Evaluating a policy aimed at creating co-operatives in Kazakhstan

Samal Kaliyeva

Thesis submitted for the degree of Doctor of Philosophy

School of Agriculture, Policy and Development

February 2021

Declaration

I certify that this is my own work and all arguments and ideas of other authors used in this study are fully and properly acknowledged.

Samal Kaliyeva

February 2021

Abstract

The government of Kazakhstan is currently developing policies to stimulate milk production at an industrial production level through creating co-operatives. Their main target members are rural households, who are currently responsible for producing most of the milk consumed in Kazakhstan. In order to analyse and identify the determinant factors behind rural households' motivation to join/create co-operatives and likewise public support for the government policy and in order to estimate its monetary value, a survey was used to collect information from 181 randomly selected rural households in the Akmola region and 307 randomly selected Kazakh citizens.

The bivariate probit model was used to jointly analyse rural households' intentions to join/create a production co-operative, accounting for the impact of psychological factors and socio-demographic characteristics along with each household's attitudes to risk, their production structure, level of information about the government support programme and co-operatives, and cultural aspects as well as the household's proximity to the main market. In addition, the drivers associated with public support for such a policy were examined using a contingent valuation method. These include psychological factors, the individuals' views on the country's former regime, their awareness of the governmental policy, their socio-demographic characteristics, and their household location. Their willingness to pay (WTP) for the policy was analysed using an interval regression model. Additionally, we examined changes in individuals' WTP before and during the COVID-19 pandemic.

In addition to indicating the determinants behind rural households' intention to join/create a production co-operative and Kazakh citizens' willingness to support the policy on co-operatives, the results of the study revealed that a third of rural households were interested in the policy. Moreover, the social value of the policy was found to be equal to the cost of the whole program after 10 years, indicating public support for this policy amongst Kazakh citizens. Taking into account these results, guidance for policymakers was prepared.

Acknowledgments

This journey has become a valuable experience in my academic and professional development. Therefore, I would like to acknowledge my country, Kazakhstan, that awarded me the "Bolashak" scholarship for the PhD program, which has allowed me to gain valuable knowledge and skills.

First of all, I would like to express my deep gratitude to my supervisors, Dr Francisco Jose Areal and Dr Yiorgos Gadanakis. It would have been impossible to successfully complete the PhD without their constant support, patient guidance and useful advice. Their role in me becoming academically mature and professional is priceless. I would also like to thank all the School of Agriculture, Policy and Development (SAPD) staff, and more specifically, Professor Chittur Srinivasan for giving me the opportunity to do my PhD at the SAPD and Dr Giuseppe Nocella, for his detailed discussions and guidance on the theories of behaviour. Special thanks go to my academic monitor Dr Anna Macready for her useful critiques and suggestions.

Special thanks also go to my friend Yerbolat Alesh in the village of Nur-Yessil, to regional state representatives in the villages of Mikhaylovka and Yenbek as well as the L.N.Gumilyev Eurasian National University and the S. Seifullin Kazakh Agro-technical University for their collaboration and help in data collection from rural households and the general public.

Beyond the academic experience, the PhD has enriched and surrounded me with new acquaintances and friends around the world. My special thanks, therefore, go to Oana Tanasache, Dr Nur Hafizah Muhammad, Dr Ponjan Prau Pinpart, and Ciro Dominguez for their personal and professional support during the time I have been studying at the University of Reading.

Finally, thanks to my family, to my husband Azat and daughter Jasmine, as well as my mother and brothers and all my relatives, for their love, trust and support.

Table of contents

List of tables

List of figures

Abbreviations and acronyms

A – Attitude

CE – Choice Experiment

CV – Contingent Valuation

EEAU - Eurasian Economic Union

GDP – Gross domestic product

ICA – International Co-operative Alliance

KZT – Kazakhstani tenge

MAO – Motivation-Ability-Opportunity

OECD – the Organisation for Economic Co-operation and Development

PBC – Perceived Behavioural Control

PCA – Principal Component Analysis

RAA – Reasoned Action Approach

SN – Social norms

SU – the Soviet Union

TIB – Theory of Interpersonal Behaviour

TPB – Theory of Planned Behaviour

TRA – Theory of Reasoned Action

WTA – Willingness-to-accept

WTP – Willingness-to-pay

WTO – World Trade Organisation

Preface

The thesis consists of 3 parts. Part I consists of 4 chapters. Chapter 1 introduces the thesis. Chapter 2 provides a review of the agricultural sector of the country and the policy in question. Chapter 3 outlines the theoretical frameworks, and the pilot studies are covered in Chapter 4. The willingness of rural households to participate in the policy and the willingness of the Kazakh citizens to support the policy are investigated in Part II, Chapters 5 and 6. Finally, the implications of the policy along with the difficulties and limitations of the study are covered in Part III, in Chapters 7 and 8 respectively. More detail on the structure of the thesis can be found in paragraph 1.4.

Part I

The first part of the thesis includes the introduction and a literature review of a) agriculture in Kazakhstan, b) agricultural policies of the country and c) the theoretical background and d) the pilot studies. This part provides information about the dairy sector in Kazakhstan and contextualises its situation with other trading countries using a variety of indicators. In addition, the Kazakh's government policy aimed at increasing dairy production through co-operatives is described. Finally, the conceptual frameworks utilised in this research and the data collection in the pilot studies are outlined.

Chapter 1

Introduction

1.1. Background of the study

Kazakhstan is part of a single market under the Eurasian Economic Union (EEAU) that was established in 2014 between Russia, Belarus and Kazakhstan. Later Armenia and Kyrgyzstan also joined the EEAU. In addition, after long years of negotiation, Kazakhstan entered the World Trade Organisation (WTO) in 2015. Opening its borders to trading partners required Kazakhstan to strengthen the competitiveness of its production sectors, including its agro-industrial complex, in comparison with other member countries (Kinyakin, 2016; Yesevi, 2014). Hence, there is political awareness that Kazakhstan needs to develop its agricultural sector to be competitive and to attain sustainable economic development.

The development of the agricultural sector has focused on strengthening export products such as oilseed, meat, grain and flour (Ministry of Agriculture of the Republic of Kazakhstan, 2017). In addition, the development of the dairy sector also remains key for attaining a competitive agricultural sector. The dairy sector is characterised by having weak competitiveness due to the low milk productivity and the lack of processing of its raw materials (milk). Despite an increase in milk production in the last 5 years (see section **2.3** for more details), the Kazakh dairy sector faces structural issues, in particular, the predomination of small-scale production leading to low productivity. The situation is that rural households are the main national source of livestock production, including milk, and they are considered as practitioners of informal trade (i.e., direct sales to consumers). At the same time, dairy factories (i.e., industry) are facing a deficit of raw materials (i.e., milk) for processing. In turn, Kazakhstan's supply of dairy products mostly relies on imported

products, creating a negative trade balance. On the other hand, rural households operating as small farms suffer from numerous issues, including limited access to credit resources and difficulties with access to sales (Lerman, 2013).

Regarding the demand side, milk and dairy consumption in Kazakhstan are relatively large compared with other food products forming an important part of the Kazakh's diet. Thus, 22.1 kg of milk/dairy was consumed by a household member in a month in 2018 (STAT, 2018). Kazakhstan ranked 15th in terms of milk consumption among 177 countries (Fellmann & Nekhay, 2012).

One policy that has been considered by the Kazakh government and may be used to increase productivity of the agricultural sector and the dairy sector in particular is the creation of co-operatives. The policy was introduced in 2017 for the first time in an attempt to reduce the number of small rural household producers by the creation of rural agricultural co-operatives. Thus, the policy aimed a) at transforming the milk production system from small-scale production to industrial scale production and b) at supporting rural households by facilitating access to services via the co-operatives created (i.e., veterinary, advisory services on feeding etc). A review of the policy can be found in section **2.5.2.**

1.2. Aim and objectives of the research

Although research on the development of the dairy sector in Kazakhstan has been conducted (FAO, 2011, 2016b; Jungbluth et al., 2004; Kazkenova et al., 2015; Nazhimedenov et al., 2011; Petrick & Pomfret, 2016; Sheikin & Kulbayeva, 2015; Tazhibaev et al., 2014), the literature on the role of co-operatives is scarce (OECD, 2015, 2019; Sedik & Lerman, 2015). The literature focuses on identifying the key problems that the country's dairy sector faces as well as identifying potential measures that could be taken to facilitate the sustainable development of the sector. Despite dairy policies in Kazakhstan

being orientated in the direction of a revival of dairy and meat production capacity following on the collapse of the former collective system and the huge amount of public funds spent with this purpose in mind, surprisingly little analytical work has been done in terms of the economics of dairy farming and the efficiency of the policies. Thus, in the majority of cases, the researchers have no choice other than to rely on official statistics (Petrick & Götz, 2019).

Thus, this thesis contributes to filling the gap highlighted above with regard to the lack of literature on the economics of the dairy sector in Kazakhstan. This research contributes to the literature by evaluating the policy on increasing milk production by creating agriculture co-operatives in Kazakhstan in three ways: 1) by analysing and identifying the determinants behind rural households' motivation to create and/or join a production co-operative; 2) by estimating the total economic value of the policy aimed at increasing milk production through a co-operative production system and 3) analysing and identifying the drivers behind Kazakh citizens' willingness to support the policy. Understanding these can help to identify ways to successfully facilitate the structural changes in Kazakhstan's milk production.

In order to analyse and identify the determinant factors behind rural households' motivation to create and/or join a production co-operative and likewise the public support for the government policy and estimating its monetary value a survey was used to collect information from 181 randomly selected rural households in Akmola region and 307 randomly selected Kazakh citizens respectively.

The objectives and questions of the study were set up in the following way.

Research question 1. What are the drivers behind rural households' participation in governmental policy aimed at increasing milk production through co-operatives?

An individual's behaviour can be influenced by several factors, including socio-demographic and psychological factors. To reveal the impact of those factors on the respondent's intention to perform/or not the particular behaviour a variety of theories have

been used in applied research, including the agricultural economics research (Armitage & Conner, 2001; Figueiredo, 2018; Hyland et al., 2018b, 2018a; Micha et al., 2015; Morais et al., 2017, 2018; Riemenschneider et al., 2003; Warsame & Ireri, 2016).

The fundamental idea of how psychological factors may underlie someone's behaviour was set out by Ajzen and Fishbein (Fishbein & Ajzen, 1975). Psychological factors are the core of Ajzen and Fishbein's Theory of Reasoned Action (TRA). Ajzen and Fishbein's theory has been expanded to accommodate other factors that may influence an individual's behaviour. In this research an updated version of the TRA, the Reasoned Action Approach (RAA) is used as a basis. Apart from psychological and socio-demographic factors, RAA is expanded by adding other factors considered relevant in an individual's decision to join or create a production co-operative. Thus, it was assumed that the rural households' decision to participate in a collective, either by joining an existing co-operative or creating/helping to create a new one, can be influenced by a) socio-demographic characteristics (e.g. age and gender); b) psychological factors (e.g. an individual's positive beliefs about having guaranteed sales); c) cultural features (e.g. trust in others, views on the former Soviet Union); d) risk attitudes (e.g. how risky a rural household is), the production structure (e.g. number of dairy cows), the level of information (e.g., if a rural household has had the information on co-operatives before) and the proximity to the main market (i.e., the distance from the capital).

Research question 2. What is the rate of acceptance of the policy (i.e., joining or creating a production co-operative) by rural households?

Based on the history of the governance of the country, there is an assumption about the rejection of the policy by rural households due to the perception of the similarity of the policy under consideration to the former collective farms (that is, kolkhozes). Previous research in post-communist countries is inconsistent. While Balint & Wobst (2006) and

Lerman (2013) argue that farmers may be reluctant to participate in collective action because of the perception of co-operatives by farmers as resembling former collective farms, Möllers et al. (2018) found a high level of interest among Romanian farmers in a co-operative form of production. Therefore, this second question aimed at revealing the rate of acceptance of the policy by Kazakh rural households. To obtain that the questions "Would you be willing to join a production co-operative?" and "Would you be willing to create/help to create a production co-operative" were asked.

Research question 3. Is the policy supported by society?

The policy encouraging co-operative creation might be beneficial for stakeholders, namely, rural households (i.e., having access to resources, support etc) and dairy factories (i.e., receiving an adequate quantity of raw milk from rural households). Also, co-operatives can contribute to increasing livelihoods, reducing poverty and food insecurity in rural areas through improved use of technology, the sharing of knowledge between members, and income from a market-oriented output (Ajates, 2020; Ishak et al., 2020; Milovanovic & Smutka, 2018; Sultana et al., 2020). Therefore, considering the substantial benefits for the society from the implications of the policy (e.g., increasing milk production whilst supporting rural development), this study aims at identifying the total economic value of the policy for the general public. Thus, the public support/value for the aim of the governmental policy was defined through their willingness to pay (WTP) for a premium price on a litre of milk to support the policy aimed at increasing co-operative production.

A relatively large amount of money, i.e., nine per cent of the state revenues were allocated for the realisation of the program. However, it should be highlighted that the program covers the development of the other sectors (e.g., efficient use of water and land resources) apart from the creation of co-operatives. Unfortunately, the exact cost of the policy on the creation of co-operatives could not be found and taking into consideration the

fact that there was a U-turn in the aims of the policy, i.e., not being aimed at creating co-operatives under a certain program (the Program), we took 2,374.2 billion tenges (KZT) for 5 years (i.e., 2017-2021) as basic fiscal support that co-operatives needed. However, taking into account the fact, that this money considered the support of other sectors along with co-operatives, the cost of the policy might be even less. The main idea behind the identification of fiscal support of co-operatives was to compare if the public support of the policy matches the cost of the policy. As this, ascertainment of the public support of the policy aimed at co-operative creation is expected to clarify to what extent the society value the policy implementation.

Research question 4. What are the drivers behind Kazakh citizens' willingness to pay a premium price for a litre of milk to support a policy encouraging co-operative production?

A range of factors may influence Kazakh citizens' intention to support a policy to encourage co-operative production. Thus, similar to research question 1, to identify the drivers behind respondents' willingness to pay an extra amount of money in order to support the government policy, psychological aspects based on the RAA (e.g., positive belief in that paying an extra amount of money for a litre of milk would support domestic milk production) was applied. Apart from that, the views on the past regime (e.g., perceiving that life was better in the Soviet Union regime), awareness about the governmental policy (i.e., having adequate information about co-operatives before) along with socio-demographic characteristics (e.g., income) and geographical location (i.e., where the respondent lives) have been included to the conceptual framework. Thus, knowing this provides information on how the value of the policy to society may vary depending on the characteristics of the population. This provides useful information for policy makers on how to get more support for the policy.

1.3. Contribution of the research

While under the control of the Soviet Union regime, the agriculture sector of Kazakhstan consisted mainly of collective farms (kolkhozes) and state farms (sovkhozes). After the collapse of the SU, the country faced a transition period from the communist regime to a market economy. A number of studies tried to shed a light on the possible implications of the transition economy on the development of post-Soviet countries (Dadabaev, 2016; Easterlin, 2009; Hinks, 2020; Valiyev et al., 2017). However, how the perception of the past regime (i.e., implications of the transition) will impact individuals' attitudes towards co-operatives in the current regime are not clear yet. Therefore, one novelty of this research lays on exploring the influence of the Soviet Union regime on the household's decision to participate in collective actions and the general public's intention to support the policy.

COVID-19 has severely damaged the economies of many countries, especially developing countries. Whilst the governments are taking measures to prevent the spread of the virus, the level of unemployment has risen showing a trade-off between health protection and economic growth in a pandemic situation. The emergence of the COVID-19 crisis offered an opportunity to analyse the effect of a pandemic on the general public's reprioritisation of their 'wants'. There might be changes in individuals' WTP for policies. Thus, another novelty of this study is in exploring the influence of the pandemic on Kazakh citizens' WTP for a policy to increase milk production by increasing the number of co-operatives. This was done by surveying the general public before and during the pandemic.

Moreover, this research contributes to previous studies on co-operatives in two ways. It is the first study, to our knowledge, that has used and expanded the RAA to gain an understanding of how the social value for the policy is moderated by a number of elements including an individual's psychological aspects based on the RAA. Second, whereas the literature on co-operatives has focused on their organisation and management, less focus has

been put on understanding the determinants of rural households' motivation to create and/or join a production co-operative. Therefore, this study contributes to the literature on co-operatives by identifying the drivers behind the intention of rural households to participate in collective actions either by joining or creating a production co-operative.

1.4. Organisation of this research

This research study is divided into three parts. Part I includes an introduction, a review of the agriculture of Kazakhstan and policies on co-operatives, as well as the theoretical background used for the study. Pilot studies carried out are also described within this part.

Chapter 1 is an introduction that provides a general background to the study along with the aims of this research with its objectives and questions. Additionally, the novelties of this study and contribution to the existing literature are also highlighted in this chapter.

Chapter 2 provides an overview of the agriculture and dairy sector in particular of Kazakhstan, including the main features of the country and agricultural production by region. This chapter also provides a comparison of the key indicators of dairy production in Kazakhstan with different countries. A determination of rural households along with the problems that rural households face and possible improvements may also be found within this chapter. Furthermore, the current situation in the dairy is established, and governmental attempts to determine its development since independence and the current government program aimed at linking up small-scale farmers in co-operatives are also reviewed. The essence of co-operative production and the examples of it in different counties will also be described within this chapter.

Chapter 3 reviews the theoretical bases underlying the study. The process of conducting the pilot studies is presented in chapter 4.

Part II of the thesis consists of two chapters, Chapter 5 and Chapter 6, that each have the format of a research article for publication. One paper has already been published in Agriculture[1] (Chapter 5), while the second is currently under review by the Journal of Agricultural Economics (Chapter 6). Along with the detailed explanation of the methodologies used, within these chapters, the results and discussions are provided. Thus, the main findings of the research are shown in the second part of the thesis. Chapter 5 answers Research Question 1 and 2, while Research Questions 3 and 4 are addressed in Chapter 6.

Part III is devoted to policy recommendations and conclusions from the research. These are presented in Chapter 7. Although some recommendations and conclusions are also given at the end of both articles (i.e., Chapter 5 and Chapter 6), Chapter 7 summarises and expands those recommendations, laying particular emphasis on those which will be valuable for Kazakhstani policymakers to consider while implementing the policy, as well as for other countries with a similar transitional economy history. Chapter 8, also in Part III, sets out the describes challenges and limitations of the study.

Finally, all references to the literature consulted are presented in the bibliography.

[1] Kaliyeva, Samal; Areal, Francisco J; Gadanakis, Yiorgos. 2020. "Attitudes of Kazakh Rural Households towards Joining and Creating Co-operatives" *Agriculture* 10, no. 11: 568.

Chapter 2

A review of agriculture in Kazakhstan and the co-operative policy

2.1. Introduction

In this chapter, we provide an overview of agriculture of Kazakhstan including the dairy sector, and a comparison in key performance indicators with other countries, including countries in the Customs Union. An overview of rural households and related issues in the dairy sector is also given in this chapter. In addition, we describe the government policy aimed at enhancing co-operative production and examine the theme of agricultural co-operatives in the context of other countries.

2.2. Overview of the agriculture sector of Kazakhstan

Kazakhstan is the ninth largest country in the world, geographically located in Central Asia. The area of the country is 2,724,900 square kilometres (sq. km). However, with a population of 18 million people in 2019, Kazakhstan is one of the most sparsely populated countries, with six people per sq. km (FAO, 2017; Petrick & Pomfret, 2018).

Kazakhstan ranks second in the world for the amount of arable land per capita - 1.5 hectares (OECD, 2015) and has got robust agricultural potential with land which is suitable for both livestock and crop production. Agriculture is the most important sector in the development of the economy of Kazakhstan, covering not only the production of food, but also the supply of raw materials for many industries, and it employs a third of the population (Petrick & Pomfret, 2016). The contribution of agriculture to the country's GDP was 4.3% in 2018 (STAT, 2019a). Approximately 80% of the total land area in Kazakhstan is used for agricultural purposes, i.e., crop and livestock production, (Baranowski et al., 2020). Crop production is prevalent in the northern, eastern and southern parts of the country, while

extensive livestock raising dominates in the centre. Mixed farming is carried out in south-east and east Kazakhstan (Petrick & Pomfret, 2018).

Background to the formation of the current structure

During the Soviet Union regime, agricultural production in Kazakhstan was carried out through state-owned sovkhozes and collective farming kolkhozes (Csaki et al., 1992; FAO, 2011; Kucherov, 1960). Agricultural output accounted for more than 20% of GDP in 1991 and the percentage of the workforce employed in the sector was just over 45% (OECD, 2019). During the Soviet Union era Kazakhstan was a net exporter of agricultural products: "*Kazakhstan exported 300,000 tonnes of meat per year, 250,000 tonnes of milk and 150 million eggs to other Soviet republics*" (Petrick & Pomfret, 2018). After the collapse of the USSR, Kazakhstan faced the problem of transitioning from a communist-collective economy to a private property-based economy (Abdrassilova, 2015; Toleubayev et al., 2010). The majority of kolkhozes were broken up, and all their former members were given shares of the holdings, proportionate to their property rights (FAO, 2011, 2016a). Support for the sector, including subsidies, decreased from 10-12% of GDP in 1991 to 2-3% in 1993 (Petrick & Pomfret, 2018). Mass privatisation broke up all the existing large companies, bringing about a dramatic decline in agricultural output (Petrick & Pomfret, 2018). Inadequate transition policies and a collapsed market had a significant impact on all areas of agricultural production, including livestock (Toleubayev et al., 2010). As the number of cattle and cows owned by enterprises fell sharply, the number of cattle and cows owned per household and per individual/peasant farm increased steadily (Petrick & Pomfret, 2018). Although the situation improved after the millennium when the government took steps to increase support for the sector, the dismantling of collective farms led to a restructuring of the farming sector with three types of farm emerging:

a) agricultural enterprises that generally mirror the previous sovkhozes and kolkhozes (Abdrassilova, 2015; Csaki et al., 1992; FAO, 2011), where the number of livestock has a range of between one thousand and ten thousand (Baranowski et al., 2020);

b) individual/peasant farms, "a joint family labour union in which individual entrepreneurial activities are directly linked with the use of land for agricultural purposes to produce, process and market farm outputs" (Toleubayev et al., 2010), where the number of livestock has a range of between ten and one thousand (Baranowski et al., 2020);

c) rural households, that "operate at small scale and keep small numbers of livestock" (Baranowski et al., 2020).

Out of the three types, rural households hold the largest share of livestock production in the country. For instance, in 2018, 55% of slaughtered livestock and poultry (in slaughter weight) was produced by rural households, while the individual/peasant farms and the agricultural enterprises accounted for 19.3% and 25.6%, respectively. Milk produced by rural households represented 78% of total production, whereas the share for individual/peasant farms and agricultural enterprises of the total production were 22% and 7% respectively in 2018.

2.3. A comparison of key differences between milk-producing systems in Kazakhstan and other countries

The dairy sector in Kazakhstan indicates that positive developments have happened in recent years compared with the early years of independence. For instance, cattle population, which fell from 9.5 million head to 4 million between 1992 and 1999, recovered to 6.2 million head by 2011 (Tazhibaev et al., 2014) and demonstrates an overall tendency towards stabilisation. Thus, there were more than 7 million head of cattle in all categories of farming in 2019 (STAT, 2019b).

According to the statistics committee, in 2019 there were nearly 5 million dairy cattle and about 2.5 million beef cattle in the country. 70% of dairy cattle were owned by households, while agricultural enterprises and individual/peasant farms accounted for 5% and 25% of all dairy cattle in the country, respectively. To note, individual/peasant farms are leaders in beef, accounting for 55% of all beef cattle in the country in 2019, whereas the comparable figures for household and agricultural enterprises were 26% and 17% respectively.

Milk production in Kazakhstan for the whole sector and different types of the farm is given in **Table 2.1.** Although there were some fluctuations, the household farming sector in recent years has clearly dominated in the field of milk production. **Table 2.1** shows that 73% of milk was produced by households in 2019.

Table 2.1. Production of cow's milk in Kazakhstan from 2015-2019, by thousand tonnes

	2015	**2016**	**2017**	**2018**	**2019**
In the whole sector	5141.6	5300. 0	5460.5	5642.3	5820.1
Including:					
Agricultural enterprises	263	317.1	358.4	381.3	411.1
Individual/peasant farms	777.5	886.5	1023.9	1106.1	1168.3
Households	4101.1	4096.4	4078.1	4154.9	4240.7

Source: Ministry of National Economy of the Republic of Kazakhstan, Committee on Statistics, www.stat.gov.kz, 2019.

Total milk production in Kazakhstan was 5.8 million tonnes in 2019 (**Table 2.1**), which is much lower than milk production in some European and Custom Union countries. For instance, 7.4 million tonnes of milk were produced in Belarus in 2019 (BELSTAT, 2020), while in the UK this indicator reached 15.2 million tonnes (AUK, 2020) in the same year.

The explanation for these differences lies in the structural variations in dairy production in these countries. Namely, the prevalence of rural households in Kazakhstan's milk production is acknowledged to cause low productivity in the sector.

The average milk yield per cow per year in the entire dairy farming sector in Kazakhstan and other countries in different years is shown in **Figure 2.1**. The graph shows not only the relatively low milk productivity of Kazakhstan compared to other countries but also shows that productivity growth in the given years has been relatively low compared to other countries.

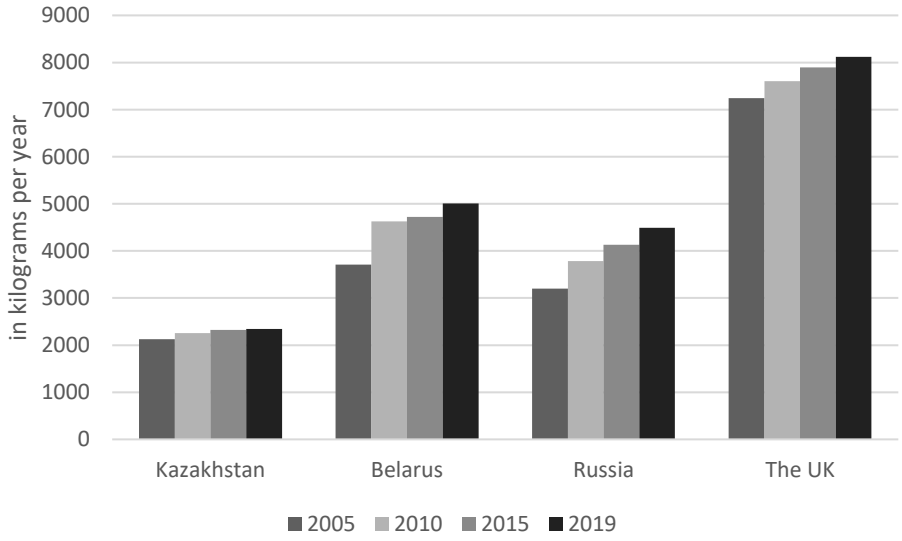


Figure 2.1. The average milk yield per cow per year in different countries

Figure 2.1 shows that Kazakhstan has the lowest average milk yield per cow, which is almost 3 times lower than in the UK and half that of Belarus and Russia. Although other countries in the graph have had a dramatic increase in the average milk yield in the following years compared with 2005, in Kazakhstan the numbers indicate a marginal increase.

Nevertheless, it is interesting to note that the average milk yield per cow in agricultural enterprises in Kazakhstan is nearly the same as that of Belarus (**Figure 2.1** and **Figure 2.2**). This may be due to the dairy herd in agricultural enterprises being thoroughbred. It should

be noted that the overall positive trend in **Figure 2.2** is the result of state programs and individuals' efforts, which have been directed towards developing the larger-scale sectors of milk production. For instance, 6,628 head of breeding cows were imported into Kazakhstan in 2015. The cost of importing these cows was 50% self-funded by agricultural enterprises and individual/peasant farms, while governmental organisations financed the remaining 50% (STAT, 2018). As a result, compared with 2015, in 2016 there was an increase in the rearing of dairy breeds of cattle in agricultural enterprises and individual/peasant farms of 22.3 % and 13.8 % respectively, whereas in households this indicator showed a decrease by 0.1%. Despite a slight fall in 2017 (the reason is unclear), overall agricultural enterprises show a positive trend in terms of the productivity of their cows.

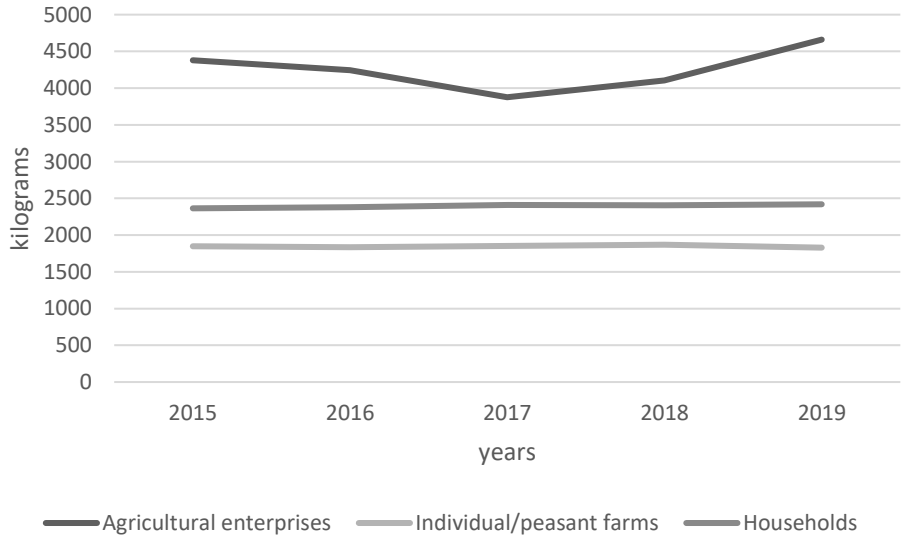


Figure 2.2. The average milk yield per cow in diverse types of the farm in Kazakhstan

Hence, the average milk yield in agricultural enterprises was 4,660 kg per cow in 2019, while in individual/peasant farms and households it was 1,829 kg and 2,419 kg respectively.

The fact that individual/peasant farms had a low milk yield per cow is explained by their strategy of not milking all the cows and keeping some of them for meat. According to the statistics in 2018, in individual/peasant farms 47.1% of cattle were dairy and the rest

were beef cattle, while in households 84.5% of all cattle were dairy (STAT, 2018). On the other hand, according to a survey in 2015, self-reported milk yields per cow were found to be only slightly lower on individual/peasant farms compared to agricultural enterprises (Petrick & Götz, 2019). The researchers explained this fact by official statistics (especially for small farms) being based on estimates of milk quantity by enumerators, rather than on surveys of farmers.

The uneven distribution of dairy production of by sector, namely, rural households' low productivity compared with other sectors and their dominance in the overall sector, has had a significant impact on overall dairy production in Kazakhstan, accounting for the relatively low productivity of the sector as a whole. For instance, both being post-soviet countries, the agricultural systems of Kazakhstan and Belarus have the same range of farming structure. However, the shares of farms in the total are different **Figure 2.3**. As a result, agricultural enterprises in Belarus accounted for 96% of all milk production in the country in 2019, while in Kazakhstan milk produced by agricultural enterprises amounted to only 7% in the same year.

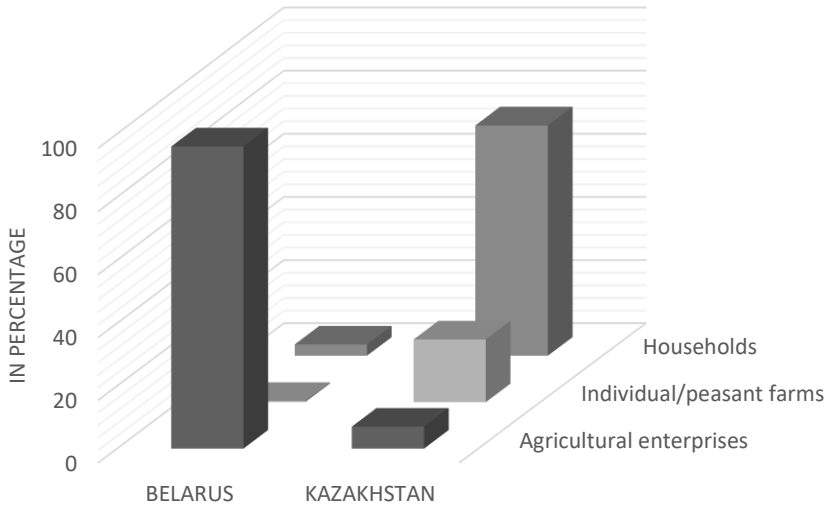


Figure 2.3. Share of farms in milk production in 2019

Milk produced by households and individual/peasant farms represents 73% and 20% of total production, respectively i.e., small-scale producers, whereas only 7% of milk was produced by agricultural enterprises (**Figure 2.3**). Thus, due to the prevalence of small-scale production, the domestic supply of dairy products is not enough to meet internal demand. Therefore, the country depends on imports of dairy products, including dried milk imported from Belarus, Ukraine and the USA (NMH KazAgro, 2015).

2.4. Households in rural areas of Kazakhstan

2.4.1. A description of rural households

Household level farms, formally known as 'personal subsidiary farming', tend to have small-scale holdings averaging of 0.15 hectares and from one to ten cows (with an average of 3 per household). (Land Code of the Republic of Kazakhstan, 2017). According to the official classification of farms, a personal subsidiary farm denotes one where the food production is mainly to meet the needs of the household, on a land plot located in a rural or suburban area (Nazhimedenov et al., 2011). Currently, 47% of the population of Kazakhstan live in rural areas (STAT, 2019b) where they produce 77% of meat and 90% of milk, mainly for their own consumption (OECD, 2019).

However, they do not only produce for personal consumption, but also use informal exchange networks (**Figure 2.4**), and as a result, their products are widespread in the market (FAO, 2011; Jungbluth et al., 2004). The volume of the commercial production of raw cows' milk was 4 million tonnes in 2019, 76.2% of it produced by households, compared with 9.4% and 14.6% for individual/peasant farms and agricultural enterprises, respectively (STAT, 2019b). In other words, "modern dairies cannot obtain sufficient raw milk of adequate quality for their processing operations, while lower-quality milk continues to find buyers" (FAO, 2010). Direct sale is economically beneficial for rural households since the price

might be on average 68% higher than the other sales channels, including processors (Petrick & Götz, 2019).

