social payments, about only 8 percent settled in the state budget in the form of various taxes and about 3 percent in the non-budgetary funds; return to capital investments made 13 percent and return to financial institutions was as high as 29 percent; and finally, profit margins of the actors along the wheat chain accounted for about 13 percent of the total value added within the WVC (Table 5.9).

Table 5.9 Composition of Khorezm WVC value added by factor in 2005, in percent

	Personnel remuneration	Profit	Depreciation	Financial charges	Taxes	Remittances to non-budgetary funds	Social Payments	Total Value Added
Total WVC	32	13	13	29	8	3	2	100

Source: own survey results

5.4.1.5   *Wheat products price determination*

Half of the wheat output of farmers was turned to the government (state mills); the remaining half stayed with the producers for sale at the market or for home processing and following consumption (Figure 5.14). Interviews with farmers, conducted in current research showed that usually it was the case that farmers pay their workers in kind, and the most preferable crop for payment in kind was wheat – the main staple in the diet of the rural population. Wheat from rural households was either sold or also home processed and consumed. Surveyed farmers reported that they preferred to sell their above state quota wheat not to the mill (even at negotiated price), but at the local markets or to the neighbours because this way they received payment in cash. The state mills could offer only bank transfers to the farmers' settlement accounts, which proved to be very hard to have access to due to controlled use of their accounts. Some cases of wheat storage were reported during farmers' survey. The better-off farmers, which had storage facilities, did store certain amounts of their wheat harvest either for sale next year (expectations of higher prices in the market), or for seeding the following vegetation season, or finally for payment in kind for their workers.

The price determination procedure along the wheat chain could not be clearly followed. Nevertheless, prices for "state" wheat and also wheat flour were fixed by the governing structure of the WVC. Such prices were set by the state so that they could cover the costs of production and usually left either a very narrow profit margin or no profit to producers at all.

Wheat submitted within the state quota was paid for at state procurement price (SPP). Wheat submitted above the state quota (if, for example, agricultural producers decided to sell their wheat to the state mills rather than at the market) was paid for at negotiated price, which was set to be 20 percent higher than SPP. Wheat seeds (wheat of the best quality) for the next vegetation season was priced at a 80 percent bonus to SPP (Figure 5.14).

As in any country in transition the prices for flour and bread products in Uzbekistan were controlled by the state in order to maintain the required consumption of the population. Bread prices were strictly controlled by the local government authorities and were set at the same level in the shops of the mills, large bakeries, private bakeries and the market. Prices for the mills' output like flour and bread were set by "UzDonMahsulot", the governing structure of the milling industry and were to be followed by all the mills in Uzbekistan. Mills (and bakeries) could not set higher prices for flour even if the fixed output price did not cover their high production costs, not even mentioning profitability margins. Prices for other products, such as fodder, bread or pasta were set by the mills themselves taking into account all production costs, profitability margin and VAT.
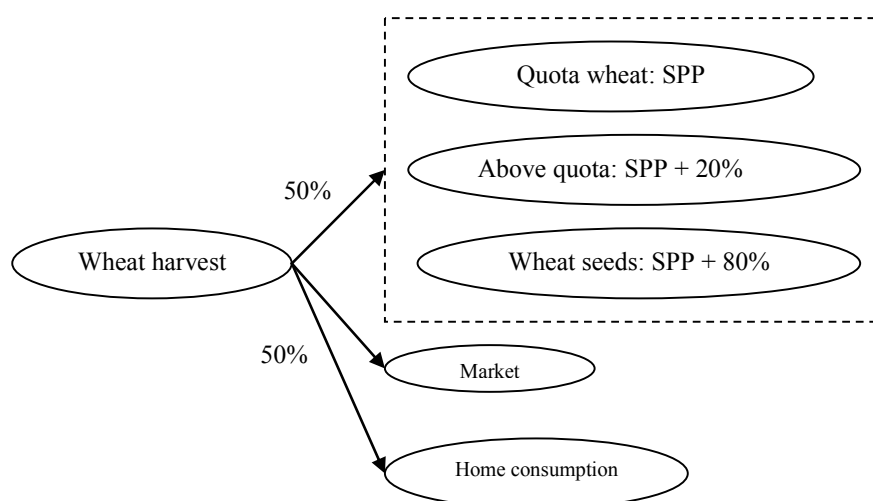
Figure 5.14 Distribution of wheat and the prices for state order wheat, 2005
(Source: own presentation based on survey results)

Summary

In general, financial analysis showed that the "official" WVC in Khorezm in 2005 (without private/home wheat processing and consumption) created total value added pf about USD 6.3 million. The major contributing factors to the total value added were: (1) wages and salaries paid along the chain; (2) charges by financial institutions. The major contributing chain actor was the agricultural sector. It provided the most wages, depreciation and financial charges.

The flour milling industry was second largest contributor; it accrued highest amount of taxes and remittances to non-budgetary funds. Financial profitability of activities along the WVC was not substantial, as shown by the low rate of return of 0.03. Subsidies provided to the WVC reached about USD 9 million. Agricultural producers received fixed state prices for the state quota wheat, lower than the prices, which producers could have obtained in the markets.

5.4.2 Economic analysis (at market prices)

Economic analysis was also feasible only for the "official" WVC based on the available data. It analysed the wheat chain in terms of its importance and integration with national/regional economy; its impact on balance of payments; and impact on the state budget.

5.4.2.1 Impact on economic growth

Contribution to GDP and economic importance of WVC

According to value chain analysis of the official flows along the WVC, the wheat value chain contributed about USD 6.3 million to the total value created in the region (Table 5.10).

Table 5.10 Contribution of the WVC to GDP of Khorezm in 2005

	GDP	Total Value Added	Contribution, %
Billion UZS	562.00	7.0	1.2
Million USD	504.26	6.3	1.2

Source: own survey results

The share of value added created by WVC in GDP of Khorezm was small, only slightly over 1 percent (and mostly contributed by agriculture).

The rate of integration with the economy

As shown by economic analysis of the WVC in 2005, the wheat chain could not be considered to be integrated with the rest of the regional economy.

Table 5.11 Integration of the WVC with the rest of the economy of Khorezm in 2005

	Total output of WVC	Total Value Added	The rate of integration
Billion UZS	52.3	7.0	0.13
Million USD	46.9	6.3	0.13

Source: own survey results

The WVC in Khorezm was characterized as having a low rate (of 13 percent) of linkage with the rest of the regional economy and thus limiting its development impact (Table 5.11). This was basically due to the fact that wheat was mostly a product for home processing and consumption and not the main input for agro-processing industry.

The average capital coefficient

The average capital coefficient of 0.13 showed that fixed capital was rather important to the WVC (in contrast to the CVC) and that fixed capital consumed along the wheat chain contributed 13 percent to the value added created by the WVC (high share of depreciation costs in total value added) (Table 5.12).

Table 5.12 Consumption of fixed capital by WVC in Khorezm in 2005

	Total Depreciation	Total Value Added	Capital coefficient
Billion UZS	0.9	7.0	0.13
Million USD	0.8	6.3	0.13

Source: own survey results

5.4.2.2   Impact on the state budget

Flows to the state budget

The WVC in the Khorezm region contributed less than 1 percent to the total taxes levied to the state (regional) budget in 2005. The Government provided subsidies to the actors of WVC in the amount of about USD 10 million, but accrued only USD 0.5 million of taxes (Table 5.13). So, basically, the wheat chain in the Khorezm region of Uzbekistan under given circumstances proved to be a drain rather than a support to the state.

Table 5.13 WVC flows to the state budget of Khorezm in 2005

	Taxes $_{total}$	Subsidies $_{total}$	Profits $_{public\ sector}$	Government budget
Billion UZS	0.6	10.0	0.34	-9.1
Million USD	0.5	9.0	0.31	-8.2

Source: own survey results

The Direct Rate of Taxation

The indicator for direct rate of taxation showed the nominal tax content of the value added created by the WVC. A rate of 0.08 showed that only about 8 percent of the created value was nominally captured by the state (Table 5.14).

Table 5.14 Direct rate of taxation of the WVC in Khorezm in 2005

	Taxes total	Value Added Total	Direct rate of taxation
Billion UZS	0.6	7.0	0.08
Million USD	0.5	6.3	0.08

Source: own survey results

The Effective Rate of Taxation/Subsidy

Table 5.15 Effective rate of taxation of the WVC in Khorezm in 2005

	Government budget, total	Value Added Total	Effective rate of taxation
Billion UZS	-9.1	7.0	-1.3
Million USD	-8.2	6.3	-1.3

Source: own survey results

The indicator for effective rate of taxation measured the real tax or subsidy content of the value added created. In the WVC in Khorezm in 2005, the effective rate of taxation was estimated at -1.3, indicating a strictly subsidy oriented government policies concerning the WVC (Table 5.15).

The real government cost coefficient

Table 5.16 Impact of subsidies to the WVC in Khorezm in 2005 on the state budget

	Government budget, total	Subsidies	Real Government cost coefficient
Billion UZS	-9.1	10.0	-0.91
Million USD	-8.2	9.0	-0.91

Source: own survey results

The indicator for the real government cost coefficient showed the real impact on the government's finances of each monetary unit given in direct subsidy to the actors along the WVC. This indicator for the WVC in Khorezm in 2005 was estimated at -0.91, indicating that overall the state was not gaining any revenues from all the activities of the WVC taken together (Table 5.16).

Summary

In general, economic analysis showed that the "official" WVC in Khorezm in 2005 contributed only slightly over one percent to the regional GDP.

The rate of integration of the WVC with the rest of economy was low, only 0.13, indicating that the WVC had a weak linkage with domestic processing sectors due to the well developed home processing and consumption of wheat by the local population.

Analysis of the flows between the WVC and the state (subsidies on the one hand and taxes and other payments on the other) showed that the WVC created negative flows to the state budget and thus overall, the state was not gaining any revenues from all the activities of the wheat chain, but rather was supporting an inefficient sector in the realms of Uzbekistan.

5.4.3 Transaction costs analysis

Total transaction costs incurred by the entire wheat value chain in Khorezm in 2005 was hard to estimate due to the presence of a large share of traditional home consumption of wheat, wheat flour, and so forth. In the framework of this study it was possible, however, to estimate transaction costs of the "official" wheat chain, i.e. without home processors. The results are summarised in Table 5.17.

Table 5.17 Transaction costs along the WVC in Khorezm, 2005

	Transaction costs, million USD	Output value, million USD	Share, %
Wheat farming	n/a	27.7	n/a
Flour milling/Cereal/Feed compound industry	1.3	15.4	8.5
Baking industry	0.2	3.5	5.2
Pasta industry	0.01	0.2	4.7
Total WVC	1.5	46.9	3.2

Source: based on data from OblStat and own survey results

As was the case with the CVC, few wheat growing farmers reported on costs that could be associated with transaction costs. Transportation of the output, state order wheat, was covered by the large half privatised mills (with state being one of the shareholders) and so was transportation of the wheat seed to farmers. In case of non-state order wheat, the farmers would buy seeds either at the markets, neighbours, or home produce (remaining wheat from the previous agricultural season). Other inputs were purchased at the input distributing outlets, located in the same neighbourhood. So, transaction costs of farmers for acquiring inputs would be at the minimum. Transaction costs incurred by farmers when handling the output above the state quota would also be negligible, as most of the produced wheat was consumed by the farmers' households, or was traded with the neighbours.

According to the interviews with the mills' authorities, there were no special marketing departments to conduct marketing research, advertise the products. Nevertheless, according to official statistics department of the Khorezm region, the flour milling/cereal/compound

industry in 2005 had to cover about USD 1.3 million of transaction costs (Table 5.17), compiled of sales costs and other operational costs (for more details refer to p.114). Numerous private mills of the region in general did not have high transaction costs because they mainly provided processing service to the population, which would have their wheat processed at the private mills and then would collect the products (flour and wheat barn) themselves. The long term relations between the private mills and the clients of the surrounding neighbourhood are well established, so that costs for advertising, finding partners/clients and also transportation costs were at minimum for the private mills.

Transaction costs of the large bakeries (formerly owned by the state, but nevertheless still controlled by the state) included basically transportation costs, and very little other marketing costs that could be associated with transaction costs. Most of their output (about 95 percent) was handled through the well-established marketing channels with the budget organization, whereas the little remaining output was sold via retail shops. Small privately owned bakeries and pasta producing firms would also have low transaction costs as most of their output was marketed right on the spot, or at best would be transported to other retail shops or to the markets.

On average transaction costs incurred along the WVC in Khorezm in 2005 stood at a 3.2 percent share of total "official" output produced (Table 5.17). The highest level of transaction costs among the actors of the WVC was attributed to the flour milling/cereal and compound industry with 8.5 percent share in total output value. The subsequent actors of the chain, baking and pasta producing industries had lower transaction costs.

6 Empirical investigation: Fruit & Vegetable Value Chains (F&VVC)

6.1 Introduction

Climatic conditions (with ample amounts of heat and sun shine), arable land and a vast irrigation network in Uzbekistan favour production of a wide variety of fruits and vegetables, grapes, and melons. These agricultural crops occupy about five percent of approximately four million hectares of irrigated, arable land in Uzbekistan and come third at the importance scale after cotton and wheat. About 176 thousand hectares were planted with fruits and vegetables, grapes and melons in 2005 (Figure 6.1).

Although, Uzbekistan has considerable amounts of agricultural inputs (sufficient to produce about seven million tons of fruits and vegetables) total production of horticulture, viticulture, vegetable and melon growing in Uzbekistan in 2005 stood at about 2.2 million tons, including more than 1 million tons of fruits and vegetables (Figure 6.2). According to the State Customs Committee about 680 thousand tons of fresh fruits and vegetables were exported from Uzbekistan in 2005 worth USD 112 million. (http://www.investuzbekistan.uz/eng/investment_opportunities/by_industry/fruit_and_veg atables_processing_industry/page_2.mgr)
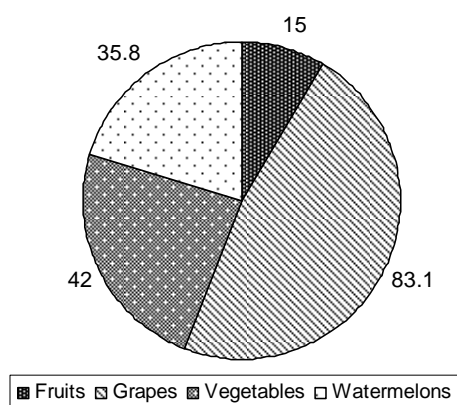
Figure 6.1 Area under fruits and vegetables in Uzbekistan in 2005, thousand ha

(Source: FAOSTAT 2007)
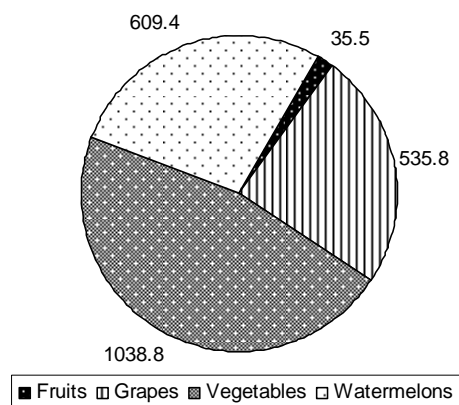
Figure 6.2 Production of fruits and vegetables in Uzbekistan in 2005, thousand tons

(Source: FAOSTAT 2007)

State order system for horticulture and vegetables growing was eliminated shortly after the dissolution of the FSU and presently, these crops are free of any state quotas. The output prices are established on a free (market) basis or on a contractual basis with processors.

The tendency of the last years shows that production of fruits and vegetables has been increasing. At present, it is considered, that half of the total produce of horticulture and vegetable growing is enough to satisfy domestic demand of the 27 million people living in the country.

With the increase in fruits and vegetables' output it was important to develop processing capacities. Plants for processing fruits and vegetables were set up throughout the country with various forms of ownership, including joint ventures with foreign direct investments. The development of the food processing (agro-processing) sector aims at increasing the processing of fruits and vegetables abundant in the country with concurrent improvement of quality of the products; compliance of locally processed fruits and vegetables to international standards; and subsequent export expansion.

Horticulture, viticulture and vegetable growing sectors on the Khorezm regional level account for a greater share in total arable land use (slightly over 10 percent) compared to the rest of Uzbekistan. Total area planted with these crops in 2005 reached about 23 thousand hectares; total output amounted to 330 thousand tons, including 271 thousand tons of fruits and vegetables. Export of fruits and vegetables contributed USD 176 thousand to the export revenues of Khorezm.

Latest reforms

The latest reforms of the food processing (or agro-processing) sector in Uzbekistan were initiated in 2005-2006 by two Presidential Decrees on reformation and development of horticulture, vegetable-growing and viticulture[59].

