

2 The Milky Ways of the Naryn Region

Milk plays a vital role in the Kyrgyz agricultural life and in the Kyrgyz diet. Industrially processed or self-processed cattle milk to produce cheese, *chechil* or *kaimak* or processed mare's milk to make *kymys* are found in many places in Kyrgyzstan (Fig. 1). Dairy farming including the sale of milk on regional markets or to milk processing factories is especially common in rural areas such as the backcountry of the Naryn Oblast'.

Kyrgyzstan's agriculture has been dominated by animal husbandry for a long time. Due to the endowment with vast grasslands, its mountainous topography and a climate favorable for animal husbandry, the Kyrgyz Socialist Soviet Republic was developed into a central wool and meat producer in Soviet times (Dörre 2012: 128; UNDP 2013: 12). More than 45 % of the total surface area and 90% of the country's agricultural land is covered by rangelands (Dörre 2015: 8; Blank 2007: 10). In the 1920s, the agricultural structures were modified by the introduction of a state-controlled agricultural production. Strict five year plans defined the quotas of meat, milk and wool production of the newly created collective and state farms (Blank 2007: 10-11). With the dissolution of the Soviet Union in 1991 and the following privatisation of agriculture, animal husbandry became essential for the survival of the people, especially in rural areas. At the beginning of the 21st century, animal husbandry added more than 40 % to the value creation of the agricultural sector (Dörre 2015: 8; Dörre & Borchardt 2012: 313).



Fig. 1: Chechil, an increasingly popular dairy product in Kyrgyzstan.

Photography: Gallus, 2016

Chechil is a kind of string cheese with a consistency of cured raw milk cheese. The cheese strings are rolled up in a figure of eight and smoked before consumption.

Kaymak is a creamy dairy product with a high percentage of milk fat. Kaymak is a basic part of the daily cuisine in Kyrgyzstan.

Kymys is fermented mare's milk with a mild content of alcohol. People ascribe healing powers to *kymys*; especially against respiratory diseases.

Within the last decade, the industrial milk processing sector developed further by using advanced dairy processing technology for the pasteurisation of milk, the production of cheese, as well as packaging and marketing of dairy products as local produce. However, scientific research paid little attention to the logistics and economics of rural dairy farming in Kyrgyzstan thus far, and little is known about the local and regional milk trade in rural areas. This paper aims to contribute to a better understanding of the milk industry in rural Kyrgyzstan by analyzing the social, economic, and spatial organisation of the dairy production and distribution in Naryn Oblast'.

The case study focuses on the At-Bashy cheese factory and Naryn milk factory as two central processing plants in the regional dairy industry. The researchers spent two weeks in several villages around Naryn Town for interviews in order to develop a better understanding of the social and economic structures of the dairy industry. The interviews with place-based actors and stakeholders were held at the locations of the companies, and were followed by additional interviews with farmers and distributors, as well as by observations conducted in grocery stores and supermarkets where dairy products are sold. This is also done with a view to analyse projects of development cooperation in the local milk-processing sector.

The Global Commodity Chain Approach as devised by Gereffi et al. (1994) served as the analytical framework of the study. The approach allows for a theoretically informed understanding of the business and company structures in the local milk-processing sector. It considers the perspectives of the milk farmers, as well as the flows of financial aid and information.

Conceptual framework: the global commodity chain approach

A commodity chain can be characterized by production processes and labour networks involved in commodity production (Hopkins & Wallerstein 1986: 159). The aim of the research is to gain a better understanding of the dairy milk industry, to reconstruct the dairy product-related commodity and value chains by looking closely at the production processes and contextualizing the involved actors. The Global Commodity Chain by Gereffi et al. (1994) provides a suitable framework for contextualisation and analysis of dairy production and trade in Naryn Oblast'. Created within the context of globalisation and putting the focus on the production of goods, the global commodity chain approach enables an analysis of the cross-links, allocation, and interactions of production sites and key stakeholders (Gereffi et al. 1994: 2). The global commodity chains framework directly relates to local production, income, employment, and trade (Gereffi & Fernandez-Stark 2016: 6). In a further perspective, the framework provides an understanding about the organisation of global industries and their structures and dynamics, and facilitates a stakeholder analysis (Gereffi & Fernandez-Stark 2016: 6). In the approach devised by Gereffi et al. (1994), the debate on commodity chain analysis is characterised by four analytical dimensions to be applied in a detailed analysis of the structures and organisation of a commodity chain: territoriality, institutional frameworks, governance structures, and economics within input-output-structures. These institutional, socio-economical, territorial and cultural variables have a decisive influence on the shape and functionings of commodity chains (Hassler 2009: 202). Gereffi et al. (1994) place commodity chains centrally in global economic processes by also explaining how production processes crosscut state borders. The four analytical dimensions are briefly outlined in the following.