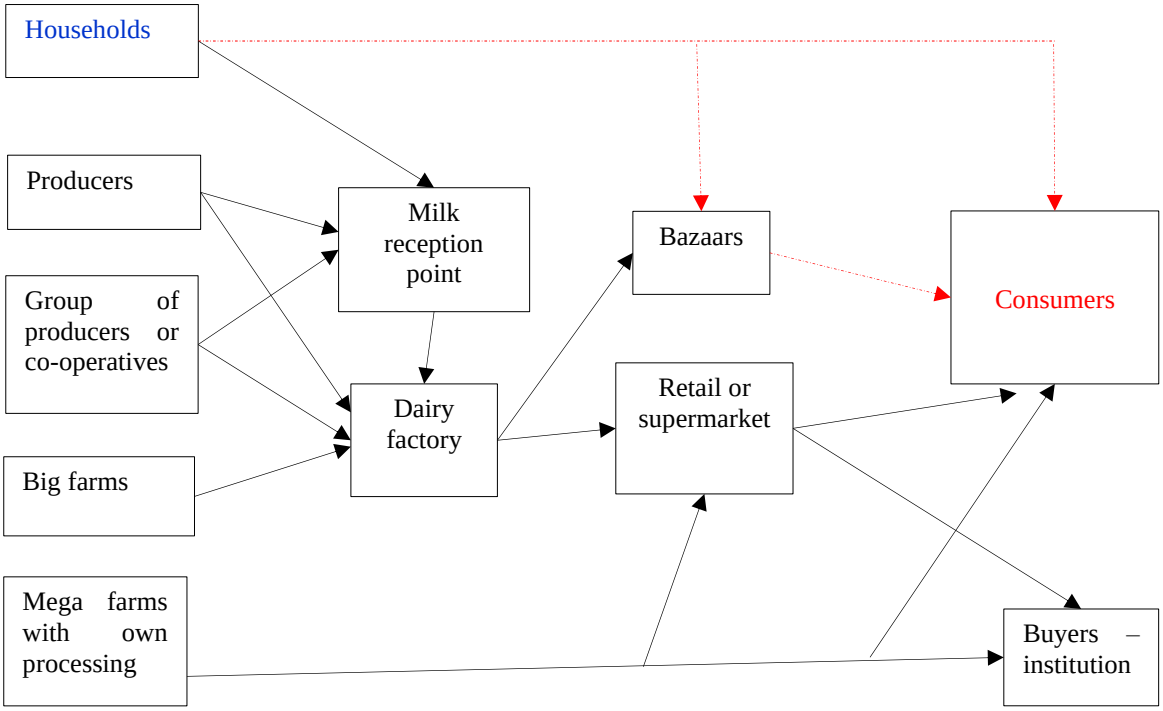


Figure 2.4. Sale of dairy products in Kazakhstan. Source: (Jungbluth et al., 2004)

Usually, traders buy products from the heads of households and then sell them to either other merchants, or wholesalers or processors, who later sell on to supermarkets and grocery stores (FAO, 2010). Some intermediaries sell goods purchased from various sources in bazaars (**Figure 2.4**). It should be emphasized that bazaars are local markets for the sale of livestock, vegetables and other products, where sellers have their own stalls to sell their own products (FAO, 2011).

Even though households must pay some fees, such as bazaar, food inspection and security costs, they are not subject to VAT (Nazhimedenov et al., 2011). Members of rural households are taxed as individuals. As such, they are not obliged to declare their income,

including that obtained through the sale of agricultural products. Incomes of households are not registered, and as a rule, they are not taxed (OECD, 2015).

2.4.2. Issues related to rural households

The advantage of rural households is their flexibility in terms of fattening regimes, and their ability to adapt to market requirements and other technical parameters of production. However, due to the lack of opportunities for the adequate organisation of feeding regimes, such as grazing, smallholders are concentrated around rural settlements and tend to make excessive use of nearby pastures. As a result, the load on the pastures is distributed extremely unevenly. Some sites suffer from overgrazing, while a significant part of the pasture is not used at all (Fileccia et al., 2010). Thus, the nutrition of dairy herds in rural households is very unsystematic. The inadequacy of fodder is generally recognized as the main factor in the low productivity of milk in rural households (Jungbluth et al., 2004). Since the rate of milk production is determined largely (50-55%) by feeding (Saphonov & Pavlov, 2015), balanced feeding is an essential factor in increasing the productivity of dairy herds. Therefore, it is necessary to create a sustainable fodder base for rural households (Tazhibaev et al., 2014). Since the feeding base and feeding technologies play a significant role in the process of dairy production, this is the first step to improving the profitability of farms and growth in the productivity of dairy herds.

Unorganized sales channels are the root cause of the problem of dairy scarcity in Kazakhstan. Virtually any market participant, regardless of his place in the marketing chain, can purchase products (**Figure 2.4**). Members of rural households might sell their dairy products in a bazaar or to consumers directly, while large food stores are forced to import products from other areas of Kazakhstan or neighbouring countries, such as Belarus, Ukraine or Russia. Producers also experience a deficit of milk for processing (Sheikin & Kulbayeva,

2015) because thay do not receive enough raw material (milk) from rural households and usually have to collect it from scattered households (Jungbluth et al., 2004). At the same time, rural household owners are usually not incentivised to participate in the supply chain. This is because their produce often passes through the hands of several intermediaries before it reaches its final market (**Figure 2.4**) which means the basic price offered by traders to the primary producers is much lower than if they sell direct to the consumer. This inefficient system reduces profits from the sale of livestock products and reduces the profitability of private farms (rural households). Rural household producers only have two viable options for making use of their milk - either using it for their own consumption or selling it to consumers directly, whilst at the same time other stakeholders are experiencing a deficit of milk for processing purposes.

Moreover, the quality of milk in rural households does not usually fulfil the requirements of processors because it frequently violates sanitary norms relating to milking, and the storage and transportation of fresh milk (Nazhimedenov et al., 2011). Quality control at the household level is problematic due to the unavailability of the technical base. Depreciation of fixed assets in these farms amounted to 50% since independence (Kazkenova et al., 2015). Despite some government policies supporting farmers, most of them are unable to afford loans for leasing and buying new equipment (Fileccia et al., 2010). Thus, old technology, which has been in use since the Soviet Union era, continues to cause problems in the dairy sector. As can be seen in **Figure 2.4** the tendency for households to sell to the consumers directly also gives rise to problems due to the absence of controls and checks of products in this chain. The milk from this direct channel is not usually safe for consumers (Kazkenova et al., 2015) due to the sanitary and hygiene conditions (Nazhimedenov et al., 2011). Therefore, the creation of an effective supply chain with quality and temperature control measures is essential. Since milk is a rapidly deteriorating

product, it is necessary to create a single refrigeration chain system (Jungbluth et al., 2004). Observance of the temperature regime at each stage of the chain will significantly improve the quality and suitability of milk for processing. Hence, it will lead to a rise in the quantity and quality of milk in the dairy sector.

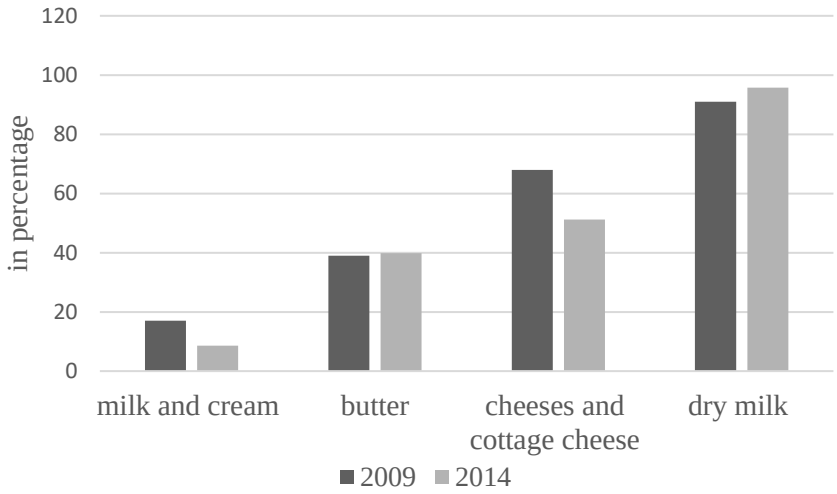


Figure 2.5. The share of imports in the total dairy sector in Kazakhstan for selected commodity groups in 2009 and 2014. Source: (NMH KazAgro, 2015)

Rural households are not sufficiently engaged in planning, which prevents them from organizing the production and sales process in such a way as to avoid seasonal overproduction and shortages (Jungbluth et al., 2004). So, owing to the fluctuations in milk availability throughout the year, dairy companies use milk powder extensively to ensure a steady milk supply in both winter and summer (FAO, 2011). As a result, the dairy industry in Kazakhstan depends on the import of dried milk due to the limited and uneven supply of raw milk from rural households, which are its dominant producers (Philatova & Kali, 2014).

A large share of the imports of dairy products consists of dried milk from Belarus, the United States and Ukraine, for use in dairy processing (NMH KazAgro, 2015). According to **Figure 2.5**, the dependence of dairy processors in Kazakhstan on dry milk has persisted and indeed there was a slight increase in 2014 compared to 2009. Although demand for some

import products such as milk, cream and cottage cheese decreased, the deficit of raw milk is still a current issue because almost all milk processed at ultra-high temperature is produced in Kazakhstan from imported dry milk. This highlights the need to organise planning in rural households in order to control milk availability throughout the year and to avoid seasonal overproduction and shortages.

The transition to market relations in the agricultural industry requires it to be ready for the use of processed products. This is because processing will result in convenient and useful products, potentially enriched with vitamins and with an increased shelf life. The quality of manufactured dairy products such as cheese, yogurt, ice cream and butter directly depends on the raw milk which is used to produce them (Rowbotham, 2015). However, in Kazakhstan the milk produced in the rural household farming sector does not fulfil the quality requirements (Nazhimedenov et al., 2011). Moreover, home processing is an integral part of dairy processing in Kazakhstan. The chain is usually the same; members of rural households make dairy products such as butter and sour cream at home and sell it to neighbours or relatives, and also in bazaars and directly to consumers (FAO, 2011). Since rural households are not connected through a supply chain with processors and milk collection networks are not developed sufficiently there is a lack of fresh milk supply for processing (Nazhimedenov et al., 2011). Consequently, the problem of manufacturing, especially the production of cheese and the expanding range of products in the dairy industry, has remained a weakness. As a result, most market niches are covered by imported products. The dairy industry, at the same time, uses only 30% of its capacity due to the scarcity of raw milk (**Table 2.2**).

Table 2.2. Production and consumption of milk in Kazakhstan, thousand tonnes

	2011	2012	2013	2014	2015
I. Resources					
At the beginning of the year	619.5	620.0	584.8	511.1	531.4
Production	5 232.5	4 851.6	4 930.3	5 067.9	5 182.4
Import	606.7	620.1	645.7	684.6	568.9
Total	6 458.7	6 091.7	6 160.8	6 263.6	6 282.7
II. Consumption					
Consumption by industries (producers)	1 599.7	1 483.2	1 507.3	1 576.1	1 593.3
Other industrial uses	0.6	0.6	0.6	0.6	0.6
Losses	32.3	30.5	30.8	31.3	31.4
Export	8.5	11.2	33.3	40.0	97.1
Possible personal consumption by the population	4 197.6	3 981.4	4 077.7	4 084.2	4 157.9
possible per capita consumption, kg / year	253.5	237.1	239.4	236.2	237.0
At the end of the year	620.0	584.8	511.1	531.4	402.3

Source: Ministry of National Economy of the Republic of Kazakhstan, Committee on Statistics, www.stat.gov.kz, 2015

Table 2.2 shows that the production of milk in Kazakhstan amounted to 5.1 million tonnes in 2015, for example, but that only 1.6 million tonnes of this went for processing by industries, while the possible personal consumption by the population accounted for almost 80%. This means that the dairy sector of Kazakhstan is experiencing not only the problem of low productivity, but also a lack of processing due to the milk scarcity. These figures underline the need to create effective marketing channels and organisational models of communication between rural households with food processors. This would give rural households the opportunity to make full use of their comparative advantages and to participate actively in economic development (Jungbluth et al., 2004).

Much of the dairy produce coming from rural households is also subject to by low productivity rates due to the genetic characteristics of livestock in households (FAO, 2010; Tazhibaev et al., 2014). In fact, the governmental support which might address this is

targeted only at large-scale farming, since to participate in subsidised programs farmers are required to have more than 70 head of livestock. Therefore, high-productivity production is possible only in large farms (FAO, 2010).

Moreover, veterinary medicine is not a priority in the professional field, so there are very few highly skilled workers in the country. Due to the low numbers of qualified specialists and diagnostic facilities to prevent or treat diseases in a timely manner, the country faces a growth in epizootic and epidemiological challenges. This inhibits not only local production, but also the ability to export dairy products (Philatova & Kali, 2014). During the Soviet period, rural households benefited from *"a symbiotic relationship with large-scale collective farms"*, namely, they were given access to veterinary services, agronomists, animal production specialists and artificial insemination (OECD, 2015). Since the collapse of the collective farming system access to those services has decreased and households have had to depend on their own resources (OECD, 2015). As a result, dairy herds in rural households are more vulnerable to diseases and display low productivity, because access to specialist services is unaffordable (Fileccia et al., 2010). Therefore, another way of increasing production volumes is to increase the number of highly productive dairy herds in rural households (Kazkenova et al., 2015) and to improve veterinary services in this field.

To sum up, rural households hold the largest share in the dairy production system of the country giving rise to several issues, including low productivity and disconnection from the supply chain which in turn has led to the dairy sector's dependence on imported products to meet internal demand. The application of measures targeted at rural households is therefore required to lead to an improvement in the quality and quantity of products in rural households and as a result, the problems of the dairy sector such as milk scarcity and uncontrolled product chains might be mitigated. The next section (i.e., **2.5.2**) describes the

current government program that takes on board the problems listed above faced by rural households and attempts to address them.

2.5. Agricultural policies of Kazakhstan

2.5.1. The establishment of the current governmental policy in Kazakhstan

In the former Soviet Union, sovkhozes and kolkhozes constituted the major pillars of the agricultural production system. In kolkhozes/collective farms "production output and all assets (productive and social, except land) were owned jointly by the collective"; while in sovkhozes/state farms, production output and all assets were owned by the state. As well as sovkhozes and kolkhozes, individual subsidiary farms (households) also existed. However, according to the Soviet statistics, only 25% of the total value of agricultural products were produced by households. Thus, "detailed production targets by commodity were set centrally in Moscow and diffused down through several administrative layers to collective and state farms throughout the Soviet Union. Farm enterprise collectivisation was designed to extract food from rural areas for increasingly industrialised urban centres at a low cost" (Csaki et al., 1992).

Apart from sovkhozes/kolkhozes and households, which were the main contributors to the agricultural production system, other structures of farming were also present, including agricultural co-operatives. Following the Soviet legal terminology, "a co-operative is simply a group of workers outside the collective or state structure who are not members of a single family" (Csaki et al., 1992).

After the collapse of the Soviet regime, the formal reconfiguration of kolkhozes and sovkhozes took four forms: “a) the establishment and expansion of individual subsidiary farms (households) within the existing kolkhoz structure and their organisation into co-operatives; b) the creation of "lease co-operatives" as comparatively independent

subdivisions of existing kolkhozes and sovkhozes; c) the conversion of the kolkhozes and sovkhozes into joint stock societies; d) the separation of individual/peasant farms or co-operatives from the kolkhoz" (Csaki et al., 1992).

Following the enactment of several land policies and the farm privatisation process, the following agri-formation types were established in independent Kazakhstan: a) agricultural enterprises; b) individual/peasant farms and c) households. The current distribution of land amongst these farming structures is uneven, large agricultural enterprises accounting for more than 60% of the cultivated area, while individual/peasant farms account for only 36% (J. Swinnen et al., 2015). This is due to "most large-scale private enterprises being established in the first phase of the transition period while the majority of individual/peasant farmers started up in the early 2000s, following the law On the Peasant Farm in 1998 and the Land Code in 2003" (Toleubayev et al., 2010).

Since 1991, the governmental policy on the development of the agricultural sector has been implemented on the basis of nine program documents:

1. The program "Aul" for 1991-1995 and for the period up to 2000;

2. The conceptual program for the development of the agro-industrial complex for 1993-1995 and up to 2000;

3. The Program for the Development of Agricultural Production for 2000-2002;

4. The State Agri-Food Program for 2003-2005;

5. The State Program for the Development of Rural Areas for 2004-2010;

6. The Concept of Sustainable Development of the Agro-Industrial Complex for 2006-2010;

7. The Program of Priority Measures for the Implementation of the Concept of Sustainable Development of the agro-industrial complex of the Republic of Kazakhstan for 2006-2010;

8. The program for the development of the agro-industrial complex for 2010-2014;

9. The program for the development of the agro-industrial complex in the RK "Agrobusiness - 2017".

As a result, the agro-industrial complex of the Republic of Kazakhstan gained good prospects for further development in terms of a) strengthening the export position of the oilseed and meat sectors and b) Kazakhstan quickly became one of the largest grain and flour exporting countries. However, households still have the largest share in the sector's gross output. Thus, about 80% of agricultural products produced in Kazakhstan are sold in the form of raw materials, without processing, and finished products have weak competitiveness (Ministry of Agriculture of the Republic of Kazakhstan, 2017). Therefore, in 2017 the government issued another Programme, according to which 500,000 rural households were planned to participate in the establishment of co-operatives in the following five years (i.e., by 2021). Co-operatives were planned to be organized in the following areas: a) production, b) marketing, c) processing of agricultural products, d) logistics, e) credit, f) services and g) information and marketing services for agricultural producers. Co-operatives, through a more efficient use of resources and the dissemination of information/technology between rural households were expected to produce 500,400 tonnes of milk in 2021. Thus, the state measures aim to increase the competitiveness of agricultural products by encouraging industrial production “to ensure the viability and profitability of the smallholder farms by counteracting the negative effects of smallness” (Lerman, 2013).

2.5.2. Key aspects of the policy on co-operatives

The legislative basis of the Program is set out in the Law "On Agricultural Cooperation", adopted in 2015[2]. , The main elements in the legislation outlining the features creating co-operatives are presented below.

According to the law, an agricultural co-operative is created when there are at least three members in it. All members of the co-operative are obliged to pay an entrance fee, in accordance with the charter of the co-operative. If necessary, members of the co-operative can make additional contributions (on a voluntary basis). In addition, the founders and members of the co-operative can also make a material (share) contribution.

The basic principles of the creation and functioning of co-operatives are expected to comply with the international principles specified in the International Co-operative Alliance (ICA). According to the ICA, there are seven main international co-operative principles: 1) Voluntary and open membership; 2) Democratic member control; 3) Member economic participation; 4) Autonomy and independence; 5) Provision of education, training and information; 6) Co-operation among co-operatives; 7) Concern for the community.

The agricultural co-operative is a commercial organisation, the main activities of which are production, processing, marketing of agricultural and aquaculture products (fish farming), a supply of crops and other types of services for members of the co-operative.

The property of an agricultural co-operative is financed by a) property (share) contributions; b) entrance fees and additional contributions of its members; c) property (share) contributions of associate members of the co-operative and d) income from its own activities and other sources not prohibited by the legislation of the Republic of Kazakhstan. In the event of the liquidation of an agricultural co-operative, its property will be distributed

[2] http://adilet.zan.kz /rus/docs/Z1500000372, accessed on 01.12.2020

among the members of the co-operative in proportion to the property (share) contributions made.

Net income received by the agricultural co-operative based on the results of its activities each year is distributed between the members of the co-operative at the general meeting of its members. The decision on the exclusion of net income or its part from the distribution among the members of the co-operative can also be made in the general meeting.

2.5.3. A production co-operative

Kazakh legislation distinguishes between two types of agricultural co-operatives: production and service/consumer co-operatives. They mostly repeat similar co-operative principles and attributes, such as voluntary participation (Sedik & Lerman, 2015). A legal term of service/consumer co-operatives includes marketing, supply, and credit co-operatives, while production co-operatives mainly focused on the collective production of goods (Kurakin & Visser, 2017). Although co-operatives can potentially be organised in many forms, e.g., service co-operatives, the main focus of the policy and therefore of this study is forwarded to production co-operatives. It is expected for rural households to be engaged in the supply chain to facilitate constant milk supply to dairy factories via co-operatives. Members of production co-operatives, i.e., rural households and individual/peasant farms, are expected to supply the co-operatives with fresh milk that goes directly to the dairy factories. As there are no intermediates, households (and individual/peasant farms) will be paid from the factories directly. In turn, co-operatives receive KZT 10 per litre of milk in the form of subsidies from the government (Ministry of Agriculture of the Republic of Kazakhstan, 2017).

An example of a production co-operative is given in **Figure 2.6**.

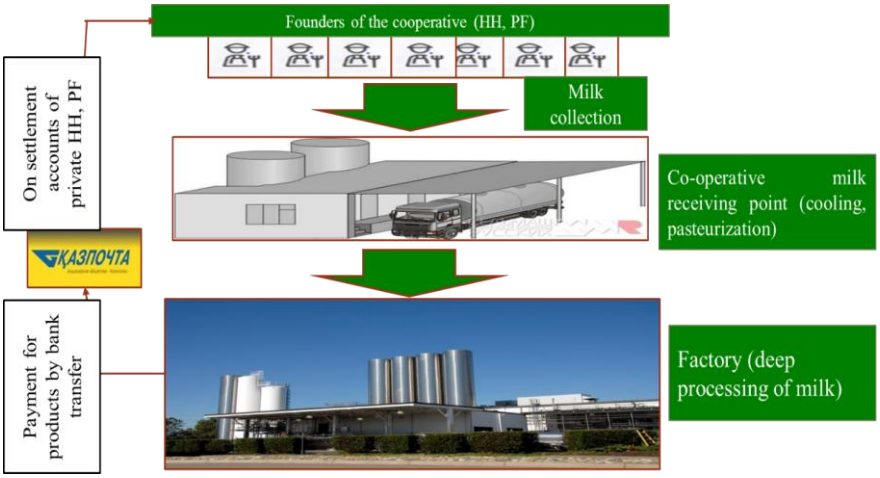


Figure 2.6. An example of a production co-operative

Source: the figure was retrieved from the initial version of the Program.

The program takes into consideration the current problems faced by rural households (mentioned in the section **2.4**) and sets out measures to resolve these issues (**Table 2.3**).

Table 2.3. Possible improvements to increase the productivity of cows in rural households

	As a member of a production co-operative a farmer will receive
Breeding	50% subsidy from government for the purchase of a breeding animal
Feeding	Access to affordable mixed fodders (feeding)
Improving the quality of veterinary services	Organisation and implementation of veterinary and sanitary measures in co-operatives
Creating (organising) advisory services for farmers	Free access to information and advice from specialists for the agricultural co-operative
Quality controlling	Co-operative milk receiving point (cooling, pasteurization)
Creating the supply chain with temperature control	The sale of products (without intermediaries) is guaranteed directly to the processing enterprise

Note: the table was compiled by the author using the information in the Program.

According to the Program (**Table 2.3**), for instance, the members of the co-operative are entitled to receive a subsidy for the purchase of equipment and pedigree cattle. 50% of the subsidy is irretrievable, so a loan is issued at 5-7% for the remaining 50% of the total cost. In addition, a system to supply the agricultural products of households to processing enterprises through agricultural co-operation (**Figure 2.6**) will allow enterprises to increase their capacity by 30% (Ministry of Agriculture of the Republic of Kazakhstan, 2017). Hence, it can be said that this program was aimed not only at aiding the transition of the dairy sector to an industrial level through the creation of co-operatives but also at solving the problems that were indicated in **Table 2.3**. It is expected that this will lead to improvements in rural households and as a result in the whole dairy sector of Kazakhstan.

2.6. An overview of agricultural co-operatives in different countries

Co-operative and community-based forms of doing agriculture are common in most countries, especially in developed countries where "the access of small farmers to markets is usually facilitated by agricultural service co-operatives" (Lerman, 2013). Farmer co-operatives in Europe and the United States were estimated at about 51,000 and 2,000 respectively in 2015, with an aggregate turnover of €347 billion and $212 billion, respectively (Grashuis & Ye, 2019). An increasing interest in co-operative production can also be seen in developing countries, where small-scale farming predominates (Garnevska et al., 2011; Moon & Lee, 2020). According to the International Co-operative Alliance (ICA), almost 32% of the world's top 300 co-operatives operate in agriculture sectors.

As well as offering a variety of advantages, farmers commonly benefit from agricultural co-operatives in two ways. First, access to government and other financial support as noted by Swinnen & Gow (1999), small farmers' access to loans is generally

limited due to the lack of guarantees from borrowers. Therefore, most financial support tends to go to large farmers, while small farmers are left out. Membership of co-operatives has been found to facilitate access to such support for small farmers since as co-operative members it is expected that people share their assets to collectively improve their well-being (Majee & Hoyt, 2011). Second, it is widely acknowledged that co-operatives mitigate production risks since as a member of a co-operative, farmers can gain access to a constant supply chain, which in turn will reduce fluctuations in sales. Thus, it is important to note that co-operative membership gives access to input and output markets, which implies a risk reduction on the part of the members (Alho, 2015; Bijman, 2018; Zhong et al., 2018).

Furthermore, co-operatives are acknowledged to contribute to reducing poverty and food insecurity in rural areas through improved use of technology and the sharing of knowledge. Thus, co-operative members can increase their livelihood by producing for the market (Ajates, 2020; Ishak et al., 2020; Milovanovic & Smutka, 2018; Sultana et al., 2020).

In 1844, the first co-operative was founded in Great Britain on behalf of a group of workers, known as the "Rochdale Equal Pioneers Society" (Qian & Olsen, 2018). Later, by about the 1890s, agricultural co-operatives were operating in Asian and Pacific countries, including India, Australia and New Zealand (Dongre, 2020). Currently, the latter is renowned for its "advanced agricultural industry and outstanding products around the world" as co-operatives play a major role in some agricultural sectors, which together "account for a significant share of the country's economic activity" (Qian & Olsen, 2018). An example would be Fonterra, New Zealand's largest company, which collects approximately 85% of milk production and owns 30% of world dairy exports (Qian & Olsen, 2018). In Italy, co-operatives constitute an important sector of the agri-food economy with 10 of the 50 largest Italian agri-food enterprises being co-operatives. Most agri-food co-operatives are functioning as marketing and processing co-operatives and the most active are in the fields

of meat, dairy products, wine, fruits and vegetables (Fonte & Cucco, 2017). In the Netherlands, dairy co-operatives have existed for more than 130 years and have held a joint market share of more than 80% since the 1950s (Bijman, 2018). In the USA co-operatives became a recognised business structure during the Industrial Revolution. Although the number of co-operatives is lower (only 3000) compared with other countries, most of the products that produce and grows in there is operated by co-operatives (Manta, 2017).

Farmer co-operatives in China began to develop before 1949 and went through several stages of development. But their rapid development started in 2006 after the first national law on co-operatives came into force (Zhao & Yuan, 2014). Thus, the number of farmer co-operatives in China accounted for only about 100,000 in the year 2006, but had reached 504,300 by September 2011, and 689,000 in 2012. Just over 15% of all farmers in China had joined co-operatives by 2011. Farmers engaged in co-operatives farm in different sectors, including crop farming and livestock-raising. Thus, the development of farmer co-operatives connected small agricultural producers to large markets, and in addition, helped farmers to develop agriculture in a small-scale production environment (Huang, 2013).

Despite the relatively positive implications of co-operative farming around the world, the development of agricultural co-operatives in post-communist countries show a slow tendency of farmers to unite.

The first agricultural co-operatives in Russia were established in 1865 and over the following fifty years the co-operative movement had great success in improving the quality of life of rural households (Sobolev et al., 2018). Russia was one of the world leaders in the number of co-operatives and their membership before the Revolution in 1918. Since the collapse of the Soviet Union the country has gone through a transition to a market economy, and as a result, as in the case of Kazakhstan, collective farms in Russia were dismantled. As a result, the number of rural household farms rose sharply. Currently, the Russian

government is making attempts to promote the development of rural co-operative among households (small farms) through state programs. However, the situation is unclear as only about 60% of the registered co-operatives in Russia are active (Sobolev et al., 2018). The co-operative sector in Russia faces several obstacles, according to Sobolev et al. (2018), including a lack of academic expertise and a poorly-developed bottom-up movement. However, there is no comprehensive study of the development of the agricultural co-operatives after the demise of the Soviet Union (or as the researchers noted, the "fate" of the co-operatives since 1991). This may be due to an assumption on the part of observers of post-Soviet agriculture that rural co-operatives have not played a significant role in the rural development of Russia, and that therefore, they might have no dynamic role to play in its growth in the future (Kurakin & Visser, 2017).

Despite the government's efforts to reorganize agricultural activities in Romania, the co-operative form of farming has negative connotations inherited from the socialist regime era and therefore privatisation/individual agricultural enterprise are deemed preferable to co-operation/association (Zotic et al., 2014). Along with the negative experience of formal co-operation during the Soviet era and the transition period, Balint & Wobst (2006) argue that the rejection of co-operatives in Romania is mostly due to “the lack of tradition and spirit of co-operation in certain regions”.

The interest of Ukrainian farmers in agricultural co-operatives is also low due to the past experience of the Soviet co-operative model and the lack of experience with alternatives. Although the Ukrainian government has consistently announced support for agricultural co-operatives, in reality the implementation of this formal support is much less consistent. Specifically, governmental support programs focus on providing subsidies and on special agricultural value added taxes (VAT) rather than the creation of co-operatives or educational programmes and legal aid which might foster their establishment. This tendency

has resulted in a significant imbalance amongst the beneficiaries of state interventions, by distributing most of the subsidies to "a relatively small number of large producers rather than tens of thousands of smallholders" (Sedik & Lerman, 2015).

A study of co-operatives in Kyrgyzstan, a former Soviet Union country that neighbours Kazakhstan, appeared to indicate an impressive growth in co-operatives there over recent years. However, over 70% of registered co-operatives in Kyrgyzstan were inactive and existed only on paper, presumably with the intention of taking advantage of future credit or tax incentives that could materialize through government policies (Lerman & Sedik, 2017). Although co-operatives are expected to ease the difficulties that farmers face in Kyrgyzstan, and farmers' perceptions of their difficulties indicate the need for co-operatives, the research revealed several explanations for farmers' unwillingness to become r co-operative members; more than half the respondents noted the lack of existing co-operatives nearby as the main reason and more than 40% cited their willingness to preserve their independence. About 20% emphasized the need for more information about co-operatives (Lerman, 2013).

The Organisation for Economic Co-operation and Development (OECD) supports the creation of agricultural co-operatives and conducted a project in 2014 to generate policy recommendations to strengthen their growth in Kazakhstan (OECD, 2015). The project was financed by the government of Kazakhstan and the European Union. Results were used by the government of Kazakhstan which worked in collaboration with all relevant stakeholders to develop its agricultural policy. The main recommendations that emerged were: 1) to reform the legal and regulatory framework for agricultural co-operatives; 2) to provide education, information services and technical assistance to agricultural co-operatives; and 3) to provide targeted financial support for the establishment of agricultural co-operatives. In 2019, the OECD conducted further research, monitoring the development of agricultural co-operatives in Kazakhstan (OECD, 2019). The implementation of the recommendations

referred to previously were shown to have had positive impacts. The legal framework had improved significantly with the adoption of a new law on agricultural co-operatives in 2015, as well as the abolition of three previously existing laws on co-operatives. Important tax incentives were provided to agricultural co-operatives and registration procedures had been simplified. Much attention was paid to education and information services: programs for the development of agricultural co-operatives were created in each region, a national register and a system of statistical monitoring were launched. However, financial support was not sufficiently targeted: about 60% of newly registered co-operatives consisted of dormant or "sham" co-operatives, created mainly to attract government subsidies.

2.7. Summary

Kazakhstan is a country with a huge territory and great agrarian potential, which is located in Central Asia. The country joined the WTO and the Customs Union, which operates on the basis of the competitiveness of the agro-industrial sector, including dairy. However, as a country that has in its recent past had to overcome the collapse of communism, the transition to a market economy has not been without consequences. Specifically, the transitional period has affected the development of the dairy sector, resulting in the prevalence of small-scale production, and therefore shortages in milk/dairy production according to all key indicators compared to comparable countries. One solution to the issue is the creation of co-operatives which link rural households in co-production. After the adoption of the Law on co-operatives in 2015, the government launched a policy that aimed to foster the creation of co-operatives. Although there are many examples of the successful implementation of similar policies around the world, in Kazakhstan, the creation of co-operatives is proceeding slowly, with various constraining factors, including the creation of a large number of fictitious co-operatives. This study examines the success of the policy in

detail. Thus, in the next chapters the main methodology and results of the study as well as possible directions for policymakers will be described.

Chapter 3

A review of the theoretical frameworks

3.1. Introduction

The psychological explanation of a given behaviour based on the reasoned action approach is described along with other factors that have been included in the conceptual framework of the study. In addition, the stated preferences method that has been utilised to reveal the monetary value of the policy which is under review can be found here.

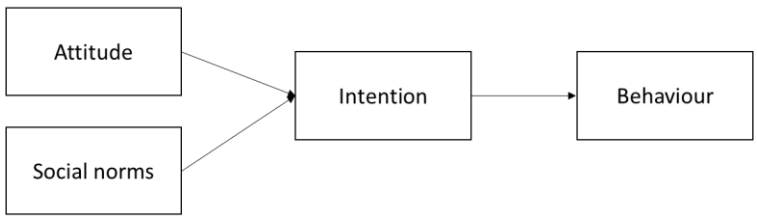
3.2. Theoretical frameworks

3.2.1. Theories of behaviour

Understanding the behaviour and drivers behind the motivation of a farmer's decision to participate in a government scheme is a complex issue. Farmers might be motivated not only by profit maximization but also by a range of socio-demographic and psychological factors (Martinovska Stojcheska et al., 2016; Sharaunga & Mudhara, 2018). A wide number of theories have been developed to explain individual's behaviour (Ajzen, 1991; Armitage & Conner, 2001; Davis et al., 2015; Fishbein & Ajzen, 1975, 2010; Jackson et al., 2006; Madden et al., 1992; Moody & Siponen, 2013; Riemenschneider et al., 2003). These theories put emphasis on the fact that an individual's intentions and behaviour may depend not only on an individual's demographic characteristics but also on their own views/evaluation of what the behaviour outcome would be, the barriers/difficulties as well as the influence of others on one's decision process (e.g., friends, family).