These decrees set the ground for:

- The increase in the number of fruit and vegetable growing farms;
- Arranging the preconditions for development of small processing units in rural areas which would process fruits and vegetables with modern, up-to-date equipment;
- Further increase in exports of processed fruits and vegetables;

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[59] Decree No.3709 of the President of the Republic of Uzbekistan on deepening of economical reforms of fruit and vegetables-growing and viticulture from January 9, 2006;
Resolution No.255 of the President of the Republic of Uzbekistan on managerial procedure for reforming of the fruit and vegetable-growing and viticulture from January 11, 2006

- Elimination of any administrative/command methods in the fruits and vegetables value chain (farms and processors) and no state interference;
- Setting the legal framework for increasing cooperation and production in farms and processing units;
- Facilitation of partnerships between F & V growing farms and processing units;
- Financial support and risk minimization for F & V growing farms via allowing for future contracts (for the upcoming harvests) with processors and upon a condition of advanced payment of 30 percent of the contract value;
- Setting privileges for the newly created horticultural farms and processors in the form of exemption from certain taxes for farms for the period of 5 years and for processors for the period of 3 years and upon a condition that these released funds will be transferred or used for the development of production capacities and increasing export potential;
- Establishment of on-field sale outlets for fresh fruits and vegetables;
- Developing local production facilities for packages for fresh or processed fruits and vegetables.

Overall, the main objective of the current reforms is to establish and develop independent private food processors, which could operate individually or jointly via associations in the framework of free market economy and no state interference. The enhanced exports of processed food items until 2010 should be considered the main outcome of initiated reforms in the agricultural and food processing sectors.

6.2 The operating environment of the F&VVC

The operating environment of the F&VVC describes not only the necessary setting for the entire chain to operate and interact with other stakeholders; it shows the direct actors of the chain as well as the governing structure, and other service providing institutions (Figure 6.3). The direct actors of the F&VVC in Uzbekistan include basically two sectors:

- agricultural sector, represented in the F&VVC by private farms and *dehqon*s growing fruits and vegetables; and small processing units, attached to private farms;

- food processing sector, represented by processors of fruits and vegetables operating in the framework of private companies, joint stock companies or joint ventures; and regional associations of "MevaSabzovot", the coordinating structure for processors.

Food processing sector

Presidential decree and resolution on enhancement of fruit and vegetable processing in the country disbanded the former state joint stock company, which was governing the food processing industry in Uzbekistan. Since the last 2 years processors of fruits and vegetables officially can operate on a "free from state" basis, have private ownership and do have the right to form (on a free membership basis) regional associations "MevaSabzovot" for coordinating their activities; seeking for investments (including foreign investments) for further technical refitting and modernisation of their processing facilities; conducting marketing research of the local and foreign markets; and finally for promotion of their produce to international markets.

At present this sector processes fruits and vegetables into various juices, syrups, sauces, dried as well as tinned/canned fruits and vegetables. Currently this sector on a nationwide scale has the capacities to produce up to 150 thousand tons of tinned/canned fruits and vegetables, about 25 thousand tons of dried fruits and vegetables and 20 million decilitres of wine per year. However, utilization of processing capacities in the last years has been low, only about 15 percent to the total designed capacities.
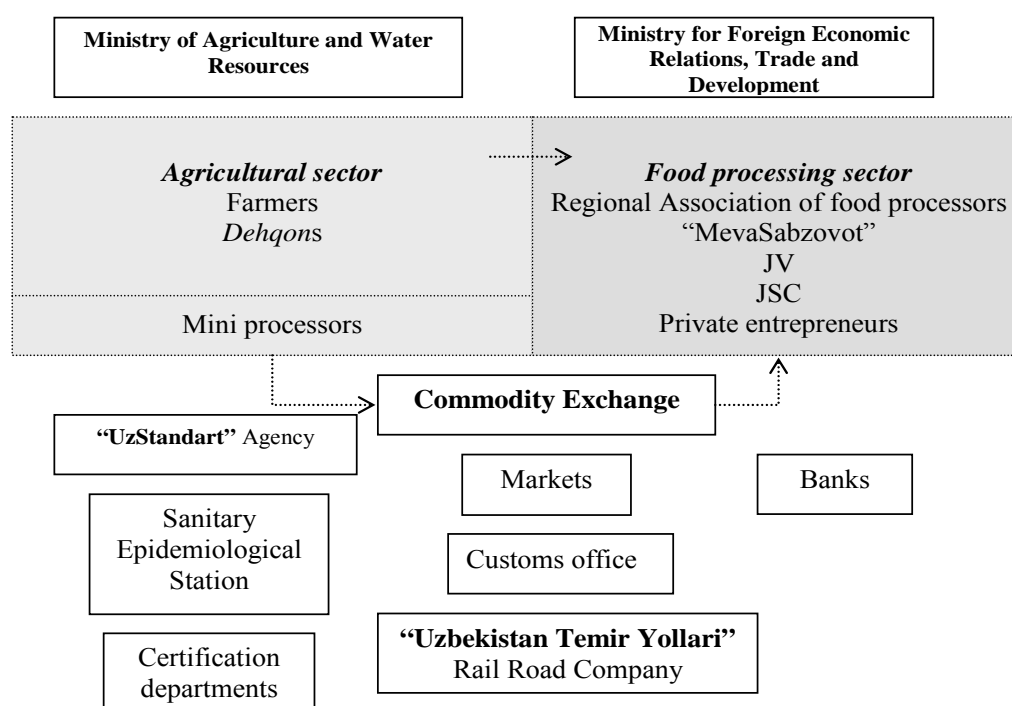
Figure 6.3 "Institutional" map of the F&VVC

(Source: own presentation based on survey results)

Although horticulture and vegetable growing as well as the food processing sectors are free of any state control, there was still a governing structure in the F&VVC, albeit smaller than

in the case of cotton or wheat value chains. The F&VVC is observed by the Ministry of Agriculture and Water Resources, which distributes agricultural land and water for irrigation, as well as some other agricultural inputs (fertilizers for example). The Ministry for Foreign Economic Relations, Trade and Development is in charge of all export transactions, taking place in all the regions of Uzbekistan; registration of the joint ventures or companies with foreign partnership.

Indirect actors of the F&VVC have the mission to provide supporting services, to enhance cooperation and operations along the chain. They include various institutions of Uzbekistan, such as "UzStandart" Agency (for setting standard and controlling compliance to these standards); Sanitary Epidemiological Station and various Certification Departments (for observing the quality of produced food items and issuing hygienic and phytosanitary certificates); customs office; rail road company; banks; and finally commodity exchange and markets (to facilitate trade).

6.3 The Fruit and Vegetable Value Chains

6.3.1 Preliminary map of the F&VVC

The value chain of fruits and vegetables in Uzbekistan (as elsewhere) starts with the agricultural producers, which produce fresh fruits and vegetables. The output of private farms (and rural households) basically has four destinations: (1) fruits and vegetables are home consumed by rural households; (2) flows to the processing plants; (3) is directly sold at the local or regional fresh markets; and (4) is purchased by wholesalers for further exporting from the region.
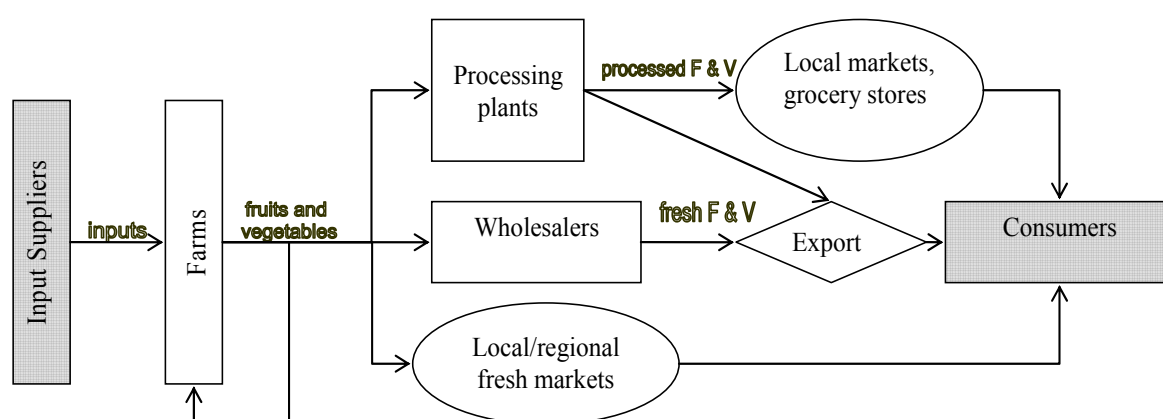
Figure 6.4 Preliminary map of the F&VVC in Khorezm

(Source: own presentation based on survey results)

The output of processing plants, be it juice, tomato paste, canned or dried fruits and vegetables, is sold at the local or regional markets, or is exported (Figure 6.4).

6.3.2 Input-output flow map of the F&VVC

Total output of the horticulture, viticulture and vegetable growing agricultural sectors in the Khorezm region of Uzbekistan in 2005 totalled 330 thousand tons (Figure 6.5). The main contributor (66 percent of total) was *dehqon*s, or rural households. Private farms, specializing in gardening and vegetable growing contributed one third, and the few collective farms (still operating until the end of 2005) had the least share of 3 percent in the total output (Table 6.1, Figure 6.5).
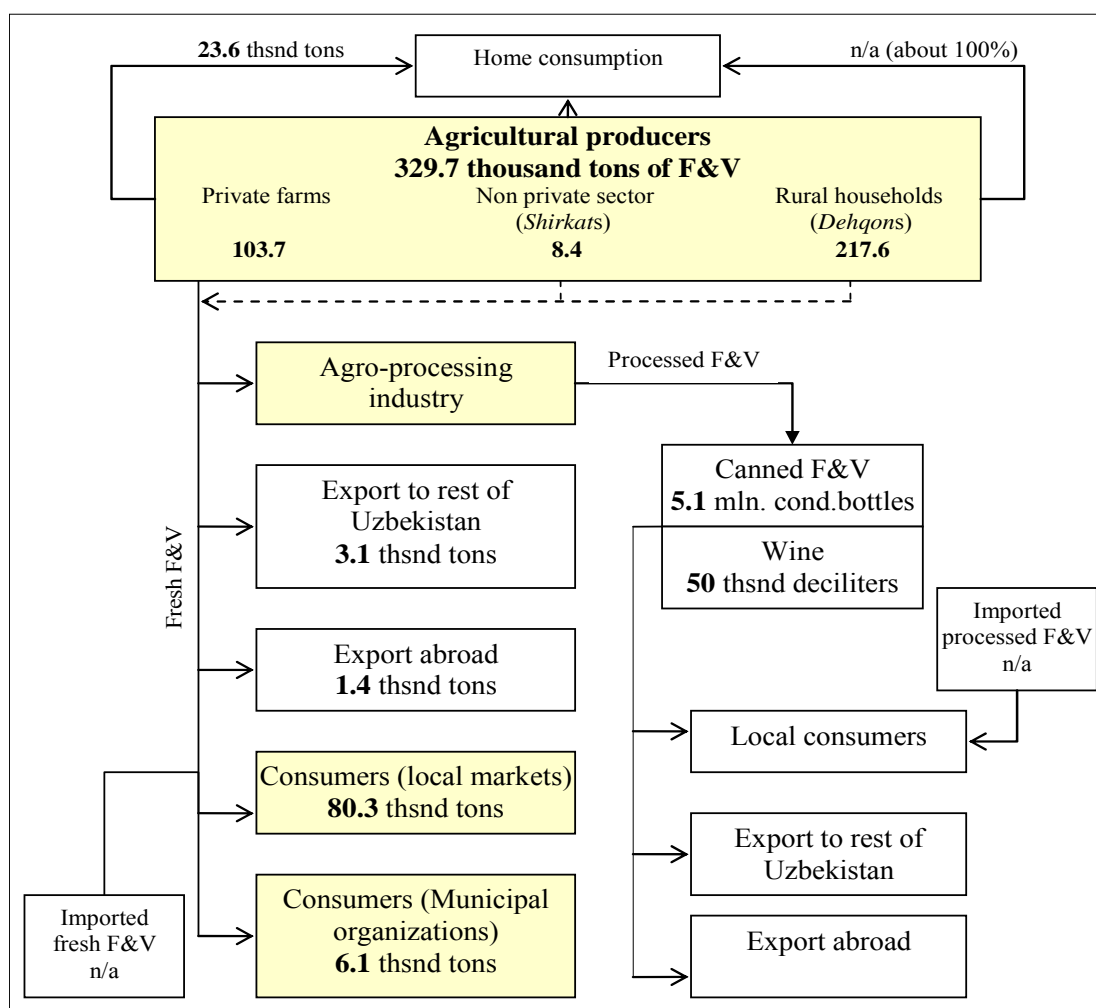
Figure 6.5 Input output flow map of the F&VVC in Khorezm in 2005
(Source: own presentation based on survey results)

Local population in Uzbekistan (especially rural inhabitants) is highly skilled in home processing of fruits and vegetables into various ready made products, like jams, juice, canned (pickled) vegetables. So, of no surprise was a high share of home consumed fruits and vegetables in Khorezm in 2005. Destination of fresh fruits and vegetables of *dehqon*s was mainly (almost 100 percent) for home consumption; about 24 thousand tons (or one fifth) of fresh fruits and vegetables produced by private farms and *shirkat*s was also home consumed (according to statistical report of the regional government). 80 thousand tons were sold at the local/regional markets; slightly over 3 thousand tons were exported to other regions of Uzbekistan and about 1.4 – exported abroad.

One of the main consumers in the F&VVC (with even a greater share of consumption compared to processing plants) were the so called budget (municipal) organizations, such like hospitals, schools, kindergartens, which in 2005 received over 6 thousand tons of fresh fruits and vegetables (Figure 6.5).

Processing plants operating in the Khorezm region experienced a small inflow of their main inputs (fruits and vegetables) in 2005, which stood at less than 5 thousand tons. Thus, processing capacities in the region were underutilized (only 15.1 percent capacity utilization) and it was possible to produce about 50 thousand decilitres of wine and about 5.1 million conditional tubes of canned fruits and vegetables.

Products of the agro-processing industry were also partly exported (small share) to the rest of Uzbekistan or abroad; and partly sold at local/regional markets.

Some fresh as well as processed fruits and vegetables were imported to Khorezm from the neighbouring regions and even countries in order to satisfy the demand of local population during the off season for fresh fruits and vegetables.

6.3.3 Actors of the F&VVC

The main actors of the F&VVC in Khorezm directly involved in production of fresh and processed fruits and vegetables were agricultural producers and processing enterprises respectively.

6.3.3.1 Agricultural producers

Horticulture and vegetable-growing in Uzbekistan has been freed from state order since the 90ies and at present is in the hands of private farms and *dehqon*s, the rural households. In 2005, at the time of conducting current research, fruits and vegetables were produced by *shirkat*s, 3655 private farms and 208 thousand *dehqon*s.

As shown in Table 6.1, in 2005 rural households contributed 61 percent to the total 330 thousand tons of fruit and vegetable production of Khorezm, or they managed to harvest about 202 thousand tons of products. Private farms contributed 36 percent with the output of 119 thousand tons and the remaining eight tons of fruits and vegetables were grown by *shirkat*s.

Table 6.1 Fruits and vegetables production in Khorezm in 2005, thousand tons

	Grapes	Fruits	Vegetables	Melons	Total	Share in total, %
Shirkats	1.5	1.2	3.6	2.1	8.4	3
Private farms	2.6	31.9	46.4	22.8	119.4	36
Dehqons	10.2	36	152.2	19.2	201.9	61
Total	14.3	69.1	202.2	44.1	329.7	100

Source: OblStat

F&VVC for *dehqon*s in Khorezm was shorter compared to the F&VVC by private farms. Rural households grew these crops basically for home consumption, or for sale at local markets, whereas private farms produced fruits, vegetables, grapes and melons not only for home consumption (1) and sale at local/regional markets (2), but also for paying their employed workers (3), exchange with neighbours (4), storage for consumption or sale in winter (5), and most importantly for further processing of fruits and vegetables by processors (6).

Fruits and vegetables farming

As in the case with cotton and wheat, fruits and vegetables in Khorezm have to be grown on the leached soil, which takes place in February-March. In March-April the soil is prepared for the upcoming vegetation season: chiselled, ploughed and loosen (Table 6.2).

Soil mechanical preparation is followed by pesticide application (except for vegetables) in May and fertilization in the period of March-September, depending on the vegetable variety. In case of fruits and grapes the existing plants are taken care of and maintained – fruit trees and grape plant are punched (in late autumn) and lime-washed[60]. Fruits and grapes depending on variety are harvested starting from June until October. However, early fruits, imported from the neighbouring regions can be found in the markets in spring, and for some fruits (apples for example) all year round. In case of vegetable growing, which are mainly annual crops, planting takes place in April-May. Planting is followed by thinning sometime in June. Vegetables are harvested in August-October

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[60] a common agricultural practice in Uzbekistan, used to protect the trees from pests/insects

mainly. Vegetables from the green houses appear on sale much earlier, starting late spring, however early vegetables are usually imported from other parts of Uzbekistan.

Vegetable fields and gardens are irrigated several times throughout the vegetation season from April to September.

Table 6.2 Farming activities for fruits, vegetables and grapes in Khorezm

	Farming Activity	Fruits	Date (month)	Vegetables	Date (month)	Grapes	Date (month)
1	soil leaching	X	02-03	X	03	X	02-03
2	soil preparation	X	03-04	X	04	X	03
3	punching	X	10			X	11
4	pesticide application	X	05			X	05-07
5	whitewashing	X	02-03			X	02-03
6	fertilizer application	X	03-05	X	05-06	X	06-09
7	planting			X	04-05		
8	thinning			X	06		
9	irrigation	X	04-09	X	05-08	X	06-09
10	harvesting	X	06-10	X	08-11	X	10

Source: based on farmers' interviews

Fresh fruits and vegetables value chains

Value chain analysis revealed that maintaining the existing fruit-bearing gardens[61] and growing fruits (on the example of apples) in the Khorezm region required approximately USD 251 per ha, or USD 49 per ton for an ordinary horticultural farmer with the average yield of 5-10 tons per ha. Setting up a new garden would require an additional cost component – cost of saplings – and would not give the anticipated profits in a short run.