Dimensions of value chain analysis

Economic dimension

The input-output structure looks at the distribution and role of all involved stakeholders in primary commodity production and further processing, the means of adding economic value

to the commodity chain at different nodes, and the principal activities of the industry. This dimension of the input-output structure also facilitates the analysis of the interaction between different local actors to achieve upgrading (Gereffi & Fernandez-Stark 2016: 7). Each segment of the value chain is characterized by social and economic dynamics and structures (e.g. of companies) adding value to a product.

Territoriality

Working within a global context, supply chains are spread out across different parts of the world. Supply and trade are the bases for the geographical analysis in the dimension of territoriality. In general, commodity chains operate on different geographical scales, i.e. the global, national, regional or local level (Gereffi & Fernandez-Stark 2016: 7). A commodity chain can be characterized by a high spatial heterogeneity. Territoriality is also influenced through competitors or consumer location. Infrastructure such as communication technologies, industrial capabilities or transport systems can be seen as major influencing aspects within the territorial dimension (Hassler 2009: 204). The case study of Naryn analyzing the territoriality of the milk value chain sheds light on the distribution of actors within the region and their interconnectedness and addresses challenges regarding infrastructure and transportation.

Institutional framework

The institutional framework addresses the rules for the functioning of a commodity chain from primary production, processes of adding value to trade and marketing of a product., The industry value chain “is embedded in local economic and social elements” (Gereffi & Fernandez-Stark 2016: 7), but national or regional institutions will also influence locally concentrated commodity chains. Analyzing the institutional framework is crucial to understand how the regional milk value and commodity chain is organized in contexts of the regulatory powers of formal and informal institutions.

Governance dimension

Governance analysis looks at the control mechanisms and power distribution of a commodity chain (Gereffi & Fernandez-Stark 2016: 10), e.g. in terms of financial, material or human resources. A governance analysis maps the local dynamics within and between companies, workers, industry associations, government institutions and aid agencies (Gereffi, Fernandez-Stark 2016: 10, 14). Within the dairy product commodity chain in Naryn, this means looking at local power configurations and their effects.

With reference to the rural dairy production in Naryn, the approach by Gereffi et al. allows for an analysis of the dairy sector chain in Naryn in its entirety, as well as the identification of challenges along the chain.

Research approach

The principal aim of this study is to contribute to a better understanding of the rural dairy business in rural Kyrgyzstan. Figure 2 illustrates the applied research framework, including objectives, research design, and methods. The empirical research took place in the Naryn Province including Naryn Town and its surrounding rural areas. The main research goal

included the collection of general socio-economic characteristics of stakeholders in the dairy sector and their strategies for value adding and marketing.