The fundamental idea of how psychological factors may underlie individual's behaviour was stated by Fishbein and Ajzen (Fishbein & Ajzen, 1975) in their Theory of Reasoned Action (TRA), where attitudes, social norms, intentions, and behaviour were

identified as its main elements (**Figure 3.1**). However, the theory was criticized by a number of researchers due to the relatively low correlation between attitudes and behaviour (Montaño, 1992). It led Ajzen and Fishbein to further development of the TRA, in which the attitude towards an object and towards a behaviour were distinguished: in other words, goal intention and behavioural intention were seen to have distinct roles in decisions (Montaño, 1992; Sheppard et al., 1988). For example, following Fishbein, attitudes toward behaviour (e.g., attitudes towards mammography) demonstrate better prediction of actually undergoing a mammogram than do attitudes towards the object at which the behaviour is directed (i.e., cancer) (Montaño, 1992). Ajzen and Fishbein clearly defined behavioural and normative beliefs, intentions, behaviour and also their measurement (Fishbein & Ajzen, 1975). They have shown that it is very important to have a high degree of congruence between measures of attitude, norm, intention and behaviour in terms of action (e.g., go get), purpose (e.g., mammogram), context (e.g., at a breast exam centre) and time (e.g., in the next twelve months). Thus, changing any of these factors leads to a different explanation of the behaviour. The low fit between model building measures in any of these factors will result in a low correlation between TRA variables, while a high fit will result in a high correlation (Fishbein & Ajzen, 1975; Montaño, 1992).



a)

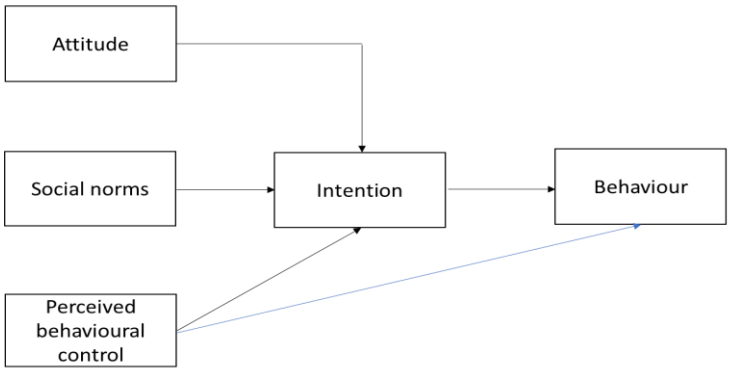


Figure 3.1. The theory of reasoned action (a) and the theory of planned behaviour (b).

Source: (Madden et al., 1992)

Later, the TRA was extended by adding perceived behavioural control (PBC) to the Theory of Planned Behaviour (TPB) (Ajzen, 1991; Armitage & Conner, 2001; Madden et al., 1992), which was defined as a determinant of behavioural intention and behaviour (**Figure 3.1**). Thus, following the TPB, PBC has a direct influence on behaviour, as well as indirect, through behavioural intention, while attitude and subjective norms can be treated as 'partly interdependent determinants of behaviour' (Madden et al., 1992). More specifically, the theory includes the role of beliefs on the possession of required resources that have a direct and indirect influence on behaviour. The more resources the individuals think they possess, the greater is their PBC over the behaviour (Madden et al., 1992). Consequently, when people feel that they have little control over the performance of behaviour due to a lack of the necessary resources, their intention to perform a specific behaviour may be less, even if they have more favourable attitudes and/or social norms about performing the behaviour (Madden et al., 1992).

The Reasoned Action Approach (RAA) is the most current form of Ajzen and Fishbein's theory of behavioural prediction. In other words, it builds on and further develops

the previous TRA and the TPB (Fishbein & Ajzen, 2010). In their recent work Fishbein and Ajzen distinguish three types of belief: behavioural, normative and control (**Figure 3.2**). It is expected that beliefs about the positive (or negative) consequences of behaviour underlie people's attitude towards the behaviour. In other words, if the behaviour is perceived as more positive than negative, the attitude towards such behaviour will be favourable. Next, people also form beliefs that important people (or groups) in their lives will approve or not of their behaviour (i.e., injunctive norms) and beliefs that these referents do themselves perform or not the behaviour in question (i.e., descriptive norms). Taken together, these injunctive and descriptive normative beliefs create a perceived norm, that is, perceived social pressure to engage or not engage in a particular behaviour. Thus, if more important others are believed to approve rather than disapprove, and if the most important others perform this behaviour, people are more likely to feel social pressure to engage in this behaviour (Fishbein & Ajzen, 2010). And finally, there are beliefs that people form about factors that can facilitate or impede people's attempts to carry out the behaviour that are referred to as control beliefs. We return here to the notion of perceived behavioural control (PBC). According to the model it is expected that "*if control beliefs identify more facilitating than inhibiting factors, perceived behavioural control should be high*" (Fishbein & Ajzen, 2010).

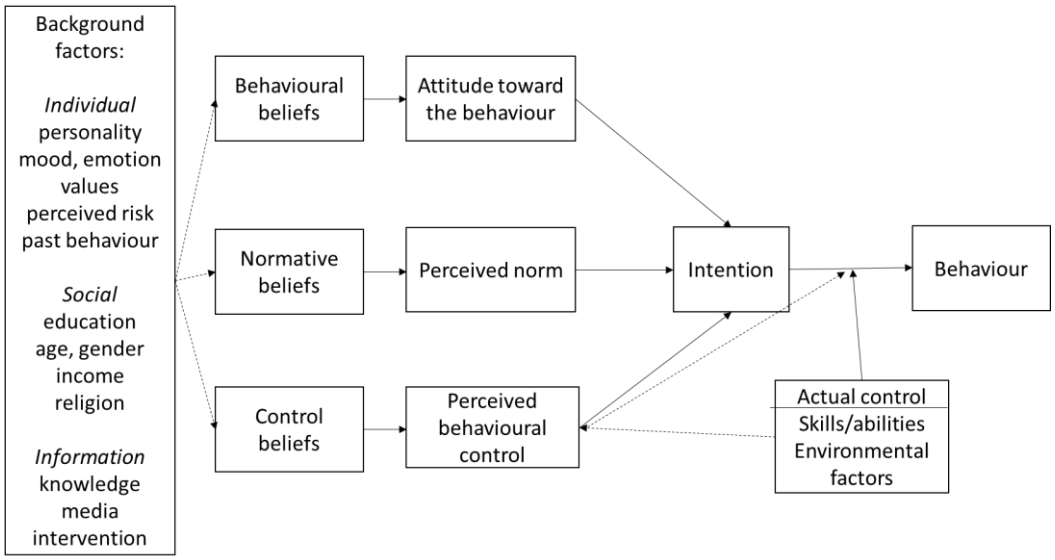


Figure 3.2. The model of reasoned action approach.

Source: (Fishbein & Ajzen, 2010)

When attitude, perceived norms and perceived behavioural control formed, they are accessible to predict intentions and behaviour. In particular, the combination of attitudes towards the behaviour, perceived norms and perception of behavioural control leads to the formation of behavioural intention or readiness to perform the behaviour. Generally, the more favourable the attitude and the perceived norm, and the stronger the perceived behavioural control, the stronger the person's intention to perform the behaviour in question should be. The intention formed in this way is now available for predicting a behaviour. The stronger the intention, the more likely the behaviour will be performed. However, it is generally accepted that a lack of the necessary skills and abilities or the presence of environmental constraints can prevent people from acting in accordance with their intentions. That is, they may lack actual control over behaviour. The intention is expected to be a good predictor of behaviour only when people are truly in control of their behaviour. Actual behavioural control thus mitigates the influence of intentions on behaviour. Therefore, in order to fully predict and understand behaviour, not only intentions but also actual behavioural control (that is, related skills and abilities, as well as obstacles and factors

that contribute to behavioural activity) have to be assessed. However, for most types of behaviour, measurement of the actual controls might not be available. In such cases, the RAA also emphasizes the importance of perceived behavioural control that can be used as a substitute for actual control to the extent that it is credible (Fishbein & Ajzen, 2010).

The RAA recognizes the potential importance of background factors such as gender, age, knowledge and mood in predicting behaviour. However, they are indicated by dashed arrows, to signal that while a given background factor may actually influence behavioural, normative, or control beliefs, "*there is no necessary connection between background factors and beliefs"* (Fishbein & Ajzen, 2010).

We acknowledge the challenge in choosing a relevant theory for the study within a large number of theories that have the same or overlapping constructs. For instance, the Theory of Interpersonal Behaviour (TIB) which was proposed by Triandis (1980) is a combination of the TRA and the TPB. However, it also includes emotional factors, habits and facilitating conditions. Triandis (1980) argued that people often make decisions not only by focusing on the cognitive aspects of a situation, but also by relying on their feelings, that is, emotions. Moreover, while the TRA and TPB assumed that intentions lead to behaviour without taking into account the previous occurrences of the same behaviour, according to the TIB, the behaviour if often repeated by a person can became automatic (i.e., a habit) and, thus, performed without conscious consideration. Facilitating conditions is a construct that is more or less consistent with the TPB and "*refers to the lack of environmental or situational constraints that may prevent the individual from performing the desired behaviour"* (Moody & Siponen, 2013).

Another example of an overlapping model is the motivation-ability-opportunity (MAO) behaviour model proposed by Ölander & Thøgersen (1995), where "*the study of consumer behaviour with an impact on the environmen*t" is said to include at least three main

determinants, i.e., motivation, ability and opportunity. The motivational component of the MAO is recognised as a simplified version of the TPB, while habit and task knowledge constituted the ability aspect. The third, opportunity component of the model was clearly in line with Triandis's concept of facilitating factors.

Furthermore, meta-analysis of the theory of behaviour showed that out of 82 identified theories, only 4 theories, that is, a) Trans-theoretical model of changes (TTM; N = 91; 33%), b) Theory of Planned Behaviour (TPB; N = 36; 13%), c) Social cognitive theory (SCT; N = 29; 11%) and e) The information-motivation-behaviour-skills model (IMB; N = 18; 7%) accounted for 174 articles (Davis et al., 2015).

However, we also consider the fact that most theories have been developed and mainly implemented in health psychology. Along with the theories of reasoned action and planned behaviour, some other theories exist, including the health belief model and the social cognitive theory. Typically, such models are designed to identify the variables underlying health decisions and assess the ability to predict behaviour. Often applications of such models are quite specific (for example, quitting smoking to donate a living kidney) (Armitage & Conner, 2001). Therefore, not all of them are appropriate for use in fields other than health psychology.

Currently, TPB (Armitage & Conner, 2001; Figueiredo, 2018; Micha et al., 2015; Riemenschneider et al., 2003; Warsame & Ireri, 2016) and its recent extension RAA (Hyland et al., 2018b; Morais et al., 2017, 2018) are widely used to explain human behaviour in a number of fields as well as in agricultural research. Therefore, the choice of the relevant theory was between these two. Since the RAA was the most recent, we chose it as the theoretical basis for this study.

Thus, the RAA was adopted to define drivers underlying a) rural households' motivation to participate in collective action either by joining or creating a production co-operative and b) Kazakh citizens' willingness to support the policy on creating co-operatives.

3.2.1.1. An expansion of the RAA

The theoretical framework encompassed psychological and socio-demographic factors, and in addition, the production structure of rural households, their awareness and knowledge of co-operatives, risk attitudes and cultural features, as well as proximity to the main market (see Chapter 5, **Figure 5.2**). The importance of the production structure (i.e., income, milk production, farm size and herd size, etc.) in determining the farmers' decision to join co-operatives, was referred to by a number of researchers (Chagwiza et al., 2016; Jitmun et al., 2020). Previous research in this field emphasized limited knowledge as a factor that has a significant association with farmers' unwillingness to join co-operatives (Bukchin & Kerret, 2020; Gong et al., 2019; Y. Zhang et al., 2019). Moreover, Lerman (2013) found the lack of information about co-operatives to be one of the main reasons for Kyrgyzstani farmers, in country neighbouring Kazakhstan, not being a member of a co-operative. Following previous studies (Alho, 2015; Bijman, 2018; Zhong et al., 2018) that show the importance of co-operative membership for farmers in mitigating risks, rural households' risk perception/attitudes towards being a member of a co-operative were also taken into account. Under the cultural features, the individualistic/collectivistic mindset of the rural households, their attitudes towards the former Soviet Union regime and the level of trust in different groups (i.e., stakeholders, relatives and people in general) were incorporated (Moldashev, 2016; Sharaunga & Mudhara, 2018; Stock & Forney, 2014; Triandis et al., 1988; Xia et al., 2019; Xiang & Sumelius, 2010). Finally, dummy variables for each selected rural district were included since there may be unobserved circumstances at the district level

(e.g., distance to capital, level of access to networks, district economic activity level, socio-demographic differences) that may influence individual's decisions (Ahmed & Mesfin, 2017).

To reveal factors underlying Kazakh citizens' willingness to support the policy, the RAA has been expanded by including other elements: a) views on the past regime (Dadabaev, 2016; Easterlin, 2009; Hinks, 2020; Valiyev et al., 2017), b) awareness of the policy (Roosen et al., 2015; B. Zhang et al., 2018) and c) location as well as d) socio-demographic characteristics of the Kazakh citizens (Tienhaara et al., 2015; Yu et al., 2018) (see Chapter 6, **Figure 6.2**).

A detailed explanation of the chosen theoretical framework, with additional information on the survey and questionnaire, the statistical analysis and the results, is presented in chapters 5 and 6.

3.2.2. Economic valuation methods

Economic valuation refers to the assignment of monetary value to non-marketable assets, goods and services, where monetary values have a specific and precise meaning. Non-marketable means products and services that cannot be bought and sold directly in the marketplace. Environmental goods and services such as clean air is an example of a non-marketable product.

In general, there are two ways to estimate the economic value associated with non-marketable goods and services: a) using revealed preferences and b) stated preferences (Mogas et al., 2006). Revealed preference approaches observe individuals' purchasing behaviour to elicit their preferences. For instance, a revealed preference approach can be used to measure the economic value of unpleasant noise through its impact on house prices. Thus, the houses in noisy areas are likely to be cheaper compared to similar houses in quieter

areas, holding everything else constant (i.e., houses with the same attributes). Also, the value of a good can be reflected in the time/money people spent getting to it (e.g., visiting forests and mountains), i.e., use values. The Travel Cost Method and Hedonic Pricing are revealed preference methods used to elicit the use-values of non-market goods and services.

As well as revealed preferences methods, stated preference approaches can be used to elicit individuals' preferences for environmental goods and services. Stated preference methods use hypothetical markets to elicit individuals' preferences; that is, economic value is revealed using questionnaires including a hypothetical or constructed market. The difference between revealed and stated preferences approaches is that the stated preferences approach can be used to estimate the total economic value of a good or service. This includes not only the use value of the good or service (which can be elicited using revealed preference methods) but also the non-use value. Whereas the use value of a good or service is derived from its direct use the non-use value includes the value that individuals put on the good even if they do not directly use it because a) they may want to use it in the future (option value); b) they may wish the good or service to be kept for future generations (bequest value); c) they may want to keep the good or service because they just want it to exist (existence value).

When using stated preference methods, the context of the valuation is described in the research survey. Since surveys can describe new goods, limit choices, and construct hypothetical markets, they offer opportunities for valuation that go far beyond those available through revealed preferences methods (Brown, 2003).

Despite the fact that the stated preferences methods were developed to assist in environmental impact assessment, the use of this technique has been extended from environmental economics to estimate non-use values and non-market goods to fields including agricultural research (Bett et al., 2009; Elbakidze & Nayga, 2012; Fahad & Jing, 2018; Tienhaara et al., 2015).

The total monetary value associated with the implementation of governmental policies also includes the provision of non-market goods and services (i.e., those that cannot be traded in the marketplace, and consequently do not have a market price). Namely, the policy might provide substantial benefits for society such as increasing milk production at the same time supporting rural development and allowing farmers to increase their livelihoods as a result of receiving higher returns for their products. Co-operative production promotes sustainable agriculture enhancing not only the environment but also the social sustainability of local communities (Luo et al., 2020). The monetary value of the policy includes the use and the non-use values. In particular, as an option value, citizens may want to use in the future the associated goods and services provided by rural communities as a consequence of the policy; and/or as a bequest value, citizens may value keeping those goods and services for future generations; and/or citizens may value the goods and services derived from the existence of the policy even though citizens may never make use of them (i.e., citizens may value the fact that rural communities are supported and never visit them). Therefore, the stated preferences approach was used to elicit the "total monetary (economic) value" of the policy in question.

Stated preference methods use a variety of approaches for valuation questions, from simply asking for maximum willingness to pay (WTP) to indirect methods including ranking and ratings (Brown, 2003). In the case of proposed changes in welfare, two categories are distinguished: compensating and equivalent. Compensating variation refers to the amount of money the respondent must give in order to achieve an increased level of utility, i.e., willingness to pay (WTP) measures. In essence, the WTP approach requires an answer to a hypothetical (conditional) question about the maximum amount that the respondent is willing to pay to gain access to a new intervention (i.e., welfare change) (Whynes et al., 2005). The collated WTP responses are used to evaluate welfare change measures. A similar variation refers to the amount of compensation that must be provided to an individual in

order to achieve an improved level of utility in the event that the provision of a public good does not occur, i.e., willingness to accept (WTA) measures (Venkatachalam, 2004).

According to the stated preference approach, the monetary value of the good can be elicited by either Choice Experiment (CE) or Contingent Valuation (CV) methods, where respondents are directly asked about their WTP for a predetermined improvement in welfare (Mogas et al., 2006). While CE uses hypothetical markets in which respondents can compare different attributes of products/policies and choose a preferred option across several choices of sets (Concu, 2007; Schreiner & Latacz-Lohmann, 2015), in CV, respondents are provided with a scenario in which a hypothetical market for the product is described and their WTP for the good is requested in accordance with the described circumstances (Mogas et al., 2006; Venkatachalam, 2004). Since we are considering a single attribute (i.e., a policy on the creation of co-operatives), the total monetary value of the policy can be elicited through the CV method by directly asking Kazakh citizens about their WTP a premium price on a litre of milk in order to support the government policy.

Economists have used surveys since at least the 1940s to understand consumers' purchase, however, only since the 1960s, when Robert Davis used what is now called CV to assess outdoor recreation opportunities, have polls been used for non-market valuations (Brown, 2003). Using the CV method, WTP values for a hypothetical change in a non-market good can be elicited through surveys (Kanninen, 1993). Established types of elicitation techniques include the bidding game, a payment card (PC) and open-ended (OE) approaches (Venkatachalam, 2004; Whynes et al., 2005).

The concept of the bidding game is that a respondent in a CV survey will be randomly assigned a specific bid from a range of predefined bids. The assigned bid can be either lowered or raised. The respondents will then be asked to say “yes” or “no” to a particular

proposal, and the process will continue until the highest positive answer is recorded (Venkatachalam, 2004).

The payment card approach offers a range of WTP values for the public good in question from which people should choose their maximum WTP value. Although some the advantages of this approach include its ability to induce maximum WTP, the possibility of WTP values being affected by the range bias and centring bias makes this approach unsuitable for use (Venkatachalam, 2004).

An open-ended approach involves asking people about their maximum amount of WTP for a public good or policy. This approach was found to be simple, as it "does not require an interviewer and would not lead to bias if respondents answered truthfully." Nevertheless, the possibility of questionnaires without answers may occur due to the fact that respondents either find it difficult to answer or do not have an incentive to respond (Venkatachalam, 2004).

Individual WTP values are usually determined through a dichotomous choice survey format (Kanninen, 1993), where a respondent is asked a series of dichotomous choice questions until some point of willingness to pay (WTP) value is reached. Generally, there are two main types of dichotomous choice: single-bounded and double-bounded. When applying a one-sided dichotomous choice, only one dichotomous choice question is asked, and the dollar (or other currency) amount is considered a threshold value. If the product is priced above the threshold dollar (or other currency) amount, the person answers "yes", otherwise - "no". While this approach is simpler for the respondent, it is statistically less efficient and requires a larger sample size to achieve a given level of accuracy. For this reason, the double bounded dichotomous choice is deemed to be statistically more efficient, as it engages participants in two rounds of bidding. More specifically, the respondent responds to a first dollar (or other currency) amount, and after that goes on to a second-round

question that involves another dollar (or other currency) amount that can be higher or lower depending on the response to the first question (Hanemann et al., 1991). This means that if the respondent answers “yes” to the first bid, the second bid is a certain amount greater than the first bid; if the respondent answers “no” to the first bid, then the second bid is a certain amount smaller than the first bid. Thus, the outcomes might be a) answers for both bids are “yes”; b) answers for both bids are “no”; c) the answer for the first bid is "yes" followed by "no" for the second bid and d) a "no" answer for the first bid followed by "yes" for the second bid (Hanemann et al., 1991; Kajale & Becker, 2015). Thus, the double-bounded dichotomous choice survey was used to determine the WTP value. Thereby, the respondents were asked to respond to randomly selected main bids in the first round, then the amount of money suggested was increased or decreased according to the responses for the first bids, in the second round.

Chapter 6 moves on from the theoretical framework to its practical implementation. Namely, information on the survey and questionnaire, and the statistical analysis and results are covered in chapter 6.

3.3. Summary

The RAA was applied to understand the intention of rural households to join or create a production co-operative, as well as the intention of Kazakh citizens to pay a premium price per litre of milk in order to support the policy. While we acknowledge the possibility of many other theories of behaviour that could potentially be employed, the RAA was favoured mainly for these reasons: a) other theories have the same or overlapping construction; b) most of the theories of behaviour are suitable for use in psychology, but not all of them have been applied in a variety of studies, other than health behaviour; c) therefore, among the most relevant theories, the recent update of the TPB, i.e., the RAA, has been used in this

study. The consequences of this policy will increase welfare; therefore, the CV method was applied to determine the willingness of Kazakhstani citizens to pay for welfare changes.

Chapter 4

Pilot studies

4.1. Introduction

This chapter focuses on the data collection process. The chapter describes the main findings of the pilot studies.

4.2. Rural households

Data collection was conducted in several stages, including pilot studies. Initially, a pilot study was conducted between July 15, 2017, and August 15, 2017, to define prior information about rural households in Kazakhstan and to develop further the research questions. The survey of rural households in Kazakhstan was conducted in three villages near the capital - Karazhar, Taitobe and Mikhaylovka – which are 5, 10 and 70 km from Nur-Sultan, respectively. Prior to this, the target audience was chosen with the help of friends and acquaintances residing in these villages. The total number of household members interviewed was 14. The questionnaire can be found in **Appendix A**. From the answers received the following conclusions were drawn:

1. Near the city of Nur-Sultan, in the villages of Karazhar and Taitobe, the price for 1 litre of milk is KZT 200 and the milk is sold directly to consumers, whereas in the village of Mikhailovka (70 km from the city of Nur-Sultan), the price for 1 litre of milk is – KZT 60-65, and the milk is sold to representatives of dairy factories.

2. Households near the city of Nur-Sultan, in the villages of Karazhar and Taitobe, are faced with the problems of grazing and building facilities because of a shortage of land.

3. Half of the respondents feed their animal during the grazing period and spend KZT 50,000-200,000 on feeding in the winter period. Hence the milk yield per cow per day

consists is 10-18 litres. Conversely, households which do not feed extra during the grazing period and spend KZT 35,000-50,000 on feeding obtain 7-10 litres of milk per cow per day.

4. Most respondents stated that private farms and dairy factories provide households with thoroughbred bulls for insemination. Therefore, it can be assumed that the improvement of livestock breed in households is not as big a problem as the improvement of the feeding base.

Information from the primary data helped us to understand the functioning of the rural households in depth and to develop potential improvements through policy implementation. At the same time, the governmental policy aimed at the creation of co-operatives was initiated, which attempted to enhance dairy production at an industrial level via encouraging rural households to join forces and produce together. Thus, rural households were able to receive support from the government and other co-operatives in terms of subsidies or cheaper feeding etc. Therefore, the focus of the study was changed and was redirected towards exploring the success of the policy.

Thus, a year later, another focus group meeting was carried out with the households in the village of Mikhaylovka to explore initial responses to the governmental policy (questions can be found in **Appendix B**). The total number of participants was 8. The age of the respondents ranged from 30 to 60, half of whom were unemployed and while the rest worked for the local authority. The majority of participants (i.e., 6 out of 8) were females. In brief, the results of the discussion in the focus-group meeting revealed:

- The lack of information – governmental programmes are poorly explained in the villages;
- People distrust each other;
- The older generation want to remain private farmers, while young people are ready to band together if there are already existing co-operatives.

- People's unwillingness to take on new responsibilities;
- The incompetence of some civil servants, which makes governmental programmes unattractive;
- Risk is an important factor;
- Associations with the word "co-operative" were positive.

The focus-group meeting revealed the existence of two types of behaviour that need to be distinguished: joining an existing co-operative and to creating/helping to create a new co-operative. The questionnaire took this distinction into account.

4.3. General public

Data collection amongst the general public also included several pilot studies. The first study was conducted in August 2017 in Nur-Sultan (the questionnaire can be found in **Appendix C**). The survey aimed at identifying the preferences of the dairy consumers in Kazakhstan and the willingness to support domestic dairy production (domestic producers). The number of participants was 20. 63% of the respondents were frequent buyers (everyday) of milk. Most of the dairy products were bought in nearby supermarkets, with only about 25% of respondents preferring to buy dairy products from households. More than half the respondents favoured homemade dairy products of all varieties to manufactured ones. To the question "How much extra money would you be willing to pay for a litre of milk in order to support domestic producers?", a quarter answered zero, out of the remaining 75%, about 38% and 12% were ready to pay KZT 50 and more than KZT 60 respectively. A further 25% of the respondents answered between KZT 10 and 20.

The second pilot study for the general public was aimed at identifying a possible range of bids for the CV survey and was conducted in Nur-Sultan in August 2018 with a total number of 32 respondents. An open-ended approach was employed for the pilot study. Thus,

the respondents were asked about their maximum amount of WTP to the following questions:

1. How much extra money would you be willing to pay for a litre of milk in order to support our producers?
2. How much extra money would you be willing to pay for a litre of fresh milk from farmers (co-operatives)?
3. Would you be willing to pay an extra tax for a litre of fresh milk from farmers (co-operatives)?

Prior to being asked a question the respondents were informed briefly about the policy. The respondents were asked to state the amount of money they were ready to pay in KZT, without giving options. More than half the respondents agreed to support domestic producers by paying an extra KZT 10-20 for a litre of milk, while another third was ready to pay an extra KZT 50-100 for a litre of milk. Only 6 respondents out of 32 were not ready to pay any extra (i.e., zero response). The answers for the second question were similar to the previous one, ranging between KZT 10 and maximum KZT 150, with only 8 zero responses. The results of the pilot study emphasized the somewhat negative attitude of the general public towards paying taxes, as 13 out of 32 respondents were not ready to pay any extra tax, while the remaining answers varied from 0.001% to 1%. The results of all the pilot studies were taken into consideration in the main survey, including the utilisation of the WTP responses from the pilot studies in adjusting the main bids for the WTP in the main survey.

4.4. Revealing accessible beliefs of the respondents

Beliefs associate attitude (or SN and PBC) with various other objects, attributes, or events. In other words, they represent information that people have about an object. This information forms the basis of their attitude (or SN and PBC). People can form many

different ideas about an object. However, according to the RAA it is assumed that only a relatively small number determine one's attitude at any given moment. In particular, salient, or in modern social psychology "accessible" means available beliefs that are activated spontaneously without much cognitive effort in the actual or symbolic presence of the attitude object. This activation can occur below the level of conscious awareness, but accessible beliefs easily come to mind when a person has a reason to restore them (Fishbein & Ajzen, 2010).

Since the theoretical framework of the study was based on the RAA and was applied for both rural households and the general public, another in-depth interview was conducted to reveal the accessible beliefs of the respondents. Accessible beliefs which determine A, SN and PCB towards behaviour can be identified by asking respondents to describe attitudes to objects (SN or PBC) in a free-response format (Fishbein & Ajzen, 2010). Thus, following the RAA, to elicit accessible beliefs of rural households towards the behaviour (i.e., to join an existing co-operative and to create/help to create a new co-operative) in-depth interviews were carried out in April 2019 Mikhaylovka village with a total number of 20 respondents. All representative data from these were written up and used in the main survey. The questions were set as follows:

1. Accessible behavioural beliefs:

'If you think about joining an existing (creating/helping to create a new) milk producing co-operative in your region what would be the advantages/disadvantages of it?'

2. Accessible normative referents:

'If you considered joining an existing (creating/helping to create a new) milk producing co-operative in your region, there might be individuals or groups who would think you should or should not perform this behaviour. If any such individuals or groups come to mind, please list them below'.

3. Accessible control beliefs:

'If you decide to join an existing (to create/help to create a new) milk producing co-operative in your region there would be factors that enable you to perform the behaviour as well as factors that are likely to impede performance. If any such factors come to mind when you think about this, please list them below'.

To reveal accessible beliefs of the general public in-depth interviews were conducted in the capital with a total number of 10 respondents in November 2019.

1. Accessible behavioural beliefs:

'If you think about paying an extra amount of money for a litre of milk in order to support the government's policy what would be the advantages/disadvantages of this?'

2. Accessible normative referents:

'If you considered paying an extra amount of money for a litre of milk in order to support the government's policy, there might be individuals or groups who would think you should or should not perform this behaviour. If any such individuals or groups come to mind, please list them below'.

3. Accessible control beliefs:

'If you decide to pay an extra amount of money for a litre of milk in order to support the government's policy there would be factors that enable you to perform the behaviour as well as factors that are likely to impede performance. If any such factors come to mind when you think about this, please list them below'

Once the individuals' accessible beliefs were identified, the most frequent ones were used in creating A, SN and PBC questions that were then presented in the main questionnaire for rural households (**Table 5.1**) and the general public (**Table 6.1**).

4.5. Summary

The pilot studies were staged in several steps. Apart from those aimed at identifying the accessible beliefs in accordance with the theoretical framework, two pilot studies (survey and focus group meeting) were conducted with rural households and another two pilot studies with the general public. The results of the pilot studies supported various aspects of the research, including revealing the problems that rural households face and their attitudes towards the policy on co-operatives as well as the general public's preferences and views on the policy. All results of the pilot studies were taken into consideration during the research and were included in the main survey where appropriate.

Part II

This part includes two chapters, Chapter 5 and Chapter 6, that have a format of a research article and are prepared to publish. Along with the methodology used, within these chapters results and discussions are given. Thus, the main findings of the research are shown in the second part of the thesis.

Chapter 5

Attitudes of Kazakh rural households towards joining and creating co-operatives

5.1. Introduction

During the Soviet Union (SU) regime, agricultural production in Kazakhstan was carried out through state owned sovkhozes and collective farming kolkhozes (Csaki et al., 1992; FAO, 2011; Kucherov, 1960). After the collapse of the USSR, Kazakhstan faced the problem of transitioning from a communist-collective economy to a private property-based economy (Abdrassilova, 2015). The majority of kolkhozes were disintegrated, and all their former members were given shares of the holdings, proportionate to their property rights (FAO, 2011). This had implications on agricultural production, including livestock. As the number of cattle and cows owned by enterprises fell sharply, the number of cattle and cows owned per household and individual/peasant farms increased steadily[3]. Thus, the dismantling of collective farms led to a restructuring of the farming sector with three types of farms emerging: (a) agricultural enterprises (generally previous sovkhozes and kolkhozes) (Abdrassilova, 2015; Csaki et al., 1992; FAO, 2011), (b) individual/peasant farms[4] and (c) rural households[5]. Out of the three types, rural households hold the largest share of livestock production in the country. For instance, in 2018, 55% of slaughtered livestock and poultry (in slaughter weight) was produced by rural households, while for the individual/peasant farms and the agricultural enterprises this accounted for 19.3 percent and 25.6 percent, respectively. Regarding the production of milk, figures show an even more significant role

[3] Data was derived from the official website (stat.gov.kz) of the Statistics Committee of the Republic of Kazakhstan

[4] "a joint family labour union in which individual entrepreneurial activities are directly linked with the use of land for agricultural purposes to produce, process and market farm outputs" (Toleubayev et al., 2010), where the number of livestock has a range between ten and thousand (Baranowski et al., 2020)

[5] Households, formally known as personal subsidiary farming, tend to have small homestead land with an average area of 0.15 hectares and the number of cows from one to ten (an average 3 per household) in each yard (Land Code of the Republic of Kazakhstan, 2017). According to the official classification of farms, a personal subsidiary farm is understood as a type of activity for the satisfaction of own needs on a land plot located in rural and suburban areas (Nazhimedenov et al., 2011). They tend to "operate at a small scale and keep small numbers of livestock" (Baranowski et al., 2020).

of rural households – with 73.5% of the milk being produced by rural households and 19.7% and 6.8% being produced by individual/peasant and agricultural enterprises, respectively.

More importantly, rural households are relatively less efficient than agricultural enterprises leading to milk production in Kazakhstan being characterized by a low productivity (Ministry of Agriculture of the Republic of Kazakhstan, 2017). Moreover, the supply of processed dairy products from the dairy industry is lower than the actual market demand (Sheikin & Kulbayeva, 2015). This is associated with dairy factories having a deficit of milk processing due to rural households not utilising the direct supply chain of milk to the dairy industry. It is common for rural households to trade dairy products through the use of informal trade (i.e., direct sales to consumers). In other words, "modern dairies cannot obtain sufficient milk of adequate quality for their processing operations, while lower-quality milk of rural households continues to find buyers" (FAO, 2010). This informal trade is economically beneficial for rural households since they receive a higher price from directly selling to consumers and relatively low transaction costs associated with milk distribution (FAO, 2011). In addition, in many rural areas of Kazakhstan, there is no formal supply chain pathway for rural households to reach the dairy factories.

In order to tackle the relatively low productivity of the dairy sector the Kazakh government considered measures to increase milk production of rural households via the creation of co-operatives (i.e., a formal network of producers) which is expected to also facilitate the access of rural households to the supply chain through the dairy processing units.