The best option for gardeners in Khorezm was to sell their produce in the market rather than to forward it to the agro-processing industry, as the price for apples for example was four times higher at local markets compared to the price offered by processors. Thus, gardeners selling apples at local markets would have received on average operating profit worth USD 1.3 thousand per ha, or USD 130 per ton (or 72.5 percent of market price for apples) (Figure 6.6). Should gardeners be bound with contracts and obliged to submit their apples to processors, their operating profit margin would have dropped to USD 158 per ha.

The major cost items of growing apples included pesticide application (12.8 percent of market price), fertilizer application (4.1 percent) and labour costs (3.9 percent) (Figure 6.6).

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[61] Surveyed horticultural farmers had fruit bearing gardens, and thus did not have a cost component of seeds

Vegetable growing (on the example of tomatoes) in the Khorezm region cost farmers approximately USD 358 per ha, or USD 39 per ton with the average output of 8-10 tons of tomatoes per ha.
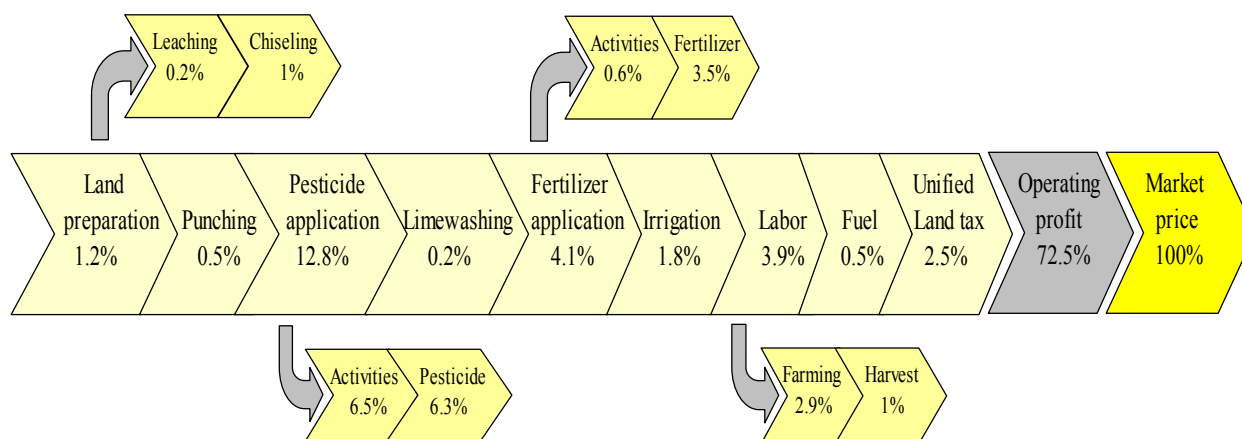
Figure 6.6 Value chain of one ton of apples for market sale

(Source: own presentation based on survey results)

Vegetable growers, as was the case with horticultural farmers, also did prefer to sell their produce at local markets rather than to forward it to the agro-processing industry, which could only offer half of the market price for tomatoes. Operating profit of tomato producers based on market prices could have reached on average USD 486 per ha, or USD 51 per ton (or 57 percent of market price for tomatoes) (Figure 6.7). Operating profit from growing tomatoes based on processors' prices would have fallen to USD 64 per ha.
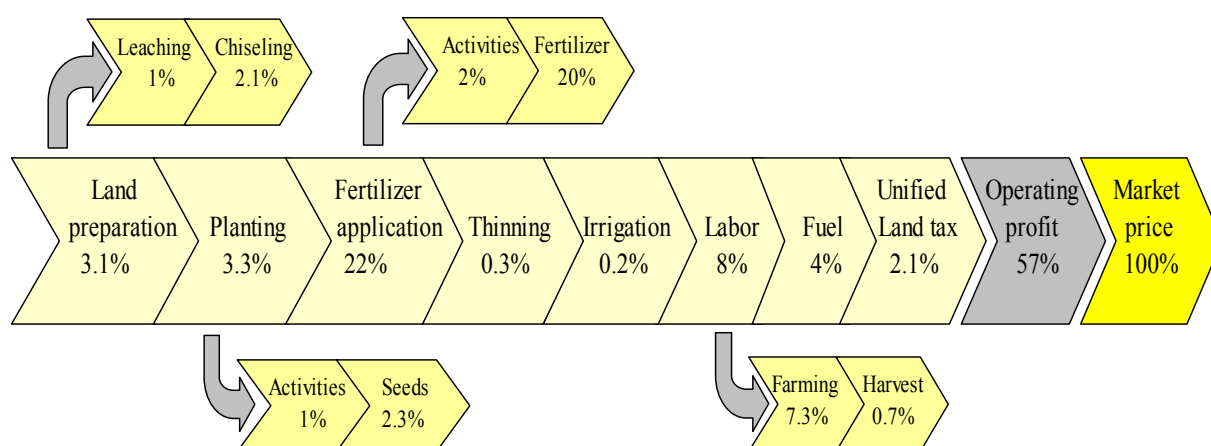
Figure 6.7 Value chain of one ton of tomatoes for market sale

(Source: own presentation based on survey results)

Fertilizers in vegetable growing constituted the major cost (22 percent of the market price for tomatoes). Vegetable growing is considered labour intensive when it comes to planting,

thinning or harvesting; labour costs for growing vegetables by the interviewed farmers contributed 8 percent to the final price. Fuel and costs of preparing soil for cultivation (chiselling, ploughing) stood at 4 and 3.1 percent respectively (Figure 6.7).

6.3.3.2   Processors

Fruits and vegetables processing plants

There were 15 fruits and vegetables processing plants in Khorezm in 2005, basically of two types of doing business: enterprises with private ownership (sometimes with foreign partnership) and enterprises with limited liabilities. The total designed processing capacity in the region stood at 30 thousand tons of fruits and vegetables and grapes per year. However, only 10 out of 15 processors were operating at the time of conducting this research, with total 15.1 percent utilization of their designed capacities (or 9.1 percent of total fruits and vegetables output of the Khorezm region in 2005). Thus about 5 thousand tons of fruits and vegetables (or about 1.5 percent of the total fruits and vegetables harvest[62]) have been processed by the agro-processing industry of Khorezm in 2005 (Figure 6.5 and Table 6.3).

Table 6.3 Processing capacities of fruits and vegetables in Khorezm in 2005

	Thousand tons	%
Total fresh fruits and vegetables	329.7	100
Total processing capacity	29.9	9.1
Actually processed in 2005	4.9	1.5

Source: own calculations based on data from OblStat

Interviewed processors mainly stated private farms as the main input source. Processors concluded contracts for production of fruits and vegetables with farmers on a condition of advanced payment of 30 percent of the total contract value. Some processors produced fruits and vegetables for further processing themselves on the land leased from the government. Other auxiliary inputs like sugar or salt, vinegar, spices and packing (bottles, jars, labels, lids, etc) were purchased by processors at local markets, imported from abroad or, and to a greater extent, came from the rest of Uzbekistan.

Quality of the main inputs was checked by Sanitary Epidemiological Station (SES) (less) and more by the workers of processing enterprises by taste and appearance of fruits and vegetables. Quality of the output products was checked and certified also by SES and by food laboratory of the region.

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[62] this points once more that home processing of fruits and vegetables is wide spread and important to the households in Uzbekistan

The main output items of the agro-processing industry included various juices, tomato paste, jam, dried and tinned/canned fruits and vegetables. These were forwarded basically to local consumers (private consumers, wholesalers, canteens, municipal organizations – kindergartens, hospitals), or were exported partly to the rest of Uzbekistan and abroad[63].

The government had not supported (provided privileges) processors of fruits and vegetables in Khorezm, they the only privilege the local processors had was simplified taxation: these small scale producers were paying one the so called Unified tax.

Processing of fruits and vegetables

As mentioned above the agro-processing industry in Khorezm produced a wide range of products. Here values chains for processed fruits and vegetables are given at the example of apple juice and tomato paste. Tomatoes have traditionally occupied the leading place among vegetables grown in Khorezm, both from the point of view of production scale (large area and harvests) and also of consumption by local population. Besides being freshly consumed, tomatoes were tinned/canned and were processed into tomato paste.
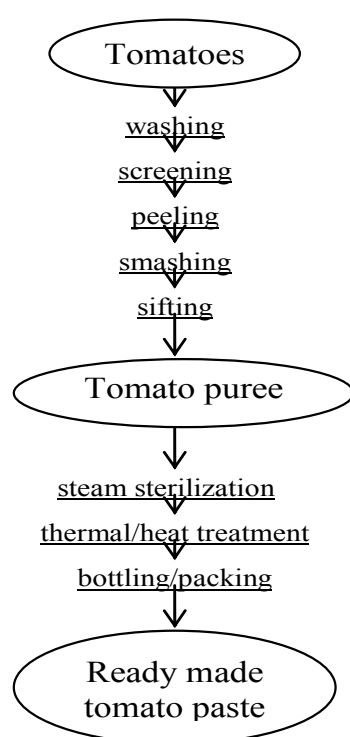
Figure 6.8 Tomato paste production

(Source: own presentation)
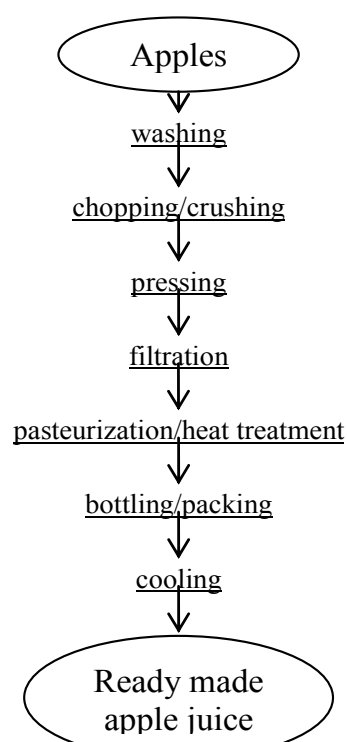
Figure 6.9 Apple juice production

(Source: own presentation)

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[63] a small share of processed fruits and vegetables were exported from Khorezm in 2005 to Kazakhstan, Ukraine, Russia, Tashkent

Tomato paste was the main output of the agro-processing industry in Khorezm in 2005, produced from tomatoes, grown by private farmers. Processing plants applied a simple process of producing tomato paste, consisting of washing, screening, peeling, smashing, sifting of fresh tomatoes; heat treatment, steam sterilization of tomato puree; and finally packing of the ready made tomato paste (Figure 6.8).

Apples could also be considered as a leading fruit type in Khorezm, with lots of summer as well as autumn apples grown every year. Apples were generally freshly consumed, with a small share of processing into apple puree[64] and apple juice. Apple juice production process applied by agro-processors in Khorezm consisted of washing and chopping the fresh apples; pressing, filtration and pasteurization of juice; bottling and cooling of the ready made apple juice (Figure 6.9).

Processed fruits and vegetables value chains

According to value chain analysis, the average primary (or total production) cost of producing tomato paste by agro-processors in Khorezm in 2005 constituted about 90 percent of the producer price for tomato paste, or USD 969 per ton (Figure 6.10). Main inputs represented the biggest share of 72.4 percent, or USD 780 per ton, including tomatoes (60.2 percent) and packing (12.2 percent). There has been no state regulation of the fruit and vegetable value chains since Uzbekistan gained independence, neither in the agricultural sector, nor in the agro-processing industry. Thus, the prices for the output of fruits and vegetables of processors were set by themselves based on production costs plus profit margin in the range of 5-30 percent.
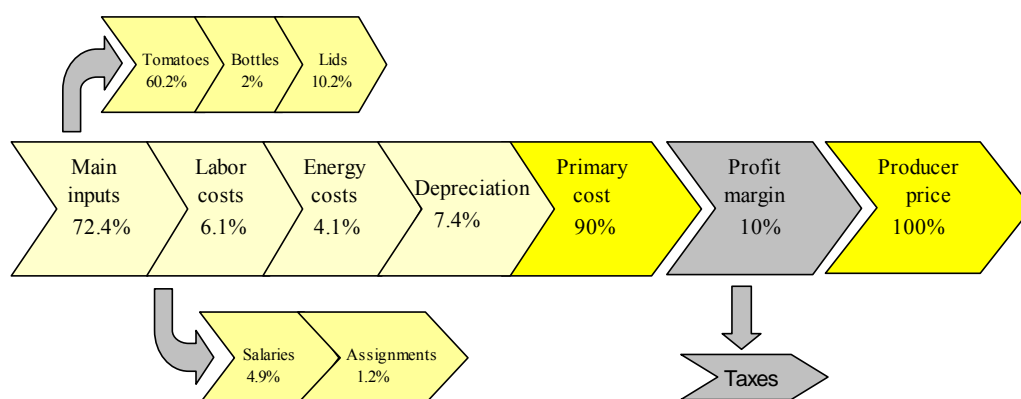
Figure 6.10 Tomato paste value chain

(Source: own presentation based on survey results)

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[64] apple puree is considered a semi-finished product for further export and use in baby food production

Tomato paste production brought to agro-processors about USD 108 of operating profit per ton, or 10 percent of producer price (Figure 6.10); apple juice – about USD 296 of operating profit per ton, or 30 percent of producer price (Figure 6.11).
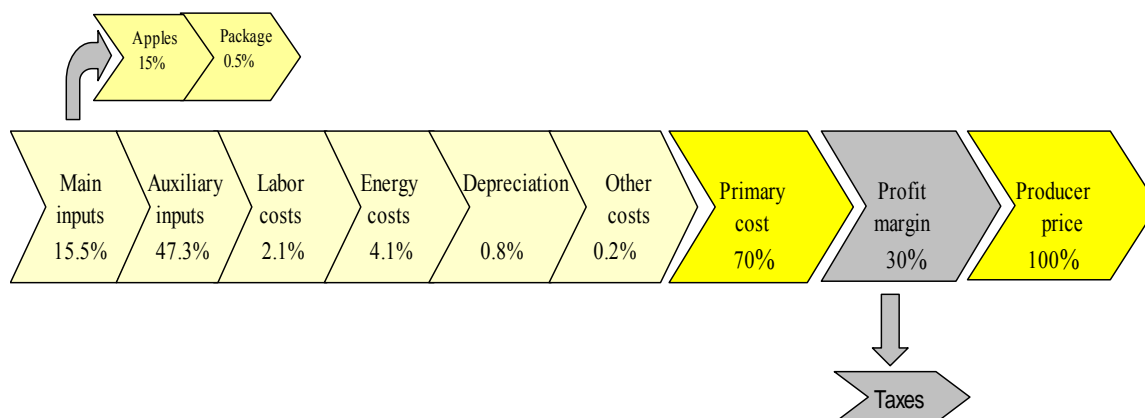
Figure 6.11 Apple juice value chain

(Source: own presentation based on survey results)

Total production costs of producing apple juice stood at about USD 691 per ton with 70 percent contribution to producer price (Figure 6.11). The major contributor to production costs of apple juice were auxiliary inputs (ferments for separation of sediments and making the juice clear) with 47 percent share in producer price. The share of main inputs (apples and packaging) was only about 15.5 percent.

Obstacles to development

Khorezmian processors of fruits and vegetables perceive their products as having comparative advantage due to low output prices, moderate quality and good taste. However, they experience many problems, as summarised below:

- *Lack of energy resources*: no stable supply of gas and electricity to the production lines of agro-processors;
- *Lack of main inputs* – fruits and vegetables: (1) agricultural producers preferred to sell their produce above home nutrition requirements at the market place due to lower prices offered by processors; (2) and because farmers usually had no or very little transportation means to bring fruits and vegetables to processors;
- *Lack of other (auxiliary) inputs*, such as packing, labels (hard for small scale producers to find and make contracts with producers of packages);
- *High costs for imported inputs*/packing/auxiliary materials due to high customs duties;
- *Weak marketing capacities* for the output: problems finding buyers, advertising;

- *Low local demand for processed fruits and vegetables* (for two reasons: local population makes self processing of fruits and vegetables, and products of the local processors in many cases do not meet quality requirements of foreign consumers);
- *Cumbersome and costly export transactions* for processed fruits and vegetables (caused by disintegration of the FSU railroad network, higher international transportation tariffs, customs and transit fees, and other barriers).

6.4   Impact assessment

Assessment of the impact of the F&VVC on the state budget, export revenues was not feasible in the context of the current study due to the lack and inconsistency of data and insufficient performance indicators of these chains, like small shares in total agricultural arable land use and underutilized processing capacities (10 percent in land use, only 0.2 percent in export revenues of the region).

However, the importance of fruits and vegetables in home consumption of the local population should not be underestimated; these crops are the main and sometimes the only staple of their diet.