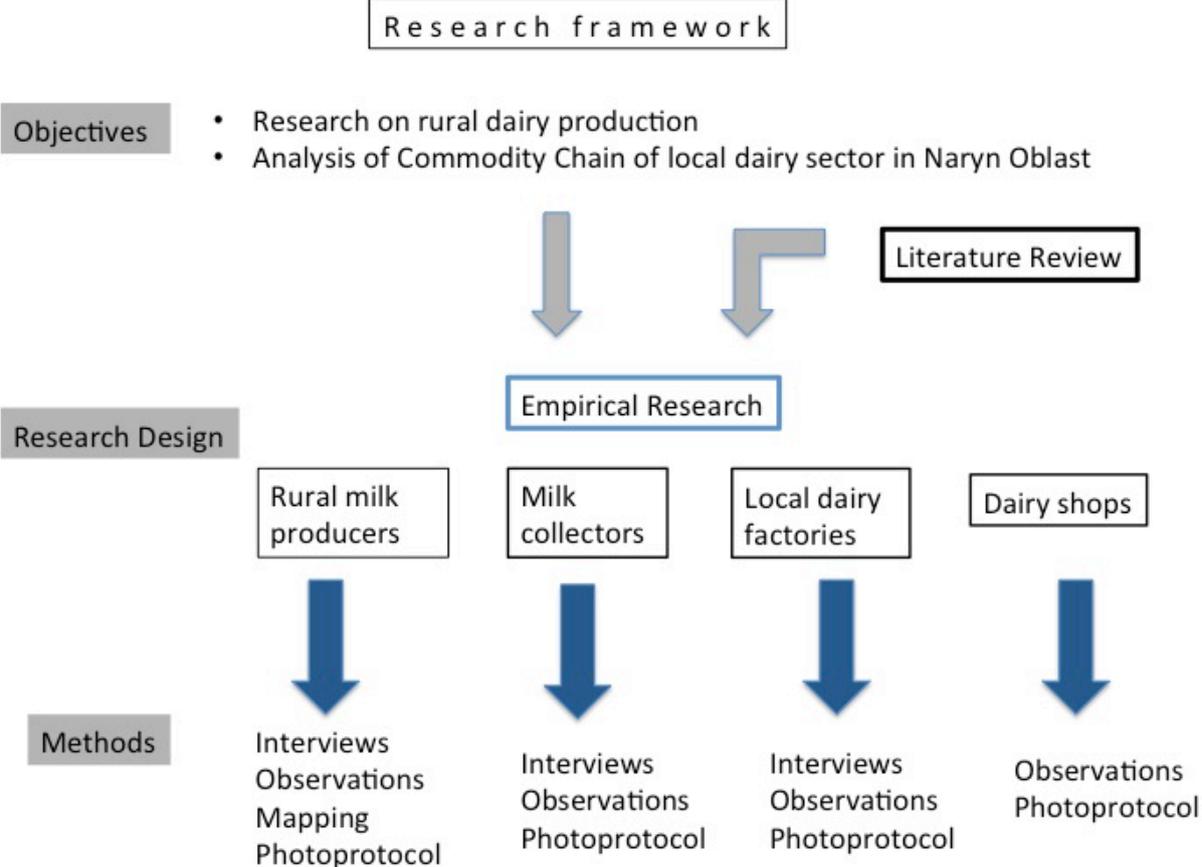


Fig. 2: Research framework. Design: Gallus, 2017

This has been approached by applying a fieldwork approach directed at multiple stakeholder along the commodity chain. The authors conducted 15 in-depth semi-structured interviews in different parts of the Naryn Oblast'. In each study village (Tash-Bashat delivering the milk to the Naryn milk processing plant, and Ak-Jar delivering to At-Bashy milk factory) the authors conducted interviews with about 20 % of the supplying farmers. Additional in-depth interviews took place with the factory owners in Naryn and At-Bashy, as well as with the collectors of the raw milk from the farmers. The observation of the raw milk collecting process in the early morning hours provided contextual information as well as insights into the everyday practices of rural dairy production. The process of milk delivery at defined collecting points was also observed. In addition to interviews, a photo documentation, and mental mapping of the villages took place for visual protocol.

Dairy agriculture in Naryn

Primary milk production in the Naryn Region is mainly a smallholder activity. The dairy factories in Naryn and At-Bashy only proceed cattle milk. About 65 % of the interviewed milk producers in the villages Tash-Bashat and At-Bashy have less than 10 heads of cattle, and only two out of 14 farmers have more than 30 heads of cattle. The smallholder farms generate income from meat, livestock trade and dairy business. For 43 % of the interviewed

rural milk producers around Naryn city, the sale of milk is the main source of income. In contrast, for the interviewed milk producers in At-Bashy the sale of milk is not the priority income source: livestock trade, pension, pensionable jobs as teachers or skilled work in mechanics as well as financial support through remittances characterize the main income sources for this group of respondents. Milk is also used and further processed for household consumption, but most primary milk production is sold to the two processing factories in the region, even though observations on markets in At-Basyh and Naryn have also shown sales of raw and processed milk by individual farmers.

Milking takes place in the morning and in the evening. The raw milk is transported in milk cans and picked up every morning by the local milk collector. Some producers in both areas deliver the milk directly to the processing factory. In At-Bashy, the milk of around 90 local milk producers is collected in 17 collecting-stations.

At each collecting point, two to ten farmers wait every morning for the collector and his milk truck. This is mainly the task of a female household member. The stations also serve as social meeting places used for networking with other women in the village. The collector is an employee of the cheese factory in At-Bashy, who uses this work to supplement his agricultural income. The cheese factory of At-Bashy staffs different milk collectors in each village.