Under the current Programme – 'The development of Agro-industrial complex for 2017-2021' – the government initially attempted to reduce the number of agricultural activities per household and expand agricultural production in enterprises through the creation of co-operatives in rural areas. Namely, one of the goals of the governmental plan

focused on attracting rural households to co-operative production, thereby increasing the processing of dairy products by the agricultural enterprises (since dairy companies face milk scarcity and in turn, have to use their capacity only by 20-60%)[6]. The Government's plan[7] was to turn over 500,000 rural households into co-operatives within a 5-year period and receive 500,000 tonnes of milk from co-operatives in 2021. The initial government plan was revised in July 2018 and it is no longer aiming at creating more co-operatives under the Programme. The reason for such U-turn in the policy is unclear but it may be due to the realisation that the aims were too ambitious given the resources (e.g., might be the budget pledged to support the creation of co-operatives was not enough to financially support rural households). Nevertheless, the idea of creating co-operatives is still relevant, and it has been included to the Strategic Plan of non-commercial organization "Atameken" for 2018-2023[8]. In 2019, the number of rural households involved in co-operative production was 27,000 whereas the production of cow's milk by co-operatives was 65,400 tonnes (the country's total production was 5,820,100 tonnes of milk in the same year).

We investigate rural households' intention to create and/or join a production co-operative in Kazakhstan in order to identify the key aspects that underpin their decision to participate in the governmental policy aimed at participating in rural co-operative production. Whereas the literature on co-operatives has focused on the organisation and management of the co-operatives (Chaddad & Cook, 2004; Iliopoulos et al., 2019; Ishak et al., 2020; Xiang & Sumelius, 2010), less focus has been put on understanding the determinants of rural households' motivation to create and/or join a co-operative (Grashuis & Ye, 2019; Möllers et al., 2018). We contribute to the latter literature in four ways: (1) by

[6] The conceptual framework of the Programme, retrieved from www.primeminister.kz
[7] The governmental program downloaded from the official site of the Ministry of Agriculture RK in 2017 was reissued in July 2018 with some corrections in it, most of part about co-operatives was deleted. The new document was retrieved from http://adilet.zan.kz/kaz/docs/P1800000423
[8] The National Chamber of Entrepreneurs of the Republic of Kazakhstan, which was created in 2013 by a joint decision of the government and NEPK "Union "Atameken". https://atameken.kz/ru/pages/39-missiya-palaty

being the first paper, to our knowledge, that has used the reasoned action approach (Fishbein & Ajzen, 2010) to jointly explain attitudes towards joining and creating farming co-operatives; (2) expanding this approach by incorporating household's cultural features, risk attitudes, the production structure, and the level of information into the framework; (3) by using a bivariate probit model to jointly analyse rural households' intention to join/create a production co-operative in the context of a transitioning economy country, Kazakhstan; (4) by supporting policy adoption through gaining understanding of how households can be motivated to join/create a production co-operative.

5.2. Materials and methods

A wide number of theories have been developed to explain individual's behaviour (Ajzen, 1991; Armitage & Conner, 2001; Davis et al., 2015; Fishbein & Ajzen, 1975, 2010; Jackson et al., 2006; Madden et al., 1992; Moody & Siponen, 2013; Riemenschneider et al., 2003). These theories put emphasis on the fact that an individual's intentions and behaviour may depend not only on individual's demographic characteristics but also on their psychological characteristics. These include an individual's own views of what the behaviour outcome would be; barriers/difficulties, including current habits, to behave in a given way, as well as the influence of others on one's decision process (e.g., friends, family). In our case, we investigate how a rural household's decision to participate in collective action may be influenced by both a rural household's socio-demographic characteristics (e.g., age and gender) and psychological factors (e.g., individual's positive beliefs about having guaranteed sales). We expand this framework by including cultural features, risk attitudes, the production structure, and the level of information.

In order to incorporate psychological factors influencing the rural households' decisions to participate in the governmental programme either by joining or creating a

production co-operative, the reasoned action approach (RAA) is utilised. Currently, RAA is widely used to explain human behaviour in different fields as well as in agricultural research (Fishbein, 2008; Hyland et al., 2018a, 2018b; Micha et al., 2015; Morais et al., 2017, 2018; Warsame & Ireri, 2016).

We expand the RAA by incorporating the role of other factors, such as trust, individualistic/ collectivistic behaviour, views about past regime, referred to as "cultural features", as well as risk attitudes into the framework and analysis. These factors have been previously found to influence co-operative behaviour (Figueiredo, 2018; Jensen-Auvermann et al., 2018; Jitmun et al., 2020; Moldashev, 2016; OECD, 2015; Xiang & Sumelius, 2010; Y. Zhang et al., 2019). Moreover, we incorporated production characteristics and policy awareness and understanding into the framework. Sultana et al. (2020) highlighted the role of production features, including herd size and support (e.g., training and credit services) on the decision of functioning as co-operative farmers and non-co-operative farmers. Rural household's awareness of the current government policy and their understanding of the essence of co-operative production are relevant in this study (Bukchin & Kerret, 2020; Gong et al., 2019). Therefore, we incorporate all these to expand the RAA. Thus, the role of own attitudes (A), social norms (SN), and perceived behavioural control (PBC) is investigated along with cultural factors (e.g., level of trust in different groups and attitudes to the Soviet Union regime), risk attitudes, household's production capacity, awareness of the current agricultural support policy, and location (distance to major market) on the rural household's decision to join or create a production co-operative.

5.2.1. Psychological factors: Reasoned Action Approach

Under the RAA, the respondent constructs a specific attitude (A) and social norms (SN) about a behaviour, and then weighs the relative importance of them in order to perform, or not to perform, the given behaviour **(Figure 5.1.)**

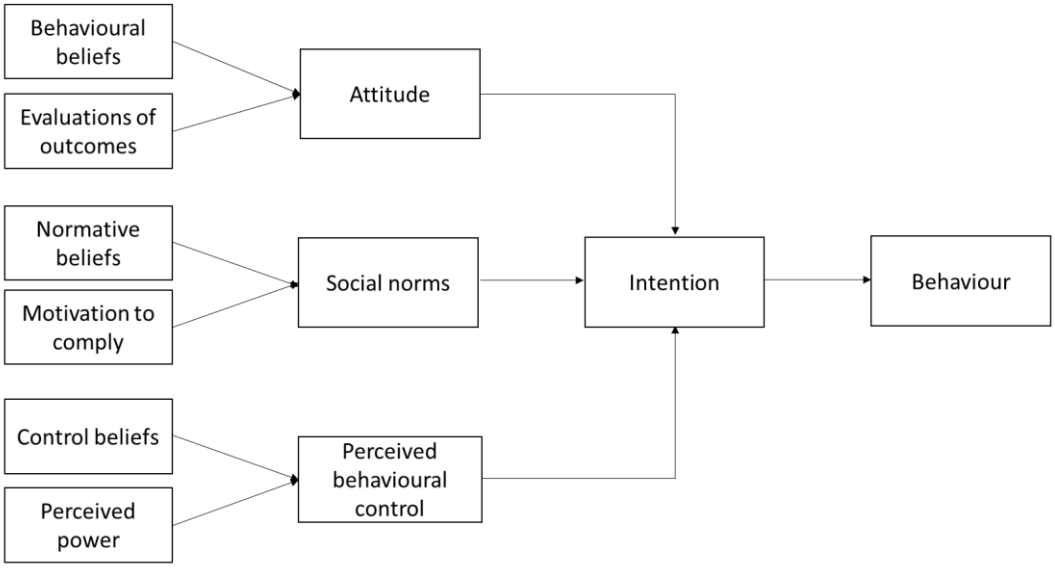


Figure 5.1. The Reasoned Action Approach. Source: (Fishbein & Ajzen, 2010) .

Thus, following the RAA a number of statements were used for rural households to evaluate (**Figure 5.1** and **Table 5.1**). These were used to construct indicators for attitude, social norms and perceived behavioural control as follows:

$$A = \sum b_i e_i \tag{5.1}$$

where A is an individual's Attitude towards the behaviour (e.g., joining a production co-operative; creating a production co-operative), b_i is strength of belief i about a consequence of the behaviour (e.g., joining a production co-operative; creating a production co-operative), and e_i is evaluation of belief i. In addition,

$$SN = \sum n_i m_i \tag{5.2}$$

where SN is an individual's social norms towards a behaviour (e.g., joining a production co-operative; creating a production co-operative), n_i is strength of normative belief *i*, and m_i is motivation to comply with a specific normative referent referred to by *i.*

Perceived Behavioural Control (PBC) has always been explained as a factor which can influence on the behaviour directly as well as indirectly through an intention (Madden et al., 1992). Nevertheless, under the RAA (**Figure 5.1**), PBC consists of two components: control beliefs, which are weighted by the power of control factors (Fishbein & Ajzen, 2010). Hence, it is defined as:

$$PBC = \sum c_i p_i \tag{5.3}$$

where c_i is the belief that control factor *i* will be present and p_i is the power of factor *i* to facilitate or impede performance of a behaviour (e.g., joining a production co-operative, creating a production co-operative) (Fishbein & Ajzen, 2010).

Based on Ajzen's and Fishbein's (2010) argument that attitude should be about the behaviour rather than about an object we distinguish between two types of behaviour: to join an existing co-operative and to create a new co-operative. Moreover, following the RAA each behaviour consists of four elements - action, target, time and context. Hence, we define behaviour as 'being a member of a production co-operative in my region', where:

Action: being a member

Target: of a production co-operative

Context: in my region

Time: unspecified, left in general.

Thus, following RAA, constructed and weighted attitude (A), social norms (SN) and perceived behavioural control (PBC) are combined to formulate the behavioural intention (BI). **Table 5.1** shows statements used to reveal rural household's A, SN and PBC. Respondents were asked to rate the statements on a set of unipolar and bipolar evaluative

adjective scales, with five places. Following Ajzen and Fishbein (2010), to elicit attitude (A) toward being a member of a production co-operative. For instance, respondents were asked to evaluate the strength of belief (B1 to B6) about a consequence of a behaviour from extremely unlikely to extremely likely (1 to 5), while respondents' evaluation of the belief (E1 to E6) were assessed from extremely bad to extremely good (−2 to +2). We translate their evaluation into scores by using Equation (1). Thus, the higher the sign of behavioural belief, the more it is expected to have a positive influence on attitude. Consequently, using Equation (1) above to sum across all scales for attitude (A), we obtain a measure of rural household's attitude towards co-operative production. Since there are 6 behavioural outcomes, the possible range of the scale for A is from −60 to +60. The same procedure was applied to reveal SN and PBC with some differences on scoring, namely, (a) respondent's normative beliefs were scored from −2 to 2 (i.e., extremely unlikely–extremely likely), while the motivation to comply with a referent was taken values from 1 to 5; (b) control beliefs were scored from 1 to 5, while the power of the factor was scored from −2 to +2 on statements capturing facilitating factors (i.e., P1; P3; P4) and from 2 to −2 on statements capturing impeding factors (i.e., P2 and P5) (Fishbein & Ajzen, 2010). Hence, the range of the scale for the SN and for the PBC is (−50 to +50).

Table 5.1. Statements to reveal respondent's attitude, social norms and perceived behavioural control towards the behaviour

Item	Questionnaire statements	Scale
	Attitude	
B1	Being a member of a co-operative in my region would give (gives) me a guarantee of sales	extremely unlikely - extremely likely
E1	For me having guaranteed sales is	extremely bad - extremely good
B2	Being a member of a co-operative in my region would give (gives) me support from recognized bodies such as Atameken, Damu and other co-operatives	extremely unlikely - extremely likely
E2	For me receiving support from recognized bodies and other co-operatives is	extremely bad - extremely good
B3	Being a member of a co-operative in my region would allow (allows) me to receive subsidies	extremely unlikely - extremely likely
E3	For me receiving subsidies is	extremely bad - extremely good
B4	Being a member of a co-operative in my region would allow (allows) me to sell a litre of milk more expensive than now	extremely unlikely - extremely likely
E4	For me an increase in the price for a litre of milk is	extremely bad - extremely good
B5	Being a member of a co-operative in my region would give (gives) me an ability to do business with close relatives/friends and people who I trust	extremely unlikely - extremely likely
E5	For me having an ability to do business with close relatives/friends and people who I trust is	extremely bad - extremely good
B6	Being a member of a co-operative in my region would require (requires) me to take responsibility for others (other members of the co-operative)	extremely unlikely - extremely likely
E6	For me taking responsibility for others (other members of the co-operative) is	extremely bad - extremely good
	Social norms	
N1	My spouse/partner thinks that it would be (is) good for me to be a member of a co-operative in my region	extremely unlikely - extremely likely
M1	With regards being a member of a co-operative in my region, I want to do what my spouse or partner thinks I should do	strongly disagree - strongly agree
N2	My parents think that it would be (is) good for me to be a member of a co-operative in my region	extremely unlikely - extremely likely
M2	With regards to being a member of a co-operative in my region, I want to do what my parents think I should do	strongly disagree - strongly agree
N3	My best friend thinks that it would be (is) good for me to be a member of a co-operative in my region	extremely unlikely - extremely likely
M3	With regards to being a member of a co-operative in my region, I want to do what my best friend thinks I should do	strongly disagree - strongly agree
N4	My relatives think that it would be (is) good for me to be a member of a co-operative in my region	extremely unlikely - extremely likely

M4	With regards to being a member of a co-operative in my region, I want to do what my relatives think I should do	strongly disagree - strongly agree
N5	I know someone who is a member of a co-operative in my region	definitely false - definitely true
M5	When it comes to matters of being a member of a co-operative, I want to be like my acquaintance	strongly disagree - strongly agree
	Perceived behavioural control	
C1	I have (had) enough money to be a member of a co-operative in my region	extremely unlikely - extremely likely
P1	Having enough money would make it (made it) easier for me to be a member of a co-operative in my region	strongly disagree - strongly agree
C2	Being a member of a co-operative would make (makes) me dependent on decisions taken by others	extremely unlikely - extremely likely
P2	Being dependent on the decisions taken by others would make (makes) it difficult for me to be a member of a co-operative	strongly disagree - strongly agree
C3	I easily would find (found) like-minded people to encourage me to be a member of a co-operative in my region	extremely unlikely - extremely likely
P3	Easily finding like-minded people to encourage me would make (makes) it easier for me to be a member of a co-operative in my region	strongly disagree - strongly agree
C4	I easily would earn (earned) trust among fellow villagers to be a member of a co-operative in my region	extremely unlikely - extremely likely
P4	Easily earning trust among fellow villagers would make (makes) it easier for me to be a member of a co-operative in my region	strongly disagree - strongly agree
C5	I would have (have) different issues, including financial as a member of a co-operative in my region	extremely unlikely - extremely likely
P5	Having different issues, including financial would make (makes) it difficult for me to be a member of a co-operative in my region	strongly disagree - strongly agree

5.2.2. Additional constituents of the model

We incorporate to our conceptual framework with other aspects highlighted in the literature as determinants of behaviour that might also be relevant in explaining the rural household's intention to join or create a production co-operative, on top of those highlighted in the RAA. These include cultural features, risk attitudes, production structure, and the level of information contained in the governmental programme.

We integrate the rural household's views about the past regime into the analysis, in order to investigate whether the rural household's intentions to become a member of a production co-operative or creating one are associated with the past (i.e., whether despite the fact that almost 30 years have passed since the collapse of collective farms (kolkhozes), people's intentions to join co-operatives in Kazakhstan are related to the country's governance history). Moreover, for a post-soviet country, that has experienced the collective economy before, achievement of the aims of the governmental programme (creation of co-operative structure to support dairy production) might face several issues, such as potential mistrust by agricultural producers towards newly created structures (Moldashev, 2016). The importance of determining the level of trust has been emphasised in previous research (Sharaunga & Mudhara, 2018; Xiang & Sumelius, 2010). We additionally incorporate rural household's individualistic and collectivistic behaviour towards culture as a dimension as this aspect of the culture has also been emphasized in previous research (Stock & Forney, 2014; Triandis et al., 1988; Xia et al., 2019). Under the "cultural aspects", we grouped rural household's views about the past regime; the level of trust; and their individualistic and collectivistic behaviour (**Table D1**, in the **Appendix D**).

The full consequences of joining or creating a co-operative are uncertain (Y. Zhang et al., 2019). Therefore, it is expected that rural household's decision to join or create a co-operative depends on their risk attitudes, with risk averse rural households being less likely

to make changes to the status-quo. It is important to note that co-operative membership gives access to input and output markets, which implies a risk reduction on the part of the members. We are interested in understanding whether individuals' attitudes towards risk may influence their decision to participate in collective actions (i.e., join/create a production co-operative).

The rural household's production structure (e.g., the potential production given the resources and the business orientation) is also considered as a potential determinant of the intention to participate in the governmental programme (Jitmun et al., 2020; Sultana et al., 2020). It is expected that structures currently dedicated to sell their product to the market with clear business orientation may be less likely to join or create a production co-operative, whereas those rural households that may need some kind of support (e.g., loan, subsidy) may be keener on joining/creating a production co-operative.

Being aware of the co-operative production policy might also have an influence on rural household's decision making. Therefore, we assume that the greater the awareness of rural households, the more likely they are to join/create a production co-operative. Finally, since there may be unobserved circumstances at the district level (e.g., distance to capital, level of access to networks, district economic activity level, socio-demographic differences) that may influence individual's decisions, we have added dummy variables for each selected rural district. Consequently, **Figure 5.2** shows the conceptual framework used in this paper.

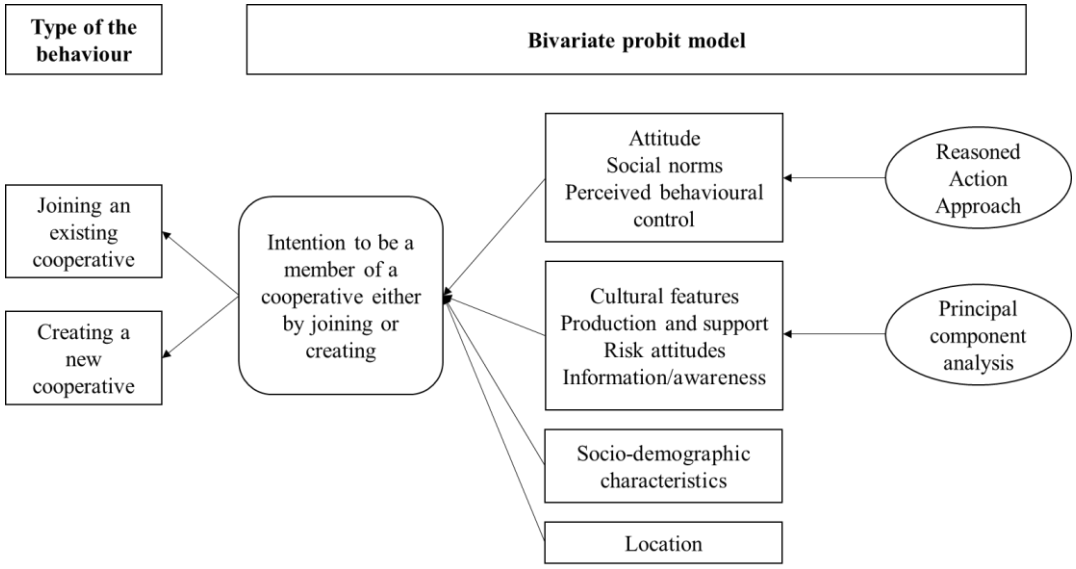


Figure 5.2. The conceptual framework for defining the factors underlying the behaviour

5.2.3. Survey and questionnaire

We conducted a survey in the Akmola region of Kazakhstan. Data were collected from rural households (n = 181) using a face-to-face questionnaire between 10 August 2019 and 31 October 2019. In addition to the survey, we also use complementary information obtained through semi-structured in-depth interviews in the village Nur-Yessil and focus group meetings on the village Mikhaylovka in August 2017 and 2018, respectively. The Akmola region was selected for data collection since it is included in the food belt around the capital, the main purpose of which is to provide food and goods to the main city of the country. Therefore, the development of food production and agriculture in this region is strategically important for the country[9]. Moreover, Akmola region offered the opportunity to have both rural households who are engaged with co-operatives and those which are not.

The region consists of 17 districts, which in turn are divided into rural districts, which are composed of several villages. Tselinograd, Arshaly and Akkol districts were selected out of possible 17 considering their:

[9] https://aqmola.gov.kz/index.php?mod=news&do=read&rel=1004108&lang=ru

▪ location (i.e., the distance to the main market). These three districts differ in terms of their proximity to their main market with 20 km (Nur-Yessil), 70 km (Mikhaylovka) and 130 km (Yenbek) in Tselinograd, Arshaly and Akkol districts respectively.

▪ population (average population for the Akmola region was 69,444 in January 2019, however, without counting Tselinograd and Burabay districts, which are capital and resort areas respectively, the average for the remaining 15 districts was 23,944 people);

▪ and availability of dairy companies in the districts, since under the Programme an increase was expected in milk supplies from rural households (through co-operatives) to dairy companies (LLP "AF Rodina", Production Co-operative "Izhevskiy" and LLP "Eco Milk" are functioning in the selected Tselinograd, Arshaly and Akkol districts respectively);

▪ and infrastructure (i.e., good transport interchange).

Thus, selected districts were generally differentiated by distance (**Figure 5.3**), and similarity of other factors (e.g., population and dairy factories nearby).

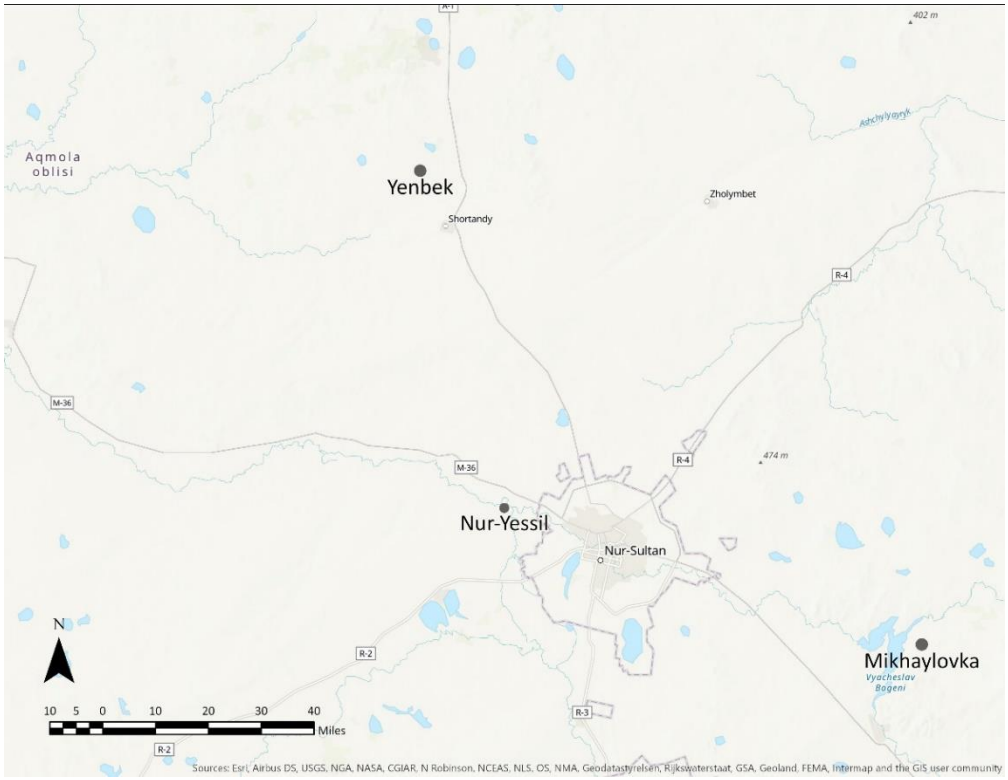
During the selection of rural districts (**Table 5.2**), the main criteria were (a) the location (i.e., not alongside the highway, at the same time not very far apart from it); (b) access to broadband (the survey was conducted in person using a tablet, but data collected were uploaded online); and (c) the number of rural households (i.e., half or more of them are engaged in farming).

Table 5.2. Descriptive data of the selected rural districts

Selected rural districts (r.d.)	Number of villages included into r.d.	Distance of r.d. from Nur-Sultan (appr.)	Transport access (highway)	Households keeping livestock and poultry/ number of households	Population	Internet (4G) coverage
1. Nur-Yessil	3	20 km	Nur-Sultan - Kokshetau	299/615	2800	yes
2. Mikhaylovka	3	70 km	Nur-Sultan Karagandy	413/534	1645	yes
3. Yenbek	3	130 km	Nur-Sultan - Kokshetau	181/342	1053	yes

Data from regional authorities in each r.d. for July 1, 2019. Note: population and number of households are increasing closer to Nur-Sultan.

(a)



(b)

Figure 5.3. The map of the selected rural districts (pictures a and b).

(a) The map of the Republic of Kazakhstan with a mark of the selected region and the capital;

(b) Indication of the selected villages by their proximity to Nur-Sultan (the capital)

The main selection criterion to identify respondents was that rural households must own at least a dairy cow. We used the snowball sampling technique by contacting previously identified heads of households in the selected villages to voluntarily take part in the study (i.e., by contacting colleagues and representatives of regional authorities). Participants were also recruited via semi-random selection process[10].

The main instrument used to collect information was a tablet-based questionnaire using Qualtrics software. All participants were provided with an information sheet and consent form containing information about the aims and objectives of the research.

[10] At each visit to the village for the survey, in addition to meeting with a predetermined respondent, we also knocked on those houses where hay for cattle (which usually lie on the roof of the barn) could be seen, which in most cases were cow's feeding.

The questionnaire was created in English, then translated to Kazakh and Russian. A second independent person reviewed and edited the translation for accuracy and natural flow of the target language.

The questionnaire consisted of 7 sections (RAA; cultural features; risk attitudes; production and support; information/awareness; socio-demographic; and questions on rural household's intention to join and create a production co-operative) and included a total 63 questions and the average duration to complete by the respondents was 30 min.

To reveal psychological aspects underlying rural household's intention to participate in collective action, initially, there were defined accessible beliefs of respondents during the pilot study in April 2019 by asking open-ended questions towards the participation in the governmental policy aimed at rural co-operative production, following that, the statements were identified and included into the survey (**Table 5.1**).

In order to help capturing cultural aspects, several statements about (a) the rural household's attitude in relation to the former Soviet Union, (b) views towards being self-employed or working in collective, and (c) the level of trust in different groups (i.e., relatives or dairy companies) were included into the survey to identify the impact of them on the behaviour (**Table D1**, in the **Appendix D**).

To elicit the risk attitudes of the rural households, statements (Bard & Barry, 2000) and self-stated risk aversion (Menkhoff & Sakha, 2017) methods are used (**Table D1**, in the **Appendix D**).

The production and support part of the survey included questions about how much the rural households produce, how much they earn as a dairy farmer, as well as, if they ever received any kind of support from governmental/non-governmental organizations (**Table D1**, in the **Appendix D**).

The information/awareness block explored the case of the rural households being previously aware of the policy creating co-operatives along with understanding principles of co-operatives and knowing members of existing co-operatives (**Table D1**, in the **Appendix D**).

Socio-demographic set of statements were included questions regarding age, gender, education and nationality (**Table D1**, in the **Appendix D**).

5.2.4. Statistical analysis

The analysis comprised a combination of methods including principal component analysis (PCA) and parameter model estimation using a bivariate probit model.

5.2.4.1. Principal component analysis (PCA)

We used a PCA to avoid degrees of freedom problem whilst minimising information loss. Hence, PCA is used to reduce the number of variables associated with cultural features, risk attitudes, the production structure, and the level of information. Thus, a set of correlated variables were transformed into a set of independent variables, referred to as components (Chapman et al., 2001; Macciotta et al., 2006). These components incorporated in the model as explanatory variables.

5.2.4.2. Bivariate probit model

The bivariate probit model was used for analysing the factors influencing rural household's motivation to participate in governmental policy aimed at co-operative production, either by joining or creating a production co-operative. Bivariate probit models are used to estimate interrelated decisions. Since individual's intentions to create and join a production co-operative may be correlated, we use a bivariate probit model to jointly

estimate the influence of independent variables on two dependent variables (i.e., joining and creating) allowing for the error terms to be freely correlated. As part of this process, we tested whether such correlation is present. If outcomes are found to be uncorrelated, then two independent probit models can be used instead of the bivariate probit model. As this, A, SN, and PBC statements, generated as independent variables following the given Equations *(5.1)-(5.3);* additional constituents of the model grouped and extracted as components by PCA (e.g., PCA on cultural features, risk attitudes etc.); socio-demographic variables and location are composed explanatory part of the bivariate probit model. Intention to join a production co-operative (i.e., would join) and to create a production co-operative (i.e., would create) are considered as dependent variables. The formula of the bivariate probit model can be expressed as:

$$y_1^* = x_1'\beta_1 + \varepsilon_1, y_1 = 1 \text{ if } y_1^* > 0, 0 \; otherwise$$

$$y_2^* = x_2'\beta_2 + \varepsilon_2, y_2 = 1 \text{ if } y_2^* > 0, 0 \; otherwise$$

$$\left(\frac{\varepsilon_1}{\varepsilon_2} | x_1, x_2\right) \sim \mathrm{N}\left[\binom{0}{0}, \begin{pmatrix} 1 & \rho \\ \rho & 1 \end{pmatrix}\right] \quad (5.4)$$

where y_1 and y_2 are household's intention to join a production co-operative and to create a production co-operative, respectively; x_1 and x_2 represents underlying factors of two types of intention, β_1, β_2 are vectors of coefficients and $\varepsilon_1, \varepsilon_2$ are the error terms (Greene, 2003).

5.3. Results and discussions

5.3.1. Descriptive statistics

Table 5.3 shows the descriptive statistics of the socio-demographic variables. Nearly 50% belonged at the age band of 31–49, and up to 65% were aged below 50 years old. One third had high education (University). Gender was differentiated equally between male and female. Just over 40% of the respondents were from Mikhaylovka and another a quarter from

Yenbek, the rest (about 30%) of the respondents reside in Nur-Yessil. Finally, the number of Kazakh respondents were slightly more than other nationalities (56%).

Table 5.3. Statistical descriptions of the socio-demographic variables

	Obs	Mean	S.D.	Min	Max
Age 50 and older (base category)					
Age18_30	181	0.149	0.357	0	1
Age31_49	181	0.503	0.501	0	1
Education (1=University; 0=otherwise)	181	0.331	0.472	0	1
Nationality (1=Kazakh; 0=otherwise)	181	0.564	0.497	0	1
Nur-Yessil (base category)					
Mikhaylovka	181	0.431	0.497	0	1
Yenbek	181	0.249	0.433	0	1
Gender (1=male; 0=otherwise)	181	0.497	0.501	0	1

5.3.2. Principal component analysis

PCA was conducted for reducing the dimensionality and increasing interpretability whilst minimising the loss of information for the following parts of the survey questionnaire: (a) the production and support part, (b) the information/awareness, (c) cultural features statements, and concluded with (d) the risk attitudes section. The principal components obtained were used as covariates in a Bivariate Probit model. Overall, 9 components (PC) with eigenvalues ≥ 1 were extracted by the PCA. The varimax rotated component loadings for the original variables are shown in the **tables 5.4 – 5.7**.

Table 5.4. The varimax rotated component loadings for the "Production and support" variables

Statements	PC1	PC2
Is production of milk and/or dairy products your main occupation?	0.413	
What percentage of your family income comes from the sale of milk and/or dairy products?	0.551	
What percentage of milk do you leave for own consumption?	-0.495	
How do you evaluate your profit from dairy business?	0.403	
How many cows do you currently have in total?		0.547
How many cows are milked?		0.534
What is the average total dairy production of these cows?		0.357
Have you ever received any types of support from (non)governmental organisations?		0.510

Table 5.5. The varimax rotated component loadings for the "Information/awareness" variables

Statements	PC3
Did you know about the current policy encouraging rural co-operative production?	0.365
I have received enough information about co-operatives from responsible bodies	0.452
I understand the principles of co-operatives	0.514
I agree with the principles of co-operatives	0.455
I know people who are members of co-operatives	0.437

Table 5.6. The varimax rotated component loadings for the "Cultural features" variables

Statements	PC4	PC5	PC6	PC7	PC8
a) individualistic/collectivistic behaviour					
I like to control my business by myself only	0.583				
I like being my own boss	0.601				
I like being free to make my own decisions	0.547				
Working with others makes work more enjoyable		0.710			
More people - more ideas for development		0.703			
b) trust					
I trust dairy companies			0.618		
I trust merchants			0.660		
I trust people in general			0.425		
I trust my neighbours				0.670	
I trust my relatives				0.688	
c) views on past regime					
During the Soviet Union keeping a cow was easier than now					0.558
During the Soviet Union keeping a cow was more profitable than now					0.586
During the Soviet Union people had more healthy food					0.468
The life is better now than in the Soviet Union					-0.355

Table 5.7. The varimax rotated component loadings for the “Risk attitudes” variables

Statements	PC9
I like trying new things, because I am adventurous	0.490
I think that every risk is new opportunity to develop my business	0.447
Please circle your willingness to take a risk in general	0.562
Please circle your willingness to take a risk in case of investing and borrowing money	0.421

The measure of sample accuracy by the Kaiser-Meyer-Olkin method (KMO) for the “production and support” variables (i.e., PC1 and PC2) was 0.80; for the “information/awareness” (i.e., PC3) was 0.80; for each aspect of the "cultural features" we carried out different PCAs, thus, KMO for the “individualistic/collectivistic behaviour” (i.e., PC4 and PC5) was 0.65; for the “trust”, was 0.64; for the “views on past regime”, was 0.68; for the “risk attitudes” (i.e., PC9), was 0.63, consequently, showed that the PCA is appropriate (> 0.500). Moreover, the Bartlett sphericity test ($P \leq 0.001$), indicates the suitability of PCA as a data reduction technique.

The first component had positive loadings on the production of milk as the main occupation, income from dairy and profit evaluation, as well as a negative sign on own consumption. Therefore, PC1 captured the relevance of dairy production for the rural household as a source of income and as a business. The second component load included aspects such as number of cows, how many cows were milked, their average productivity and the level of support received (governmental/nongovernmental, including financial and non-financial, i.e., training). Therefore, PC2 captures the rural household’s capacity to produce.