7   Comparative analysis of the value chains

In the preceding chapters, cotton, wheat, fruits and vegetable value chains were described and analysed separately. In this chapter a general view on these value chains is offered in the form of a comparative analysis: firstly each value chain is compared against one another; secondly, a comparison is made by benchmarking their main performance metrics with comparators from other countries. Comparative analysis and benchmarking of key indicators along the value chains was applied to assess the economic efficiency and potential of the chains, as well as to facilitate the formulation of recommendations by determining the obvious performance gaps and identifying the main constraints to further development of the value chains.

7.1   Measuring performance of the value chains

Performance of the value chain was explained by examining the activity measurements and assessing the various performance metrics, both at regional (macro) and local (micro) levels.

7.1.1   Comparison at the Macro level

The metrics used to measure performance of the value chain at the macro level included such indicators as value added (a useful measure to understand the sector's potential as a source of growth for the overall economy); also impact on the regional economy and state budget, and others. A macro-level comparison was possible for cotton and wheat chains only; insufficient and inconsistent data on fruit and vegetable chains did not allow for deeper economic analysis.

In general, according to value chain analysis, the CVC in Khorezm could be characterized as having growth potential and market oriented/production objectives. The WVC could be characterized as having poverty alleviation potential and aiming at food security objectives[65].

The CVC produced products worth half of the total output value of Khorezm region in 2005; it earned virtually the entire foreign exchange revenues; provided real support to the government in terms of tax payments, which amounted to about half of total taxes levied in Khorezm. Finally, value added created by the CVC was much higher than value added of the WVC (Figure 7.1, Table 7.1). Concerning marketing efficiency, both value chains had

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[65] In this chapter, the cotton value chain is compared to the "official" wheat value chain only (for more details see Chapter 5).

the same level of transaction costs on a per unit of monetary output basis (USD 0.03). However, in absolute terms, the CVC incurred much higher transaction costs along the chain (USD 9.2 million vs. USD 1.5 million) (Table 7.1) (for more details on indices from Table 7.1 refer to chapter 4.5 and 5.4).
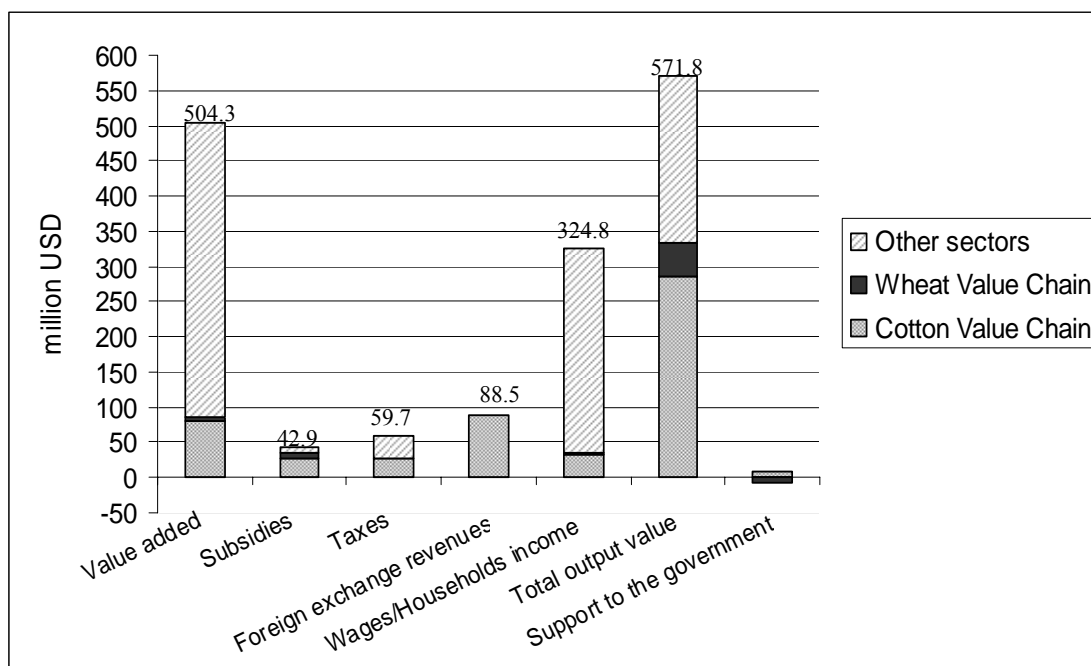
Figure 7.1 Cotton and wheat value chains against the background of the Khorezm regional economy, 2005

(Source: own presentation based on survey results and OblStat data)

The WVC had moderate or low performance indicators compared to the CVC. It created low value added, and produced products of low total output value. Taxes accrued by the wheat chain could not cover subsidies provided by the state for wheat growing, thus the WVC was more like a drain to the government (Figure 7.1, Table 7.1). However, wheat continues to be the second most important crop in the country as it provides food security.

Other sectors, as shown in Figure 7.1, included industrial sectors (other than agro-processing of cotton and wheat); construction; trade and public food sectors; and services.

Lower performance of the WVC compared to the CVC can be explained partly by the fact that wheat was consumed by the local population (predominantly rural) and thus such indicators as output values, taxes, value added did not appear in official statistics and were hard to estimate.

In terms of households' income, both cotton and wheat chains had low shares due to the large share of population engaged in non-industrial sectors, like trade, catering, or other services provision. This partly explains also low shares of the chains in total value added to the region, or GDP (Figure 7.1).

Table 7.1 Value chains' performance macro indicators

	Unit	Cotton Value Chain	Wheat Value Chain
Personnel remuneration	million USD	32.265	2.04
Profits	million USD	5.842	0.81
Depreciation	million USD	2.108	0.80
Financial charges	million USD	4.331	1.84
Taxes	million USD	26.817	0.50
Remittances to non-budgetary funds	million USD	7.760	0.19
Social payments	million USD	0.155	0.12
Value added	million USD	79.278	6.29
Output value	million USD	285.804	46.968
Subsidies	million USD	26.307	8.968
Support or drain to the government	million USD	8.425	-8.162
Transaction costs	million USD	9.230	1.506
Share in GDP	%	16	1.2
Integration with economy	coefficient	0.28	0.13
Consumption of fixed capital	coefficient	0.03	0.13
Real government cost coefficient	coefficient	0.32	-0.91
Efficiency of activities	coefficient	0.02	0.03
Transaction costs per output unit	USD	0.03	0.03

Source: OblStat, own survey results

Due to the more complex character of the CVC, with many products produced from cotton and thus many industries are involved, integration with the rest of the economy is higher than in the WVC. In general, integration of the CVC is still considered rather low, with only 28 percent, determining strictly export-oriented value chain (in 2005 89 percent of cotton fibre was exported from Khorezm). The chains did not differ substantially in terms of efficiency of activities and strictly from a traditional economic perspective. In both chains efficiency indicators (as measured by simple rates of return) were quite low, in the range of 2-3 percent.

7.1.2 Comparison at the Micro level

Comparison of the value chain at the micro level was based on such indicators as costs of production, profits received and productivity. Comparative analysis here was undertaken for different stages of the chains, starting with farmers and encompassing primary and secondary processors.

Among the crops, analysed in the value chains, cotton had highest production (primary) costs, followed by vegetables, winter wheat and fruits respectively (Table 7.2). The CVC did also receive the highest support from the government in the form of subsidisation; second came wheat. Fruits and vegetables, although out of the state order system, were also implicitly subsidised (for irrigation and drainage costs).

Table 7.2 Value chains' performance micro indicators (agricultural producers)

	CVC (raw cotton)	WVC (wheat)	FVC (apples)	VVC (tomato)
Cropped area, thousand ha	109.8	47.3	7.2	2.9
Cropped area, % of total	49	21	3	1
Primary costs, USD / ha	487	296	251	358
Primary costs, USD / ton	193	90	49	39
Operating profit (state/processors), USD / ha	138	-2	158	64
Operating profit (state/processors), USD / ton	55	0	-4	6
Operating profit (market sale), USD / ha	n/a	293	1300	486
Operating profit (market sale), USD / ton	n/a	80	130	51
Profit margin	19.9	-11.7	-14	14
Profit margin (market sale)	n/a	44	72.5	57
Subsidies, USD / ha	229	190	181	184

Source: OblStat, own survey results

At the same time, cotton brought agricultural producers a stable and comparatively high operating profit per unit of output. Wheat, fruits and vegetables could provide farmers with high income if sold on the market, rather than to the state, or even to private processors. The highest return was measured from fruits sold fresh on the markets, which in part justified the reluctance of farmers to cooperate with processors; this has therefore led to undeveloped, short and weak fruit and vegetable chains.

The study showed that the costs of fertilizers and pesticides (especially with fruits and partly[66] cotton production) constitute the two major costs, (Figure 7.2) and therefore might offer a substantial cost reduction potential. High cost share of fertilizers resulted from either high amounts that had to be used in order to reach the targeted output levels, or due to quite high prices charged for this indispensable input. In general, other main cost drivers for all specified crops were planting costs (including land preparation and costs of seeds) and fuel.

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[66] Less pesticides are used now in cotton production, pest control is undertaken via biomethods (refer to chapter 4.4)

The policy of self sufficiency in food pursued by the government of Uzbekistan after independence has been generally considered economically unjustified[67]. Export revenues accrued from cotton sales would allow the government to buy a higher volume of wheat than could be produced in Uzbekistan (economically the return from one hectare of cotton is higher than of wheat).
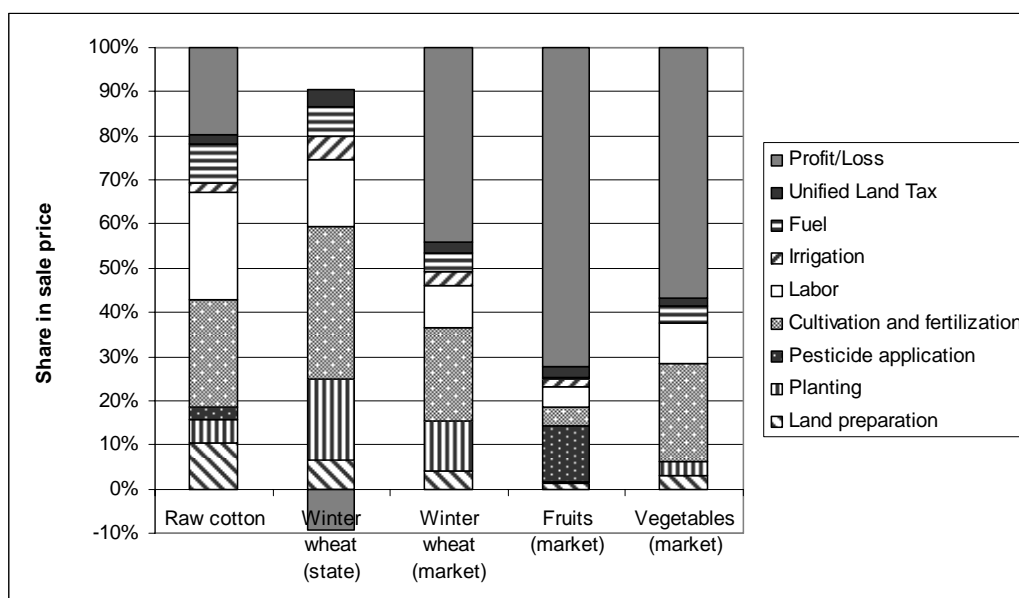
Figure 7.2 Structure of the value chains of agricultural producers in Khorezm, 2005

(Source: own presentation based on survey results)

Average wheat yields in Uzbekistan were not lower compared to the yields in other countries (as found in FAOSTAT); however, the quality remains low according to international standards and, as a consequence, influences the quality of subsequent products such as wheat flour and bread. Thus, either the quality of local wheat should be raised via improving agricultural practices or introducing better varieties; or to move away from producing an inferior product in the country.

7.2   Benchmarking

Benchmarking allowed for the comparison of the value chains with other producers in the industry, and thus to compare best practices among competitors. The comparison aimed at identifying upgrading needs and potentials. Based on the available data from countries (both developing and developed) with similar value chains and also based on the studies of the chains at stake, it was possible (first) to benchmark to a larger extent the performance of

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[67] based on informal interviews in the current study

the CVC, rather than other chains; and (second) to benchmark indicators from the areas such as state support, production costs and efficiencies of producers (agricultural as well as others involved in the chains).

State subsidies

The highest subsidies are paid to cotton farmers in Europe: about 342-594 Euro per hectare in Greece, and 1,039 Euro per hectare in Spain (USDA, 2005b). The United States and China also heavily support their farmers. These countries provide state support in different ways from direct payments to farmers to cover the difference between the world price and loan rates and to protection of the domestic markets through a system of quotas and levies. Cotton growing farmers in China receive as much as USD 0.23 per 1 kg of ginned cotton, which if translated into raw cotton (given Chinese productive efficiency) would almost underwrite the cost of production[68]. Estimates of the International Cotton Advisory Committee (ICAC, 2007) show that annually subsidies reach 50 percent of world prices in the USA, 20 percent in China, and over 100 percent in the EU. Countries like Turkey, Colombia, Mexico and Brazil provide smaller support in the form of direct income and price supports. In contrast to the majority of cotton producing countries in the world, farmers in Uzbekistan do not get price differentials, but are subsidised at the amount of USD 229 per cotton hectare through handling and maintaining of agricultural production infrastructure, like irrigation and drainage (refer to chapter 4).

The impact of state support in the world is generally believed to keep cotton prices artificially low, while cotton producing countries classified as developing (especially in Africa) bear the losses. There is an agreement in the International Cotton Advisory Committee (ICAC) that government measures worldwide, which distort cotton production and trade, should be reduced and eventually eliminated. With the elimination of subsidies in Uzbekistan, it is most likely that agricultural producers would be affected the most, with their profits going substantially down and no scope remaining to build farm capital. Farmers would have to cover the costs which were previously subsidised by the state and thus their production costs would get much higher. The outcome and impact of the eventual removal of agricultural subsidies in Uzbekistan is described in detail in the next chapter.

Raw cotton production efficiency and pricing

The tendency of cotton yields in the world in the last decades has been rising. The average world cotton yield rose from 580 kg (in terms of ginned cotton) in the 1990s to 740 kg presently (ICAC, 2007). It was estimated that in order for the farmers to get profits from the

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[68] http://www.downtoearth.org.in/editor.asp?foldername=20060615&filename=Editor&sec_id=2&sid=1

production of cotton, the yield should be equal or over 2.8 tons of raw cotton per hectare (ADB, 2006). The highest yielding cotton growing countries include Australia, Israel, Syria, Turkey; among the lowest yielding are India and sub-Saharan Africa (ICAC, 1998; FAS, USDA, 2000). The Central Asian countries, such as Kyrgyzstan can produce from 2.2 to 3.5 tons of raw cotton per hectare. Uzbekistan, with farmers producing on average 2.6 tons of raw cotton (refer to chapter 4), or about 850 kg of ginned cotton per hectare, falls in a range of average yielding countries, although some improvements could be achieved in the quality of raw cotton (better varieties and less trash content).

Raw cotton production in Uzbekistan in 2005 required on average USD 487 per hectare or USD 193 per ton of raw cotton (Table 7.2), which is slightly higher than in countries with a similar post Soviet heritage. In Kyrgyzstan, this figure was in the range of USD 407 per hectare or USD 166 per ton (Global Development Solutions, LLC™, 2003). A recent survey on costs of cotton production in the world showed that West Africa (especially Benin, Mali, and Burkina Faso), Uganda, Tanzania, are among the lowest cost producers. High cost producing countries are the United States, Israel, and Syria, while the two European cotton producers, Greece and Spain, are probably the world's highest cost cotton producers (Baffes, 2004). Another survey on raw cotton production costs conducted by the ICAC at an earlier stage suggests that Turkey and the United States are high-cost producers of cotton, both calculated on a per hectare and on a per-kilogram basis (ICAC, 1998; FAS, USDA, 2000). In the United States, costs of biotech seeds, a strong currency, relatively high labour costs, and additional costs due to irrigation regulations were among the factors contributing to higher production expenses. Only some of these costs could be offset by higher per hectare yields and better staple quality. According to the same survey, China and Pakistan had the lowest per-kilogram costs in the group of eight, which reflected an increased use of GM seeds (to control weed and animal pest damage and increase yields), and the continued use of low-wage labour to hand-pick the harvest. Growing GM cotton in Uzbekistan is currently not practiced basically due to the unknown longrun impact of GM cotton on human health as well as on animals (cotton by-products such as oil and cottonseed meal and husk are largely consumed in local realities).

According to price determination analysis the returns to farmers from production of raw cotton in Uzbekistan stands higher than that of Tajikistan (with 66 percent share in the export price of ginned cotton vs. 52 percent share in Tajikistan). But if compared to the return to farmers (up to 90 percent of ginned cotton price) in developed countries like Australia, the return in Uzbekistan is lower.

Ginning efficiency and costs

In the ginning sector not much has changed in Uzbekistan since independence, the reforms and upgrading of this sector have been slow and the ginning output ratio of 30-33 percent (Table 7.3) remains lower than in other cotton producing countries. The ginning efficiency in countries with similar preconditions of the cotton sector (Kyrgyzstan for example) was reported at 33-45 percent and in many other developing countries at 39 percent (UNDP Uzbekistan, 2006a). Countries of West and Central Africa, where the cotton sector was in some way liberalised, manage to process raw cotton with 40-43 percent ginning efficiency (Badiane et al., 2002; Cotton Outlook, 2005).