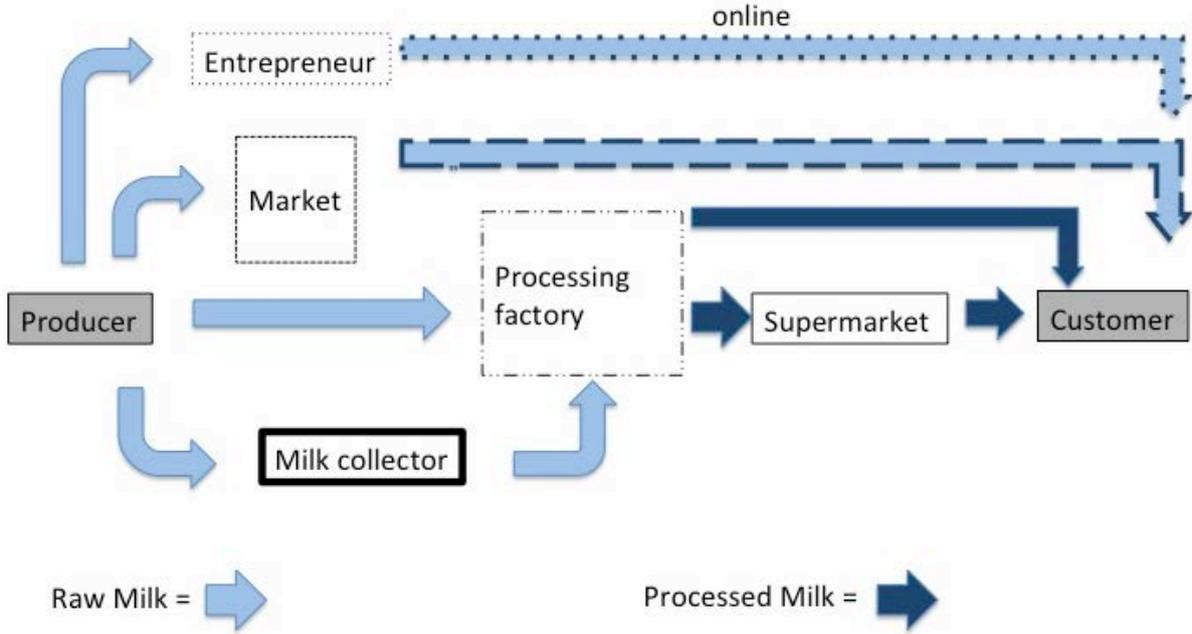


Fig. 3: Commodity chain of the rural dairy sector in Naryn Oblast'. Design: Gallus, 2017

The collector of Tash-Bashat who delivers to the Naryn processing site collects milk from 15 farmers, but has no formal work contract with the factory. The individual dairy business of a local female entrepreneur consists of the purchase of raw milk and self-processed products for sale in her local shop, as well as online-trade with the help of a national online-shop called Zakupki¹, where potential buyers get information about her business and product portfolio. However, customers of this start-up also have the possibility to order dairy

¹ Sale is partly organized by national online shop Zakupki.gov.kg as the entrepreneur stated in the interview.

products in Naryn. Hospitals and kindergartens are among her biggest client group but she also collects now increasing quantities of raw milk out of local village production. As a stakeholder combining several links of the chain, this femal entrepreneur can be seen as an exceptional actor within the dairy commodity chain in the rural context of Naryn. Figure 3 shows the flow of the raw milk from the production site to the customers.

Value chains of milk production and processing in Naryn

The analysis of input-output structures examines the processes of adding value within a commodity chain. Another focus is directed on how the involved stakeholders regulate the commodity chain, i.e. how value is added to the raw milk by processing, packing, storing, and marketing.

Farmers sell their milk via a milk collector or directly to the milk processing factories in Naryn Town and At-Bashy, which then further process the milk into cheese products. The At-Bashy cheese factory produces five different kinds of cheese, as well as butter and cream. Figure 4 shows the proportion of milk and Gouda-cheese, and its added value for the case of the At-Bashy cheese factory. The factory owners sell their products to supermarkets in Naryn and Bishkek. In the Naryn factory, the raw milk is primarily processed to packed milk, cottage cheese, and ayran.