The third component relates to the “information/awareness” section of the survey. Hence, PC3 was defined as the level of knowledge of policy and co-operatives that rural households have.

Regarding the “cultural features”, five components were identified within this section (PC4-PC8). The loading of PC4 included variables associated with individualistic thinking

(i.e., preference to be independent in doing business and making decisions (i.e., own bosses), while PC5 captures perceived benefits of collaboration. In the trust subsection, two components were identified—PC6 and PC7, defined as trust in dairy stakeholders (referred to as trust business) and trust in close people, respectively. Finally, PC8 includes statements that indicate positive views on the Soviet Union (SU) period by rural households as well as the statement "The life is better now than in the Soviet Union." Consequently, PC8 was identified as a positive attitude towards the Soviet Union (i.e., SU nostalgic).

All variables in the "risk attitudes" section had a positive sign, therefore PC9 was intended for risk-seeking rural households.

5.3.3. Bivariate probit model

In order to test the appropriateness of the bivariate probit model, we tested for the correlation between error terms using a likelihood ratio test. The parameter that measures the correlation between error terms (rho) was found to be statistically different from zero (see LR test in **Table 5.8**.). 60 and 59 respondents out of 181 intended to join and create a production co-operative respectively, that constitutes 33% of the sample.

Table 5.8. Results of the bivariate probit model.

	Would join		Would create	
	Coeff.	z statistics	Coeff.	z statistics
Attitude (A)	0.059***	4.61	0.041***	3.23
Social norms (SN)	0.021*	1.64	0.016	1.30
Perceived behavioural control (PBC)	-0.016	-0.94	-0.007	-0.40
Dairy as a source of income (PC1)	-0.179*	-1.85	-0.205**	-2.06
Capacity to produce (PC2)	0.193**	2.00	0.140	1.50
Awareness and knowledge (PC3)	0.044	0.54	0.263***	3.23
Own boss (PC4)	0.023	0.25	0.063	0.69
Benefits collaboration (PC5)	0.058	0.47	0.008	0.07
Trust business (PC6)	-0.152	-1.39	-0.046	-0.43
Trust close ones (PC7)	0.188	1.60	-0.128	-1.17
SU nostalgic (PC8)	-0.084	-0.83	-0.015	-0.16
Risk (PC9)	0.241**	2.21	0.175*	1.69
Age 50 and older (base category)				
Age 18 – 30	0.145	0.32	0.560	1.26
Age 31- 49	0.144	0.48	0.339	1.15
Nur-Yessil (base category)				
Mikhaylovka	-0.324	-0.94	-0.483	-1.41
Yenbek	-0.227	-0.61	-0.269	-0.72
Nationality (1. Kazakh)	-0.181	-0.59	0.589**	2.00
Gender (1. Male)	0.463*	1.70	-0.172	-0.68
Education (1. University)	-0.018	-0.07	-0.524*	-1.86
Constant	-1.853***	-3.64	-1.524***	-3.11
rho (ρ)	0.647	5.56		
Number of observations	181			
Log-likelihood	-136.656			
LR test of rho=0: chi2(1) = 17.6369	Prob > chi2 = 0.000			

Note: *, **, *** for 10, 5 and 1% of significance level, respectively.

The results of the bivariate probit model are presented in the **Table 5.8** and show that attitude (A) on intention is positively associated to both behaviours, joining and creating a production co-operative (p-value < 0.01). Hence, an increase in positive attitudes towards being a member of a production co-operative will increase the chance of rural households joining and creating a production co-operative. A similar positive association between smallholders' attitudes towards co-operatives and their intention to join a co-operative was found for Romanian smallholders (Möllers et al., 2018). Farmers' attitude was also found to

be related to their intention to uptake rural development policy in North Macedonia, Serbia and Bosnia and Herzegovina (Martinovska Stojcheska et al. 2016). Regarding social norms, we found a statistically significant association between SN and joining a production co-operative (p-value = 0.10). More specifically, the greater the respondent's perceived belief has, that others want the rural household to join a co-operative as well as the higher the motivation to comply with them is, the more likely that the respondent will join a co-operative. In other words, *"the stronger the perceived social pressure, the more likely it is that an intention to perform the behaviour will be formed"* (Fishbein & Ajzen, 2010). Previous research on the association between SN and joining and creating co-operative is inconclusive. Whereas Hyland et al. (2018b); Warsame and Ireri (2016) found no association between SN and being a member of a co-operative, Möllers et al. (2018) and Sabates-Wheeler (2007) found that the role of relatives and friends is positively associated with being a member of a co-operative. Finally, we found that PBC (i.e., the extent to which households believe that they are capable of joining and creating a co-operative) was associated with neither joining nor creating a co-operative.

Previous studies on dairy farmers' self-reported value of co-operative membership showed that farmers may benefit from co-operatives in a way of (a) having a stable market channel, (b) no transaction cost, since a co-operative obligated to collect agricultural products and (c) competitive producer price (Alho, 2015). The results of this study revealed that structures currently dedicated to sell their produce to the market with clear business orientation (i.e., dairy as a source of income) are less likely to join (p-value < 0.10) and create (p-value < 0.05) a co-operative than those which do not. It is worth noting that prices received by households may differ depending on the buyer (co-operatives, dairy factories, and direct consumers) due to the structure of the milk market (e.g., market shares of co-operatives in relation to other milk buyers). Market's structure was highlighted previously as

a determinant of product price differences amongst other parameters (Grashuis, 2020; Malvido Perez Carletti et al., 2018). This was found in the discussions with households during the in-depth interviews, which showed that the price offered by dairy factories[11] is less compared with the direct sales to consumers. Although the existence of co-operatives is argued to lead to higher prices for farmers compared with no co-operatives (Bijman, 2018), this study showed that business-orientated rural households (e.g., who might sell to an established market that offers a higher price for a litre of milk) would not be as motivated to participate in the governmental program as those without a business orientation. However, rural households that have a capacity to produce and may need further support (e.g., subsidy, training) are more likely to join (p-value < 0.05) a production co-operative. For instance, an increase in the number of cows might require more resources, such as feeding, consequently, increase the need in support (e.g., cheapened feeding). These results are somewhat consistent with Jitmun et al. (2020) where an increase in herd size is suggested to be positively associated with an increase in the likelihood of rural households to become a member of a production co-operative. Wossen et al. (2017) have also found that households that have more livestock are more likely to be a member of a co-operative.

As indicated in **Table 5.8** rural household's intention to create a production co-operative is positively associated with being aware of the policy and with having adequate information about co-operatives (p-value < 0.01). Discussions with rural households during the focus-group meeting also revealed the interest of participants in creating a co-operative, but most of them noted a lack of information on the procedure and principles for creating co-operatives. This result is in line with the findings of Gong et al. (2019) and other research on technology adoption and agricultural insurance purchases by farmers (Bukchin & Kerret,

[11] Following the Programme, rural households have to pass the milk to dairy factories through co-operatives, consequently, dairy factories will release the payment for the received milk. Additionally, co-operatives will receive 10% subsidy from the government

2020; Y. Zhang et al., 2019) which highlights limited knowledge as a factor associated with farmers' unwillingness to join co-operatives. Lerman (2013) found that the lack of existing co-operatives and the lack of information about co-operatives were the main two factors for farmers in Kyrgyzstan, a neighbouring country to Kazakhstan, not being a member of a co-operative.

Interestingly, we did not find any correlation of cultural features (Jensen-Auvermann et al., 2018; Nahayo et al., 2017; OECD, 2015; Xia et al., 2019; Xiang & Sumelius, 2010) on the rural household's motivation to create/join a production co-operative, despite expecting these to be essential determinants of rural household's participation in collective actions. Additionally, no difference was found between the three locations covered.

Regarding risk perception, we investigated whether household's attitudes towards risk may be associated with their decision to participate in collective actions (i.e., join/create a production co-operative). We found that risk seeking rural households are more likely to join (p-value < 0.05) and create (p-value < 0.10) a production co-operative. Results indicate that rural households that are willing to take risks in general and/or take risks in case of investing and borrowing money; households that like trying new things; and/or take every risk as a new opportunity to develop their business will be more likely to join/create a production co-operative. Although one could expect that more risk-averse individuals would be more likely to join/create co-operatives since these are a form of risk management (Y. Zhang et al., 2019), it is possible that risk-seeking behaviour is the result of risk-averse motives (e.g., avoiding production risks) by rural households (Leonhardt et al., 2011).

Finally, the socio-demographic characteristics of rural households were found to be associated with both joining and creating a production co-operative. Men are more likely to join a production co-operative than women (p-value < 0.10). This result is somewhat consistent with the study of Gebre et al. (2019) on agricultural technology adoption which

also highlighted the positively significant role of being male headship in the decision making. Ahmed and Mesfin (2017) has also indicated men being more likely to participate in agricultural co-operatives than women. At some point, it can be an implication of the socio-cultural norms, which makes great discrimination in women's ability to make decisions (Adegbite & Machethe, 2020; Dohmwirth & Hanisch, 2019) or just because women are less considered on farming in a long scale perspective (Rietveld (Anne) et al., 2020).

Although a number of studies found a positive correlation between education and willingness to participate in collective actions (Ahmed & Mesfin, 2017; Jitmun et al., 2020; Y. Zhang et al., 2019), the results of this study showed that higher educated rural households are less likely to create a production co-operative (p-value < 0.10). It might be due to the agriculture in Kazakhstan being unattractive from a social viewpoint, therefore, higher educated rural households are seeking more prestigious and well-paid professions to preserve their social status (Bednaříková et al., 2016; Otar et al., 2020). Age of rural households was found not being correlated with their intention to join/create a production co-operative, in spite of it having a positive and significant relationship with co-operative membership in previous studies (Ahmed & Mesfin, 2017; Chagwiza et al., 2016). In addition, Kazakh (p-value < 0.05) are likely to create a production co-operative than other nationalities, which can be explained by Kazakh nation being an indigenous nation in Kazakhstan, and compared with other ethnic groups, the Kazakh desire more to manage social processes in the country, i.e., being active in political-economic decision-making (Assyltaeva et al., 2014).

Additionally, we have run a set of model specifications including a bivariate probit model using RAA variables only, a bivariate probit model using components derived from the PCA, and a bivariate probit model with only significant covariates, that can be found in

the **Appendix E**, **tables E1-E4**. We conducted LR tests to compare the different model specifications. The full model (Model 1) was found to perform better than models using only reason action approach variables (Model 2) and only components derived from PCA (Model 3). No difference was found between Model 1 and model using significant variables only (Model 4). However, we present results for Model 1 to show the significant level of all independent variables used in the analysis

5.4. Conclusions

The dairy sector of Kazakhstan is experiencing structural problems, such as the prevail of rural households and their disconnection with the supply chain, that leads to low milk productivity of the sector. Co-operatives are suggested by the government to be a way to increase milk supply to dairy factories via creating a formal network of producers (i.e., rural households). We analysed the factors underlying rural household's motivation to join or create a production co-operative in Kazakhstan. A number of policy recommendations can be proposed on the basis of this research. Firstly, the study has highlighted the importance of psychological factors such as holding positive attitudes toward co-operative production and perceived social norms on the decision to join and create a production co-operative. More specifically, an increase of beliefs on benefits of co-operative production as well as support from social referents would increase the chance of the governmental programme to be accepted by rural households. Moreover, the results showed that being aware of the co-operative production-related policy and having adequate knowledge of concepts of co-operatives would increase the chance of rural households to create a production co-operative. Additionally, we found that risk-seeking rural households are more inclined to join and create a production co-operative. This indicates that policies aimed at increasing awareness of the benefits of co-operatives by providing information on co-operative creation would be

advisable. More specifically, our findings suggest that such policies should target not only individual rural households but communities as a whole too, where social referents can also be informed and influence rural households' decisions. This provision of information could be deployed by extension services on the basis of currently existing organisations, such as Atameken. This would help rural households and communities to understand the main differences between production systems and, in addition, inform rural households about the benefits of joining and creating a production co-operative and avoid uncertainty. Extension services work could be complemented using mass media and the regional authorities to extend the impact of informing rural households on co-operatives. To better target households and communities, policies should take into account the current business orientation of rural households in producing milk. Thus, emphasis should be put on rural households in which dairy is not currently a main source of income, but they have the capacity to increase milk production. Thus, for supporting the increase in milk productivity through the rural household's (either joining or creating a production co-operative), supportive policies (e.g., subsidies to increase capacity, training to increase awareness) are recommended for rural households that have the capacity to increase production. Conversely, rural households which are business oriented can be attracted by the guarantee of sales or increase in the price of milk. Additionally, gender and nationality are significantly correlated with joining and creating, respectively. These results suggest that not all member of society may have the same interest and/or opportunities. We recommend a policy to be inclusive to ensure support to both genders as well as all nationalities. To conclude, this study provides guidelines and suggestions for policy makers and stakeholders of the agricultural sector. We offer key information to consider when preparing documents to successfully create and support agricultural co-operatives in Kazakhstan. Furthermore,

findings presented in this paper might also be relevant for post-communist countries, where small-scale agriculture prevails.

Chapter 6

Would Kazakh citizens support a milk co-operative system?

6.1. Introduction

Prior to Kazakhstan joining the World Trade Organisation in 2015, Kazakhstan joined Belarus and Russia to create the Eurasian Economic Union (EAEU), a free trade zone in 2014. Later Armenia, Belarus, and Kyrgyzstan also joined the EAEU. The opening of Kazakhstan's economy to international markets challenged its agro-industrial complex competitiveness and a rural economy, highly dependent on agricultural production (Kinyakin, 2016). Hence, improving agriculture productivity is key for the development of the rural economy of Kazakhstan. Consequently, the government decided to stimulate the production of agricultural products allocating a significant part of its governmental budget, 2,374.2 billion tenges (KZT), for the development of the country's agro-industrial complex, part of which considers also the creation of agricultural co-operatives. This is a relatively large budget accounting for 9% of the sum of revenues of the state, republican and local budgets in 2017. To compare, 1,868.4 billion tenges (KZT) were budgeted under the state program for the development of education and science for the period 2016-2019; 1,385.6 billion were budgeted for the development of tourism for the period 2019-2025, and 1,762.5 billion tenges were budgeted for the development of the regions for the period 2015-2020[12].

Amongst agricultural products produced in Kazakhstan dairy is one of the key agricultural sectors, representing 16% of the total agricultural production of the country (OECD, 2015). Milk production has increased by 16% in the last 5 years reaching a total of 5,820,000 tonnes of cow's milk produced in 2019 compared to 5,020,000 tonnes in 2014. However, the domestic supply of dairy products is not enough to meet their internal demand.

[12] These numbers were retrieved from the Legal information system of Regulatory Legal Acts of the Republic of Kazakhstan, http://adilet.zan.kz/eng

Specifically, dairy products exports amounted to $ 53,517,500[13] whereas the imports were $ 252,450,400 in 2019 indicating a $ 198,932,900 trade deficit. Hence, a transformation of the structure of the dairy sector seems key to reduce this gap.

Currently the structure of Kazakh's dairy is dominated by small-scale producers, such as rural households and individual/peasant farms representing 93% of total production (of which rural households are 78% and individual/peasants are 22%, respectively), whereas only 7% of the milk was produced by agricultural enterprises. Thus, due to the prevailing of small-scale production, dairy factories face a deficit of milk for processing, and consequently, the country experiences a low level of processed dairy products (Schmitz & Meyers, 2015; Sheikin & Kulbayeva, 2015). In 2019, a total of 262,000 tonnes of milk released to the processing factories in Kazakhstan, only a 4.5% of the total 5,820,000 tonnes produced that year.

Considering therefore the status of the agricultural sector, the government's intervention plan aimed at reducing the number of agricultural activities conducted by small farm/household with the objective of expanding agricultural production (including dairy) in enterprises through the creation of co-operatives in rural areas[14]. Co-operatives can contribute to uplifting livelihoods, reducing poverty and food insecurity in rural areas through improved use of technology, share of knowledge between members, and income from a market-oriented output (Ajates, 2020; Ishak et al., 2020; Milovanovic & Smutka, 2018; Sultana et al., 2020).

Estimating the social value of agricultural policies, or any other policy for that matter is paramount for policy decision making under constrained budgets. As Price (2000) points

[13] 1 US dollar (USD) is equal to 425.11 tenges (KZT) as of 12/02/2020.

[14] However, the initial government plan was revised in July 2018 and it is no longer aiming at creating more co-operatives under the Programme (the reason of which remains unclear). Despite the fact, the idea of creating co-operatives is still relevant and it has been included to the Strategic Plan of non-commercial organisation "Atameken" for 2018-2023, thus, in 2019, the number of rural households involved in co-operative production was 27.2 thousand whereas the production of cow's milk by co-operatives was 65.4 thousand tonnes (the country's total production was 5,820.1 thousand tonnes of milk in the same year).

out that an *"unbiased and focused evaluation of unpriced benefits is an important pre-condition for needed policy interventions"*. The estimation of monetary values of agricultural policies, such as conservation of agricultural genetic resources (Tienhaara et al., 2015), safe vegetables (B. Zhang et al., 2018), and agri-environment schemes (McGurk et al., 2020) has been previously studied. Although the attitudes of Kazakh rural households towards joining and creating co-operatives has been previously studied (Kaliyeva et al., 2020), to the best of our knowledge, no study has estimated the total economic value of a policy aimed at increasing milk production through co-operative creation. More specifically, we contribute to the literature in 3 ways: 1) by estimating the social value of the transformation of the milk production system from small-scale production to industrial production through creating co-operatives; 2) by being the first paper, to our knowledge, that has used and expanded the reasoned action approach to gain an understanding of how the social value for the policy is moderated by a number of elements including individual's psychological aspects based on the Reasoned Action Approach (RAA), views on the past regime (i.e., to the former Soviet Union), awareness about the governmental policy along with socio-demographic characteristics and geographical location; 3) by analysing whether a pandemic shock as COVID-19 may be associated with changes in individual's WTP for the policy.

6.2. Materials and methods

We used the Contingent Valuation (CV) method to elicit the "total economic value" of the policy through the respondents' WTP for a premium price on a litre of milk in order to support the government policy. We used the RAA to analyse how psychological factors may be associated to respondents' WTP. We extend the RAA to integrate the respondents' a) views on the past regime (i.e., to the former Soviet Union); b) their socio-demographic

characteristics and the location; c) awareness about the governmental policy and d) COVID-19 into out framework to investigate the role of these elements on respondent's WTP.

6.2.1. Contingent valuation method

The total value associated with the implementation of governmental policies includes not only the provision of market goods, but the provision of non-market goods and services (i.e., those that cannot be traded in the marketplace, and consequently do not have a market price) too. The policy might provide substantial benefits for the society such as increasing milk production whilst supporting rural development and allowing farmers to uplift their livelihoods as a result of receiving higher returns for their products. Co-operative production promotes sustainable agriculture enhancing not only the environment but also the social sustainability of local communities (Luo et al., 2020). The stated preferences method is employed as a double bounded dichotomous choice contingent valuation (CV) to elicit the total value of the policy. Although the majority of the stated preference research focuses on the demand for environmental benefits, the use of this technique has spread to evaluating other type of goods, including farmers' WTP for crop insurance (Fahad & Jing, 2018), animal welfare (Elbakidze & Nayga, 2012), agricultural genetic resources (Tienhaara et al., 2015), and the provision of production services (Bett et al., 2009).

Preferences of the respondents are explained by the Random Utility Theory (RUT) since it is the theoretical basis for the CV method (Mogas et al., 2006; Tuan & Navrud, 2007). Thus, the utility of a good is expressed as follows:

$$U_{iq} = V_{iq} + \varepsilon_{iq} \quad (6.1)$$

where U is the utility of good i for individual q, V_{iq} is the expected value of U and ε is the error term.

Two main approaches are used to elicit the value of a good using CV: a) single-bounded (take-it-or-leave-it) and b) double-bounded (take-it-or-leave-it with follow-up) dichotomous choice techniques. However, the single bounded approach has been criticized due to the limitation in revealing the true WTP (Bradford et al., 2004; Venkatachalam, 2004). The double-bounded dichotomous choice approach was used to deal with the limitations of a single bound approach. The singularity of this approach is that participants are simply asked if they would pay or not a certain amount of money for the good and if the answer is 'Yes' ('No'), the monetary amount can be raised (or decreased) with follow-up questions according to Yes/No answers (Bennett & Balcombe, 2012; Bradford et al., 2004; Hanemann et al., 1991; Kanninen, 1993). Consequently, by follow-up questions 4 possible outcomes can be derived (Kajale & Becker, 2015):

1. Respondent answers YES for both the main bid P^I and the higher bid P^H (YES-YES), in this case, $WTP \geq P^H$
2. Respondent answers YES for the main bid P^I and NO for the higher bid P^H (YES-NO), in this case, $P^I \leq WTP > P^H$
3. Respondent answers NO for the main bid P^I and YES for the lower bid P^L (NO-YES), in this case, $P^L \leq WTP < P^I$
4. Respondent answers NO for both the main bid P^I and the lower bid P^L (NO-NO), in this case, $WTP < P^L$

A common issue that researchers face while applying the CV method is the identification and treatment of protest WTP responses (Hernández et al., 2018). In CV studies protest responses can account for 50% of WTP (Frey & Pirscher, 2019; Halstead et al., 1992).

The most common treatment of protest bids is the exclusion of them from the sample (Halstead et al., 1992; Johansson & Kriström, 2020). However, some researchers argue that only deleting is not an option, it is important to investigate protest responses to define the motivation behind that (Frey & Pirscher, 2019; Hernández et al., 2018). Thus, several reasons have already been identified in the literature. Namely, possible subjects of protest might be a) need in more information or b) a conviction that the government is responsible for payment; while c) "I cannot afford it" is defined as a true WTP of zero (Frey & Pirscher, 2019; Hernández et al., 2018).

6.2.2. The Reasoned Action Approach

We use the Reasoned Action Approach (RAA) to assess the level of influence that psychological factors may have on Kazakh citizens' valuation of the government policy aiming at increase milk production through co-operatives. How psychological factors may underlie individual's behaviour was stated by Fishbein and Ajzen (Fishbein & Ajzen, 1975) in their Theory of Reasoned Action (TRA), where beliefs, attitudes, intentions, and behaviour were identified as its main elements. The TRA was extended by adding perceived behavioural control in the Theory of Planned Behaviour (TPB) (Armitage & Conner, 2001), that was defined as a determinant of behavioural intention and behaviour (Ajzen, 1991). RAA is a continuation of the TPB, where behaviour is assumed to consist of 4 elements - action, target, time and context (Fishbein & Ajzen, 2010). Hence, the generality of behaviour can be controlled by making those elements more or less specific. Following the RAA, individuals construct a) behavioural belief b_i, which is weighted by evaluation e_i of its outcome b) normative beliefs n_i that evaluated by the motivation to comply m_i with a referent and c) control beliefs c_i assessed by the power p_i of that belief. Together they compose attitude (i.e., $A = \sum b_i e_i$), social norms (i.e., $SN = \sum n_i m_i$) and perceived behavioural

control (i.e., $PBC = \sum c_i p_i$) which underly the intention to perform the given behaviour (**Figure 6.1).** Thus, constructed and weighted A, SN and PBC are combined to formulate the behavioural intention (BI).

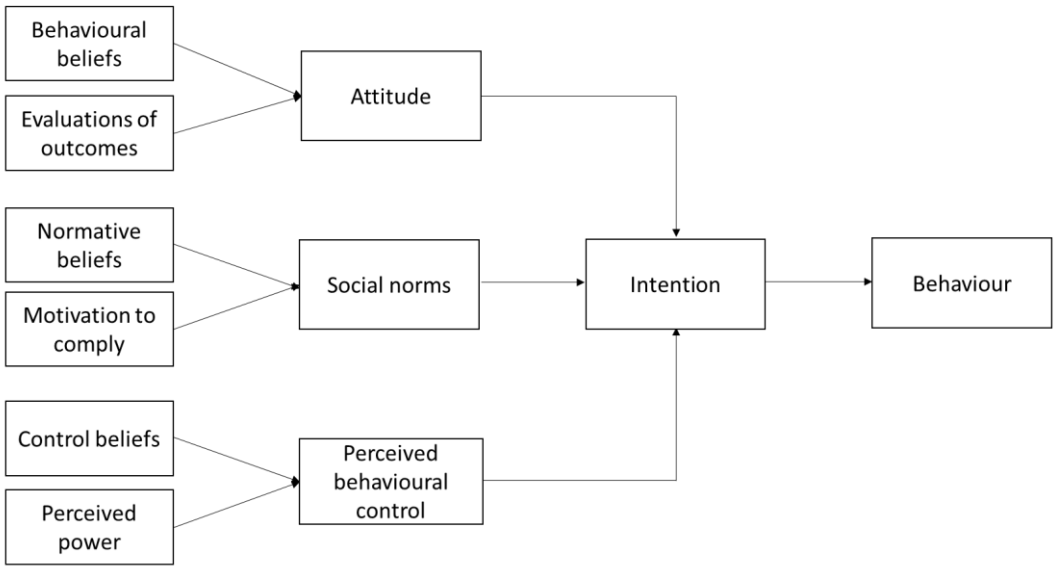


Figure 6.1. The Reasoned Action Approach. Source: Fishbein & Ajzen (2010)

6.2.3. Other constituents of the model

We expand the RAA framework to include other contextual elements that may be relevant in the respondent's valuation of the policy in our framework (**Figure 6.2**). Thus, prior to announcing independence in 1991, Kazakhstan was a part of the Soviet Union and regarding the collectivist-communist regime, agricultural production was organised mostly on the basis of collective farming, i.e., kolkhozes and sovkhozes (Csaki et al., 1992; FAO, 2011; Kucherov, 1960). Even though almost 30 years have passed since the collapse of collective farms, the transition from centrally planned to market economy might left some impact on individuals' views towards the current government and its policies. Although numerous studies tried to shed a light on implications of the transition economy on post-Soviet countries' development (Dadabaev, 2016; Easterlin, 2009; Hinks, 2020; Valiyev et al., 2017), the influence of post-communist regime on the policy in question is not clear yet.

Thus, we investigate how individuals' views on the past regime may be associated with their valuation of a policy aimed at increasing co-operatives. There main associations are possible. Individuals who miss the Soviet Union may a) be supportive of a policy which reminds them previous regime (the structure and function of kolkhozes as agricultural production systems) but they may also b) be sceptical about the current regime delivering a policy on co-operative production as one in the past, and as a result, may be less likely to support it. Thus, the mistrust in current regime and unattractiveness of current policies compared with the Soviet Union regime might lead to less support of the current regime by general public.

Moreover, we investigate the association of a) socio-demographic characteristics, b) the location where a respondent resides; c) awareness of the policy in question and d) COVID-19 with respondents' intention to pay an extra amount of money for a litre of milk.

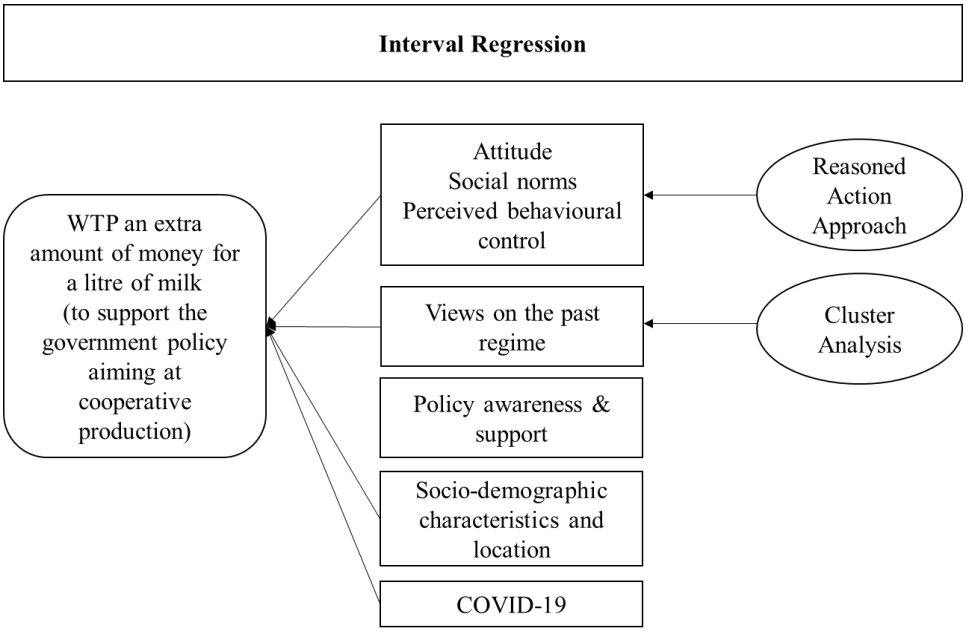


Figure 6.2. The conceptual framework of the study

6.2.4. Survey and questionnaire

A snowball sampling technique was used to contact Kazakh citizens to voluntarily take part in the study, i.e., by sending the link to the questionnaire to colleagues and friends via social media, e.g., Facebook.

The instrument used to collect information was a questionnaire survey using Qualtrics software[15].

The data was collected in two periods, before and during COVID-19 pandemic. The first wave of the data collection (n=272) was completed in a month period, between 10th of December 2019 and 10th of January 2020.

In March 2020 the COVID-19 first case was reported in Kazakhstan and the government implemented a lockdown for 2-month until May 2020. However, as soon as the restriction was eased, the number of cases of the disease has been increased sharply beating its peak in June-July 2020. Considering such situation and the government's measure to deal with it, in June 2020, we took the opportunity of exploring the effect of COVID-19 on respondents' WTP. Thereby, during the period of a month, between June 13 and July 13, 2020, 234 fully complete additional responses were collected, making a total of 506 observations.

The questionnaire consisted of 5 sections (awareness and support; CV; RAA; views on the past regime; socio-demographic and location) and included a total 37 questions.

The aim and features of the governmental policy were delivered in the form of short informative text within the first section of the survey and respondents were asked to respond a) if they have had information about co-operative creation and b) if they agree with the aim of the policy.

[15] All participants were provided with an information sheet and consent form containing information about the aims and objectives of the research. The questionnaire was created in English and translated to Kazakh and Russian. To guarantee accuracy, a second, independent person reviewed and edited the translation for accuracy, natural flow in the target language and adherence to the needs of the survey.

Within the CV section, respondents were asked to answer the WTP questions. Information from a pilot questionnaire[16] was used to assign the prices for the WTP questions (KZT 10, 40, 70, 100 and 130). Thus, the amount of money that Kazakh citizens are willing to pay for the transformation in the dairy sector was obtained by providing information about the governmental policy and asking them the following question:

"Would you be willing to pay extra X amount of money for a litre of milk in order to support the government's policy?"

- where X amount of money was chosen randomly from the given bids.

If respondent answered 'No', then the requested amount of money was decreased by KZT 15 (P^L) or it was increased up to KZT 15 (P^H) if the answer was 'Yes'.

If a respondent ticks the 4th option and answers No-No, then further questioning was used to indicate the reasons.

The third section of the questionnaire included questions on RAA in order to reveal psychological aspects underlying Kazakhs citizens' intention to pay an extra amount of money for a litre of milk. Accessible beliefs of the respondents were defined during the pilot study in November 2019 by asking open-ended questions towards the support of the governmental policy aimed at co-operative creation, following that, the statements were identified and included into the survey[17]. **Table 6.1** shows statements used to reveal Kazakh citizens' A, SN and PBC. During the survey, prior to responding on RAA questions,

[16] During the pilot study in August 2018 we used open-ended questions allowing respondents to decide without giving options, then received amount of money has been used in adjusting main bids for WTP.

[17] Respondents were asked to rate the RAA statements on a set of unipolar and bipolar evaluative adjective scales, with five places. To elicit attitude (A) toward paying an extra amount of money for a litre of milk in order to support the government policy, for instance, respondents were asked to score the strength of belief about a consequence of the behaviour from 1 to 5 (i.e., extremely unlikely – extremely likely), while evaluation of the belief was assessed from -2 on the negative side to +2 on the positive side. Thus, the higher the behavioural belief the more it is expected to have a positive influence on attitude. Consequently, the sum across all scales (since there are 3 behavioural outcomes, the possible range of the scale for A is from -30 to +30) was taken as a measure of a respondent's attitude towards co-operative production. The same procedure was applied to reveal SN and PBC with some differences on scoring, namely, a) respondent's normative beliefs were scored from -2 to 2 (i.e., extremely unlikely – extremely likely), while the motivation to comply with a referent was taken values from 1 to 5; b) control beliefs were scored from 1 to 5, while the power of the factor was scored from -2 to +2 on statements capturing facilitating factors (i.e., P1) and from 2 to -2 on statements capturing impeding factors (i.e., P2; P3 and P4) (Fishbein & Ajzen, 2010). Hence, the range of the scale for the SN and for the PBC is (-40 to +40).

respondents were informed about the aim and features of the governmental policy in the form of short informative text.

Table 6.1. Statements to reveal respondent's attitude, social norms and perceived behavioural control towards the behaviour

Item	Questionnaire statements	Scale
	Attitude	
B1	Paying an extra amount of money for a litre of milk would improve the quality of milk	extremely unlikely - extremely likely
E1	For me improving of the quality of milk is	extremely bad - extremely good
B2	Paying an extra amount of money for a litre of milk would motivate farmers to produce better	extremely unlikely - extremely likely
E2	For me motivating farmers is	extremely bad - extremely good
B3	Paying an extra amount of money for a litre of milk would support domestic milk production	extremely unlikely - extremely likely
E3	For me increasing domestic milk production is	extremely bad - extremely good
	Social norms	
N1	My spouse/partner thinks that it would be good for me to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
M1	With regards paying an extra amount of money for a litre of milk, I want to do what my spouse or partner thinks I should do	strongly disagree - strongly agree
N2	My close relatives think that it would be good for me to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
M2	With regards paying an extra amount of money for a litre of milk, I want to do what my close relatives think I should do	strongly disagree - strongly agree
N3	My parents think that it would be good for me to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
M3	With regards paying an extra amount of money for a litre of milk, I want to do what my parents think I should do	strongly disagree - strongly agree
N4	My close friend thinks that it would be good for me to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
M4	With regards paying an extra amount of money for a litre of milk, I want to do what my close friend thinks I should do	strongly disagree - strongly agree
	Perceived behavioural control	
C1	I have enough money to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
P1	Having enough money would make it easier for me to pay an extra amount of money for a litre of milk	strongly disagree - strongly agree
C2	I don't trust dairy factories to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
P2	The lack of trust in dairy factories would make it difficult for me to pay an extra amount of money for a litre of milk	strongly disagree - strongly agree

C3	I don't trust farmers (households) to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
P3	The lack of trust in farmers (households) would make it difficult for me to pay an extra amount of money for a litre of milk	strongly disagree - strongly agree
C4	I don't trust the government's policy to pay an extra amount of money for a litre of milk	extremely unlikely - extremely likely
P4	The lack of trust in the government's policy would make it difficult for me to pay an extra amount of money for a litre of milk	strongly disagree - strongly agree

Statements in section 4 of the questionnaire were used to capture whether the respondent's views on the past regime are associated with their willingness to support the governmental policy.

