



Effect of Dairy Cooperatives on Small Scale Farmers' Economy in Afghanistan

**- A Case Study of Kabul Dairy Union (KDU) –
(アフガニスタンにおける酪農協同組合の小農
経済に対する効果－カブール酪農組合を事例と
して－)**

By

HABIBULLAH HIMAT

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Department of Sustainable Economics Science

Graduate School of Bioresources, Mie University

Tsu, Japan

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DEDICATION

Dedicated to my parents who sacrificed much of their life to bring me up to this level. I wish Almighty ALLAH I could serve them in whole my life.

BIOGRAPHICAL SKETCH

The author was born in Kabul city third district Afghanistan in 5 January 1982. He attended his primary and secondary school at Deh-i-Now School known as Professor Rsuol Amin and Qala-e-Wahed which are found in third and fifth districts of Kabul city. He completed his High school education in Naderya High School in September 2001. Later he joined Kabul University mid-2004 and graduate from Department of Agriculture Economics and Extension Faculty of Agriculture. On September 2009 he completed his Bachelor of Science Degree studies From Kabul University. Also from 2001 to 2014 he was as employee of government in deferent organizations such with ministry of agriculture irrigation and livestock. Following that, author applied for master degree in competition among MAIL staffs in 2015. In 2018 September he graduates from Department of Sustainable Economic Science, Mie University, Japan.

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ABBREVAITIONS

CSO	Central Statistic Organization
FAO	Food and Agriculture Organization Department of the United Nations
IDS	Integrated Dairy Scheme
MAIL	Ministry of Agriculture Irrigation and Livestock
MCC	Milk Collection Center
KDU	Kabul Dairy Union
GDP	Gross Domestic Production
NGO	Non-governmental Organization
ICA	International Cooperative Alliance
AI	Artificial Insemination
DACD	Directorate of Agriculture Cooperative Development
SPSS	Statistical Package for Social Science
AFG	Afghanistan Currency
TTG	Temporary Transitional Government
ITGA	Islamic Transitional Government of Afghanistan
WB	World Bank
ILO	International Labor Office
PACCA	Programme on Agricultural Credit and Cooperatives in Afghanistan
SIDA	Swedish International Development Assistance

STATEMENT OF AUTHOR

I declare that this thesis is the result of my own research and all data and materials used for this thesis have been duly acknowledged. This thesis is submitted in partial

fulfillment of the requirements for an advanced degree of Master of Science in Department of Sustainable Economics Science Mie University, JAPAN and to be made available at the university library under the rules of the library. I HABIBULLAH HIMAT, confidently declare that this thesis has not been submitted to anywhere for the award of any academic degree, diploma of certificate.

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Name: Habibullah Himat

Place: Mie University

Date of submission: September 10, 2018

Signature:

E-mail: habib.himat@yahoo.com

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Abstract

The research was done to show the effect of Kabul Dairy Union (KDU) in increasing milk production, marketing and as well as small farmers' income. In the survey 100 small farmers randomly was selected and interviewed through using questionnaire. Data on their milk production, marketing and income were collected and analyzed by Ms. Excel, SPSS and Prism Graphpad. Factors such age of the households was very important when it comes to decision making. As well as educated members in cooperative were the key for success and had the significant role in management of cooperative and are adoptable in accepting of new technologies. Using family members as a source of labor prevents hired labor that avoids cost addition. Land was the most important asset for both groups and have important role in providing green hay for the animals. Livestock was the main occupation of cooperative members and non-members, which stood as the main source of income. Before the establishment of KDU, farmers were faced with difficulties in milk marketing, establishment of a stable market for milk selling through KDU was very significant. Provision of services in different fields for cooperative can be one of the strong points in case of improving their economic condition. Furthermore, KDU could lead to introduce a complete value chain which covering the production, collection, processing, marketing of milk and dairy products. Cooperative members had bigger herd size which can be attributed to an improvement in access to improved breeds and other veterinary services through KDU. For this reason cooperative members had better economic situation compared to non-members. Cooperative doesn't only create economic benefits for members but also as social group which improves social networks among rural farmers. Training programs related to animal husbandry for cooperative members caused to fed better the animals. This could be one of the reasons for more milk production by the cooperative members. In addition, lack of access to enough water was the other problem for farmers which might partly explain the poor performance of dairy cows. Cooperative had made an improvement to water availability and quality by ensuring that farmers had access to piped water from the well. Further, record keeping for cooperative members was important to make sound decisions, control production and reproductive performance of dairy cattle as well as help to determine profit made