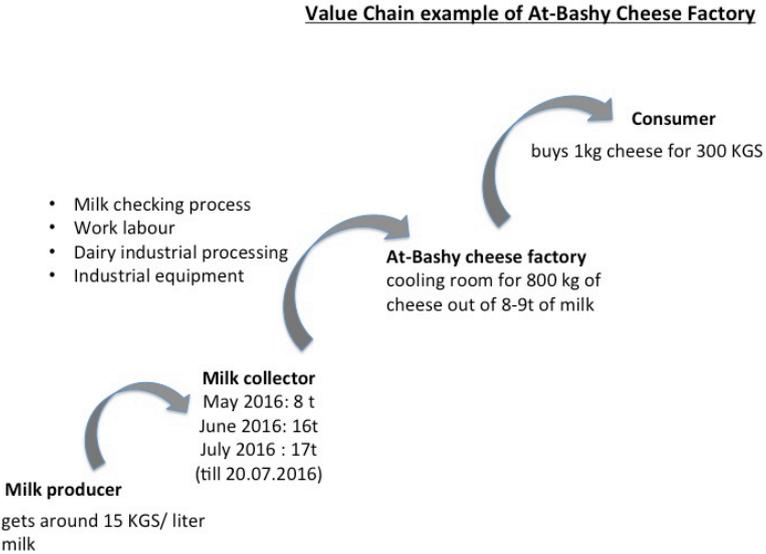


Fig. 4: Proportion of milk/cheese and its added value At-Bashy Cheese Factory. Design: Gallus, 2017

The products are exclusively sold in Naryn Town. Some producers in both areas deliver their milk directly to the processing factory. Packed milk offers the highest profit to the factory owners in Naryn. The factory buys one liter raw milk for 12 Som in summer and 25 Som in winter when overall production is lower. The sale price for one liter packed milk is 35 Som. The research showed that the farmers prioritized selling the milk directly to the factory and processing only small amounts of raw milk for own consumption. The milk collector of At-Bashy collects a wide range of quantities from the various milk farmers, from three liters up to 60 liters, on average around 25 liters per day per milk producer. The milk prices in the At-Bashy region vary, with the cheese factory being endowed with price setting power. In 2016, the price dropped from 15 Som per liter to 13 Som in May, and to 11 Som in June. For the interviewed milk producers the fixed acceptance of the prices set by factories nevertheless provides secure income even though price fluctuations occur. Once a year animals get a vaccination resulting in a 15-day break of raw milk delivery. Figure 4 shows the value-adding process for one liter of milk provided by the primary producer remunerated with 15 Som, and the upgraded product in form of cheese sold for 300 Som per kilogram at the At-Bashy Cheese Factory. The smoked cheese from the At-Bashy cheese factory is a

durable product that is sold in Naryn’s grocery stores and supermarkets, and is even exported to the Kyrgyz capital of Bishkek.

Territoriality of milk production

The Naryn Oblast’ is a strongly rural administrative entity with a localised concentration of the commodity chain in the dairy sector. Analysis of the marketing situation for milk and milk products further supports the characterisation of the commodity chain as locally concentrated, with the processing factories as bottlenecks because they are the only processing industries in the area that buy raw milk from the farmer (Fig. 5).