Finally, age, education, gender and income composed the socio-demographic part of the survey. Within this part respondents were also asked to indicate the location where they reside.

6.2.5. Statistical analysis

The analysis comprised a combination of methods including cluster analysis and parameter model estimation using an interval regression model.

6.2.5.1. Cluster Analysis

Cluster analysis is used to group respondents according to their views on the past regime. Concisely, it involves a search through data for observations that have high similarity in comparison to one another but are very dissimilar with respect to objects in other clusters.

Two main approaches are known to cluster analysis: hierarchical and partitioning. Considering the hierarchical approach, which can also be interpreted as a top-down procedure, each observation represents its own cluster. At any following stage similar and closer in characteristics clusters merge, creating a group and continue until cutting the tree at a suitable level. Otherwise, the procedure terminates when all members of a group are

consistent and create one common cluster at the top of a tree-like form, called a dendrogram (Babu & Sanyal, 2009; Jain, 2010; Mooi et al., 2018).

In the partitioning (*K*-means) approach, a cluster can be formed by specifying the number of clusters prior to the analysis. Using this number as an input, the algorithm specifies an initial centre of the cluster (i.e., *k*), afterwards, observations are assigned to the cluster according to their nearest cluster centres (i.e., one of the *k* clusters). According k-means approach, the number of clusters is not known in advance (Babu & Sanyal, 2009; Jain, 2010; Mooi et al., 2018). Therefore, the choice of an initial configuration can be based on the results of hierarchical clustering (Hyland et al., 2018b). Since *k*-means is stated as superior to the hierarchical methods due to its ease of implementation, simplicity, efficiency, and empirical success (Hyland et al., 2018b; Jain, 2010), we followed this approach; thus, initially, the number of clusters were identified through dendrogram, then *k*-means method was applied.

6.2.5.2. Interval Regression

An interval regression model, a generalisation of the tobit model (Gustavsen & Hegnes, 2020), was used to analyse factors underlying Kazakh citizens' WTP extra amount of money for a litre of milk in order to support the government policy aimed at co-operative creating and dairy production. The singularity of this model is in the observed range of the dependent variable being censored, since the dependent variable y_i^* (i.e., respondent's WTP an extra amount of money for a litre of milk) is unobserved (Bettin & Lucchetti, 2012). What is observed is an interval, which has lower m_i and upper M_i bounds,

$$m_i \leq y_i^* \leq M_i$$

where, basically, the data can be defined with 3 possible outcomes. In case if the lower bound is known, but the upper is not, then "right-censored"; or visa-versa, if the upper bound is

known, but the lower is not, then “left-censored”. But if both lower and upper bound are known, then the data can be defined as “interval” (Martinez-Ribaya & Areal, 2020). We can state that

$$y_i^* = x_i\beta + u_i, \qquad u_i|x_i \sim Normal\ (0, \sigma^2) \tag{6.2}$$

where x_i is a vector of an explanatory variable of WTP of a respondent i, β is a parameter vector associated with x_i. The error terms u_i is assumed to be normally distributed with mean zero and standard deviation σ (Shen, 2012; Wooldridge M. Jeffrey, 2010).

6.3. Results and discussions

6.3.1. Descriptive statistics

Descriptive statistics of the explanatory variables are shown in **Table 6.2.** Lower and upper are dependent variables, which refer to left-censored and right-censored observations. A, SN and PBC were generated following Fishbein & Ajzen (2010) (see section 0). Two variables were created to indicate the awareness (i.e., infopolicy) and support (i.e., policyagree) of the considered policy, respectively. SU_likers is an explanatory variable obtained from the Cluster Analysis and captures respondent’s views on the past regime. A dummy variable for COVID-19 was created with a value of 1 for respondents participating during the COVID-19 wave and 0 otherwise.

Finally, socio-demographic variables including age, education, gender, income and location are the explanatory variables which refer to the socio-demographic and location part of the study. Almost 60% of the respondents were female. Nearly 50% belonged at the age band of 18-30, and up to 83% were aged below 50 years old. A quarter had education at school and college level, while undergraduate and postgraduate levels of education were

44% and 30% respectively. Almost 40% of the respondents stated their income up to KZT 100,000, which can be defined as low-income, about 24% indicated middle income (KZT 101,000 – 150,000), while the rest 40% were respondents with high-income. The majority of respondents reside in the capital (about 68%), while the rest were from different cities. Therefore, within the location variable, we treated the capital as a zero point and identified the distance for other cities in kilometres from the capital.

Table 6.2. Variable's definitions and statistical descriptions

Variable	Definition	Mean	Min	Max
Lower	Obs. (n=265), lower bound	72.615	1	145
Upper	Obs. (n=138), upper bound	75.522	1	145
A	Attitude of the respondents towards the co-operative creation policy	16.560	-13	30
SN	Perceived social norms of the respondents	7.586	-34	40
PBC	Perceived behavioural control of the respondents	-3.909	-40	24
SU_likers	cluster derived by the Cluster Analysis; dummy variable 1= like the Soviet Union regime; 0=otherwise	0.580	0	1
infopolicy	dummy variable, 0 = if otherwise; 1= if the respondents received information about the government policy before;	0.238	0	1
policyagree	dummy variable, 0= if otherwise; 1= if the respondents agree with the aim of the policy	0.932	0	1
age	Age of the respondents 1 = 18-30; 2 = 31-49; 3 = 50 and older	1.704	1	3
education	The final completed education of the respondents 1 = school; 2 = college; 3 = undergraduate; 4 = postgraduate	2.948	1	4
gender	dummy variable, 0 = male, 1 = female	0.616	0	1
income	The respondent's monthly income 1 = KZT 0 – 50000; 2 = KZT 51000 – 100000; 3 = KZT 101000 – 150000; 4 = KZT 151000 and higher	2.824	1	4
location	the location of the respondents in kilometres from the capital	303.655	0	2600
covid	dummy variable, 0 = pre-covid period, 1 = covid period	0.567	0	1

A comparison between the Kazakh population in 2019 and our survey sample is provided in **Table 6.3**.

Table 6.3. Kazakhstan population (2019) versus the sample

	Kazakhstan (2019)	%	Sample (n=307)
Total population	18 395 567	-	-
Female population	9,749,650	0.53	0.61
Male population	8,645,916	0.47	0.39
Age (15-34, Kazakhstan; 18-30, sample)	5,509,210	0.42	0.47
Age (35-54, Kazakhstan, 31-49, sample)	4,504,423	0.35	0.36
Age (55+)	3,034,521	0.23	0.17
School	117,204	0.28	0.10
College	144,333	0.34	0.16
Undergraduate	142,435	0.34	0.44
Post-Graduate	22,765	0.05	0.30
Household income (< KZT 50,000)	n/a	0.50*	0.15
Household income (KZT 51,000 – 100,000)	n/a	0.39*	0.24
Household income (KZT 101,000 – 150,000)	n/a	0.08*	0.24
Household income (> KZT 151,000)	n/a	0.03*	0.37

Note: Education figures are based on individuals that graduated in 2019 only; * Distribution of population by average per capita income (by the number of the population is not available). An average nominal per capita income of the population was KZT 104 282 in 2019. The data were derived from the official website (www.stat.gov.kz) of the Statistics Committee of the Republic of Kazakhstan.

The main difference is education at school and college level as well as household income up to KZT 50,000 being underrepresented, while education at post-graduate degree and household income over KZT 100,000 are overrepresented. Education and level of income are highly correlated to one another, and since the survey was distributed mainly with the support of colleagues from national universities, the sample covered mostly educated and high-income earning respondents. Although most of the population hold the average per capita income of up to KZT 100,000; the sample household income was equally distributed amongst the 4 categories.

6.3.2. Cluster Analysis

Overall, 3 statements were used to define the views of respondents towards the past regime. Respondents were asked to evaluate these statements from strongly disagree to strongly agree on a 5-point Likert scale. Primarily, we run a hierarchical procedure for these variables to determine the number of clusters by using the dendrogram. Then, we checked the validation of the chosen number through Calinski and Harabasz's and Duda/Hart indices (i.e., cluster stopping rules). Both indices showed n=2 cluster as appropriate.

Once the number of clusters was specified, a k-means procedure was carried out. **Table 6.4** illustrates the summary statistics of these clusters by means. Cluster 2 was characterised by having higher mean rates, while cluster 1 has mean=3 or less on the given statements. Therefore, cluster 2 is assumed that captures the Soviet Union regime likers, while cluster 1 is not. We created a dummy variable with a value of 1 of SU_likers and a value of 0 otherwise (non-SU likers).

Table 6.4. Summary statistics (by mean) of the clusters

	During the Soviet Union people had more healthy food	During the Soviet Union, Kazakhstan's economy was better	I like the idea of collective farming (kolkhozes) during the Soviet Union
0 = non_SU likers (Cluster 1)	3.016	2.016	2.426
1 = SU_likers (Cluster 2)	4.669	3.652	4.011
Total	3.974	2.964	3.345

6.3.3. The value of the policy for society

The average premium price respondents were WTP for a litre of milk in order to support the policy was KZT 110.37. The average price paid by respondents for a litre of milk was KZT 300. This means that on average respondents are prepared to pay a 37% higher than usual to support the policy in co-operative creation. However, this is possibly an overestimate given that our sample contains more respondents with relatively high levels of

income. In order to obtain a WTP estimate more representative of the population we looked at how the WTP varies according to socio-demographic characteristics (**Table 6.5**). Using the household income population information (**Table 6.3**) we weighted the estimated WTP by income group according to the population (%) in each income group. This gives a WTP of KZT 95.18 (i.e., a 32% premium price).

Table 6.5. The estimated average WTP according to socio-demographic characteristics of the respondents

	Obs.	Mean	S.D.
Female population	189	109.157	35.819
Male population	118	105.341	34.424
Age (18-30, sample)	144	124.089	34.944
Age (31-49, sample)	110	122.491	36.639
Age (50+, sample)	53	116.349	37.411
School	29	111.119	36.940
College	50	102.184	30.818
Undergraduate	136	109.392	35.920
Post-Graduate	92	111.930	35.333
Household income (< KZT 50,000)	46	85.233	26.837
Household income (KZT 51,000 – 100,000)	74	98.860	32.874
Household income (KZT 101,000 – 150,000)	75	132.591	35.643
Household income (> KZT 151,000)	112	113.411	31.025

The budget of the Program, where the creation of co-operatives had been stated, was 2,374.2 billion tenges (KZT) for 5 years (i.e., 2017-2021). We highlight, the Program covered not only the support of small farmers through creating co-operatives but also other sectors, including a) efficient use of water and land resources; b) increasing the provision of agricultural producers with equipment and chemicals and c) scientific-technological, personnel and information-marketing support of the agro-industrial complex.

Assuming that a certain age needs to be reached to evaluate the policy, the total value of the policy was calculated by multiplying the number of Kazakh citizens at age 15 and over (13,000,000) (**Table 6.3**) by the corrected average WTP (i.e., KZT 95.18) times %

Kazakh population consuming milk (app.90% of the population); kg milk/dairy consumed per month (22kg) times 12 months. The total value of the policy aimed at the creation of the co-operatives for the Kazakh citizens was KZT 294 billion per year, or KZT 1,470 billion per 5 year (the 5-year Program period) which is half of the total budget for the whole program. The social value of the policy would equal the cost of the whole Program after 10 years.

6.3.4. Drivers for WTP

Table 6.6 shows how elements of the RAA are associated with respondents' WTP. Namely, social norms and perceived behavioural control are associated with an increase in participants' WTP an extra amount of money for a litre of milk in order to support the government policy. Although holding a positive attitude is found not being associated its statistical insignificance level is marginal (p-value=0.11). These results are in line with studies on consumer's willingness to purchase organic milk (Carfora et al., 2019); to purchase pasture-raised livestock products (Stampa et al., 2020) and to pay for meat from mobile slaughter units (Hoeksma et al., 2017).

The results also show that Kazakh citizens who like the Soviet Union regime were willing to pay KZT 29.64 less to support the policy on co-operative creation than citizens who do not like the Soviet Union regime (p-value < 0.01). Possible reasons for this result may lay on the possibility that individuals like the Soviet Union (i.e., who perceive the past Communist as a better regime than the current regime) may also have a feeling of frustration of democracy (Klicperova-Baker & Košťál, 2017). Moreover, one of the reasons behind satisfaction with the past regime was its stability and guaranteeing basic needs (Klicperova-Baker & Košťál, 2017). As pointed out by Toleubayev et al. (2010), "*Kazakhstani people express great nostalgia for their past lives in the Soviet era and their narratives express a*

strong appreciation for the level of social security, income stability, low food prices, and the sense of a more egalitarian communal life". This frustration present in Post-communist countries may be consequence of a transition economy towards a "wild capitalism" characterized by "rapid and massive liberalization, by the lack or the inefficiency of the state intervention in the economy, by corruption, and significant social movements of protest" and not achieving the similar level of democracy such as in Western Europe (Dascălu, 2014; Rabikowska, 2009).

For that reason, it might be possible for Kazakh citizens who like the Soviet Union regime to perceive policies from the government since independence as unattractive including the current government as ineffective.

Table 6.6. Results of the interval regression

	Coefficient	z-statistics
A	0.880	1.59
SN	1.123***	3.01
PBC	1.082**	2.47
1. SU_likers	-29.635***	-2.95
1. Infopolicy	25.409**	2.31
1. policyagree	7.682	0.44
Age (18-30, base category)		
31_49	-14.176	-1.34
50 and older	-14.065	-0.97
Education (School, base category)		
College	-5.706	-0.28
Undergraduate	-16.005	-0.82
Post-Graduate	-30.655	-1.48
1. female	5.740	0.55
Income (< KZT 50,000, base category)		
KZT 51,000 – 100,000	4.598	0.31
KZT 101,000 – 150,000	54.531***	3.43
> KZT 151,000	35.148**	2.29
Location	0.012	1.52
1. COVID-19	-15.550	-1.58
_cons	94.562***	3.60
sigma	62.911	13.43
Number of observations	307	
Left-censored	42	
Right censored	169	
Interval censored	96	
Log-likelihood	-382.467	

Note: *, **, *** for 10, 5 and 1% of significance level, respectively

The results indicate that respondents' WTP is positively associated with having adequate information about the policy (p – value < 0.05). Kazakh citizens with relatively higher awareness about the policy are ready to pay KZT 25 more than those that had no knowledge before. Undoubtedly, for a respondent receiving essential information about the product may be crucial for decision making. A similar finding was also reported by Stampa et al. (2020) and B. Zhang et al. (2018). Moreover, Zhang et al. (2020) who found that increasing awareness of cultured meat influenced positively on Chinese consumer's

acceptance of it. A similar effect was found by Roosen et al. (2015), when investigating consumers' WTP for nanotechnology food differed according to the information provided.

The results showed an increase in income is associated with a higher WTP. Respondents with the income between KZT 101,000 and KZT 150,000 and more than KZT 151,000 are willing to pay KZT 55 and KZT 35 more, respectively than respondents with monthly income up to KZT 50,000. This finding is expected and in line with Tienhaara et al. (2015) and (Yu et al., 2018), where a WTP was stated being increased with higher levels of income.

The parameter measuring the relationship between COVID-19 and respondents' WTP was found not to be statistically significant. However, was close to a 10% significance level (p-value = 0.11) suggesting that COVID may have had some impact on individual's WTP. Kazakh citizens seem less likely to support government policy under the current circumstances. Results show that an average WTP in the pandemic period was lower compared with the pre-pandemic period. Thus, the average WTP to support the policy was KZT 118 prior to COVID-19 outbreak, whereas during the pandemic it decreased by 11% and was KZT 105. This can be due to the rise of unemployment (Blustein et al., 2020) that stated as one of the dramatic implications of the COVID-19, which touched Kazakhstan as well. According to the news agency "Khabar 24", during the pandemic, the number of unemployed Kazakh citizens only in one city has increased by 3.5 times[18]. Thousands of entrepreneurs forced to pause their works, about 1.6 million employees were sent to leave without payment[19]. Thus, widespread dissatisfaction with the measures taken by the government to stop the spread of the virus might cause decreased support of the current government by the general public.

[18] The news was retrieved from https://24.kz/kz/zha-aly-tar/o-am/item/420240-auipti-indet-kezinde-atyrauda-zh-myssyzdar-sany-3-zharym-esege-art-an. Accessed 18/08/2020

[19] The news was retrieved from https://informburo.kz/kaz/koronavirus-pandemiyasyny-azastan-ekonomikasyna-ser-anday-saraptama.html. Accessed 18/09/2020

6.3.5. Protest WTP responds

Within n=506 observations, n=199 were labelled as protest bids and were deleted, which is almost 40% of the sample.

Respondents were asked to state the reason for zero WTP, where the most common 4 reasons are found. Both "I am already paying tax and think that the government has to use that money to support" and "The prices of milk/dairy products are already expensive" were stated 67 times. Next was "I am sceptical about that the money will go to the farmers" that repeated in 52 places. 45 times protestors mentioned, "I will need to have more information about this policy". Although “I don’t have enough income to pay extra money” was stated 56 times, this reason was labelled as true WTP of zero, therefore not been excluded from the sample.

6.4. Policy implications

Our results show the readiness of the general public to support the government’s plan in creating co-operatives and the economic viability of the plan. In addition, Kaliyeva et al. (2020) showed the willingness of rural households to participate in joining and creating co-operatives. Hence, policies aimed at the creation of co-operatives can be a viable solution to increase milk production in Kazakhstan. Interestingly, our findings suggest that although there is general support for the policy, there are still parts of the population, individuals missing the SU regime, who may mistrust newly created forms of organisation that might be presented as similar as kolkhozes. The term "co-operative" may be understood as production co-operative, i.e., former collective farming "kolkhozes", therefore, may cause rejection from these individuals (Balint & Wobst, 2006; Lerman, 2013). We recommend policymakers to acknowledge a need in introducing unambiguous definitions of the term of

"co-operative" under the current policy, "*that will prevent any possibility of misunderstanding or misinterpreting the strategic intentions"* (Lerman, 2013). Thus, Kazakh citizens (and farmers) should be provided with an adequate explanation on rights and obligations of co-operatives functioning to gain a better understanding of the differences between the former collective farming and a new term of collective action, i.e., co-operatives. Hence, in order to gain policy support for increasing dairy/milk production by creating co-operatives, good communication of the policy seems key to build trust amongst Kazakh citizens. The lack of awareness of the policy was found to be a key factor in supporting the policy.

It is worth noting that the government could also take other approaches to increase dairy/milk production. For instance, policies such as promoting family farming by introducing tax relief and/or subsidies could also achieve the aim of increasing milk production, but farmers would not have the same level of access to information and technology that what a co-operative would offer. The level of public support for policies promoting family farming is unknown, but this policy may find less opposition from individuals liking the SU. The policy on co-operative creation might facilitate connection of farmers (rural households) with supply chains (dairy factories). Not only for producers (farmers, dairy factories) might benefit from the policy, but also society. The structural changes in the dairy sector may enhance the production of domestic products, as a result, may positively affect the country's trade balance by reducing the demand on imported dairy products. Moreover, co-operatives are an acknowledged way of poverty-reducing in rural areas and sustainable development (Ajates, 2020; Ishak et al., 2020; Milovanovic & Smutka, 2018).

Although what share of the total budget was aimed to be used for co-operatives creation is not clear, the results of the study showed the importance of the policy for the

Kazakh society. Extrapolating to the Kazakh population who consume milk/dairy products would mean that the social value of the policy would be KZT 1,470 bn for the length of the program at KZT 294 bn per year, which is approximately half the total program budget, which includes other interventions beyond the creating of co-operatives. The social value of the policy would equal the cost of the Program after 10 years. This indicates there is public support for this policy. However, as a country with a transition economy, the Kazakhstan government may face with non-acceptance the policy by some of the population. The main reason is found to be the implications of the wild capitalism that Kazakh people faced since after the transition from communism to a market economy. Public rejection of the policy might also be connected with COVID-19, that had dramatic damage to the economy of the country. Therefore, the government attempts on increasing its attractiveness will facilitate the policy to be more supported.

Finally, a "top-down" way of creation of agricultural co-operatives has been widely criticized around the world due to its non-viability and non-effectiveness (Lerman, 2013). However, in developing world the "top-down" process can be legitimate way of organising co-operatives (Kurakin & Visser, 2017). For instance, the classic form of co-operative production in China that involves participation of state and farmers has been stated as widespread and effective. In post-socialist Vietnam also state involvement played a crucial role in development of agricultural co-operatives, where the sector suffered from a weak initiative of farmers (Deng et al., 2010; Kurakin & Visser, 2017).

6.5. Conclusions

We assessed the public support for a policy aimed at increasing milk production through co-operatives by estimating the monetary value for society of the policy. It was found that Kazakh citizens showed support for the government policy. The findings

presented in this paper might also be relevant for post-communist countries, such as Russia, Ukraine and Kyrgyzstan, the agricultural development of that has a similar pattern to Kazakhstan's.

Psychological factors played an important role in the success of the policy. Namely, having positive endorse regarding the behaviour (the support of the policy) from the social referent (e.g., family members and friends) as well as being in a position to control the behaviour, i.e., SN and PBC, significantly influence on Kazakh citizens' WTP/support of the policy. Moreover, individual's awareness of the policy was found to be important in supporting the policy. Therefore, good communication of the policy and its aims to the general public is key for the policy to be supported. Findings suggest that countries that have transitioned to new policy regimes can face difficulties in implementing policy programmes in cases where significant parts of the population miss characteristics of the past regime. We also found some evidence of reprioritisation of people's preferences under COVID-19, with relatively lower support for the policy. Therefore, to achieve the support of the general public, the government should take measures to increase its attractiveness and try to earn public acceptance.

Part III

This part describes general recommendations and gives the overall conclusion of the research. Challenges and limitations of the study have also been described in this part.

Chapter 7

Conclusions and policy recommendations

7.1. Summary of the results

This thesis aimed at evaluating the likely success of the policy on co-operatives in Kazakhstan to provide recommendations for policymakers to consider for successfully implementing structural changes in the dairy sector of Kazakhstan. Although the majority of studies have focused on the organisation and management of co-operatives (Chaddad & Cook, 2004; Iliopoulos et al., 2019; Ishak et al., 2020; Xiang & Sumelius, 2010), there are some that have examined the success of existing co-operatives (Garnevska et al., 2011; Lerman, 2013; Möllers et al., 2018; Tulus, 2020). The findings of this thesis contribute to the literature on the success of policies on co-operatives and on identifying ways the implementation of a co-operative creation policy might be delivered successfully. This is relevant for Kazakhstani policymakers as well as those in countries with a similar agricultural structure.

At the beginning of the study, 4 research questions were drawn up:

Research question 1. What are the drivers behind rural households' participation in governmental policy aimed at increasing milk production through co-operatives? And,

Research question 2. What is the rate of acceptance of the policy (i.e., joining or creating a production co-operative) by rural households?

Research question 3. Is the policy supported by society?

Research question 4. What are the drivers behind Kazakh citizens' willingness to pay a premium price for a litre of milk to support a policy encouraging co-operative production?

The obtained answers to those can be formulated as follows. Summary table of the results given in tables 7.1 and 7.2 refers to the research questions 1 and 4.

The findings (**tables 7.1** and **7.2) e**mphasize the role of psychological factors in determining the intention of rural households to join/create a production co-operative and in Kazakh citizens' willingness to support the policy. More specifically, the holding of a positive behavioural belief about the consequences of a behaviour form a positive attitude towards a behaviour (in this case, joining/creating a production co-operative or paying extra money per litre of milk) and this was found to be significantly associated with rural households' intention to participate in the government policy as well as general public support for the policy. Social pressure was found to be another important factor in defining behaviour. Thus, if a greater number of important others (e.g., friends, relatives) are believed to approve rather than disapprove of the behaviour (i.e., joining/creating a production co-operative or paying extra per litre of milk), as well as if most important others perform this behaviour, people are more likely to feel social pressure to engage in this behaviour (i.e., to join/create a production co-operative or pay extra per litre of milk in order to support the policy). The third component of the RAA refers to the perception of having control over one's behaviour. This factor is found to be important in paying a premium price for a litre of milk in order to support the policy. Thus, if Kazakh citizens believe themselves to have more facilitating than inhibiting factors, PBC should be high, and consequently, the behaviour will be performed (i.e., they will pay a premium price for a litre of milk in support of the policy).

Next, the findings reveal that rural households that are already engaged in the dairy business are less interested in participating in the policy, while those that have a capacity to produce (i.e., to keep livestock), but are in need (of support either financial or non-financial) are more inclined to join a production co-operative. Furthermore, risk is defined as a significant factor in joining/creating a production co-operative. Therefore, the provision of extension services (educational and advisory centres for interested groups) is highly

recommended. With those services, rural households (and other interested groups) may seek support and advice regarding the benefits of co-operative farming that will help them to understand the advantages of it.

Rural households that might be interested in creating co-operatives feel that there is a lack of adequate information about the policy. The importance of information is also found to matter in regard to support for the policy by the general public. Therefore, it is recommended that diversified channels, including the mass media, should be employed to explain the policy.

The results of the public support survey showed that Kazakhstanis who regard the Soviet Union favourably may be less inclined to support the policy in question. This may be due to the consequences of the transition economy, which is associated with government programs that had limited appeal for some part of the population of Kazakhstan. The significance level of the effect of the COVID-19 pandemic on WTP was 11%. That is, respondents questioned during the pandemic were less likely to support the policy than those questioned before the pandemic. This impact might be related to the inefficiency of the government measures taken during the crisis. Therefore, it was suggested that the government employ measures that have a greater measure of success in order to increase their attractiveness.

Finally, although there were some significant findings relating to socio-demographic characteristics (**tables 7.1.** and **7.2**), we recommend that the policy be applied in an inclusive manner, to all segments of the population regardless of their socio-demographic characteristics.

Table 7.1. Summary table of the results of rural households' willingness to participate in the policy

		Would join a production co-operative	**Would create a production co-operative**
Reasoned Action Approach	Attitude (A)	*** (positive)	*** (positive)
	Social norms (SN)	* (positive)	
	Perceived behavioural control (PBC)		
Production structure	Dairy as a source of income	* (negative)	** (negative)
	Capacity to produce	** (positive)	
Information/awareness	Having adequate information about co-operatives		*** (positive)
Cultural features	Own boss	Non-significant	Non-significant
	Benefits collaboration	Non-significant	Non-significant
	Trust business	Non-significant	Non-significant
	Trust close ones	Non-significant	Non-significant
	Soviet Union Nostalgic	Non-significant	Non-significant
Risk attitudes	Risk seeking households	** (positive)	* (positive)
Socio-demographic characteristics	Age		
	Gender (1. Male)	* (positive)	
	Education (1. University)		* (negative)
	Nationality (1. Kazakh)		** (positive)

Note: *, **, *** for 10, 5 and 1% of significance level, respectively; positive and negative refer to the sign

Table 7.2. Summary table of the results on Kazakh citizens evaluation of the policy

		Willingness to pay a premium price for a litre of milk in order to support the policy
Reasoned Action Approach	Attitude (A) Social norms (SN) Perceived behavioural control (PBC)	P-value=11 (positive) *** (positive) ** (positive)
View on past regime	Soviet Union in favour	*** (negative)
Information/awareness	Having adequate information about co-operatives	** (positive)
Socio-demographic characteristics	Age Gender Education Income (KZT 101,000-150,000) Income (> KZT 151,000)	Non-significant Non-significant Non-significant *** (positive) ** (positive)
Location	Where respondents live	Non-significant
COVID-19	Respondents during the pandemic	P-value=11, (negative)

Note: *, **, *** for 10, 5 and 1% of significance level, respectively; positive and negative refer to the sign

The rate of acceptance of the policy (i.e., joining or creating a production co-operative) by rural households, that is the research question 2, was obtained by directly asking them to respond to the questions: “Would you be willing to join a production co-operative?” and “Would you be willing to create/help to create a production co-operative”. Overall, 181 rural households were surveyed in three villages of the Akmola region. Out of the total number of rural households (n=181) surveyed, 60 intended to join, and 59 to create a production co-operative, constituting 33% of the sample. Contrary to the assumption that the creation of co-operatives might not be an easy task in post-communist countries (Balint & Wobst, 2006; Lerman, 2013; Moldashev, 2016), these results indicate there is a clear interest from significant numbers of rural households in doing so. Whether this will lead to a high level of co-operation in the coming years is difficult to judge. Yet, it is worth noting that only about

30% of the respondents (rural households) were aware of the existence of the program before the survey. Therefore, we believe that provision of extension services to disseminate such information, as well as to help establish positive attitudes towards co-operative production will provide a good basis for the development of co-operatives.

The support of the policy in question by society was examined under research question 3. Extrapolation of the results to the population of Kazakhstan who consumes milk/dairy products showed that the monetary value of the policy would amount to 1,470 billion tenges over the duration of the program (5 years) at a rate of 294 billion tenges per year. This is approximately half the total program budget. Thus, the monetary value of the policy would be equal to the cost of the Program in 10 years. This indicates public support for this policy.

7.2. Guidance for policymakers

Co-operatives are acknowledged as being beneficial for farmers in many ways, such as strengthening their bargaining power and reducing risks related to price and production. They help small farmers gain access to markets and thus are recognised to be instrumental in reducing poverty in rural areas. However, as well as those countries where the co-operative movement has proved a success, there are others where the expectations have been disappointed. In Croatia, though co-operatives were established before WWI and played an important role in the country's socio-economic tradition in the latter part of the 19th and the beginning of the 20th centuries, the current situation of Croatian co-operatives, for example, has been argued as being *"marked primarily by a large number of small and rather weak local co-operatives"* (Božić et al., 2019). The same occurred in Bangladesh, where the co-operative movement was set up in the 1900s and has a long history, the current situation with co-operatives has been criticized for its failure in its desired goal of poverty alleviation due to management issues and corruption (Milovanovic & Smutka, 2018).

These failures may be due to an inadequate implementation of a co-operative policy. Therefore, this research attempts to shed light on the specific context and the understanding of the term co-operative in contemporary Kazakhstan, in order to help policymakers successfully develop strategies to improve dairy production, and the whole agricultural sector. The general recommendations are as follows:

- **Clarify the definition of "co-operatives" which will help to distinguish the differences between kolkhozes and this new form of collective farming.**

Kazakhstan, as a former Soviet Union country, has faced the implications of the transition economy ever since the announcement of the country's independence. One of these, the collapse of collective farming and the mass privatisation of agriculture, led to an increase in small-scale farming and food production at household level in rural areas. Since the prevalence of the rural households' share in total agricultural production in the country is considered to be a barrier to the country's agricultural development, the government has introduced a policy of creating co-operatives amongst such smallholders. However, in a post-communist country, which has already had to confront the outcomes of a collective economy, the creation of co-operatives might not be an easy task for several reasons. One reason may be people's lack of trust in newly created forms of organisation that might be perceived as similar to kolkhozes. However, this has not been found to be the case in other post-communist economies. For instance, Möllers et al. (2018) noted the strength of the attractiveness of co-operatives for Romanian farmers. It is worth noting that Romania has also experienced the domination of small-scale farming as is the case in Kazakhstan. It is also worth noting that we found a positive in interest amongst rural households in the policy and a readiness amongst the general public to support the government's plan in creating co-operatives. Moreover, during the pilot studies, we tried to capture and elucidate perceived connections between co-operatives and kolkhozes by asking the respondents to state any

associations with the word “co-operative”. Although within our study no association was uncovered between the former kolkozes and co-operatives, previous research has argued that the term "co-operative" is sometimes interpreted as co-operative production, akin to the former collective farming "kolkhozes", and that therefore, farmers may reject participation in such initiatives (Balint & Wobst, 2006; Lerman, 2013). Therefore, first of all, we recommend *“the new legislative framework must acknowledge this psychological barrier to co-operatives by introducing unambiguous definitions that will prevent any possibility of misunderstanding or misinterpreting the strategic intentions”* (Lerman, 2013). Thus, rural households should be provided with adequate explanations concerning the rights and obligations of joining/creating co-operatives to gain a better understanding of the differences between the former collective farming and the new form of collective action, i.e., co-operatives.

- **Organisation of educational and advisory services**

Studies of co-operatives suggest that a key determinant in their success is the educational level, technical skills and the commitment of the members co-operative. Therefore, training and education are considered to be key to the successful development of co-operatives (Garnevska et al., 2011). The policy on co-operatives should regard education and training services for farmers as the main tool for increasing milk production in rural households. In the majority of cases, members of rural households do not see themselves as proper farmers, since doing agricultural work is not regarded as attractive to them, in terms of income or for other reasons (Bednaříková et al., 2016; Otar et al., 2020). Food production at the household level (‘householding’), is more of a tradition or is seen merely as a source of additional income for Kazakh families. As a rule, they have not received any agricultural education, and knowledge and information about caring for animals are passed on gradually from the older generation to the younger. Therefore, to achieve the aim of the policy the

government should focus on the provision of extension services for farmers (rural households), such as education and training. In addition to the exchange of knowledge and supporting services between diverse participants of the dairy sector in rural areas, advisory services should be created. Advisory services will provide farmers with relevant information about innovations in the dairy industry. There are diverse types of advice service around the world. For instance, in Scotland, the Public Good and Veterinary Advisory Services (Prager & Thomson, 2014) and the Scottish Agricultural Organisation Society (SAOS), with the support of the Scottish Government, assist co-operatives via consulting, market research and strategy development (OECD, 2019). Another example is the USDA Co-operative Program that provide extensive information support for farmers in the USA, including a library of over 150 publications on topics ranging from how to start a co-operative, to member training and co-operative management as well as more technical topics such as accounting and tax law for co-operatives (OECD, 2019). Thus, the creation and provision of such services in Kazakhstan will lead to the enhancement of agricultural knowledge in rural households (innovation, education, etc.).