Although not very efficient, ginning in Uzbekistan is nevertheless less expensive than in many cotton producing countries in the world. According to value chain analysis, the average cost of ginning of Uzbek cotton stands at about USD 158 per ton of fibre, roughly half of which is attributed to taxes (Table 7.3). Other costs of ginning cotton in Uzbekistan include labour payments, energy and depreciation costs, current repairs, packing, as well as transportation costs for the produced cotton fibre.

Table 7.3 Value chains' performance micro indicators (1st stage processors)

	CVC (fibre)	WVC (flour)	FVC (apple juice)	VVC (tomato paste)
Input costs, USD / ton	644	138	610	780
Processing costs, USD / ton	158*	15	81	189
Primary costs, USD / ton	802	153	691	969
Profit (state/processors), USD / ton	-42	-14		
Profit (market sale), USD / ton	n/a	33	296	108
Profit margin (state/processors), %	-4.5	-8.3		
Profit margin (market sale), %	n/a	15.2	30	10
VAT, USD / ton	190	35		
Processing efficiency (outturn ratio), %	30-33	75-80	33-37	12-13

Source: OblStat, own survey results

* processing costs 87 + taxes 71 USD / ton

The highest cost of ginning was reported in Spain, standing at USD 549 per ton of fibre (Chaudhry, n/a). Ginning is also expensive in Argentina, Bolivia, Pakistan, Paraguay, Philippines and Zimbabwe. Ginning was reported least expensive in China (Mainland), where ginning is publicly owned and under the control of the Bureau of Cotton and Jute of the All China Federation of Supply and Marketing Cooperatives (Chaudhry, n/a).

Textiles manufacturing

With privatisation of the textile industry in Uzbekistan and the attraction of foreign investors into the industry, many developments could be traced. Not only did production efficiency and quality of the products improve (due to the imported up-to-date technologies), but so did the diversification of the textile products produced in Uzbekistan. Nevertheless, for the moment, only yarn-producing joint ventures benefit from modern equipment and quality certificates which allow them to compete on world markets. However, approximately 20 percent of yarn is produced by enterprises with outdated equipment whose low quality yarn reduces the quality of cotton and blended fabrics. Only a few new joint ventures produce cotton fabrics in plants equipped with modern facilities (UNDP Uzbekistan, 2006a). On the other hand, given the present favourable circumstances created for the textile manufacturers, the level of profitability is much lower than that not only of China, Bangladesh and other developing countries but also of Kazakhstan and Russia (UNDP Uzbekistan, 2006a). The reason lies in a heavy tax burden on textile enterprises, including compulsory payments to Non-budgetary Funds. According to the survey costs of producing cotton yarn in Uzbekistan is as high as USD 340 per ton (Table 7.4).

Table 7.4 Value chains' performance micro indicators (2nd stage processors)

	CVC (yarn)	WVC (bread)
Input costs, USD / ton	1182	153
Processing costs, USD / ton	340	36.7
Primary costs, USD / ton	1522	189.7
Profit (market sale), USD / ton	136	23.6
Profit margin (market sale), %	6.5	9-10
VAT, USD / ton	285	37.9
Processing efficiency (outturn ratio), %	86	135

Source: OblStat, own survey results

Benchmarking of prices for textiles showed that according to price, textile products manufactured in Uzbekistan in 2005 were competitive compared to prices paid in the European Union for products locally produced (i.e. in EU), and for products imported to EU from abroad (as found in Commission of the European Communities, 2003). Uzbek cotton yarn (exported from Khorezm), for example, was 2.4 and 4.8 times cheaper than EU imported and EU produced cotton yarn, respectively. Likewise, Uzbek cotton fabrics were 2.5 and 3.4 times cheaper; whereas Uzbek T-shirts were 2 and 10 times cheaper respectively.

In order to be able to compete in the world textiles' sphere, not only the production costs should be lowered, but most importantly the production facilities modernised and quality upgraded further; credits or investments for which can only be assured if the whole cotton-textile sector is privatised. Other important aspects of entering competition are the compliance of the Uzbek textile products to consumer demands (and this can be overcome if global fashion trends are followed closely). The availability of interim goods is likewise very important, such as dyes and accessories (for this is important either to develop such adjacent industries or to lower import tariffs and other barriers).

Export opportunities and barriers

The Centre for Economic Research in Uzbekistan in 2005 has conducted a survey of export barriers and opportunities in Uzbekistan (CER, 2005). According to their results, export procedures are seen by producers operating in the country as burdensome, i.e. incurring high time and monetary expenses. The "...high cost of Uzbek exports could be explained by four interrelated factors: (1) overall trade policy; (2) export barriers; (3) deficiencies in transport and transit; and (4) insufficient attention to export promotion..." (UNDP Uzbekistan, 2006b). The main obstacles when exporting include high customs clearance (0.2 percent of export value), transport and transit barriers, which have a negative impact on time of deliveries, high volume and costly export documentation (about 1 percent of export value), including registration of export contracts, certification. The total time of exporting, a procedure which can take up to three weeks, was similarly noted as a significant concern (CER, 2005, UNDP Uzbekistan, 2006b).

Some other business regulations (and specifically for private exporting units) prevent export development, such as non-reimbursement of VAT, 100 percent prepayment of total export value, little access to information, and undeveloped marketing and consulting services (Abdurazakov, 2006). Due to the mentioned and other reasons these private exporting units account only for a very low share of export transactions, the biggest share (80 percent) comes from the large scale state trading companies dealing with exports.

Uzbekistan is a landlocked country, and its geographical location contributes further to export obstacles. Export of the Uzbek goods through third countries entails high administrative and unofficial barrier and costs; such costs account for 24 percent of total export value (Abdurazakov, 2006). For comparison, in countries of the EU, such costs account for less than 13 percent; in countries of Latin America – 17 percent (Abdurazakov, 2006).

8   Policy simulation models in the value chains

This chapter deals with additional analyses and deterministic policy simulation models in order to provide some guidelines for possible strategy formation. Policy simulations in the context of the CVC and partly of the WVC are demonstrated here due to the CVC's higher importance and scope, as described and compared in Chapter 7. A total of five models were designed and simulated as described in the following chapter; each with its own objective and including multiple scenarios to test the stated hypothesis for each model. The first two models were designed to reveal how increased processing of cotton fibre inside the region could contribute to (1) the generation of higher export revenues, and (2) receiving the same export revenue, but with less agricultural resource endowment. The third (3) model looks at subsidisation and the impact of eliminating subsidies on cotton growing farmers. The fourth (4) model deals with the potential scope of higher returns to the Uzbek cotton growing farmers. The fifth and final model (5) in the context of the WVC, tests if wheat imports are economically more efficient and feasible in the region when compared to local production of wheat.

8.1   Policy simulation models in the CVC

Four models were simulated for the Khorezm region in order to tackle the potential impact and benefits from upgrading and developing the CVC. Each model in turn tested several scenarios, as described in each subchapter below.

8.1.1 Model 1:   Increasing domestic fibre processing to achieve higher revenues

The main objective of Model 1 was to further understand what improved utilization of present textile capacities (with no additional investments or state support) would generate in terms of revenue. To this end, the following hypothesis was tested: It would be possible to generate higher export revenues with the same resource endowment by the CVC, if more cotton fibre is processed inside the region into products with higher value added.

As shown by value chain analysis, the maximum processing capacities of the actors of the CVC in the Khorezm region in 2005 were, in general, underutilized. This was especially true for the textile producers, who only processed about 9 thousand tons of cotton fibre (or 11 percent of total fibre output), although they had processing capacities of up to 20 thousand tons of fibre (refer to Figure 4.6, p.63 and Chapter 4.4.4.4, p.91). The underlying reasons for the low processing performance of textile producers were discussed in more details in Chapter 4. Larger share of cotton fibre (89 percent of total fibre output) was

exported from the region. Other CVC products, like cotton yarn, fabrics, ready made garments, and absorbent cotton were produced and exported from the region in little amounts. The ginneries operated with low ginning efficiency. The raw cotton to fibre output ratio was in the range of 30-33 percent, which is lower than in other cotton producing countries (refer to Chapter 7.2, p.174).

The variables to be changed across the scenarios were: the amount of cotton fibre forwarded for local processing as opposed to exports; ginning efficiency; stages of production along the CVC, and the products to be exported.

For the simulations performed under the assumptions in Model 1, the textile industry was set to fully utilize the existing processing capacities – to process about 20 thousand tons of cotton fibre (or around 20 percent of all marketed fibre in the region). A higher figure, such as 50 percent as suggested by the National Programme on Development of Textile Industry, was not considered realistic based on the existing infrastructure in the Khorezm region. Several scenarios (Table 8.1) were simulated in order to reflect the processing of fibre through all subsequent stages up to the ready-made garments.

Baseline Scenario

The *baseline scenario* depicts the actual situation for 2005 (as found during the survey), where 9 thousand tons of fibre are processed domestically, and the remaining (89 percent) exported. Total export revenue of the CVC in Khorezm totalled USD 86.7 million in 2005, including a small contribution of the textile industry of about USD 2.3 million.

Scenario 1

Scenario 1 simulated the possible absence of the textile industry in the region. To this end, two assumptions were made*:* firstly, that textile producers did not operate at all; secondly, all fibre produced in the region was exported. Because the present textile capacities were underutilized, most of the textile enterprises hardly managed to cover their fixed costs and especially to pay off credits. Due to this underutilization, most enterprises went bankrupt; many foreign partners withdrew their activities from the country/region.

Scenario 2

In *scenario 2* the ginning efficiency was increased by 3 percent, raising efficiency from the existing 33 percent to 36 percent of raw cotton to fibre output; the resulting output of fibre was then assumed to be exported. According to the interviews with local ginning specialists it is possible to reach the ginning efficiency of maximum 36 percent if the ginning equipment is used more efficiently or is slightly upgraded (repaired).

Scenarios 3-5

Scenarios 3-5 allowed local textile enterprises to process 20 thousand tons of cotton fibre into cotton products for subsequent exporting. The remaining amount of fibre (about 80 percent) continues to be exported. In *scenario 3* along with export of cotton fibre, local textile enterprises produced and exported cotton yarn. In *scenario 4* cotton fabrics were manufactured and exported along with the rest of cotton fibre. And finally, *scenario 5* assumed production and export of the ready made garments (on the example of T-shirts) along with the rest of fibre.

Table 8.1 Description of scenarios for Model 1

Scenario	Description
Baseline	**2005** indicators
Scenario 1	Export of **total fibre** output
Scenario 2	Increased **ginning efficiency** and export of total fibre output
Scenario 3	Export of fibre and produced **yarn**
Scenario 4	Export of fibre and produced **fabrics**
Scenario 5	Export of fibre and produced **T-shirts**

Source: own compilation

Simulation results showed that deeper processing of cotton fibre inside the region had potential to increase export revenues and to improve the performance of the CVC in general in terms of additional jobs created along the CVC, higher value added within the region and thus benefiting not only the state, but also other actors of the chain. Thus, the above stated hypothesis is supported by the results. Had local processors of cotton fibre been allowed to fully utilize all their processing capacities and more textile products been exported, the export revenue in the best case scenario (scenario 5) would have increased about two times and reached USD 164.6 million (Table 8.2 and Figure 8.1).

Table 8.2 Potential increase in export revenues according to Model 1

	Export revenue, billion UZS	Export revenue, million USD	Potential increase in export revenue, million USD	Fibre export, % of total fibre output
Baseline	96.58	86.66	0	89
Scenario 1	121.74	109.23	22.57	100
Scenario 2	133.39	119.69	33.03	100
Scenario 3	135.23	121.34	34.68	80
Scenario 4	148.99	133.68	47.02	80
Scenario 5	183.39	164.55	77.89	80

Source: own survey results

Export revenue from textile products in the baseline scenario was as low as USD 2.3 million. In the case of increased domestic fibre processing and subsequent export of textile products, an additional revenue of USD 34.7 million could be generated in case of yarn exports; USD 47 million in case of cotton fabrics exports; and up to USD 77.9 million in case of ready-made garments exports (Table 8.2). The increase in the ginning efficiency alone (scenario 2) could bring up to USD 33 million compared to the baseline scenario.
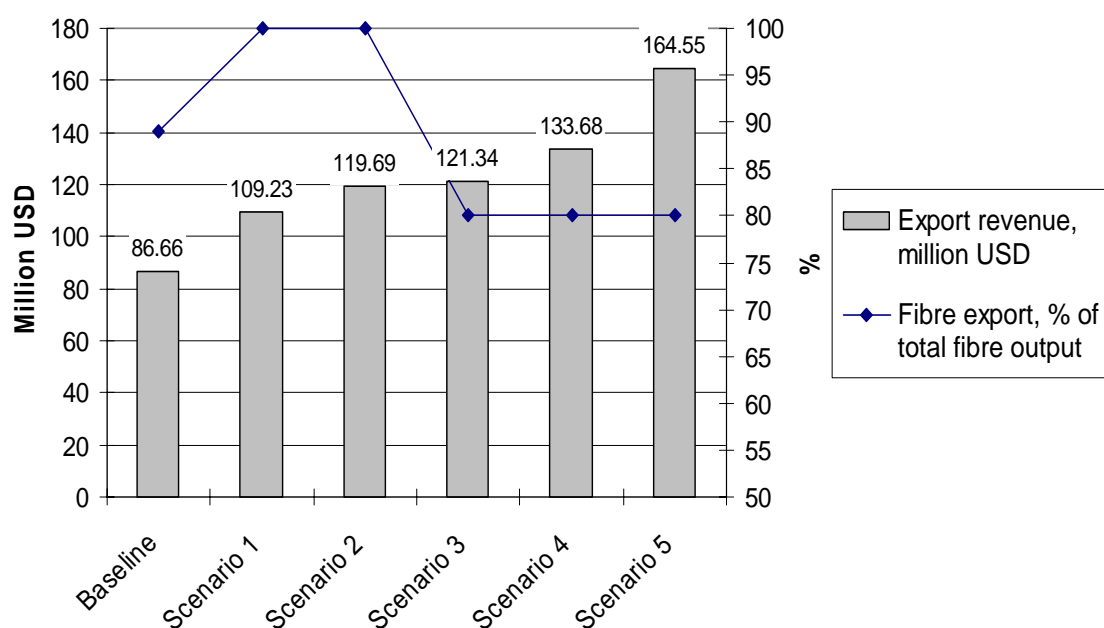
Figure 8.1 Export revenues according to Model 1

(Source: own presentation based on survey results)

8.1.2 Model 2: Increasing domestic fibre processing for less raw cotton production

The main objective of Model 2 was to see what full utilization of present textile processing capacities inside the region would bring. The hypothesis here, however, was: It would be possible to maintain the present export revenues from the CVC with less raw cotton production, if more cotton fibre is processed inside the region into products with higher value added and more such cotton products are exported.

The variables to be changed across the scenarios in Model 2 were also the amount of cotton fibre forwarded for local processing as opposed to exports; ginning efficiency; stages of production along the CVC and the products to be exported. The export revenue across

scenarios was kept the same; however, various amounts of cotton fibre and cotton products required to get this fixed revenue were simulated in this Model.

Baseline Scenario

Performance of the CVC as observed in 2005 (with the export of 89 percent of total fibre output and 11 percent locally processed) set the basis for the *baseline scenario* and was compared to other scenarios (Table 8.3). The CVC earned about UZS 97.6 million (or USD 86.7 million) of export revenues in the Khorezm region in 2005. About 287 thousand tons of raw cotton were produced from 110 thousand hectares of land and with the use of about 824 million cubic meters of water for irrigation. The government spent about USD 20 million on subsidising cotton production in Khorezm in 2005.

Scenarios 1 and 2

Scenario 1 and *Scenario 2* have similar settings as in Model 1. First, no textile industry was operating in the region; and second, ginning efficiency was increased by three percent compared to the baseline scenario and the yielded fibre was assumed to be exported.

Scenario 3

Scenario 3 assumed that spinning factories were operating at 100 percent capacities and all cotton yarn produced in the region was exported together with the remaining 71 percent of produced fibre. This remaining amount of cotton fibre to be exported (also in *scenarios 4 and 5*) was calculated as residual between the fixed export revenue and the revenue received from the export of produced yarn (in *scenario 4* – of fabrics and in *scenario 5* – of T-shirts), which together could earn the required amount of export revenue.

Scenario 4

Scenario 4 allowed for deeper fibre processing in the region with the export of not cotton yarn but cotton fabrics with the remaining 65 percent cotton fibre, required to receive the fixed amount of export revenue.

Scenario 5

In *scenario 5* certain amounts of cotton fibre went through the complete processing cycle, ready made garments (on the example of T-shirts) were produced and exported with the remaining 32 percent fibre in order to receive the same value of regional export revenue.