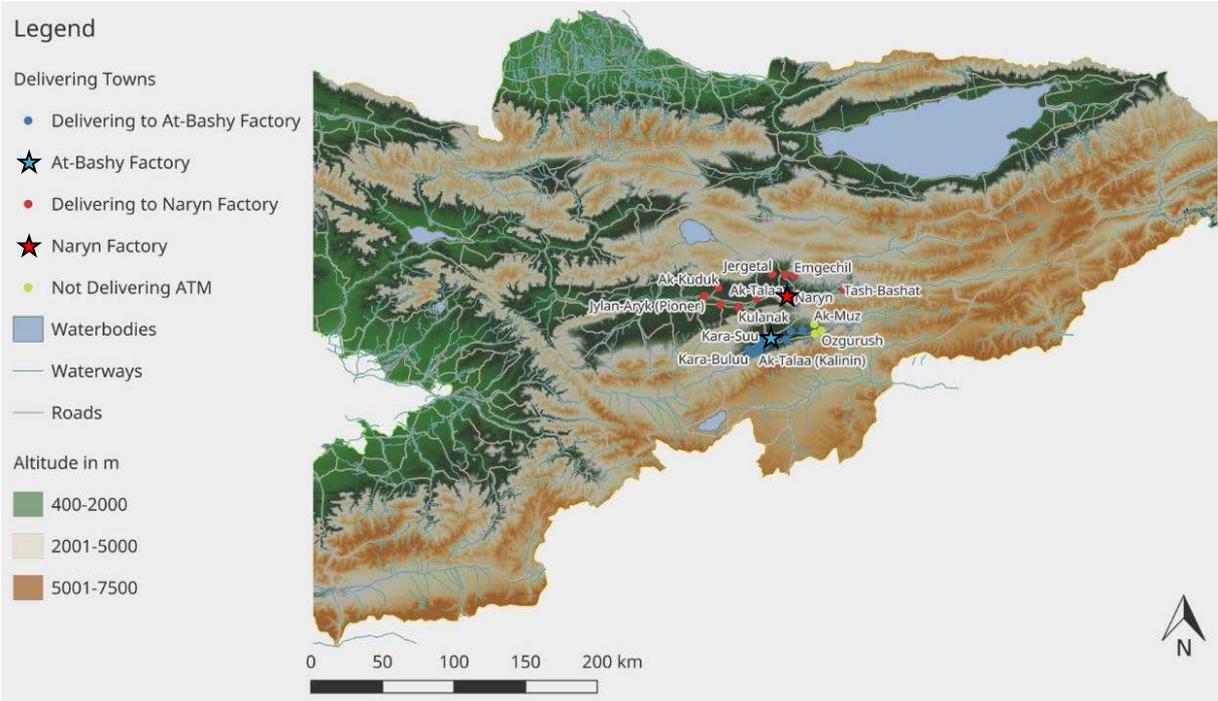


Fig. 5: Settlements from where milk is delivered to the dairy in Naryn. Design: Bothe, 2017

The milk collectors of the At-Bashy factory pick up the milk from milk producers in nine different villages from up to 40 km distance. The pastures of the milk producers in At-Bashy are up to 70 km away, keeping only a certain amount of cattle within the factory’s milk acquisition area. The catchment area of the factory in Naryn Town has a radius of approximately 40 km. The distance between the factories in Naryn and At-Bashy is a one-hour drive for around 50 km. Some farmers organize themselves in collectives to drop off raw milk. The processed dairy products are primarily sold within the Naryn Oblast’ itself, except for the At-Bashy smoked cheese that can also be found in a few supermarkets in Bishkek. In addition to supermarkets, the factory in Naryn Town also delivers about seven tons of milk per month to kindergardens and schools in the region.

The challenge of storing milk is common knowledge, and the greater the distance and travel time to the factory, the greater the possibility that the raw milk turns bad by the time of its arrival. Recent road improvements by the government however improved the transport connections.

Institutional framework in Naryn

The At-Bashy cheese factory was the first of its kind in the Naryn region, established in 2011, although the equipment as well as the official registration for milk processing exist since

2009. The membership in the National Milk Association is not obligatory for milk and cheese factories, but members have to pay a fee of 10,000 Som per year. The association has the aim to help the dairy business in Kyrgyzstan by representing a social network of the stakeholders. For the factory owner in At-Bashy, the association does not fulfil its supportive role of improving and consulting his business because the large distance between At-Bashy and Bishkek results in a sluggish flow of information. The owners of the At-Bashy cheese factory hope to receive consultancy for the development of an export market for their products, which include ecological pure cheese due to the antibiotic-free dairy industry and therefore probably have a high potential for export.

The Naryn Town milk factory is also not a member of the association. The factory in Naryn Town was founded in 2009 and had to be relocated to Naryn Town from another village site after a USAID project that aimed to support the venture posed the condition of Naryn needing to be the factory location. Both factories however stated a lack of support from the relevant government institutions and bemoaned the lack of transparency in the National Milk Association, and a transparent distribution of donor funds. This vacuum has been addressed by development agencies, and both factories were endowed with support by international donor agencies.

In 2014, UNDP and the Ministry for Foreign Affairs of Finland sent experts to provide capacity building and technical equipment to both factories. The Naryn milk factory was further involved in a NGO-programme on cheese production. In November 2015, the German Senior Expert Service (SES) conducted additional programmes in building local capacity for Gouda cheese production. As milk is difficult to further process using old machineries, the manager of the factory plans to increasingly focus on cheese production with hopes for a higher income. However, because Gouda is an unknown product in Kyrgyzstan, the Naryn Town milk factory produces locally demanded smoked cheese.