- **Increasing the attractiveness of the policy amongst rural households**

The OECD (2013) clearly stated that "*Efforts to develop large scale agriculture should be complemented by helping small farms to integrate into local supply chains*". However, the current situation in the Kazakh dairy sector is characterised by the disconnection of small farms (i.e., rural households) from dairy factories and this is due to several factors. One of the most important of them is that rural households perceive direct sales as beneficial compared with sales to intermediaries or dairy factories. Bijman (2018) argues that the co-operative model can be successful under the following conditions: a) if acting as individual market participants, participants incur high transaction costs in selling their products or services, b) if there is a need to achieve economies of scale and strengthen the bargaining

power, and c) if direct or indirect institutional support exists. However, a) and b) may not be sufficient without c). Our findings clearly show the unattractiveness of the co-operative production policy for rural households who are currently dedicated to selling their produce and have a clear business orientation (i.e., for whom the dairy is a source of income). Thus, it can be concluded that although co-operatives might have many benefits, there might be rural households that will not be inclined to participate in the policy. It is known that the probability of choosing i is greater if alternative k is smaller than i (i.e., $U_{iq} > U_{kq}$), therefore, rural households are expected to choose the better option from given sets. Specifically, if the utility gained through joining/creating a production co-operative is smaller than acting as a private farmer, then the households will prefer to remain operating as individual businesses. Therefore, the government's efforts in attracting those rural households should be directed to increasing the utility gained by joining/creating a production co-operative, such as by creating effective sales channels. Möllers et al. (2018) suggested policymakers build up long-term development strategies (including the provision of information and monetary incentives, i.e., subsidies) that will help smallholders to understand the economic and financial benefits of joining co-operatives as well as incentivising them. However, as stated by J. Swinnen et.al. (2015), the danger of "*increased loan defaults and write-offs as a result of altered incentive structures"* exists. Lerman (2013) also argues that financial support will impede the success of co-operatives in Kazakhstan due to the country's record of inefficiency and corruption. For instance, the beginning of the government program and the consequent allocation of subsidies gave a strong impetus to the new co-operative movement: as of June 2018, a total number of 2,872 agricultural co-operatives with 62,825 member farmers was registered in Kazakhstan (STAT, 2019b). However, government authorities estimate that around 60% of the registered co-operatives were "fake" co-operatives. Many of them were created to attract government subsidies or

with the help of regional authorities to achieve pre-planned goals. As a result, there were discrepancies in the official statistics and data collected by the regional authorities (OECD, 2019). Therefore, financial incentives should have control measures such as the setting up of monitoring systems to avoid households misusing the allocated money.

- **Taxes and entrance fees might be hindering factors**

Agricultural producers in Kazakhstan have been subject to two special tax regimes: 1) a *"special tax regime for small farmers on the basis of a single land tax, which depends on the amount of land and does not exceed 0.5% of the appraised value of agricultural land"* and 2) a special tax regime for legal entities/producers of agricultural products that provides 70% discount for corporate income tax, value added tax, property tax, and tax on vehicles (Fellmann & Nekhay, 2012; OECD, 2015). Rural households "*benefit from significant tax concessions and are only eligible for personal taxes (land and property taxes)"* (OECD, 2015). Co-operatives, as legal entities are obliged to pay tax, both tax on their profits and VAT, and while some discounts exist, rural households are not subject to this taxation. "*As a result of the taxes that co-operatives pay, a smallholder dealing through a co-operative is likely to net less from his marketing transactions (or pay more for purchasing transactions) than the amounts he would have received (or paid) by dealing directly with buyers and suppliers. These tax distortions place co-operative members at a disadvantage compared to those who operate independently*" (Sedik & Lerman, 2015). Previous studies in Kyrgyzstan, a country neighbouring Kazakhstan, showed taxes as not being a major barrier for farmers in joining co-operatives, as only 6% of respondents indicated tax as an impeding factor in joining a co-operative (Lerman, 2013). Swinnen et al. (2015) emphasise the important role of taxes in encouraging producers to adopt better financial reporting systems. By obliging farmers to file income tax returns, it may well be possible to shift their attention from production efficiency to the more important issue of financial efficiency. In turn, this could

lead to a decrease in the irrational use of governmental support (e.g., special discounts and subsidies).

According to the law on agricultural co-operatives, farmers (including rural households) who wish to be a member of a co-operative have to pay an entrance fee and additional fees if required, which in turn can be another hindering factor for farmers. We emphasize the lack of previous studies on farmers' willingness to become members of a co-operatives in the context of Kazakhstan. Although this research tried to shed light on this issue, more research with a bigger sample size and including other regions of Kazakhstan is highly recommended.

- **A bottom-up route to co-operative creation might be more viable**

Finally, a "top-down" route to the creation of agricultural co-operatives has been widely criticized around the world due to its non-viability and non-effectiveness. Pilot studies and survey results in this research showed that information on the policy aimed at creating co-operatives had not been widely distributed and or explained to rural households. The majority of the participants only discovered the existence of the program from the researchers during the survey. Despite these shortcomings, a high level of interest amongst rural households was identified in the policy and a willingness to learn more about it. Therefore, it can be concluded that "co-operatives *created "top-down" according to government programs seldom survive, and only co-operatives created "bottom-up" based on user initiative in rural areas have a chance of proving to be viable*" (Lerman, 2013). However, some researchers argue that in the developing world the "top-down" process can be a legitimate way of organising co-operatives (Kurakin & Visser, 2017). For instance, the classic form of establishing co-operatives in China that involves the participation of the state and farmers has been regarded as widespread and effective. In post-socialist Vietnam, state involvement also played a crucial role in the development of agricultural co-operatives,

where the sector suffered from low levels of initiative on the part of farmers (Deng et al., 2010; Kurakin & Visser, 2017). Despite this, we believe that the initiative to create co-operatives should come from rural households. Moreover, dairy factories need to also be involved in such initiatives from the outset. Otherwise, the top-down process may not be implemented successfully.

Chapter 8

Challenges and limitations

8.1. Challenges during the research

There were a number of challenges encountered in the course of this research. Obstacles faced during the study pathway can be grouped in the following way:

Pilot studies. As the capital grows, all the surrounding villages up to 80 km from Nur-Sultan have been absorbed into its outskirts. As a result, the number of households keeping livestock is decreasing, which caused difficulties in the selection of villages. After several unsuccessful visits to surrounding villages, it was concluded that:

- Selected villages needed to be far away from the motorways, as the grazing land in those areas is reducing and, as a result, livestock has all but disappeared.
- Taking into account that infrastructure is not developed everywhere, the villages need to be easily accessible by road.
- Since the survey was being conducted by Qualtrics software, having access to the internet was essential.

Consideration of the difficulties during the pilot studies allowed us to find appropriate villages to conduct the main survey.

Main survey. Considering the fact that not all villages have internet coverage or good transport links, a decision was taken to visit in person a large number of respondents in the selected villages. In order to reduce the number of incomplete questionnaires, the personal presence of the researcher was required. This turned out to be time-consuming, as it took an average of 30 minutes for each respondent. In order to optimize the survey, the members of the regional authorities were involved, which greatly facilitated and accelerated the process. The survey of the general public was not as difficult as that of the rural households since it

did not require a personal presence. Potential respondents were accessed through the collaboration of friends through social networks and with the help of universities (i.e., S. Seifullin Kazakh Agro-Technical University and L.N. Gumilyev Eurasian National University).

Publishing. Once the results of the research questions 1 and 2 were ready and written up, suitable journals for publication were sought. We applied to *Rural Studies* and *The Post-Communist Economies*, but unfortunately in both cases, the paper was rejected by editors due to its not fitting the scope of the journals. On the third attempt, the article had a positive response from an editor of the journal "*Agriculture*" (ISSN 2077-0472). The manuscript went through a peer-review process with 2 rounds of corrections. The published paper can be found in Chapter 5.

The second manuscript that includes the results to questions 3 and 4 is currently being processed by *The Journal of Agricultural Economics*. The paper can be found in Chapter 6.

8.2. Limitations

Despite some significant findings in this study, the limitations must be acknowledged while interpretating the results. Namely, the household study was conducted in Akmola region, out of 14 possible regions, since the majority of co-operatives are functioning there and almost 50% (31,545 tonnes) of milk produced by co-operatives in the country were in this region. However, the results might differ in other regions. Moreover, the sample size of 181 rural households may not be sufficient to generalise the results. Therefore, in order to expand the validity of the results, more studies with a higher sample size should be conducted.

This study has been limited by considering the willingness of rural households to engage in a production co-operative only, either by joining or creating. However, it should

be noted that the results might differ according to the type of the co-operative, e.g., service/consumer co-operatives, and other specification of the co-operatives, i.e., brand and reputation of a co-operative.

The statistical analysis of the study of the willingness of rural households to join or create co-operatives was based on a bivariate probit model. In addition, a mixed-effect model was applied to see if background factors such as age and gender had an impact on the RAA components (i.e., attitude, social norms and PBC). However, the results showed that the linear model is better suited than the mixed effect (**Appendix E, table E5**) though this may be related to the sample size. Therefore, further studies in this direction with a large sample size may allow us to see the influence of background factors on the RAA.

Additionally, it should be emphasized that this research has considered only a single attribute, i.e., the value of the policy on creation of production co-operatives. However, there is a potential of exploring the general public's willingness to pay for co-operatives through including other specifications. This might include other attributes, including diversify of co-operatives such as service co-operatives. Alternatively, consumers' preferences can be explained by extending product attributes, e.g., quality and price of the milk from co-operatives. In such a case, a choice experiment approach can be utilized to investigate individual's WTP for welfare changes by offering different attributes of goods/policies and choosing a preferred option across several sets (Concu, 2007; Schreiner & Latacz-Lohmann, 2015). The estimation procedure could be implemented by multinomial logit (MNL) and/or mixed logit (ML) models (Arellana et al., 2020; Bazzani et al., 2017; Danne & Musshoff, 2017).

References

Abdrassilova, R. (2015). *Understanding barriers and opportunities in agricultural information management in post-Soviet states: a case study of Kazakhstan* [Robert Gordon University]. http://openair.rgu.ac.uk

Adegbite, O. O., & Machethe, C. L. (2020). Bridging the financial inclusion gender gap in smallholder agriculture in Nigeria: An untapped potential for sustainable development. *World Development*, *127*, 104755. https://doi.org/10.1016/j.worlddev.2019.104755

Ahmed, M. H., & Mesfin, H. M. (2017). The impact of agricultural cooperatives membership on the wellbeing of smallholder farmers: empirical evidence from eastern Ethiopia. *Agricultural and Food Economics*, *5*(1). https://doi.org/10.1186/s40100-017-0075-z

Ajates, R. (2020). An integrated conceptual framework for the study of agricultural cooperatives: from repolitisation to cooperative sustainability. *Journal of Rural Studies*, *78*(May), 467–479. https://doi.org/10.1016/j.jrurstud.2020.06.019

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*, 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Alho, E. (2015). Farmers' self-reported value of cooperative membership: evidence from heterogeneous business and organization structures. *Agricultural and Food Economics*, *3*(1). https://doi.org/10.1186/s40100-015-0041-6

Arellana, J., Garzón, L., Estrada, J., & Cantillo, V. (2020). On the use of virtual immersive reality for discrete choice experiments to modelling pedestrian behaviour. *Journal of Choice Modelling*, *37*(September), 1–18. https://doi.org/10.1016/j.jocm.2020.100251

Armitage, C. J., & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour : A meta-analytic review. *British Journal of Social Psychology*, *40*, 471–499.

Assyltaeva, E., Tolen, Z., & Nassimova, G. (2014). Kazakhstan as a Model for Regulating Interethnic Relations. *Procedia - Social and Behavioral Sciences*, *114*, 291–297. https://doi.org/10.1016/j.sbspro.2013.12.701

AUK. (2020). Agriculture in the United Kingdom. In *Department for Environment, Food and Rural Affairs*.

Babu, S. C., & Sanyal, P. (2009). Classifying households on food security and poverty dimensions – application of K-mean cluster analysis. *Food Security, Poverty and Nutrition Policy Analysis*, 265–277. https://doi.org/10.1016/b978-0-12-374712-9.00013-4

Balint, B., & Wobst, P. (2006). Institutional factors and market participation by individual farmers: The case of Romania. *Post-Communist Economies*, *18*(1), 101–121. https://doi.org/10.1080/14631370500505396

Baranowski, E., Thevs, N., Khalil, A., Baibagyssov, A., Iklassov, M., Salmurzauli, R., Nurtazin, S., & Beckmann, V. (2020). Pastoral Farming in the Ili Delta, Kazakhstan, under Decreasing Water Inflow: An Economic Assessment. *Agriculture*, *10*(7), 281. https://doi.org/10.3390/agriculture10070281

Bard, S. K., & Barry, P. J. (2000). Developing a scale for assessing risk attitudes of agricultural decision makers. *International Food and Agribusiness Management Review*, *3*, 9–25. http://ageconsearch.umn.edu/bitstream/34573/1/03010009.pdf

Bazzani, C., Caputo, V., Nayga, R. M., & Canavari, M. (2017). Revisiting consumers' valuation for local versus organic food using a non-hypothetical choice experiment: Does personality matter? *Food Quality and Preference*, *62*(June), 144–154. https://doi.org/10.1016/j.foodqual.2017.06.019

Bednaříková, Z., Bavorová, M., & Ponkina, E. V. (2016). Migration motivation of agriculturally educated rural youth: The case of Russian Siberia. *Journal of Rural Studies*, *45*, 99–111. https://doi.org/10.1016/j.jrurstud.2016.03.006

BELSTAT. (2020). *Statistical Yearbook of the Republic of Belarus*.

Bennett, R., & Balcombe, K. (2012). Farmers' Willingness to Pay for a Tuberculosis Cattle Vaccine. *Journal of Agricultural Economics*, *63*(2), 408–424. https://doi.org/10.1111/j.1477-9552.2011.00330.x

Bett, R. C., Bett, H. K., Kahi, A. K., & Peters, K. J. (2009). Evaluation and effectiveness of breeding and production services for dairy goat farmers in Kenya. *Ecological Economics*, *68*(8–9), 2451–2460. https://doi.org/10.1016/j.ecolecon.2009.04.014

Bettin, G., & Lucchetti, R. (2012). Interval regression models with endogenous explanatory

variables. *Empirical Economics*, *43*(2), 475–498. https://doi.org/10.1007/s00181-011-0493-9

Bijman, J. (2018). Exploring the sustainability of the cooperative model in dairy: The case of the Netherlands. *Sustainability (Switzerland)*, *10*(7). https://doi.org/10.3390/su10072498

Blustein, D. L., Duffy, R., Ferreira, J. A., Cohen-Scali, V., Cinamon, R. G., & Allan, B. A. (2020). Unemployment in the time of COVID-19: A research agenda. *Journal of Vocational Behavior*, *119*(May), 1–4. https://doi.org/10.1016/j.jvb.2020.103436

Božić, J., Šprajc, I., & Srbljinović, A. (2019). Croatian co-operatives' story of revival: Overcoming external obstacles. *Journal of Co-Operative Organization and Management*, *7*(2). https://doi.org/10.1016/j.jcom.2019.100090

Bradford, W. D., Kleit, A. N., Krousel-Wood, M. A., & Re, R. M. (2004). Willingness to pay for telemedicine assessed by the double-bounded dichotomous choice method. *Journal of Telemedicine and Telecare*, *10*(6), 325–330. https://doi.org/10.1258/1357633042601991

Brown, T. C. (2003). *Introduction to Stated Preference Methods* (pp. 99–110). https://doi.org/10.1007/978-94-007-0826-6_4

Bukchin, S., & Kerret, D. (2020). The role of self-control, hope and information in technology adoption by smallholder farmers – A moderation model. *Journal of Rural Studies*, *74*(June 2019), 160–168. https://doi.org/10.1016/j.jrurstud.2020.01.009

Carfora, V., Cavallo, C., Caso, D., Del Giudice, T., De Devitiis, B., Viscecchia, R., Nardone, G., & Cicia, G. (2019). Explaining consumer purchase behavior for organic milk: Including trust and green self-identity within the theory of planned behavior. *Food Quality and Preference*, *76*(September 2018), 1–9. https://doi.org/10.1016/j.foodqual.2019.03.006

Chaddad, F. R., & Cook, M. L. (2004). Understanding new cooperative models: An ownership-control rights typology. *Review of Agricultural Economics*, *26*(3), 348–360. https://doi.org/10.1111/j.1467-9353.2004.00184.x

Chagwiza, C., Muradian, R., & Ruben, R. (2016). Cooperative membership and dairy

performance among smallholders in Ethiopia. *Food Policy*, *59*, 165–173. https://doi.org/10.1016/j.foodpol.2016.01.008

Chapman, K. W., Lawless, H. T., & Boor, K. J. (2001). Quantitative descriptive analysis and principal component analysis for sensory characterization of ultrapasteurized milk. *Journal of Dairy Science*, *84*(1), 12–20. https://doi.org/10.3168/jds.S0022-0302(01)74446-3

Concu, G. B. (2007). Investigating distance effects on environmental values: A choice modelling approach. *Australian Journal of Agricultural and Resource Economics*, *51*(2), 175–194. https://doi.org/10.1111/j.1467-8489.2007.00381.x

Csaki, C., Gray, K., Lerman, Z., & Thiesenhusen, W. (1992). *Land Reform and the Restructuring of Kolkhozes and Sovkhozes* (p. WP3.1).

Dadabaev, T. (2016). Evaluations of perestroika in post-Soviet Central Asia: Public views in contemporary Uzbekistan, Kazakhstan and Kyrgyzstan. *Communist and Post-Communist Studies*, *49*(2), 179–192. https://doi.org/10.1016/j.postcomstud.2016.03.001

Danne, M., & Musshoff, O. (2017). Analysis of farmers' willingness to participate in pasture grazing programs: Results from a discrete choice experiment with German dairy farmers. *Journal of Dairy Science*, *100*(9), 7569–7580. https://doi.org/10.3168/jds.2017-12756

Dascălu, D. I. (2014). Individualism and Morality in the Post-communist Capitalism. *Procedia - Social and Behavioral Sciences*, *149*, 280–285. https://doi.org/10.1016/j.sbspro.2014.08.230

Davis, R., Campbell, R., Hildon, Z., Hobbs, L., & Michie, S. (2015). Theories of behaviour and behaviour change across the social and behavioural sciences: a scoping review. *Health Psychology Review*, *9*(3), 323–344. https://doi.org/10.1080/17437199.2014.941722

Deng, H., Huang, J., Xu, Z., & Rozelle, S. (2010). Policy support and emerging farmer professional cooperatives in rural China. *China Economic Review*. https://doi.org/10.1016/j.chieco.2010.04.009

Dohmwirth, C., & Hanisch, M. (2019). Women's active participation and gender homogeneity: Evidence from the South Indian dairy cooperative sector. *Journal of Rural Studies*, *72*(August), 125–135. https://doi.org/10.1016/j.jrurstud.2019.10.005

Dongre, Y. (2020). Agricultural cooperatives in Asia: state, market, governance, and sustainability. In *Waking the Asian Pacific Co-Operative Potential*. INC. https://doi.org/10.1016/b978-0-12-816666-6.00017-3

Easterlin, R. A. (2009). Lost in transition: Life satisfaction on the road to capitalism. *Journal of Economic Behavior and Organization*, *71*(2), 130–145. https://doi.org/10.1016/j.jebo.2009.04.003

Elbakidze, L., & Nayga, R. M. (2012). The effects of information on willingness to pay for animal welfare in dairy production: Application of nonhypothetical valuation mechanisms. *Journal of Dairy Science*, *95*(3), 1099–1107. https://doi.org/10.3168/jds.2011-4730

Fahad, S., & Jing, W. (2018). Evaluation of Pakistani farmers' willingness to pay for crop insurance using contingent valuation method: The case of Khyber Pakhtunkhwa province. *Land Use Policy*, *72*(September 2017), 570–577. https://doi.org/10.1016/j.landusepol.2017.12.024

FAO. (2010). *Highlights on four Livestock sub-sectors in Kazakhstan*. http://www.fao.org/3/a-bl168e.pdf

FAO. (2011). *Dairy development in Kazakhstan*. http://www.fao.org/3/a-al751e.pdf

FAO. (2016a). *AQUASTAT website*. Food and Agriculture Organization of the United Nations (FAO).

FAO. (2016b). *Development of organic agriculture in the world and Kazakhstan*. www.fao.org/publications

FAO. (2017). *Human Development Index -Country fact sheet on food and agriculture policy trends – Kazakhstan*. *March*.

Fellmann, T., & Nekhay, O. (2012). Agricultural sector and market developments: a special focus on Ukraine, Russia and Kazakhstan. In *JRC Scientific and Policy Reports*. https://doi.org/10.2791/16451

Figueiredo, V. F. M. (2018). Factors influencing cooperator satisfaction: A study applied to wine cooperatives in Portugal. *Journal of Cleaner Production*, *191*, 15–25. https://doi.org/10.1016/j.jclepro.2018.04.177

Fileccia, T., Jumabayeva, A., & Nazhmidenov, K. (2010). *Highlights on four Livestock sub-sectors in Kazakhstan*. http://www.fao.org/3/a-bl168e.pdf

Fishbein, M. (2008). A reasoned action approach to health promotion. *Medical Decision Making*, *28*(6), 834–844. https://doi.org/10.1177/0272989X08326092

Fishbein, M., & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Reading, MA: Addison-Wesley. https://people.umass.edu/aizen/f&a1975.html

Fishbein, M., & Ajzen, I. (2010). *Predicting and Changing Behavior: the reasoned action approach*. Psychology Press. https://doi.org/10.4324/9780203838020

Fonte, M., & Cucco, I. (2017). Cooperatives and alternative food networks in Italy. The long road towards a social economy in agriculture. *Journal of Rural Studies*, *53*, 291–302. https://doi.org/10.1016/j.jrurstud.2017.01.019

Frey, U. J., & Pirscher, F. (2019). Distinguishing protest responses in contingent valuation: A conceptualization of motivations and attitudes behind them. *PLoS ONE*. https://doi.org/10.1371/journal.pone.0209872

Garnevska, E., Liu, G., & Shadbolt, N. M. (2011). Factors for successful development of farmer cooperatives in Northwest China. *International Food and Agribusiness Management Review*, *14*(4), 69–84.

Gebre, G. G., Isoda, H., Rahut, D. B., Amekawa, Y., & Nomura, H. (2019). Gender differences in the adoption of agricultural technology: The case of improved maize varieties in southern Ethiopia. *Women's Studies International Forum*, *76*(March), 102264. https://doi.org/10.1016/j.wsif.2019.102264

Gong, T. (Charles), Battese, G. E., & Villano, R. A. (2019). Family farms plus cooperatives in China: Technical efficiency in crop production. *Journal of Asian Economics*, *64*, 101129. https://doi.org/10.1016/j.asieco.2019.07.002

Grashuis, J. (2020). Returns To Debt and Equity in Farm Producer Organizations. *Annals of*

Public and Cooperative Economics, *91*(1), 55–69. https://doi.org/10.1111/apce.12260

Grashuis, J., & Ye, S. U. (2019). a Review of the Empirical Literature on Farmer Cooperatives: Performance, Ownership and Governance, Finance, and Member Attitude. *Annals of Public and Cooperative Economics*, *90*(1), 77–102. https://doi.org/10.1111/apce.12205

Greene, W. (2003). Econometric Analysis, fifth ed. In *New Jersey, ua: Prentice Hall*.

Gustavsen, G. W., & Hegnes, A. W. (2020). Individuals' personality and consumption of organic food. *Journal of Cleaner Production*, *245*, 118772. https://doi.org/10.1016/j.jclepro.2019.118772

Halstead, J. M., Luloff, A. E., & Stevens, T. H. (1992). Protest Bidders in Contingent Valuation. *Northeastern Journal of Agricultural and Resource Economics*, *21*(2), 160–169. https://doi.org/10.1017/s0899367x00002683

Hanemann, M., Loomis, J., & Kanninen, B. (1991). Statistical Efficiency of Double-Bounded Dichotomous Choice Contingent Valuation. *American Journal of Agricultural Economics*, *73*(4), 1255–1263. https://doi.org/10.2307/1242453

Hernández, J. I., Hunt, A., Pazzona, M., & Lavín, F. V. (2018). Protest treatment and its impact on the WTP and WTA estimates for theft and robbery in the UK. *Oxford Economic Papers*, *70*(2), 468–484. https://doi.org/10.1093/oep/gpx050

Hinks, T. (2020). Bribery, motivations for bribery and life satisfaction in transitional countries. *World Development Perspectives*, *17*(December 2018), 100172. https://doi.org/10.1016/j.wdp.2020.100172

Hoeksma, D. L., Gerritzen, M. A., Lokhorst, A. M., & Poortvliet, P. M. (2017). An extended theory of planned behavior to predict consumers' willingness to buy mobile slaughter unit meat. *Meat Science*, *128*(2017), 15–23. https://doi.org/10.1016/j.meatsci.2017.01.011

Huang, Z. (2013). Farmer Cooperatives in China: Development and Diversification. *Economics and Management of Networks Conference. November 21-23, 2013. Agadir, Morocco, EMNet 2013*, 1–6.

Hyland, J. J., Heanue, K., McKillop, J., & Micha, E. (2018a). Factors influencing dairy

farmers' adoption of best management grazing practices. *Land Use Policy*, *78*(July), 562–571. https://doi.org/10.1016/j.landusepol.2018.07.006

Hyland, J. J., Heanue, K., McKillop, J., & Micha, E. (2018b). Factors underlying farmers' intentions to adopt best practices: The case of paddock based grazing systems. *Agricultural Systems*, *162*(February), 97–106. https://doi.org/10.1016/j.agsy.2018.01.023

Iliopoulos, C., Värnik, R., Filippi, M., Võlli, L., & Laaneväli-Vinokurov, K. (2019). Organizational design in Estonian agricultural cooperatives. *Journal of Co-Operative Organization and Management*, *7*(2), 100093. https://doi.org/10.1016/j.jcom.2019.100093

Ishak, S., Omar, A. R. C., Sum, S. M., Othman, A. S., & Jaafar, J. (2020). Smallholder Agriculture Cooperatives' Performance: What Is in the Minds of Management? *Journal of Co-Operative Organization and Management*, *8*(2). https://doi.org/10.1016/j.jcom.2020.100110

Jackson, E. L., Quaddus, M., Islam, N., & Stanton, J. (2006). *Hybrid Vigour of Behavioural Theories in the Agribusiness Research Domain . Is It Possible ? Theory of Reasoned Action (Tra)*. *3*(3), 1–15.

Jain, A. K. (2010). Data clustering: 50 years beyond K-means. *Pattern Recognition Letters*. https://doi.org/10.1016/j.patrec.2009.09.011

Jensen-Auvermann, T., Adams, I., & Doluschitz, R. (2018). Trust—Factors that have an impact on the interrelations between members and employees in rural cooperatives. *Journal of Co-Operative Organization and Management*, *6*(2), 100–110. https://doi.org/10.1016/j.jcom.2018.09.001

Jitmun, T., Kuwornu, J. K. M., Datta, A., & Kumar Anal, A. (2020). Factors influencing membership of dairy cooperatives: Evidence from dairy farmers in Thailand. *Journal of Co-Operative Organization and Management*, *8*(1), 100109. https://doi.org/10.1016/j.jcom.2020.100109

Johansson, P.-O., & Kriström, B. (2020). Why rational agents report zero or negative WTPs in valuation experiments. *Journal of Environmental Economics and Policy*, *00*(0), 1–6. https://doi.org/10.1080/21606544.2020.1760142

Jungbluth, F., Schillhorn Van-Veen, Tjaart Gray, J., Samarasinghe, B., Engelen, Anton van Karaky, R., Utkelov, B., Urazov, T., Yegeubayev, A., Zhazylbekov, N., Kineyev, M., Biyashev, B., Blarel, B., Lundell, M., & Le Gall, F. (2004). *Kazakhstan's Livestock Sector – Supporting Its Revival*.

Kajale, D. B., & Becker, T. C. (2015). Willingness to Pay for Golden Rice in India: A Contingent Valuation Method Analysis. *Journal of Food Products Marketing*, *21*(4), 319–336. https://doi.org/10.1080/10454446.2012.726946

Kaliyeva, S., Areal, F. J., & Gadanakis, Y. (2020). Attitudes of Kazakh rural households towards joining and creating cooperatives. *Agriculture (Switzerland)*, *10*(11), 1–20. https://doi.org/10.3390/agriculture10110568

Kanninen, B. J. (1993). *Optimal Experimental Design for Double-Bounded Dichotomous Choice Contingent Valuation*. *69*(2), 138–146.

Kazkenova, A., Ainakanova, B., Kuzmenko, S., Yerdenbekova, B., & Kassenova, A. (2015). Analysis of Dairy and Meat Products in the Republic of Kazakhstan. *Asian Social Science*, *11*(19), 70–74. https://doi.org/10.5539/ass.v11n19p90

Kinyakin, A. (2016). The Eurasian Economic Union : between co-existence , confrontation and cooperation with the EU. *ROCZNIK INTEGRACJI EUROPEJSKIEJ*, *10*, 461–480. https://doi.org/10.14746/rie.2016.10.29

Klicperova-Baker, M., & Košťál, J. (2017). Post-communist democracy vs. totalitarianism: Contrasting patterns of need satisfaction and societal frustration. *Communist and Post-Communist Studies*, *50*(2), 99–111. https://doi.org/10.1016/j.postcomstud.2017.05.002

Kucherov, S. (1960). The Future of the Soviet Collective Farm. *Association for Slavic, East European, and Eurasian Studies; Cambridge University Press*, *19*(2), 180–201. https://www.jstor.org/stable/3004190

Kurakin, A., & Visser, O. (2017). Post-socialist agricultural cooperatives in Russia: a case study of top-down cooperatives in the Belgorod region. *Post-Communist Economies*, *29*(2), 158–181. https://doi.org/10.1080/14631377.2016.1267974

Land Code of the Republic of Kazakhstan. (2017). *Land Code of the Republic of Kazakhstan of June 20, 2003 (with amendments and additions as of February 27, 2017)* (No. 442–

II). online.zakon.kz

Leonhardt, J. M., Keller, L. R., & Pechmann, C. (2011). Avoiding the risk of responsibility by seeking uncertainty: Responsibility aversion and preference for indirect agency when choosing for others. *Journal of Consumer Psychology*, *21*(4), 405–413. https://doi.org/10.1016/j.jcps.2011.01.001

Lerman, Z. (2013). Cooperative development in Central Asia. *Policy Studies on Rural Transition*, *4*, 38.

Lerman, Z., & Sedik, D. (2017). Cooperatives in Kyrgyzstan: Findings from a Survey of Cooperatives and Users. In *Contributions to Management Science* (pp. 233–249). https://doi.org/10.1007/978-3-319-57276-5_13

Luo, J., Han, H., Jia, F., & Dong, H. (2020). Agricultural Co-operatives in the western world: A bibliometric analysis. *Journal of Cleaner Production*, *273*, 122945. https://doi.org/10.1016/j.jclepro.2020.122945

Macciotta, N. P. P., Vicario, D., & Cappio-Borlino, A. (2006). Use of Multivariate Analysis to Extract Latent Variables Related to Level of Production and Lactation Persistency in Dairy Cattle. *Journal of Dairy Science*, *89*(8), 3188–3194. https://doi.org/10.3168/jds.S0022-0302(06)72593-0

Madden, J. T., Ellen, P., & Aizen, I. (1992). A comparison of the Theory of Planned Behavior and the Theory of Reasoned Action. *Personality and Social Psychology Bulletin*, *18*.

Majee, W., & Hoyt, A. (2011). Cooperatives and community development: A perspective on the use of cooperatives in development. *Journal of Community Practice*, *19*(1), 48–61. https://doi.org/10.1080/10705422.2011.550260

Malvido Perez Carletti, A., Hanisch, M., Rommel, J., & Fulton, M. (2018). Farm Gate Prices for Non-Varietal Wine in Argentina: A Multilevel Comparison of the Prices Paid by Cooperatives and Investor-Oriented Firms. *Journal of Agricultural and Food Industrial Organization*, *16*(1), 1–14. https://doi.org/10.1515/jafio-2016-0036

Manta, O. (2017). The Agricultural Cooperative in Romania and Worldwide. *Global Economic Observer*, *5*(1), 98.