Table 8.3 Description of scenarios for Model 2

Scenario	Description
Baseline	**2005** indicators
Scenario 1	Export of **100% cotton fibre**
Scenario 2	Increase in ginning efficiency and **100% fibre** export
Scenario 3	Export of **71% cotton fibre** and produced **cotton yarn**
Scenario 4	Export of **65% cotton fibre** and produced **fabrics**
Scenario 5	Export of **32% cotton fibre** and produced **garments (T-shirts)**

Source: own compilation

As expected, results from simulation of Model 2 showed that development, upgrading and streamlining of the CVC in Khorezm would allow for reduction in raw cotton production, cotton plantations, water used for irrigation and also it would allow the state to save a significant amount of budgetary resources, which would be used to subsidise raw cotton production (Figure 8.2).
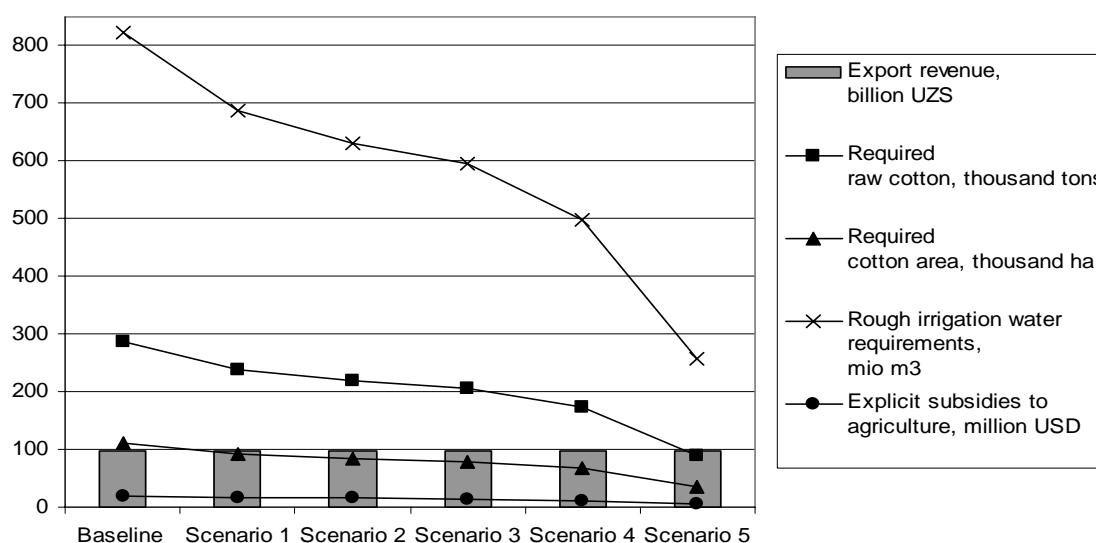
Figure 8.2 Reduction in the main raw cotton inputs against the same export revenues according to Model 2
(Source: own presentation based on survey results)

Improvement and better management of the ginning sector alone could allow for the reduction of 18 thousand ha of cotton plantations, 136 million m^3 of water for irrigation and about USD 3 million of explicit subsidies compared to the baseline outcomes (Table 8.4, scenario 1). Increased ginning efficiency to about 36 percent would increase cotton fibre

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output and could support the baseline export revenue with less raw cotton (reduction of 23 thousand ha), less water for irrigation (reduction of 193 million m^3) and less subsidies for cotton farming (a USD 4 million reduction) (Table 8.4, scenario 2).

Table 8.4 Reduction in raw cotton plantations, irrigation water and subsidisation according to Model 2

	Export revenue, billion UZS	Required raw cotton, thousand tons	Required cotton area, thousand ha	Reduction in cotton area, thousand ha	Reduction in cotton area, %	Irrigation water on field level, mln. m3	Explicit subsidies to agriculture, million USD
Baseline	97.615	287	110	0	0	824	20
Scenario 1	97.615	239	92	18	17	688	17
Scenario 2	97.615	219	84	26	23	631	16
Scenario 3	97.615	207	79	30	28	596	14
Scenario 4	97.615	173	67	43	39	499	12
Scenario 5	97.615	89	34	76	69	257	6

Source: own survey results

The more processing stages cotton fibre undergoes, the higher prices for the produced cotton products may be received and thus less amount of these products (and in the end less amount of cotton fibre and raw cotton) would be required to receive the same level of regional export revenue. Because of such price differentials, involvement of the local textile enterprises in processing cotton fibre into cotton yarn had a potential to earn the same regional export revenue at the expense of reductions of 30 thousand ha of cotton plantations, 228 million m^3 of irrigation water and about USD 6 million of explicit subsidies (Table 8.4, scenario 3). The best case scenario (Table 8.4, scenario 5) with textile enterprises of Khorezm being engaged in deeper processing of cotton fibre into ready made garments could decrease the main critical inputs for raw cotton production by more than two thirds (!), or by about 76 thousand ha (69 percent of the baseline cotton area), 567 million m^3 of irrigation water and about USD 14 million of subsidies.

It should be mentioned that along with the reduction in raw cotton production, the oil extracting industry in Khorezm could get affected (less raw cotton produced – less cottonseed for the oil extraction) and would have to lower its production capacities. Production of edible cotton oil would be reduced by three times, which however, should not represent a problem because other types of vegetable oil (sunflower seed oil for example) are available and can be used as substitutes, being both healthier for the people and the environment.

8.1.3   Model 3: Reduced subsidisation

In the light of the latest developments on the international trade arena (where major cotton producing countries are pushed to eliminate subsidies from their cotton production schemes in order to create a more favourable and competitive environment and to increase world prices (WTO, 2007)), it is likely that Uzbekistan would have to do so as well. Elimination (or reduction) of subsidies by the Uzbek government would also fit to the ongoing cotton sector privatisation plan, which is to be enforced and the real changes to take place in the near future (2008-2010). The main objective of Model 3 stated that the GoU was no longer subsidising the CVC. Elimination of subsidies for the costly irrigation and drainage networks, as well as such agricultural inputs like fuel, fertilizer and water, and also credits to farmers was tested stepwise in 4 scenarios in order to tackle the impact of subsidies' elimination on the cotton growing farmers.

Baseline Scenario

The *baseline scenario* depicts subsidisation of the CVC in Khorezm in 2005. Subsidies which the GoU provided to the entire CVC in 2005 (and 2004 in case of cotton farming agriculture) reached USD 26.31 million, including USD 26.28 million to cotton producing farmers. Subsidies per cotton hectare, thus, reached 229 USD. According to farmers' survey and value chain analysis of the present study, farmers had to cover about USD 487 per cotton hectare.

Scenario 1

Scenario 1 tested the radical change case, where the GoU eliminated all subsidies to agriculture including the maintenance costs for irrigation and drainage network, free water for irrigation, debt write-offs, VAT waiver on fertilizers and fuel, as well as low interest rate credits; these costs being transferred to cotton producing farmers.

Scenarios 2-4

In *scenarios 2-4* subsidies' elimination was tested stepwise. For example, *scenario 2* assumed that the GoU continued to cover maintenance costs for irrigation and drainage, as well as provided free water for irrigation. All other subsidies to agriculture (cheap fertilizers, fuel, credits at low interest rate) were eliminated. In *scenario 3* water charges for irrigation were introduced and the GoU was covering only maintenance costs. In *scenario 4* the GoU in addition to maintenance costs provided also credits at low interest rates to cotton growing farmers (Table 8.5.)

Table 8.5 Description of scenarios for Model 3

Scenario	Description
Baseline	subsidies provided to the CVC in 2005 (2004*)
Scenario 1	no subsidies to cotton farming
Scenario 2	subsidies for irrigation and drainage + water for irrigation
Scenario 3	subsidies for irrigation and drainage
Scenario 4	subsidies for irrigation and drainage + credits to farmers

Source: own compilation

* subsidies to cotton growing farmers were provided in 2004

The impact of elimination of subsidies by the state seems almost unpredictable. The lump sum of subsidies provided to the CVC was directed mainly to the agricultural sector. With elimination of subsidies it is most likely that agricultural producers would be affected the most, with their profits going substantially down and no scope for building the farm capital remaining. Farmers would have to cover the costs which were previously subsidised by the state and thus their production costs would be much higher compared to the baseline scenario. For example, it was estimated that the government spent on subsidisation about USD 229 per each cotton hectare. If farmers had to take over the responsibility for irrigation and drainage, and water, etc. then their average cotton production costs would increase from USD 487 (according to VCA) to USD 716 per hectare (Table 8.6, scenario 1).

Table 8.6 Reduction in subsidies to the CVC and its impact on the farmers according to Model 3

	Subsidies to the CVC, million USD	Total subsidies for cotton farming, million USD	Subsidies for cotton farming, USD per ha	Production costs of cotton farming, USD per ha
Baseline	26.31	26.28	229	487
Scenario 1	1.21	0	0	716
Scenario 2	21.29	20.08	183	533
Scenario 3	20.65	19.44	177	539
Scenario 4	21.32	20.10	183	532

Source: own survey results

At the same time under the present cotton procurement system and fixed state prices the farmers received a narrow margin of disposable[69] profits. It is questionable if the farmers

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[69] Disposable profit is what the farmers actually had left at their disposal after covering all the costs and undertaking compulsory payments (remittances) to non-budgetary funds

could bear even higher production costs, i.e. including the unsubsidised inputs. In order to avoid the complete collapse of raw cotton production it would make sense to eliminate subsidies stepwise, so that to give the farmers time to adapt. Elimination of subsidies for the inputs like fertilizers and fuel, and low interest rate credits would increase production costs for farmers up to USD 533 per hectare (Table 8.6, scenario 2). If the state continued to maintain irrigation and drainage systems but introduced water charges, the production costs of farmers would not be so drastically increased: they would go up to about USD 539 per cotton hectare (Table 8.6, scenario 3).

On the other hand the state would undoubtedly benefit from the policies of subsidies elimination. Total amount of subsidies provided to the CVC would go down to USD 1.2 million (Table 8.6, scenario 1) compared the USD 26.3 million of the baseline scenario. Continuation of maintaining of irrigation and drainage network only and elimination of other subsidies would allow the state to save about USD 5 million.

8.1.4 Model 4: Changing of the governing structure of the ginning sector for higher return to farmers

As shown in chapter 4.5 under the present state cotton procurement system, cotton growing farmers received in 2004 slightly above 66 percent of the world market price for cotton fibre, the rest being distributed among the service providing actors of the CVC: the Foreign Trade Companies, certification centre, customs, financial institutions, and transportation network. The ginning branch absorbed a quite large share of the cotton revenue (with 4.4 percent for the administrative or governing structure and about 20 percent for the producing units, the ginneries).

The general objective in simulation of Model 4 was based on the potential scope to raise the income of the Uzbek cotton growing farmers by excluding some of the CVC actors, providing governing functions (for more details refer to Chapter 4.5.1.5, p.105). This Model simulation was based on basically two scenarios.

Baseline Scenario

Baseline scenario was build upon the real settings of the CVC in 2005, where price for cotton fibre reached USD 737 per ton, price for raw cotton reached USD 236 per ton and the share of revenue from cotton fibre sales, transmitted to the farmers, reached 66 percent (Table 8.7).

Scenario 1

In *scenario 1* the ginning sector was simplified via removing its governing structure, the SJSC "UzPakhtaSanoat" and its regional branch in Khorezm, the SJSC "KhorezmPakhtaSanoat" (for details refer to Chapter 4.3.2, p.50). Exclusion of this actor from the chain seems most realistic and was in particular tested in this Model because all other actors of the CVC perform and provide indispensable services to the CVC as opposed to services provided by the ginning governing structure, which could potentially be transferred to the ginneries.

Table 8.7 Increase in return to farmers according to Model 4

	Baseline scenario	Scenario 1
Cotton fibre price, USD per ton	737	786
Raw cotton price, USD per ton	236	252
Share in export price of cotton fibre, percent	66	71

Source: own survey results

The results of simulation of Model 4 (Table 8.7) showed that even if the governing structure of the ginning branch was excluded from the CVC, the return to farmers from raw cotton would not increase substantially. This would only add about USD 16 per ton of raw cotton (Table 8.7).

What could be done, however, in order to further increase the return to farmers was to improve the efficiency of the ginneries and also (and most importantly!) to lower their processing expenses, which as shown by the analysis of price determination for Uzbek cotton fibre accounted for about 20 percent of the export price (refer to chapter 4.4.4.2, p.81). The ginning industry was heavily taxed: 73 percent of all taxes generated in the CVC, 64 percent of all remittances to non-budgetary funds were accrued by the ginning branch of the CVC. Financial charges comprised 43 percent, indicating that ginneries depended on credits. The fact that depreciation costs were low indicates that most of the ginning equipment was worn out and led to low productivity, lower fibre quality and higher expenses for maintenance and spare parts. Furthermore, privatising the ginning sector and giving them the freedom to market their produce – cotton fibre – could lead to a reduction in the revenue shares absorbed by the State Foreign Trade Companies.

The GoU started the privatisation of the cotton sector; however, the implementation has been slow and has not yet shown visible results on the ground. It will take time to change not only the structure of the CVC, but also, and maybe equally important the present mind-set of the stakeholders. Stakeholders along the CVC need to develop marketing and other capacities so that they can function effectively in terms of time and monetary flows.

Privatisation and upgrading of the main actors of the CVC may very well lead to an elimination of various intermediate agents and thus to lower transaction costs. If their present share of the revenues would consequently be allocated to farmers, it may result in an increase in farmers' revenues.

Summary

Simulation results showed that it would be possible to generate higher export revenues with the same resource endowment by the CVC, if more cotton fibre is processed inside the region into products with higher value added. In addition, deeper processing of cotton fibre would also open up job opportunities especially for the rural population (as most of textile enterprises are located in rural areas).

On the other hand, increased domestic fibre processing along with development, upgrading and streamlining of the CVC could allow for decrease in raw cotton production, cotton plantations and water used for irrigation, because the required (targeted by the regional government) value of export revenue could be received from exports of products with higher value added and higher prices.

With elimination of subsidies the farmers would have to cover the costs which are currently subsidised by the state and thus their production costs would be much higher compared to the current situation. In order to avoid abandonment of raw cotton production (due to high production costs) and in order for the farmers to adjust and to build some farm capital, it would make sense to eliminate subsidies stepwise.

The general assumption that income of the Uzbek cotton growing farmers could be substantially increased via excluding some of the governing structures from the CVC, specifically from the ginning sector of the chain, did not show much scope. This could only increase the prices paid to cotton producing farmers by about USD 16 per ton of raw cotton.

8.2 Policy simulation Model in the WVC

Value chain analysis of the wheat chain in Khorezm in 2005 showed that wheat production, although highly important in terms of preventing social unrest and fulfilling food security objective, was quite inefficient from economic considerations. In contrast to the CVC which created positive flows into the state budget, the WVC represented a drain to the government (basically through subsidisation of wheat growing farmers).

Wheat was not grown in Uzbekistan prior to independence, but rather was imported from the neighbouring countries, basically from Kazakhstan. The underlying idea in the WVC policy simulation Model was to see: (1) how much of foreign exchange would the

government have to spend on imports of wheat to cover the demand of local population; (2) how much of cotton fibre would be required to cover wheat import expenditures; (3) will such imports be economically efficient and feasible (compared for example to the land use for alternative crops).

Baseline Scenario

In 2005 wheat in the region was grown by large collective farms (*shirkats*, now extinct); private farmers; and by rural households (*dehqons*). The former two producers submitted their wheat output to the state (whereas farmers submitted only half of their output) and the latter cultivated wheat merely for home consumption (refer to chapter 5.3.4.1, p.126). No wheat was imported to Khorezm from abroad countries, but some wheat came from the neighbouring regions of Uzbekistan in order to meet total wheat demand. These aspects were included in the *baseline scenario*.

Scenario 1

In *scenario 1* state quota for wheat is abolished, however, farmers and *dehqons* continue growing cotton for their home consumption. Wheat which is not delivered to the state by the farmers and which is required to cover all the needs of local population in wheat products, is then imported.

Scenario 2

In *scenario 2* wheat as such is not included in agricultural production; neither farmers nor rural households cultivate wheat. The land released from wheat is used for growing alternative crops. The whole required amount of wheat to meet the demands of local population is imported from abroad (focus made on the neighbouring Kazakhstan, as a country which long used to be the major wheat exporter to Uzbekistan, which is located closest among wheat producing countries and which produces sufficient amounts and quality of wheat).

The advantage of this policy simulation is that the milling industry can continue operating, receiving the required inputs to keep processing capacities utilized and thus avoiding crashing of the large industrial sector and avoiding job losses in rural areas. Another positive aspect is that the main wheat by-product can also be utilized in the region, providing the animal breeding farms with an important animal feed.

Simulation results (Table 8.8) showed that with decentralisation of wheat production in Khorezm the state would have to import additional 79.3 thousand tons of wheat at the expense of about USD 9 million, which could be earned via export of about 8 thousand tons

of cotton fibre. Because cotton is an economically more efficient crop on a per hectare basis it would require only 9 thousand hectares to be planted with cotton in order to cover wheat import expenditures. The remaining land (about 11 thousand hectares) could be used for alternative crops, such as profitable (based on value chain analysis) fruits or vegetables, or tree plantations.

Table 8.8 Wheat imports according to the WVC Model

	Baseline	Scenario 1	Scenario 2
Wheat area, thsnd ha	47.3	27.5	0
Wheat output, tons	204.3	125.0	0
Wheat imports, tons	0	79.3	235.6 *
Wheat import expenditure, mio USD	0	8.7	25.9
Required cotton fibre exports, thsnd tons	0	7.8	23.3
Required cotton area, thsnd ha	0	9.1	27.2
Area for alternative use, thsnd ha	0	10.7	20.1

Source: own survey results

*this figure reflects total realistic wheat demand in the region based on the size of population and average wheat consumption per capita per year for Uzbekistan as found in FAO plus maintenance of the State Reserve Fund for wheat, excluding wheat seeding stock

In the case of a more radical scenario, where wheat is excluded from agricultural production pattern the total amount of wheat, stated at about 236 thousand tons, would have to be imported at the expense of about USD 26 million. Again, in order to cover these costs about 23 thousand tons of cotton fibre (currently the main export earner in the region) would have to be marketed. This scenario would release 20 thousand hectares of land, giving agricultural producers some room to diversify their cropping patterns, as well as income possibilities.