The different activities within institutional spheres in the dairy sector are visible through the activities of foreign development agencies. In both factories, the projects supported the needs of the factory managers or individual entrepreneurs in a short-term manner, exemplifying the increasing role of international actors in steering locally concentrated commodity chains with a focus on value-adding in factory settings. The Naryn Oblast' Administration is aware of the international projects and seeks a complementary way by advising individual milk producers in value adding strategies in order to soften their dependence from the milk processing factories.

Milk governance in Naryn

The raw milk bought by the factory in At-Bashy needs to fulfil certain standards. Milk collectors need to attend seminars about hygienic rules every two years in order to become certified milk collectors. Collectors test raw milk immediately at the collection points before transporting it to the factory. It is clearly their responsibility to deliver "good" milk, and raw milk that does not pass the quality test at the factory will be rejected without refund. There are 52 workers of the At Bashy cheese factory with a formal work contract. The factory pays taxes and supports collectors financially by providing a truck and petrol money. This is in contrast to the privately organised milk collection around Naryn that operates without support by the Naryn milk factory. In addition to picking up and dropping off the raw milk,

collectors are also responsible for the exact payment of primary milk producers. The milk producers are listed with the amount of milk they supply, but they are not direct contractors with the factory. Rather, the relationship of the collector with the milk producers operates on a personal level.

The price for one liter of milk is set by the At-Bashy cheese factory and Naryn Town milk factory, and price negotiations are not common in both factories. The “private” milk collectors of Naryn get an amount of two Som per liter from the farmers for their service. Milk is checked upon arrival by the factory staff. Obligatory for the milk producers is a veterinary document showing the latest vaccinations of the animals. In both locations, the farmers are paid every fortnight.

Most milk producers deliver their milk directly to the factory in Naryn. The At-Bashy factory is among the bigger dairy processing factories in the country, being the first of its kind in the Naryn Province and showing a higher degree of professionalism regarding hygiene standards and storage of processed goods when compared to the factory in Naryn.

At Bashy and Naryn Dairy Industry

Kyrgyz dairy processors face a number of constraints when they attempt to produce locally and export within the closer region or beyond the nation borders. For instance, the cross-border cooperation is difficult as the region’s transport network is not set up with connections between economic interest zones. The data assessment presented in Figure 6 is explicitly based on the qualitative data from the conducted interviews.

At-Bashy Cheese factory		Naryn	
<p>Strengths</p> <ul style="list-style-type: none"> - Well known brand for smoked cheese - Priced according to kyrgyz mindset - Customers have positive perception about brand - Local staff - Highly structured company guidelines - Fostering business relationships through supports as petrol money for collectors 	<p>Weaknesses</p> <ul style="list-style-type: none"> - Lack of finance - Lack of machinery for ice-cream production - Lack of knowledge for export licence 	<p>Strengths</p> <ul style="list-style-type: none"> - Local production site - Close to consumers - Short transport within Naryn 	<p>Weaknesses</p> <ul style="list-style-type: none"> - Lack of finance to implement advices by SES - Lack of new packing machines - Lack of hygienic standards - No certification process of collectors - Technical equipment out of order
<p>Opportunities</p> <ul style="list-style-type: none"> • Staff-power for growth • Membership in milk association 	<p>Threats</p> <ul style="list-style-type: none"> - Increasing import products from Russia - Infrastructure issues (transport) 	<p>Opportunities</p> <ul style="list-style-type: none"> - Branding of local milk - Shop sale due to big factory space - SES teaching of Gouda cheese 	<p>Threats</p> <ul style="list-style-type: none"> - Increasing import products from Russia - Competitor factory At-Bashy - Decrease of milk deliveries due private milk processing shops

Fig. 6: SWOT-Tables of the cheese factories in At-Bashy and Naryn Town. Design: Gallus, 2017

The analysis of the strengths, weaknesses, opportunities and threats of the At-Bashy factory shows opportunities in expansion by developments of staff size and by accessing support of the National Milk Association. A lack of investment funds results in restrictions of further

product diversity such as in ice cream production. The lack of knowledge for an export licence further restricts production increase. The factory owners have not conducted business plans for the planned export of cheese products.

The supermarkets and merchants in Naryn Town showed little interest in local dairy brands or activities directed towards improved local branding, even though the local production site of the Naryn Town factory represents a clear strength for local branding. Weaknesses such as a lack of hygienic standards, lack of technical equipment, and finance, but also the possible improvement of the organisation of milk collectors are not seen as a priority of the director.