Martinez-Ribaya, B., & Areal, F. J. (2020). Is there an opportunity for product differentiation between GM and non-GM soya-based products in Argentina? *Food Control*, *109*(September 2019), 106895. https://doi.org/10.1016/j.foodcont.2019.106895

Martinovska Stojcheska, A., Kotevska, A., Bogdanov, N., & Nikolić, A. (2016). How do farmers respond to rural development policy challenges? Evidence from Macedonia, Serbia and Bosnia and Herzegovina. *Land Use Policy*, *59*, 71–83. https://doi.org/10.1016/j.landusepol.2016.08.019

McGurk, E., Hynes, S., & Thorne, F. (2020). Participation in agri-environmental schemes: A contingent valuation study of farmers in Ireland. *Journal of Environmental Management*, *262*(March), 110243. https://doi.org/10.1016/j.jenvman.2020.110243

Menkhoff, L., & Sakha, S. (2017). Estimating risky behavior with multiple-item risk measures. *Journal of Economic Psychology*, *59*, 59–86. https://doi.org/10.1016/j.joep.2017.02.005

Micha, E., Areal, F. J., Tranter, R. B., & Bailey, A. P. (2015). Uptake of agri-environmental schemes in the Less-Favoured Areas of Greece: The role of corruption and farmers' responses to the financial crisis. *Land Use Policy*, *48*, 144–157. https://doi.org/10.1016/j.landusepol.2015.05.016

Milovanovic, V., & Smutka, L. (2018). Cooperative rice farming within rural Bangladesh. *Journal of Co-Operative Organization and Management*, *6*(1), 11–19. https://doi.org/10.1016/j.jcom.2018.03.002

Ministry of Agriculture of the Republic of Kazakhstan. (2017). *State program for the development of the agro-inductrial complex of the Republic of Kazakhstan for 2017-2021*. https://primeminister.kz/ru/page/view/razvitie_agropromishlennogo_kompleksa

Mogas, J., Riera, P., & Bennett, J. (2006). A comparison of contingent valuation and choice modelling with second-order interactions. *Journal of Forest Economics*, *12*(1), 5–30. https://doi.org/10.1016/j.jfe.2005.11.001

Moldashev, A. (2016, December 1). On the problems of development of cooperation in the agricultural sector of Kazakhstan / О проблемах развития кооперации в аграрном секторе Казахстана. *The Newspaper "KazakhZerno.Kz."* http://www.kazakh-zerno.kz/novosti/agrarnye-novosti-kazakhstana

Möllers, J., Traikova, D., Bîrhală, B. A. M., & Wolz, A. (2018). Why (not) cooperate? A cognitive model of farmers' intention to join producer groups in Romania. *Post-Communist Economies*, *30*(1), 56–77. https://doi.org/10.1080/14631377.2017.1361697

Montaño, D. E. (1992). Health Behavior and Health Education: Theory, Research, and Practice. *Annals of Internal Medicine*, *116*(4), 350. https://doi.org/10.7326/0003-4819-116-4-350_1

Moody, G. D., & Siponen, M. (2013). Using the theory of interpersonal behavior to explain non-work-related personal use of the Internet at work. *Information and Management*, *50*(6), 322–335. https://doi.org/10.1016/j.im.2013.04.005

Mooi, E., Sarstedt, M., & Mooi-Reci, I. (2018). Market Research. The Process, Data, and Methods Using Stata. In *[Book]*. https://doi.org/10.1007/978-981-10-5218-7

Moon, S., & Lee, S. (2020). A Strategy for Sustainable Development of Cooperatives in Developing Countries: The Success and Failure Case of Agricultural Cooperatives in Musambira Sector, Rwanda. *Sustainability*, *12*(20), 8632. https://doi.org/10.3390/su12208632

Morais, M., Binotto, E., & Borges, J. A. R. (2017). Identifying beliefs underlying successors' intention to take over the farm. *Land Use Policy*, *68*(July), 48–58. https://doi.org/10.1016/j.landusepol.2017.07.024

Morais, M., Borges, J. A. R., & Binotto, E. (2018). Using the reasoned action approach to understand Brazilian successors' intention to take over the farm. *Land Use Policy*, *71*(February 2017), 445–452. https://doi.org/10.1016/j.landusepol.2017.11.002

Nahayo, A., Omondi, M. O., ZHANG, X. hui, LI, L. qing, PAN, G. xing, & Joseph, S. (2017). Factors influencing farmers' participation in crop intensification program in Rwanda. *Journal of Integrative Agriculture*, *16*(6), 1406–1416. https://doi.org/10.1016/S2095-3119(16)61555-1

Nazhimedenov, K., Dzhumabayeva, A., & Philechchia, T. (2011). *The main aspects of the study of four sectors of the livestock sector in Kazakhstan. Dairy sector / Основные аспекты изучения четырех секторов животноводства в Казахстане. Молочный сектор*. www.fao.org

NMH KazAgro. (2015). *Express analysis of the market of milk and dairy products in Kazakhstan for 2014-2015 / Экспресс-анализ рынка молока и молочных продуктов в Казахстане за 2014-2015 годы*. http://www.kazagro.kz/en/holding

OECD. (2015). *Strengthening agricultural co-operatives in Kazakhstan*. www.oecd.org

OECD. (2019). *Monitoring the Development of Agricultural Co-opertives in Kazakhstan*.

Ölander, F., & Thøgersen, J. (1995). Understanding of Consumer Behaviour as a Prerequisite for Environmental Protection. *Journal of Consumer Policy*, *18*(4), 345–385. https://link.springer.com/content/pdf/10.1007%2FBF01024160.pdf

Otar, E. S., Salikzhanov, R. S., Akhmetova, A. S., Issakhanova, A. A., & Madyarbekov, G. B. (2020). Entrepreneurs as representatives of the new middle class of Kazakhstan. *Talent Development and Excellence*, *12*(1), 855–868.

Petrick, M., & Götz, L. (2019). Herd Growth, Farm Organisation and Subsidies in the Dairy Sector of Russia and Kazakhstan. *Journal of Agricultural Economics*, *70*(3), 789–811. https://doi.org/10.1111/1477-9552.12318

Petrick, M., & Pomfret, R. (2016). *Agricultural policies in Kazakhstan* (No. 155).

Petrick, M., & Pomfret, R. (2018). Agricultural Policies in Kazakhstan. In *Handbook of International Food and Agricultural Policies (In 3 Volumes)* (pp. 461–482). https://doi.org/10.1142/9789813226463_0021

Philatova, O., & Kali, A. (2014). *Analysis of the livestock sector*. www.rfcaratings.kz

Prager, K., & Thomson, K. (2014). *AKIS and advisory services in the United Kingdom. Report for the AKIS inventory (WP3) of the PRO AKIS project.* (Issue 311994). www.proakis.eu/publicationsandevents/pubs

Qian, X., & Olsen, T. L. (2018). Operational and financial management in agricultural cooperatives. In *Finance and Risk Management for International Logistics and the Supply Chain*. Elsevier Inc. https://doi.org/10.1016/B978-0-12-813830-4.00008-3

Rabikowska, M. (2009). The ghosts of the past: 20 years after the fall of communism in Europe. *Communist and Post-Communist Studies*, *42*(2), 165–179. https://doi.org/10.1016/j.postcomstud.2009.04.007

Riemenschneider, C. K., Harrison, D. A., & Mykytyn, P. P. (2003). Understanding it adoption decisions in small business: Integrating current theories. *Information and Management*, *40*(4), 269–285. https://doi.org/10.1016/S0378-7206(02)00010-1

Rietveld (Anne), A. M., van der Burg (Margreet), M., & Groot (Jeroen), J. C. J. (2020). Bridging youth and gender studies to analyse rural young women and men's livelihood pathways in Central Uganda. *Journal of Rural Studies*, *75*(February), 152–163. https://doi.org/10.1016/j.jrurstud.2020.01.020

Roosen, J., Bieberstein, A., Blanchemanche, S., Goddard, E., Marette, S., & Vandermoere, F. (2015). Trust and willingness to pay for nanotechnology food. *Food Policy*, *52*, 75–83. https://doi.org/10.1016/j.foodpol.2014.12.004

Rowbotham, R. (2015). *Associations between Dairy Cow Bedding and Milk Quality* [University of Wisconsin-Madison]. http://reading.summon.serialssolutions.com

Sabates-Wheeler, R. (2007). Safety in small numbers: Local strategies for survival and growth in Romania and the Kyrgyz Republic. *Journal of Development Studies*, *43*(8), 1423–1447. https://doi.org/10.1080/00220380701611501

Saphonov, M., & Pavlov, M. (2015). Cow's feed basket / Кормовая корзина коровы. *Tsenovic. Agricultural Review*, *5*. http://www.tsenovik.ru/articles/obzory-i-prognozy/kormovaya-korzina-korovy/

Schmitz, A., & Meyers, W. H. (2015). Transition to agricultural market economies: The future of Kazakhstan, Russia and Ukraine. In *Transition to Agricultural Market Economies: The Future of Kazakhstan, Russia and Ukraine*. https://doi.org/10.1079/9781780645353.0000

Schreiner, J. A., & Latacz-Lohmann, U. (2015). Farmers' valuation of incentives to produce genetically modified organism-free milk: Insights from a discrete choice experiment in Germany. *Journal of Dairy Science*, *98*(11), 7498–7509. https://doi.org/10.3168/jds.2015-9515

Sedik, D., & Lerman, Z. (2015). Agricultural cooperative development in Kazakhstan and Ukraine. *Transition to Agricultural Market Economies: The Future of Kazakhstan, Russia and Ukraine, June*, 81–91. https://doi.org/10.1079/9781780645353.0081

Sharaunga, S., & Mudhara, M. (2018). Determinants of farmers' participation in collective maintenance of irrigation infrastructure in KwaZulu-Natal. *Physics and Chemistry of the Earth, February 2017*, 0–1. https://doi.org/10.1016/j.pce.2018.02.014

Sheikin, D., & Kulbayeva, A. (2015). *Food Industry of the Republic of Kazakhstan*. www.rfcaratings.kz

Shen, J. (2012). Understanding the Determinants of Consumers' Willingness to Pay for Eco-Labeled Products: An Empirical Analysis of the China Environmental Label. *Journal of Service Science and Management*, *05*(01), 87–94. https://doi.org/10.4236/jssm.2012.51011

Sheppard, B. H., Hartwick, J., Warshaw, P. R., Sheppard, B. H., & Warshaw, P. R. (1988). The Theory of Reasoned Action : A Meta-Analysis of Past Research with Recommendations for Modifications and Future Research. *Journal of Consumer Research*, *15*(3), 325–343.

Sobolev, A., Kurakin, A., Pakhomov, V., & Trotsuk, I. (2018). Cooperation in rural Russia: Past, present and future. *Mir Rossii*, *27*(1), 65–89. https://doi.org/10.17323/1811-038X-2018-27-1-65-89

Stampa, E., Schipmann-Schwarze, C., & Hamm, U. (2020). Consumer perceptions, preferences, and behavior regarding pasture-raised livestock products: A review. *Food Quality and Preference*, *82*(September 2019), 103872. https://doi.org/10.1016/j.foodqual.2020.103872

STAT. (2018). *The National Statistics Committee of the Ministry of Economy of the Republic of Kazakhstan*. www.stat.gov.kz

STAT. (2019a). *Agriculture, forestry and fisheries in the Republic of Kazakhstan 2014-2018*. http://stat.gov.kz

STAT. (2019b). *The National Statistics Committee of the Ministry of Economy of the Republic of Kazakhstan*. Official Statistical Information (by Sectors). www.stat.gov.kz

Stock, P. V., & Forney, J. (2014). Farmer autonomy and the farming self. *Journal of Rural Studies*, *36*, 160–171. https://doi.org/10.1016/j.jrurstud.2014.07.004

Sultana, M., Ahmed, J. U., & Shiratake, Y. (2020). Sustainable conditions of agriculture

cooperative with a case study of dairy cooperative of Sirajgonj District in Bangladesh. *Journal of Co-Operative Organization and Management*, *8*(1), 100105. https://doi.org/10.1016/j.jcom.2019.100105

Swinnen, J. F. M., & Gow, H. R. (1999). Agricultural credit problems and policies during the transition to a market economy in central and Eastern Europe. *Food Policy*, *24*(1), 21–47. https://doi.org/10.1016/S0306-9192(98)00067-0

Swinnen, J., Herck, K. Van, & Vranken, L. (2015). TWENTY-FIVE YEARS OF TRANSITION AND EUROPEAN INTEGRATION: SOME OBSERVATIONS ON THE GOVERNANCE OF LAND MARKETS IN AN INTEGRATED EUROPE. In *Agricultural Transition in Post-Soviet Europe and Central Asia after 25 Years* (p. 10). https://www.iamo.de/fileadmin/documents/sr_vol79.pdf

Tazhibaev, S., Musabekov, K., Yesbolova, A., Ibraimova, S., Mergenbayeva, A., Sabdenova, Z., & Seidahmetov, M. (2014). Issues in the Development of the Livestock Sector in Kazakhstan. *Procedia - Social and Behavioral Sciences*, *143*, 610–614. https://doi.org/10.1016/j.sbspro.2014.07.446

Tienhaara, A., Ahtiainen, H., & Pouta, E. (2015). Consumer and citizen roles and motives in the valuation of agricultural genetic resources in Finland. In *Ecological Economics* (Vol. 114, pp. 1–10). Elsevier B.V. https://doi.org/10.1016/j.ecolecon.2015.03.005

Toleubayev, K., Jansen, K., & van Huis, A. (2010). Knowledge and agrarian de-collectivisation in Kazakhstan. *The Journal of Peasant Studies*, *37*(2), 353–377. https://doi.org/10.1080/03066151003595069

Triandis, H. C. (1980). Values, attitudes, and interpersonal behavior. *Nebraska Symposium on Motivation. Nebraska Symposium on Motivation*, *27*, 195–259.

Triandis, H. C., Brislin, R., & Hui, C. H. (1988). Cross-cultural training across the individualism-collectivism divide. *International Journal of Intercultural Relations*, *12*(3), 269–289. https://doi.org/10.1016/0147-1767(88)90019-3

Tuan, T. H., & Navrud, S. (2007). Valuing cultural heritage in developing countries: Comparing and pooling contingent valuation and choice modelling estimates. *Environmental and Resource Economics*, *38*(1), 51–69. https://doi.org/10.1007/s10640-006-9056-5

Tulus, R. (2020). Asian cooperatives and public policy. In *Waking the Asian Pacific Co-Operative Potential*. INC. https://doi.org/10.1016/b978-0-12-816666-6.00005-7

Valiyev, A., Babayev, A., Huseynova, H., & Jafarova, K. (2017). Do citizens of the former Soviet Union trust state institutions and why: The case of Azerbaijan. *Communist and Post-Communist Studies*, *50*(3), 221–231. https://doi.org/10.1016/j.postcomstud.2017.08.002

Venkatachalam, L. (2004). The contingent valuation method: A review. *Environmental Impact Assessment Review*, *24*(1), 89–124. https://doi.org/10.1016/S0195-9255(03)00138-0

Warsame, M. H., & Ireri, E. M. (2016). Does the theory of planned behaviour (TPB) matter in Sukuk investment decisions? *Journal of Behavioral and Experimental Finance*, *12*, 93–100. https://doi.org/10.1016/j.jbef.2016.10.002

Whynes, D. K., Frew, E. J., & Wolstenholme, J. L. (2005). *Willingness-to-Pay and Demand Curves: A Comparison of Results Obtained Using Different Elicitation Formats*. *5*(4), 369–386.

Wooldridge M. Jeffrey. (2010). *Econometric analysis of cross section and panel data*. The MIT Press.

Wossen, T., Abdoulaye, T., Alene, A., Haile, M. G., Feleke, S., Olanrewaju, A., & Manyong, V. (2017). Impacts of extension access and cooperative membership on technology adoption and household welfare. *Journal of Rural Studies*, *54*, 223–233. https://doi.org/10.1016/j.jrurstud.2017.06.022

Xia, D., Li, Y., He, Y., Zhang, T., Wang, Y., & Gu, J. (2019). Exploring the role of cultural individualism and collectivism on public acceptance of nuclear energy. *Energy Policy*, *132*(October 2018), 208–215. https://doi.org/10.1016/j.enpol.2019.05.014

Xiang, L. Y., & Sumelius, J. (2010). Analysis of the factors of farmers' participation in the management of cooperatives in Finland. *Journal of Rural Cooperation*, *38*(2), 134–155.

Yesevi, Ç. G. (2014). New Regionalism in Post-Soviet Territory: Evolution from Eurasian Economic Community to Eurasian Economic Union. *Mediterranean Journal of Social*

Sciences, *5*(23), 75–76. https://doi.org/10.5901/mjss.2014.v5n23p1986

Yu, H., Neal, J. A., & Sirsat, S. A. (2018). Consumers' food safety risk perceptions and willingness to pay for fresh-cut produce with lower risk of foodborne illness. *Food Control*, *86*, 83–89. https://doi.org/10.1016/j.foodcont.2017.11.014

Zhang, B., Fu, Z., Huang, J., Wang, J., Xu, S., & Zhang, L. (2018). Consumers' perceptions, purchase intention, and willingness to pay a premium price for safe vegetables: A case study of Beijing, China. *Journal of Cleaner Production*, *197*, 1498–1507. https://doi.org/10.1016/j.jclepro.2018.06.273

Zhang, M., Li, L., & Bai, J. (2020). Consumer acceptance of cultured meat in urban areas of three cities in China. *Food Control*, *118*(May), 107390. https://doi.org/10.1016/j.foodcont.2020.107390

Zhang, Y., Ju, G., & Zhan, J. (2019). Farmers using insurance and cooperatives to manage agricultural risks: A case study of the swine industry in China. *Journal of Integrative Agriculture*, *18*(12), 2910–2918. https://doi.org/10.1016/S2095-3119(19)62823-6

Zhao, L., & Yuan, P. (2014). Rural Cooperative in China: Diversity and Dynamics. *Chinese Economy*, *47*(4), 32–62. https://doi.org/10.2753/CES1097-1475470402

Zhong, Z., Zhang, C., Jia, F., & Bijman, J. (2018). Vertical coordination and cooperative member benefits: Case studies of four dairy farmers' cooperatives in China. *Journal of Cleaner Production*, *172*, 2266–2277. https://doi.org/10.1016/j.jclepro.2017.11.184

Zotic, V., Alexandru, D., & Scridon, I. (2014). Insights into the Romanian Agricultural Post-Socialist Transition to Sustainability on the European Open Market. *Journal of Settlements and Spatial Planning*, *5*(2), 139–163.

Appendix A

Questionnaire title: Improving the production capacity and management efficiency of household dairy farms in Kazakhstan (pilot)

I. Demographic

1. Which of the following categories includes your age?
   - 18 – 30
   - 31 – 49
   - 50 – 69
   - 70 years or older

2. How many members are in your family?

_____

3. How many workers (labour) do you have in your business?
   - None
   - Please fill the table below

Family members	Not family members

4. Where is your business located?

_____

II. Production

5. What type of farm do you work on/own?
   - household farm
   - family farm
   - peasant farm
   - small/medium farm
   - other _____

6. For how many years have you been keeping dairy cows?

- ☐ several generations
- ☐ since independence
- ☐ since 2000
- ☐ recent years only _____
- ☐ other _____

7. How many cows did you have when you started the business?

_____

8. How many cows do you have at the moment?

_____

9. What is the average cost in KZT for maintaining a cow per year on the following input categories?

	KZT
Grazing services	
Fuel	
Buildings, buildings maintenance	
Feeding	
Veterinary services and treatment costs	
Labour other than grazing services	
Rent of land for grazing	
Other	

10. Please answer to the question that you feel more confident in providing the most accurate answer

10 a. What is the average milk production per cow per day?

_____

10 b. What was the total milk production per cow last year?

_____

10 b.1. What was the number of cows last year?

_____

10 c. What is the average total milk production per year?

_____

10 c.1. What is the average number of cows per year?

_____

11. Do you have a calving pattern?

- Yes
- No

12. How long is grazing period length? (please circle)

January	February	March	April	May	June	July	August	September	October	November	December

13. Do you supply extra feed to the cows during grazing period?

- Yes, _____ *(please specify the type of forage)*
- No

14. What is the percentage and type of feed supplied to your cow during the winter period?

In percentage	Name/ type of feed
1.	E.g., concentrate
2.	
3.	

III. Income

15. Have you received a loan, including loans from informal sources, such as family and friends to cover the costs of maintaining the cow? Please tick all that apply

- Yes, from bank
- Yes, from family
- Yes, from friends
- Yes, from non-governmental organisations
- No
- Other _____

16. What percentage of your family income comes from the sale of milk and dairy products?

- 0%
- 1 - 25%
- 26 – 50%
- 51 – 75%
- 76 – 100%

17. How much money do you receive for 1 litre of milk?

_____

18. How do you evaluate your profit from dairy business?
    - The profit is over the cost
    - Profits and costs are equal
    - The profit does not cover cost

19. If you had more milk, would you sell it?
    - Yes
    - No (why?) _____

20. If the price of milk increases by 10%, how much of the extra income generated from the sale of milk and dairy products would you spend on this business development?
    - 1 % - 25 %
    - 26 % - 50 %
    - 51 % - 75 %
    - 76 % - 100 %
    - 0 %

20 a. If the price of milk increases by 30%, how much of the extra income generated from the sale of milk and dairy products would you spend on this business development?
    - 1 % - 25 %
    - 26 % - 50 %
    - 51 % - 75 %
    - 76 % - 100 %
    - 0 %

IV. Chain

21. How much milk are you producing for each of the following parts in the food chain?

Who?	How much? (in percentage)
Own consumption	
Merchants	
Consumers	
Dairy factory	
Other	

If you only produce for own consumption, please go to section V

22. How does the process of transferring milk happen?

- I use my own equipment and transfer to company in my own vehicle
- Merchants collect it and transfer to company in their own vehicle
- Dairy company provides appropriate equipment and transfer to company in special vehicle of company
- Other _____

23. Do you control the temperature over time (from period of milking to transferring to factor/merchants/consumers)?

- Yes, I control the temperature over time by using special equipment (refrigerator, vehicle with temperature control)
- No, I do not have special equipment, so I milk early and try to sell it as soon as possible
- I am not aware about temperature controlling, if I receive some guidance about it, I will definitely control
- Other _____

24. What exactly do producers/retailers check? (you can tick more than one)

Fat	○ yes ○ no	Hygienic conditions	○ yes ○ no
Sanitary conditions	○ yes ○ no	Protein	○ yes ○ no

			○
Freshness	○ yes	Other	○ yes
		_____	
	○ no		○ no

V. Support

25. What do you think the most and least important factors are for improving the productivity of cows?

- I do not know
- Difficult to answer
- Other (Please, mark in the table below)

	Extremely important	Less important
Feeding		
Breeding		
Veterinary		
Building		
Technology		
Other		

26. What difficulties do you face with marketing the final product? *(you can tick more than one)*

- Lack of credit
- Undeveloped supply chains
- Lack of branding and labelling
- Difficult access to markets
- Lack of regulation
- Weak co-operation among farmers
- Expensive feed
- Other _____

27. What difficulties do other local farmers face with marketing the final product? *(you can tick more than one)*

- Lack of credit
- Undeveloped supply chains

- ☐ Lack of branding and labelling
- ☐ Difficult access to markets
- ☐ Lack of regulation
- ☐ Weak co-operation among farmers
- ☐ Expensive feed
- ☐ Other _____

28. Do you receive any support from government?

- ☐ Yes, *please choose*:
  - Subsidy
  - Loan
  - Advisory services
  - Other _____
- ☐ No

28 a. Do you receive any support from companies?

- ☐ Yes, *please choose*:
  - Subsidy
  - Loan
  - Advisory services
  - Other _____
- ☐ No

29. Do you have any advisory services in the village?

- ☐ Yes, *please specify* _____
- ☐ No

30. What type of advisory services you ever received and when?

Type		When?
Animal ration		
Animal welfare		
Other _____		

31. Would you like to receive any advisory services about animal ration and welfare?

- ☐ Yes

 No

VI. Rural cooperation

Currently, government attempts to reduce number of rural households and to expand production in enterprises. One example of this would be a rural co-operative production, which was mentioned in the plan of the Nation "100 steps". The 60th step of this plan ‘Attracting strategic investors for the development of milk and dairy products’ says that “the main goal is to provide up to half of the export to the market of the post-soviet countries within three years, according to the models of the New Zealand Fonterra and the Danish Arla on the development of rural co-operative production” (Grigoruk, Klimov, & Mumindzhanova, 2016). The government is planning to turn over 500 thousand rural households into co-operatives during the following 5 years.

32. Have you heard about a current policy named ‘Rural cooperation’?

 Yes

 No

33. Will you agree to become a part of these co-operatives?

 Yes (please provide the reasons) _____

 No (please provide the reasons) _____

 Difficult to answer (please provide the reasons) _____

 Other _____

VII. Farmers needs

34. How much money do you think it will be require making these changes in a typical farm?

Possible improvements	Cost, KZT
Increasing the percentage of concentrates in feed ration (cost per cow per year)	
Buying temperature and quality control equipment (cost per cow per year)	
Schedule calving pattern to keep constant production across the year (cost per cow per year)	
Replace 70% of the cows in the herd with high yielding breeds	

Treating cows to reduce the risk of mastitis within the herd	
Creating (organising) advisory services for farmers	

35. Have you made any of these changes?

Possible improvements	Yes / No
Increasing the percentage of concentrates in feed ration	
Buying temperature and quality control equipment	
Schedule calving pattern to keep constant production across the year (cost per cow per year)	
Replace 70% of the cows in the herd with high yielding breeds	
Treating cows to reduce the risk of mastitis within the herd	
Creating (organising) advisory services for farmers	

36. Will you be willing to make any of these changes?

Possible improvements	Yes / No
Increasing the percentage of concentrates in feed ration	
Buying temperature and quality control equipment	
Schedule calving pattern to keep constant production across the year (cost per cow per year)	
Replace 70% of the cows in the herd with high yielding breeds	
Treating cows to reduce the risk of mastitis within the herd	
Creating (organising) advisory services for farmers	

VIII. Environment and animal welfare

37. What do you do with the manure and slurry?

	%
Nothing	
Heating fuel	
Dispose it directly (not stored previously) to a field	
Stored for a period of time in a slurry tank before disposing it in a field	

Stored for a period of time in a slurry tank before selling it	
Sell it to other farmers directly (not stored previously)	
Give it to other farmers directly (no money exchanged)	
Other	

38. Does the herd have unrestricted access to riverbanks, lakes and ponds?

- Yes
- No

39. Do you maintain any form of woodland in your farm?

- Yes
- No

40. Are all animals sheltered in the same building as cows?

- Yes
- No

41. How do you manage a diseased animal?

- Cull
- Separate from the herd and treat
- Leave it with a herd and treat
- Other (please specify) _____

Appendix B

Focus groups meeting in summer 2018

1. Have you heard about the Program?
2. What do you think about this program?
3. Which is the best: working together or individual? why?
4. What are the advantages of co-operative?
5. What are the disadvantages of co-operative?
6. What is your association with the word co-operative?
7. Have you ever been in co-operatives? If yes, what kind of?
8. Are you currently members of co-operative? If yes, what kind of?
9. Have your parents ever been in co-operatives? If yes, what kind of?
10. What difficulties might farmers face up in process of joining a co-operative?
11. How easy or difficult to be members of a co-operative?
12. What makes it easy? What makes it difficult?
13. Will you be a member of co-operative? Which?
14. Does it affect your decision to join / not join co-operatives the fact that the country used to have co-operatives?
15. What will change after being in the co-operative? (expectations)
16. Where do you usually buy dairy products?
17. If there is a choice between domestic and imported milk, what you choose?
18. If there is a choice between co-operative and non-co-operative milk, what you choose?

Appendix C

Questionnaire title: Consumers' support of domestic dairy production (pilot)

1. Which of the following categories includes your age?
   - □ 18 – 30
   - □ 31 – 49
   - □ 50 – 69
   - □ 70 years or older

2. What is your gender?
   - □ Male
   - □ Female

3. How much is your average income per month in KZT?

_____

4. Do you consume dairy products?
   - □ No
   - □ Yes (please, fill the table below)

	Everyday	Once a week	Twice a week	Every 2 weeks	Once a month	Once in 3 months	Once in 6 months	Once a year
Tvorog								
Sour cream								
Qurt								
Butter								
Kefir								
Yogurt								
Milk								
Cheese								
Your answer								

5. Where do you buy it from?

	Bazaars	Supermarket	Local shop	From households	*Your answer*	*Your answer*
Tvorog						
Sour cream						
Qurt						
Butter						
Kefir						
Yogurt						
Milk						
Cheese						

6. By what criteria do you choose dairy products? (please rank in the table below, where 1 is the most important, 12 is the least)

Freshness	
Shelf life (ex. tetra pack)	
Local / domestic	
Package	
Quality (fat, protein)	
Organic (ex. whole milk)	
Brand, label of product	
Certification (ISO standard)	
Sanitary condition (in market, bazaar etc.)	
Price	
Animal welfare status	
Animal health status	

7. What kind of product do you prefer?

	Manufactured	Homemade
Tvorog		
Sour cream		
Qurt		
Butter		
Kefir		

8. Would you support a government policy aiming at improving environmental and animal welfare aspects associated with dairy production by domestic producers?

   Yes

   No

9. How much do you pay for a litre of milk?

_____

10. How many litres of milk do you by in a week?

_____

11. How much extra money would you be willing to pay for a litre of milk in order to support our producers?

   No

   Yes (please state how much for a litre of milk) _____

Appendix D

Table D 1. All other questions included in the survey

Questionnaire statements	Likert scale from 1 = strongly disagree to 5 = strongly agree
Production and support	
How many cows do you currently have in total?	stated numbers
How many cows are milked?	stated numbers
What is the average total dairy production of these cows?	stated numbers
Have you ever received any types of support from (non)governmental organisations?	yes/no
Is production of milk and/or dairy products your main occupation?	yes/no
What percentage of your family income comes from the sale of milk and/or dairy products?	0; 1-25%; 26-50%; 51-75%; 76-100%
What percentage of milk do you leave for own consumption?	stated numbers (percentage)
How do you evaluate your profit from dairy business?	profit>expenses profit=expenses profit<expenses
Information/awareness	
Did you know about the current policy encouraging rural co-operative production?	yes/no
I have received enough information about co-operatives from responsible bodies	Strongly disagree – strongly agree
I understand the principles of co-operatives	Strongly disagree – strongly agree
I agree with the principles of co-operatives	Strongly disagree – strongly agree
I know people who are members of co-operatives	Strongly disagree – strongly agree
Cultural features	
I like to control my business by myself only	Strongly disagree – strongly agree
I like being my own boss	Strongly disagree – strongly agree
I like being free to make my own decisions	Strongly disagree – strongly agree
Working with others makes work more enjoyable	Strongly disagree – strongly agree
More people - more ideas for development	Strongly disagree – strongly agree
I trust my neighbours	Strongly disagree – strongly agree
I trust my relatives	Strongly disagree – strongly agree
I trust dairy companies	Strongly disagree – strongly agree
I trust merchants	Strongly disagree – strongly agree
I trust people in general	Strongly disagree – strongly agree

During the Soviet Union keeping a cow was easier than now	Strongly disagree – strongly agree
During the Soviet Union keeping a cow was more profitable than now	Strongly disagree – strongly agree
During the Soviet Union people had more healthy food	Strongly disagree – strongly agree
The life is better now than in the Soviet Union	Strongly disagree – strongly agree
Risk attitude	
I like trying new things, because I am adventurous	Strongly disagree – strongly agree
I don't like changes in my life	Strongly disagree – strongly agree
I think that every risk is new opportunity to develop my business	Strongly disagree – strongly agree
Please circle your willingness to take a risk in general	from 1 to 5
Please circle your willingness to take a risk in case of investing and borrowing money	from 1 to 5
Socio-demographic	
Age	18-30; 31-49; 50 and older
Education	= 1 if University = 0 otherwise
Gender	= 1 if Male = 0 if otherwise
Nationality	= 1 if Kazakh = 0 otherwise

Appendix E

Table E 1. The results of the Bivariate Probit Model using RAA variables only

	Would join		Would create	
	Coeff.	z-statistics	Coeff.	z-statistics
Attitude (A)	0.060***	5.54	0.041***	4.29
Social norms (SN)	0.024**	2.18	0.024**	2.27
Perceived behavioural control (PBC)	-0.005	-0.33	0.000	-0.01
_cons	-1.752	-6.82	-1.361	-6.03
rho (ρ)	0.599	5.70		
Number of observations	181			
Log-likelihood	-166.206			

Note: **, *** for 5 and 1% of significance level, respectively.

Table E 2. The results of the Bivariate Probit Model using components derived from the PCA

	Would join		Would create	
	Coeff.	z-statistics	Coeff.	z-statistics
Dairy as a source of income	-0.090	-1.10	-0.119	-1.38
Capacity to produce	0.098	1.14	0.071	0.87
Awareness and knowledge	0.135**	2.00	0.252***	3.58
Own boss	0.032	0.44	0.075	0.93
Benefits collaboration	0.150	1.57	0.096	1.00
Trust business	-0.164*	-1.78	-0.109	-1.17
Trust close ones	0.239**	2.43	-0.027	-0.29
SU nostalgic	-0.094	-1.13	-0.021	-0.25
Risk	0.375***	4.65	0.395***	4.84
_cons	-0.581	-5.12	-0.595	-5.22
rho (ρ)	0.673	7.19		
Number of observations	181			
Log-likelihood	-164.612			

Note: *, **, *** for 10, 5 and 1% of significance level, respectively

Table E 3. The Bivariate Probit Model with only significant covariates

	Coeff.	z-statistics
Would join		
Attitude (A)	0.062***	0.01
Social norms (SN)	0.009	0.01
Dairy as a source of income	-0.156*	0.09
Capacity to produce	0.114	0.08
risk	0.247***	0.09
Gender (1. Male)	0.601***	0.22
_cons	-2.176	0.32
Would create		
Attitude (A)	0.039***	0.01
Dairy as a source of income	-0.123*	0.07
Awareness and knowledge	0.248***	0.07
Risk	0.263***	0.09
Nationality (1. Kazakh)	0.655***	0.24
Education (1. University)	-0.422*	0.25
_cons	-1.636	0.31
rho (ρ)	0.626	5.40
Number of observations	181	
Log-likelihood	-147.226	

Note: *, **, *** for 10, 5 and 1% of significance level, respectively

Table E 4. Comparison of the results from different models

	Likelihood-ratio test		Prob > chi2
Model 1 vs model 2	LR chi2(32) =	59.10	0.0025
Model 1 vs model3	LR chi2(20) =	55.91	0.0000
Model 1 vs model 4	LR chi2(26) =	21.14	0.7348

Model 1 – The full model using all variables (i.e. RAA, PCA, socio-demographic and location)

Model 2 – Model using only RAA variables (i.e. A, SN, PBC)

Model 3 – Model using only components derived from PCA (i.e. PC1 - PC9)

Model 4 – Model using significant variables only

Table E 5. The results of the mixed-effect model

Would join	Coef.	Std.err.	z	P>|z|	[95% Conf. Interval]	
A	0.059	0.011	5.44	0.000	0.037	0.080
SN	0.026	0.011	2.27	0.023	0.004	0.048
PBC	-0.002	0.014	-0.13	0.895	-0.030	0.026
_cons	-1.728	0.256	-6.74	0.000	-2.231	-1.226
Cluster						
var (A)	2.02e-37	3.28e-21			.	.
var (SN)	3.06e-39	5.09e-22			.	.
var (PBC)	2.75e-43	5.64e-24			.	.
var (_cons)	0.001	0.041			2.09e-26	1.11e+20
Number of observations	181					
N of groups	5					
Log - likelihood	-83.773					

LR test vs. probit model: chibar2(01) = 1.5e-03 Prob > = chibar2 = 0.4848

Note: A cluster in the **table E 5** refers to all background factors that were grouped into 2 clusters then multiplied by the location of the respondents.