On the other hand, as shown by farmers' survey, scenario 2 seems less feasible from the farmer's perspective. The majority (about 50 percent[70] of responses) of the surveyed wheat growing farms confirmed that they would prefer to continue growing wheat due to (1) profitability of this crop; (2) suitability of this crop to the given agricultural conditions; (3) and because wheat was the main source of cash inflow to the farm and the main staple of their diet.

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[70] other crops included cotton (19 percent); other grains, like rice or sorghum (19 percent); and horticultural crops (12 percent)

9 Summary, conclusions and policy implications

9.1 General summary and conclusions

The survey of agro-commodities' value chains in the Khorezm region of Uzbekistan showed that in general the CVC could be characterized as having growth potential and aiming at market-oriented and production objectives. The WVC could be characterized as having poverty alleviation potential and could achieve food security objectives. Lower performance of the WVC, however, could be explained partly by the fact that wheat was consumed by the local population (predominantly rural) and thus such indicators as output values, taxes, value added, did not appear in official statistics and were hard to estimate. The ephemeral character of the poorly developed F&VVC and lack of data did not allow for a deeper analysis of the importance of these chains to rural/regional development, although they do have latent opportunities and advantages.

Uzbekistan is predominantly an agrarian country with a large share of the population living in rural areas and engaged in agricultural production. At present, most Uzbek rural areas face certain hardships, like low employment rates (caused by unattractiveness of rural employment due to low wages, hard work, and financial instability of rural enterprises, processors of agricultural products); low living standards and quality of life (including undeveloped infrastructure, lack of medical care centres and poor transportation network). In this respect, the agro-processing industry possesses the highest potential for sustainable development of rural areas as well as of regional economies. As shown by other studies (UNESCAP, 2003) the possible outcomes of development and upgrading of the agro-processing industry, and thus development of the value chain of agro-commodities would be: *poverty alleviation* (as labour intensive industries provide employment and specifically in the rural areas and raise income); *increased job opportunities for women* (agro processing is labour intensive with high involvement of female labour force); *improving balance of trade and performance of regional economies* (marketing of products with higher value added); *reduced negative impact on environment* (supporting revenues via production and marketing of value added products – processed agricultural products, rather than via intensive agricultural production and marketing of unprocessed products).

In order to achieve the benefits of the value chain development and of producing and exporting of goods (agriculture based) with higher value added, it is important to create a favourable environment for increasing exports. For this, the Uzbek export regime has to be fully and properly defined, including financial, fiscal and other instruments in compliance with international settings, rules, and standards (Abdurazakov, 2006). In order to promote

exports from Uzbekistan, it is necessary (1) to support exporting efforts through financing and insurance (public institutions for dealing with market failures and minimizing risks of exporting companies); to adhere to division of labour between producers and sellers for more efficient exporting and marketing (research); (3) to address the problems of customs regime, like transparency, standardization, risk management, cooperation of all institutes involved in trade and exports; (4) to reduce the deficiencies of transport and transit through development of transportation and forwarding services, regional cooperation among the Central Asian countries, creation of a general transportation network, and development of cheaper (non-monopolistic) air cargo; (5) to improve state regulations for clear, systematic and consistent government policies for support and promotion of exports; (6) to further attract FDI and to update business standards and practices (in order to export Uzbek goods to developed countries' markets); (7) to participate in various Regional Trade Agreements and other bilateral and multilateral agreements and negotiations (in order to increase exports to the neighbouring developing countries).

The survey has pointed to a number of problematic areas along the chains and thus possible areas where to intervene. The major concerns across the chains were: lack of coordination, institutional failure, policy failure (non-compliance), lack of competitiveness and low performance.

Lack of coordination and cooperation, which shows that chains are not functioning effectively as chains as such, but rather like separate producing units. In the course of economic development, both in rural areas and on a regional level, the integration, cooperation and coordination between and among the actors of the surveyed chains becomes increasingly important. Coordination is needed to create a competitive national chain (or a section of a chain).

Unstable working (business) environment, including taxation, financing, crediting and customs systems, as well as administrative control and barriers, caused by institutional and policy failure. Transaction costs analysis showed that transaction costs incurred by the state controlled actors of the value chains were in general higher (on per unit basis) than those of the decentralised (private) chain actors; one reason for this may lie in the lack of incentives for the state regulated actors to operate more efficiently and thus to increase marketing efficiency in particular. In this respect, privatisation and removal of some state structures from the value chain would induce actors of the chains to reduce costs, and operate more efficiently. On the other hand, in countries, where society's judicial system is not fully developed or is not functioning properly, centralised regulation of the marketing institutional settings (including enforcement of property rights, public regulation of grading,

standardization, quality monitoring) could be viewed as a necessary and better way of reducing transaction costs and making markets work more effectively, as well as supporting coordination and cooperation along the value chains.

Lack of inputs, both main and auxiliary. All the value chains' actors (from farmers to processors) stated lack of inputs as one of the major constraints. There are very few if hardly any alternative markets for the inputs. Due to a lack of coordination, the demands of processors down the chains are not taken into consideration, thus leading to the widespread underutilization of capacities, low returns, increased payoff times for investments, larger interest payments and low efficiencies. Furthermore, high costs of inputs such as electricity or other energy resources, unstable supply of gas and water to production sites increase production costs and reduce the opportunity of agro-processors to face tough competition from other local as well as foreign producers. Lack of auxiliary inputs, such as accessories, paints, or packaging represents a problem in making locally produced products appealing to consumers.

Financial problems are faced by most of the actors of the value chain, leading to lack of circulating assets among producers, their financial instability and insolvency. Problems of financial background arise from delayed payments for the marketed products, tax burden and compulsory remittances to non-budgetary and other funds, high transaction costs, costly services of intermediaries and high interest charges for credits.

Rather *low performance metrics*, efficiency indicators in particular segments of the value chain are caused basically by worn equipment and tools and lack and high costs of spare parts for equipment and machinery.

9.2 General policy implications

A value chain approach allows capturing real economic structures and thus can be useful in guiding development interventions. Below are listed the possible directions for improvement of the chains' performance, points to intervene and upgrade. These recommendations were identified based on the problems along the chains underpinned by the survey. These should not be seen as isolated measures, but rather changes that must be made in combination.

Initiation of legal framework (concerning taxation, training, financing and investments). It is proposed that for the chain to function effectively, incentives must be given at all levels of the chains, starting from agricultural producers, farmers and rural households, to processors and manufactures. Such incentives can include tax rebates from exported items (as foreseen in the Tax Code), improved (lower) taxation for producers and rationalisation

of prices. In the context of legal framework the Government could adhere to a complex industrial policy by developing the required settings for vertically integrated and coordinated industry with a special attention to all corresponding industrial branches.

Upgrading and increasing efficiency along the chains is highly important and can be carried out via private and government support initiatives. Upgrading along the value chains can help in moving towards productivity, quality and other standards, increased international recognition and trust, so that global value chains can develop. Literature on international upgrading experience suggests (Kaplinsky and Morris, 2002) that value chain upgrading should start with process upgrading (in production terms this would include productivity, efficiency, reduced costs and in marketing/management this would include inventory management, supply chain management).

Process upgrading or industrial upgrading in the studied value chains is definitely required at all the stages. At the farming level, this would entail an increase in quality of the products via introducing better varieties, better agricultural practices, and capacity building with respect to the demands of the subsequent chains' links. At the agro-processing level (ginning, textiles, milling, food processing), process upgrading would include modernisation of equipment and production technologies, raising productive efficiencies, as well as quality and also capacity building in terms of products demanded on international markets and competitive benchmarking. Process upgrading would set the basis for product upgrading, including development of new products (design) and higher quality; collectively, this would require increased investments and support. Production efficiency is necessary, but the quality of linkages and support systems plays a critical role in creating competitiveness (Baker, 2006); this calls for the next absolutely necessary condition for development of agro-commodities' value chains.

Constructing a close relationship between participants of the chains and improving linkages and partnerships along the chains is key to development. Consistency and reliability in supply and quality of products are significant hurdles for any value-added producer (Cowan, 2002). In order to overcome such hurdles, it is necessary to construct a close relationship between the participants of the chains. Improved management of the chains as part of process upgrading would be possible only via vertical integration, cooperation and coordination between and among the chains' actors.

Investments, financing and export promotion via low rates for domestic financing, rural banking system, domestic and foreign direct investments promotion. In order to attract further foreign direct investments, however, it is essential to establish a more stable business environment. For export promotion, the respective legal setting and infrastructure

are in need as well as capacity building with respect to the international standards applicable to the actors, processes and products along the chains.

Gradual development of private sector. For developing the chains, for export promotion, for producing auxiliary inputs, for creating alternative marketing opportunities for the actors of the chains and creating a competitive environment state should accelerate the emergence of private sector participants by privatising state-owned agro-processing enterprises and encouraging new entrants.

9.3 Summary, conclusions and policy implications in the value chains

9.3.1 The Cotton Value Chain

Uzbekistan has the potential to develop agro-processing industry, especially in the field of textiles based on its cotton production. However, lack of funds, rather low technological level and inefficiently working institutional settings present barriers to the future development of the whole cotton sector. The GoU started the privatisation of the cotton sector; however, the implementation has been slow and has not yet shown visible results on the ground. It will take time to change not only the structure of the CVC, but also, and maybe equally important the present mind-set of the stakeholders. Stakeholders along the CVC need to develop marketing and other capacities so that they can function effectively in terms of time and monetary flows. Privatisation and upgrading of the main actors of the CVC may very well lead to the elimination of various intermediate agents and thus to lower transaction costs and eventually to increased returns to agricultural producers. However, privatisation should be treated with care and should be carried out stepwise in order to avoid complete breakdown of the entire system. There are several short and long-term options for improvement of the CVC, often associated with the right, focused and transparent legislation and the state should take a great deal in pursuing and enforcing it. On a broader scale and from long term perspective, a system of financial incentives and manufacturing integration among the producers along the CVC could be introduced. Prospects for poverty reduction in rural areas would be improved with the reform of the cotton sector in order to enhance competition and allow a larger share of the world price to be passed through to farmers.

The results of the deterministic simulation models, as described in Chapter 8, are summarised below.

Policy simulation 1. Consumption of cotton fibre inside the region, i.e. deeper processing of cotton fibre into products with higher value added, has a potential to increase export

revenues and to improve the overall performance of the CVC in terms of additional jobs created along the CVC, higher value added within the region and thus benefiting not only the state, but also all the actors of the chain. If local processors of cotton fibre are allowed to utilize all their processing capacities and more textile products are exported, the revenue from exporting ready made garments can increase two fold. No doubt that in order to adhere to this scenario concurrently it is needed to create favourable export settings; support process, or industrial upgrading of local producers and also subsequent product upgrading, which could lead to higher competitiveness and world recognition of the Uzbek (cotton) products. Some lessons could be learnt from the EU textile and clothing sectors, which had responded to a highly competitive and demanding world market by factors (other than price), like the quality of production and "fashion content", the capacity to develop the highly demanded brands, the ability to deliver the products in a fast and reliable way, and finally the sustainability and safety of industrial systems for the environment and the employed workers (Commission of the European Communities, 2003).

Policy simulations 2. Development, upgrading and streamlining (coordination) of the CVC can allow for decrease in raw cotton production, cotton plantations, water used for irrigation (and thus less negative impact of cotton production on environment), also to reduce significantly state spending on cotton subsidisation given that current export revenues from the CVC are maintained. With local textile producers being engaged in deeper processing of cotton fibre into ready made garments the main critical inputs for raw cotton production can be reduced by more than two thirds. In order to combine the economic and ecological demands of the region it would be better to intensify production of raw cotton on suitable land and to release marginal (unsuitable) land from raw cotton for alternative crops, or establishing less intensive and less expensive land use systems like for example tree plantations or pastures. This would create a greater potential to support ongoing attempts to prevent, or at least lessen further aggravation of the ecological situation in the region with no adverse effect on economic performance of the CVC.

Policy simulations 3. The impact of elimination of subsidies by the state seems almost unpredictable. The lump sum of subsidies provided to the CVC was directed mainly to the agricultural sector. With elimination of subsidies it is most likely that agricultural producers would be affected the most, with their profits going substantially down and no scope for building the farm capital remaining. Farmers would have to cover the costs which were previously subsidised by the state and thus their production costs would be much higher compared to the current situation. At the same time under the present cotton procurement

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system and fixed state prices the farmers received a narrow margin of disposable[71] profits. It is questionable if the farmers can bear even higher production costs, i.e. including the unsubsidised inputs. In order to avoid the complete collapse of raw cotton production it would make sense to eliminate subsidies stepwise, so that to give the farmers time to adapt. On the other hand the state would undoubtedly benefit from the policies of subsidies elimination. Saved resources could be used for upgrading, modernisation and development of the CVC (establishing alternative marketing channels, upgrading ginning capacities, developing textile production, etc).

Policy simulations 4. Due to the complex character of the CVC, there are many actors – direct and indirect (various services providers) – involved along the chain. All these actors are absorbing their shares from cotton revenues and thus leaving a quite low amount of revenue to be passed through to farmers. The general assumption that income of the Uzbek cotton growing farmers can be substantially increased via excluding some of the governing structures from the CVC did not show much scope. For example, elimination of the governing structure of the ginning industry would only add about USD 16 per ton of raw cotton.

What could be done, however, in order to further increase the return to farmers is to raise the value of their cotton via introducing better cotton varieties, establishing cotton pre-treatment facilities on the fields, independent (private) quality setting (determining) schemes, possibly alternative marketing channels in the form of private ginneries. As in many other developing cotton producing countries local farmers do not yet have the capacities to market their output independently and to face competition. At present it is important to improve the efficiency of the ginneries and also to lower their processing expenses, which as shown by the analysis of price determination for Uzbek cotton fibre accounted for about 20 percent of the export price. Furthermore, as has been shown by Swinnen (2005) in transition countries "…where the government has allowed the private gins to develop and to compete the farmers are doing much better…". So, gradual privatisation of the ginning sector and giving it the freedom to market its produce – cotton fibre – could lead to a reduction in the revenue shares absorbed by the Foreign Trade Companies and to higher competition among fibre processors and thus higher prices paid to the farmers.

Farmers. Although cotton production in Uzbekistan is heavily controlled by the state, the system provides concurrently an income security to the cotton producers, which at present

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[71] Disposable profit is what the farmers actually had left at their disposal after covering all the costs and undertaking compulsory payments (remittances) to non-budgetary funds

is a strategy that suits farmers. The presently applied state order system, in which farmers are obliged to meet the imposed production targets, also ensures that inputs are supplied at low costs to farmers. At the same time it is argued that a tight control of agriculture by the state creates strong disincentives for development and more rational resource use (World Bank, 2005).

The recurrent repeated postulation that the Uzbek cotton farmers are receiving only one third of the world market price for their output and that the GoU takes the lions share (World Bank, 2005) could not be confirmed based on the estimations of the 2004 price determination. The detailed and in-depth analysis showed that farmers actually did not lose from growing cotton as such. In 2004-2005, cotton brought on average some profit to the farmers. However, the received profit margins were reduced owing to the compulsory remittances to non-budgetary funds and as charity donations. If this social burden would be eased, the net profits for farmers would likely increase. Higher returns to farmers from developing alternative marketing schemes and thus creating a competitive environment would not only give the necessary incentives to the farmers but would also increase their freedom and would allow them to uptake the responsibility for maintaining the irrigation and drainage, and other costs incurred in agricultural production. In the end, this would possibly lead to the increase in water use efficiency.

Even though various previous postulated recommendations point in the same direction, the implementation of isolated strategies, as often suggested (World Bank, 2005), would likely create more problems than it could solve (Rudenko and Lamers, 2006; Müller, 2006). An increase in farmers' revenues seems feasible, but only when caused by a sequence and combination of policy actions rather than isolated ones. Conducive policy actions include, for example, the change of several stakeholders within the CVC such as the monopolistic ginning sector or eliminating the governing body of the ginning industry which would free their shares from cotton revenues; or liberalising cotton marketing and exports, and lowering the commission of the Foreign Trade Companies (World Bank, 2005).

9.3.2 The Wheat Value Chain

Value chain analysis of the wheat chain in Khorezm in 2005 showed that wheat production, although highly important in terms of preventing social unrest and fulfilling food security objectives, was quite inefficient in terms of economic welfare. In contrast to the CVC, which created positive flows into the state budget, the WVC represented a drain to the government. Export revenues accrued from cotton sales would allow one to buy a higher volume of wheat than could be produced in Uzbekistan (economically the return from one hectare of cotton is higher than of wheat). Average wheat yields in Uzbekistan were not low

compared to the yields in other countries (as found in FAO statistical database), however, the quality remains low according to international standards and this influences the quality of subsequent products such as wheat flour and bread. Thus, either the quality of local wheat should be raised via improving agricultural practices or better varieties should be introduced. Furthermore, wheat of better quality can be imported from neighbouring countries (like Kazakhstan, Ukraine or Russia), which have gained their reputation of being a grain belt and which produce wheat of sufficient quality at a comparatively low cost.