Within the research of the rural dairy value chain, different power relations became visible. The milk processing factories set fixed prices for raw milk purchase, but primary producers are not organized in a cooperative or interest group to get a better stake in price negotiations.

Development Cooperation focusing on Naryn Town shows a high impact on the development of local dairy industries. The creation of new value creating processes was made possible by international development cooperation, but the implementation was not focused on a long-term business partnerships. Technical equipment was provided but the means for maintenance and repair were not established. Programme recipients nevertheless stated some degree of satisfaction with the funds offered by external donors. While the demand for milk in the countryside is relatively low because almost every household keeps cattle for household milk supply, there exists a growing market for processed milk products.

Conclusion

The milk products produced by the two milk factories feed the growing urban demand for dairy products in Naryn Town. This lends credence to the interpretation that the dairy industry in Naryn Province has a growing future market. Still, it is apparent that the dairy industry lacks financial investment possibilities to grow within the national market, and faces the additional challenge of competitors from other Kyrgyz regions like Bishkek City or the Issyk-Kul Oblast'.

Development cooperation organisations provide only punctual support, e.g. by enabling entrepreneurship as evident in the example of the online milk trade store by an individual entrepreneur, or by supporting factories rather than local primary producers. Primary milk producers continue to depend on personal relationships with milk collectors, and the growing demand for raw-milk for further processing.

References

Blank M. (2007): Rückkehr zur subsistenzorientierten Viehhaltung als Existenzsicherungsstrategie. Hochweidewirtschaft in Südkirgistan (=Occasional Paper Geographie 34). Berlin. Zentrum für Entwicklungsforschung. Freie Universität Berlin.

- Dörre A. (2012): Legal arrangements and pasture-related socio-ecological challenges in Kyrgyzstan. In: Kreutzmann H. (ed.): Pastoral practices in High Asia. Agency of "development" effected by modernisation, resettlement and transformation (Advances in Asian Human-Environmental Research). Dordrecht/Heidelberg/New York, NY/London: Springer. 127-144.
- Dörre A. & P. Borchardt (2012): Changing Systems, changing effects – pasture utilization in the post-soviet transition. Case Studies from Southwestern Kyrgyzstan. In: Mountain Research and Development 32(3): 313-323.
- Dörre A. (2015): Promises and realities of community-based pasture management approaches: Observations from Kyrgyzstan. In: Pastoralism: Research, Policy and Practice 15(5). Available at: <http://pastoralismjournal.springeropen.com/articles/10.1186/s13570-015-0035-8> (01.03.2017).
- Gereffi G., Korzeniewicz M. & R. Korzeniewicz (1994): Introduction Global Commodity Chains. In: Gereffi G. & M. Korzeniewicz (Eds.): Commodity Chains and Global Capitalism. Westport, London. Praeger: 1-14.
- Gereffi G. & K. Fernandez-Stark (2016): Global Value Chain Analysis. A primer. Durham. Duke University, Center on Globalization, Governance & Competitiveness (CGGC). Available at: http://www.cggc.duke.edu/pdfs/Duke_CGGC_Global_Value_Chain_GVC_Analysis_Primer_2nd_Ed_2016.pdf (02.03.2017).
- Hassler M. (2009): Commodity Chains. In: Kitchin R. & N. Thrift (eds.): The International Encyclopaedia of Human Geography. Oxford/Amsterdam. Elsevier: 2:202-2:208.
- Henderson J., Dicken P., Hess M., Coe N. & H. Wai-Chung Yeung (2002): Global production networks and the analysis of economic development. In: Review of International Political Economy 9(3): 436-464.
- Hopkins T. & I. Wallerstein (1986): Commodity chains in the world economy prior to 1800. In: Review (Fernand Braudel Centre) 10(1): 157-170.
- UNDP United Nations Development Programme (2013): Naryn Area Based Development Programme, Kyrgyzstan. Bishkek. United Nations Development Programme. Available at: https://info.undp.org/docs/pdc/Documents/KGZ/PRODOC%20Naryn%20ABD_Feb'14.pdf (01.03.2017).



Partial view of the Solton Sary Gold-mine. Photography: Dörre, 2016



Waste dump of the Solton Sary Gold-mine. Photography: Dörre, 2016