As shown by policy simulations in Chapter 8, the import of wheat is possible and feasible. This would require considerable foreign exchange expenditures, but on the other hand would allow using much land in alternative and potentially economically more beneficial ways. The source of financing wheat imports can come from cotton fibre, currently the main hard currency earner in the region, or to take this idea further, from textile products manufactured by the local upgraded and coordinated textile producers. In both cases, much less area and fewer agricultural inputs would be required to meet wheat requirements of the region. Concurrently, legislation regarding customs regulations on import duties and other barriers for wheat import would have to be reconsidered.

Another alternative to wheat imports (and currently the most feasible from the government's perspective) would be the improvement of local wheat production via: (1) introducing better wheat varieties; (2) creating incentives for the farmers to increase wheat quality through price differentials for better quality wheat, or through educational or awareness programs of wheat/wheat products' quality; (3) improving on-field agricultural practices, like better irrigation scheduling, or fertilization.

9.3.3 The Fruit and Vegetable Value Chains

Agro-climatic conditions of Uzbekistan render production of fruits and vegetables of sufficient quantity and quality. Due to this natural comparative advantage, products of the agro-processing industry could become one of the prominent foreign exchange earners. The tendency over recent years has shown, furthermore, that the production of fruits and vegetables has been increasing. At present, half of the total produce of horticulture and vegetable growing is enough to satisfy the respective domestic demand. Nevertheless, the survey showed that some fresh as well as processed fruits and vegetables were imported to Khorezm from the neighbouring regions and even countries (especially during the off season for fresh fruits and vegetables). The reason lies in underutilized processing and storage capacity and facilities. In this respect, recent reforms taking place in the country aim at establishing and developing independent private food processors, which could operate individually or jointly via associations in the framework of a free market economy

and no state interference. The development of the food processing sectors would allow for an increase in the processing of fruits and vegetables in the country, while simultaneously improving the quality of the products, help to achieve international standards in quality and, at the same time, allow for increased exports.

Currently, the value chains of fruits and vegetables do not play considerable roles in rural/regional economies. The chains are short and weak with few actors involved. Because horticultural and vegetable growing sectors are free from state orders, they are not governed centrally. Yet, decentralised governance is not developed and thus the chains lack regulations, coordination and cooperation. However, the importance of fruits and vegetables in home consumption of the local population should not be underestimated; these crops are the main and sometimes the only source of nutrition. Because the main contributors in horticultural and vegetables production are rural households, these value chains have significant potential for poverty eradication if rural households get incentives, thus becoming better integrated in the chains. Meanwhile, the best option for gardeners and vegetable growers in Khorezm is either home production and processing, or to sell their produce in the market rather than to forward it to the agro-processing industry, as the prices are times higher at local markets compared to the price offered by processors and because of high transportation and transaction costs.

Processors of fruits and vegetables perceive their products as having comparative advantage due to low output prices, moderate quality and good taste. However, they experience many problems, including: (1) *lack of the main inputs* – fruits and vegetables; (2) *lack of other resources* – not stable supply of gas and electricity to the production lines of agro-processors; (3) *lack of auxiliary inputs*, such as packing, labels, etc. (hard for small scale producers to find and make contracts with producers of packages, etc.); (4) *high costs for imported inputs*/packing/auxiliary materials due to high customs duties; (5) *weak marketing capacities* for the output/problems with finding buyers, advertising; (6) *low local demand for processed fruits and vegetables;* (7) *cumbersome and costly export transactions* for processed fruits and vegetables (caused by disintegration of the former SU railroad network, higher international transportation tariffs, customs and transit fees, and other barriers); (8) agro-processing industry (including food-processing) in rural areas is hindered by *underdeveloped and unreliable infrastructure and transport.*

The required directions for development and improvement of the F&VVC are focused on stable inputs supplies, lower transportation and transaction costs, improved logistics, better quality of the products. These are summarised below.

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Incentives to agricultural producers to cooperate with processors, rather than wholesalers, exporting (and in general illegally) fresh fruits and vegetables from the region. Such an incentive system should also induce the farmers to produce agricultural products of specified quality, as required by the processors;

Process, or industrial upgrading of processing capacities in the F&VVC via attracting investments, or introducing new processing and storage technologies, so that the end products are of higher quality and with higher value added;

Building marketing capacities, concerning finding the markets and compliance to international standards;

Stable working (business) environment, including constant supply of energy resources (like gas and electricity to the plants) and availability of imported auxiliary materials (lower customs duties for imported inputs). Alternative to imports of inputs could be establishment of enterprises working on design and production of such auxiliary inputs locally.

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Appendices

Appendix 1. Geographical map of the CVC in Khorezm

Geographical presentation of value chain usually does not resemble a chain in its pure sense. It rather shows the location of all the actors involved in the value chain in consideration, scaled down to the regional level. The cotton value chain of Khorezm is shown in figure 5. The cotton chain actors (farmers, ginneries and textile enterprises) are scattered all over the region, however with a higher concentration (cotton terminal, oil extracting plant, commodity exchange) in the regional centre – Urgench city.
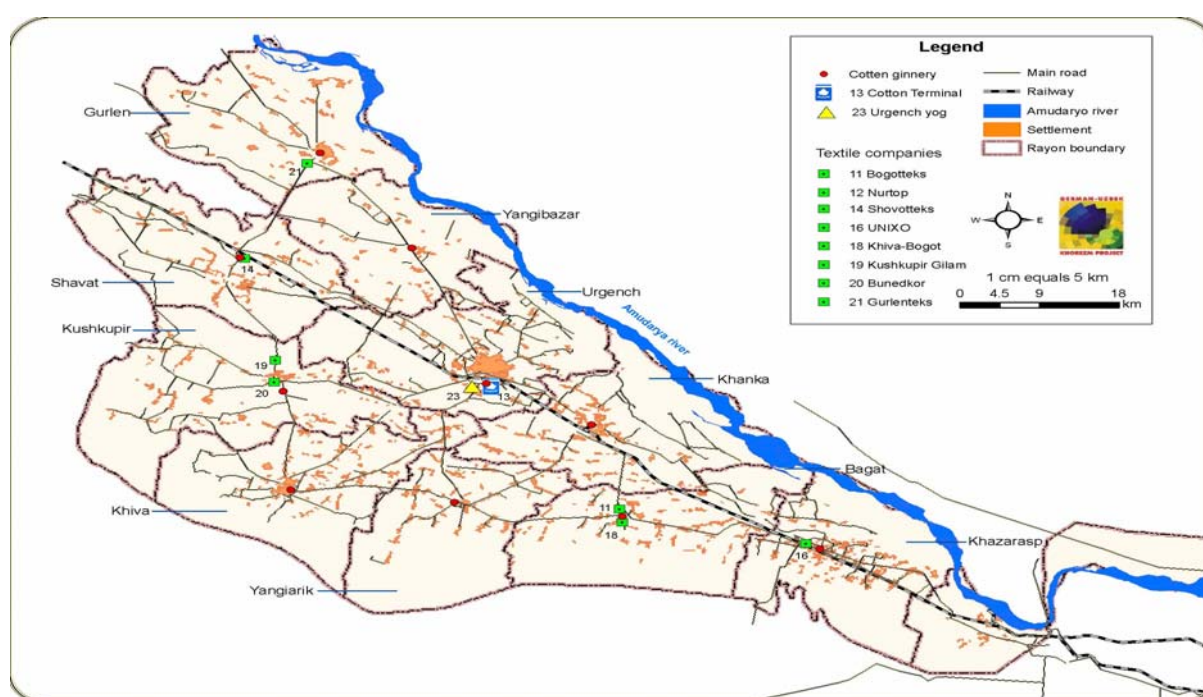

Figure. The Khorezm region and the cotton chain actors

Source: GIS laboratory of the ZEF/UNESCO Khorezm project

Appendix 2. Questionnaire for the Ginneries' survey

1. What does your plant produce?

2. Can other types of fibre be processed/produced at your plant? (besides cotton fibre)

3. When was it established?

4. What type is your plant (joint stock, privately owned or state controlled)?

5. What are your capacities present and future:

    a. Processing (how many tons of raw cotton can be processed)
    b. Production (how many tons of cotton lint is produced
    c. Storage (tons of cotton lint)
    d. Working places (permanent and temporary workers)

6. Do you think you will get enough local raw inputs to meet production capacity requirements?

    a. Yes
    b. No

7. How do you find the marketing channels for your output? (present compared to state regulation in the past)

    a. Marketing channels are predetermined by the contract arrangements with partners
    b. Marketing channels are subscribed by the government
    c. Others

8. Who is your output oriented for? If both of the following, specify shares.

                                            Share (%)
    _____
    Domestic buyers
    For Export

9. Were there any problems or complaints from your buyers?

    a. Yes
    b. No

10. If yes, please specify the reason and how you settled the problem.

11. How competitive do you think your output is? In terms of

    a. Price
    b. Quality
    c. Variety
    d. Availability
    e. Others

12. How is the quality of your product defined/regulated?

13. What other organizations or institutions are involved in quality control?

14. What are the prices for your products?

	Cotton lint	Cotton seed
Wholesale price		
Export price		

15. How do you set the prices?
    a. Primary cost + _____ profit margin
    b. Prices are set from above (in this case specify by who)
    c. Other

16. Please describe the production process of your output. List the activities.

17. How do you check the quality of the inputs?

18. What problems/concerns/inconveniences do you encounter in:

	Delayed shipment	Lack of resources	Inadequate prices	Others
Production process				
In input acquisition				
In output distribution				
Others				

19. Do you have contacts with organizations, providing various services, like staff training, quality testing, standards control, medical org., trading org., exchanges, transportation infrastructure. Please, list them and describe services, provided to you.

20. What organizations are you accountable to?

21. How would you draw the flow chain of your products? (cotton lint, cotton seed)

22. How do you think the farmers could get the incentive to grow cotton (or increase the incentive)?

23. What do you think are the factors inhibiting growth and competitiveness of value added cotton and ginneries activities?

24. How should it be improved?

25. Please describe activities and inputs for the production of cotton lint.

Product	Activities	Input	Input price
Cotton fibre			

Appendix 3. Questionnaire for the Wheat Mills' survey

1. What does your company produce? Please specify.

   - Wheat flour
   - Pasta
   - Bread
   - Others

2. What are their shares in total production? (in physical units)

   - Wheat flour
   - Pasta
   - Bread
   - Others

3. When was your company established?

4. What type is your company (shareholding, governmental or private)?

5. What are your capacities present and future (if presently capacities are not fully employed:

   - Processing (how many tons of wheat can be processed)
   - Production (how much of each product)
   - Storage (how many tons of wheat)
   - Working places (permanent and temporary workers)

6. Do you get enough raw inputs (wheat) to meet production capacity requirements?

   - Yes
   - No

7. How do you find the marketing channels for your products?

   - Marketing channels are predetermined by the contract arrangements with partners (if so, for what period)
   - Wholesalers (trading organizations)
   - Specialized shops of your plant
   - Others

8. Who are your products oriented for? specify the shares

                          Share in total production output (%)
   _____
   - Budget organizations
   - Wholesale
   - Retail sale

9. List your buyers (please, give contacts) and period of your relationships with each buyer.

- Budget organizations   years   months
- Wholesale   years   months
- Retail sale   years   months

10. Were there any problems or complaints from your buyers?

11. In case there were, please specify the reason and how you settled the problem.

12. Do you expect to have long lasting relationship with your buyers?

                              Yes (why?)   No (why?)
_____

- Budget organizations
- Wholesale
- Retail sale

13. Do you expect that the turnover between you and your buyers will increase or decrease?

                           Increase (why?)   Decrease (why?)
_____

- Budget organizations
- Wholesale
- Retail sale

14. How competitive do you think your products are? Please specify the competitive advantages you think your products have in terms of:

- Price
- Quality
- Variety
- Availability
- Others

15. How is the quality of your products defined/regulated? What other organizations or institutions are involved in quality control?

16. What is the procedure of the inputs' quality check?

- By the laboratory within your plant
- By an outside institute
- Other

17. Where do you get your basic input - wheat?

                                                Share (%)
_____

- Directly from farmers (if so, farmers from which rayon)
- From the Grain preparing points
- Other source

18. Do you expect that the turnover between you and your suppliers will increase or decrease? Why?

<div style="text-align:center">Increase (why?)   Decrease (why?)</div>

_____

- Farmers
- Grain preparing points
- Other source

19. What problems/concerns/inconveniences do you encounter in:

| Delayed shipment | Lack of resources | Inadequate prices | Others |

_____

- production process
- in input acquisition
- in output distribution
- others

20. Please describe activities and inputs for the production of the listed products.

Product	Activities	Inputs	Input price
Flour			
Pasta			
Bread			
Other			

21. What are the prices for your products?

                          Wheat flour   Macaronies   Bread   Others

    Wholesale price
    Retail price
    Export price

22. How do you set the prices?

- Primary cost + _____ profit margin
- Prices are set from above (in this case specify by who)
- Other

23. How big is your fixed capital?

24. Are you liable to any privileges or tax concessions?

25. Do you have contacts with organizations, providing various services, like staff training, quality testing, standards control, medical org., trading org., exchanges, transportation infrastructure. Please, name them and describe services, provided to you.

26. What organizations are you accountable to?

27. How would you draw the flow chain of your products?

28. What do you think are the factors inhibiting growth and competitiveness of wheat processing?

29. How should competitiveness be improved?

30. Who do you think governs the wheat-flour chain in Uzbekistan?

31. Who sets the quality/labour or other standards in the chain?

Appendix 4. Questionnaire for the Textile Companies' survey

32. What does your company produce? Please specify.
    - Yarn
    - Fabrics
    - Ready maid clothes (garments)
    - Others

33. What are their shares in total production?
    - Yarn
    - Fabrics
    - Ready maid clothes (garments)
    - Others

34. When was your company established?

35. By who (if your company is a joint venture, specify partners)?

36. Based on what preconditions was your company established?
    - Regulations of the State Program on attraction of investments into the textile industry
    - Personal entrepreneurship of the director
    - Others

37. What are your capacities per year present and future (if presently capacities are not fully employed):

    - Processing (how many tons of cotton lint can be processed)
    - Production (how many items of each product)
    - Storage (tons of cotton lint)
    - Working places (permanent and temporary workers)

38. Do you think you will get enough raw inputs to meet production capacity requirements?

    - Yes
    - No

39. How do you find the marketing channels for your products?
    - Marketing channels are predetermined by the contract arrangements with partners (if so, for what period)
    - Randomly (local markets and shops)
    - Specialized shop of your plant
    - Others

40. Who are your products oriented for? If both of the following, specify shares.

                            Share (%)
    _____
    - Domestic buyers
    - For Export

41. List your buyers (please, give contacts) and period of your relationships with each buyer.

- Domestic buyers   years   months
-                                  years   months
-                                  years   months
- Foreign buyers (give country names)   years   months

42. Were there any problems or complaints from your buyers?
- Yes
- No

43. If yes, please specify the reason and how you settled the problem.

44. Do you expect to have long lasting relationship with your buyers?

                                     Yes (why?)   No (why?)
_____
- Domestic buyers
- Foreign buyers

45. Do you expect that the turnover between you and your buyers will increase or decrease?

                                Increase (why?)   Decrease (why?)
_____
- Domestic buyers
- Foreign buyers

46. How competitive do you think your products are? Please specify the competitive advantages you think your products have in terms of:

- Price
- Quality
- Variety
- Availability
- Others

47. How is the quality of your products defined/regulated?

48. What other organizations or institutions are involved in quality control?

49. What are the prices for your products?

                             Yarn   Fabrics   Garments   Others
_____
Wholesale price
Retail price
Export price

50. How do you set the prices?

    - Primary cost + _____ profit margin
    - Prices are set from above (in this case specify by who)
    - Other

51. Please describe activities and inputs for the production of the listed products.

Product	Activities	Inputs	Input price
Yarn			
Fabrics			
Garments			

52. What is the procedure of the inputs' quality check?
    - By the laboratory within your plant
    - By an outside institute
    - Other

53. Where do you get your basic input - cotton lint?

    Share (%)

    _____
    - Directly from ginneries (if so, which ginneries)
    - From the Cotton terminal
    - Other source (for example stock exchange)

54. Do you expect that the turnover between you and your suppliers will increase or decrease? Why?

    - Increase
    - Decrease

55. What problems/concerns/inconveniences do you encounter in:

	Delayed shipment	Lack of resources	Inadequate prices	Others
Production process				
In input acquisition				
In output distribution				
Others				

56. Are you liable to any privileges or concessions (in taxation for example), as stated in the Textile Industry Development Program of the Government? What are they?

57. Do you have contacts with organizations, providing various services, like staff training, quality testing, standards control, medical org., trading org., exchanges, transportation infrastructure. Please, name them and describe services, provided to you.

58. What organizations are you accountable to?

59. How would you draw the flow chain of your products?

60. What do you think are the factors inhibiting growth and competitiveness of value added cotton and textile industries?

61. How should competitiveness be improved?

62. Who do you think governs the cotton-textile chain in Uzbekistan?

63. Who sets the quality/labour or other standards in the chain?

Appendix 5. Questionnaire for the Farmers' survey