that KDU has provided Record Keeping Book. While non-members didn't keep records, it was difficult for them to control their activities. Cooperative members produced higher milk compared to non-members and obtained higher income daily. This is an indication that cooperatives have played a positive role in increase of milk marketed by cooperative members. Meanwhile, cooperative members consume more milk compared to non-members. Transportation was one of the main problems for cooperative members in the past, whereas non-members still face problem-related to milk transportation. Therefore, KDU has created MCC in the villages for cooperative members. Regardless of the high demand for milk in the country for local dairy products, farmers are unable to get profitable prices. Because the government does not intervene in price setting in the dairy industry as well as doesn't even control dairy imports to protect local dairy products and support rural productions. For making clear the effect of KDU, the comparative analysis between the members and non-members were conducted by the farmers' survey data. The members' dairy income per day was 476 Afg (6.8 US\$) on average, while the non-members' income was 262 Afg (3.7 US\$) on average in 2018. The members earned near twice larger than non-members. Such a difference was mainly caused by the larger number of keeping cows, higher proportion of improved bred cows in total keeping cow, and larger amount of produced milk per cow. There were no significant differences in these factors before KDU had established. KDU seemed to contribute to an improvement of the members' animal husbandry practice. The provision of services, concentrated fodder and technical training is thought to be important factors for the improvement of KDU which is the most successful agriculture cooperatives in Afghanistan seems to play the important role for improvement of farmers' economy by joint marketing and technical support. Development of agricultural cooperatives can be thought the effective policy for improvement of farmers' economy in Afghanistan. But most of the cooperatives haven't gone well, though a large number of cooperatives had established since 2003. The important issue for development in agricultural cooperatives is to spread the effective systems and management of cooperatives which contribute to improvement in farmers' economy.

Chapter 1

Background and Subject

Afghanistan is located in the Central Asia and have border with the following countries. From the north and west 2,430 kilometers border with Pakistan, east 936 kilometers with Iran, from the south 744 kilometers with Turkmenistan and 1,206 kilometers, 137 kilometers with Uzbekistan and Tajikistan. 76 kilometers the narrow WA-khan Corridor extends from northeastern most Afghanistan to meet China. Afghanistan occupies approximately 652,860 square kilometer¹.

Figure 1-1 Afghanistan map



According to the estimation of Afghanistan Central Statistic Organization (CSO) in 2017, the population was estimated around 29.7 million². Majority of the people live in rural areas. Boros and McLeod stated: close to 77% of the Afghanistan population was engaged in agriculture-related activities³. Due to existence decades of civil war and

¹ Library of Congress – Federal Research Division (2008), p.4.

² Afghanistan Statistical Yearbook 2015-2016, <http://cso.gov.af/en>, accessed December 26- 2017.

³ Boros and McLeod (2014), empowering women in Afghanistan: reducing gender gaps through integrated dairy scheme, p. 15.

conflict in the country, it has been not possible to conduct the second survey and the existed census is estimated from the previous census.

From the total area 46% is permanent pasture, 39% is mountainous which is not usable for agriculture, 3% is covered by forests and just 12% is arable land. Agriculture is the backbone for Afghanistan economy. Majority of farmers in Afghanistan are small farmers who have less than one hectare land and many dilemmas prevent them to produce standard products. Besides farming the farmers at least have 1 or 2 milking cows and busy in animal husbandry. Animal husbandry is the inseparable part of agriculture in Afghanistan and has the deep correlation. Farmers produce milk in rural area for the family consumption and as well as selling to the market. Therefore, animal husbandry plays important role in Afghanistan economy.

Agriculture in Afghanistan

Agriculture is the main source of employment in rural areas more than 2/3 of the populations are engaged in agriculture practices. Although most farmers are busy in agriculture activities, but are unable to provide their own food. Agricultural practices are mostly done in extremely traditional manners. Poor economic conditions of farmers and inadequate infrastructures have caused agriculture practices remain in weak condition. World Bank (WB) list of economies (June 2017) reported that Afghanistan was one of the lowest income country in the world⁴.

Afghanistan is land lock country with economy which heavily depends on agriculture. Livestock is extremely important sub-sector of agriculture which can provide multifunction for rural farmers; for instance provision of foods, income, saving, manure and transport. Bonnier stated: in 1970s the country was self-sufficient in meat and milk and enjoyed significant exports of animal fiber and high-value processed products such as carpets and skins garments⁵. The evidence is indicating that Afghanistan was self-sufficient in livestock products in the past and animal husbandry was playing essential role in economic development.

⁴ World Bank list of economies (June 2017), accessed September 30/2017 <https://data.worldbank.org/country/afghanistan>.

⁵ Bonnier (2007), Dairy Production and Processing in Afghanistan, MAIL, HLP, appendix 4, p.2.

Decades of civil war damaged all infrastructures and industries that much of which depended on animal husbandry output. In 2001 Afghanistan became little quiet and out of war. From 22 December 2001 Afghanistan governed by Temporary Transitional Government (TTG) and Islamic Transitional Government of Afghanistan (ITGA) till 2004. In October 9/2004 election, Karzai was elected as Afghanistan's president and the parliament was inaugurated on December 19/2005. The President presented his cabinet for vote of confidence to Wolesi Jirga (Lower House of Parliament) in 2006⁶. Since establishing of the new government small-scale trade in urban centers and agriculture in rural regions revived quickly.

Despite several years of efforts on improving agriculture outputs, agriculture system didn't improved very well. Even now civil war is going on in some rural areas. This caused insecure villages' that created many obstacles for agricultural development and agriculture practices have remained predominantly traditional. Based on the observation of milk producers in the surveyed area low quality of agricultural inputs that imported illegally from neighbor countries mostly Iran and Pakistan have harmed farming practices and have caused the low production quality. Inadequate agriculture inputs such as seed, fertilizer, pesticides and new technology also unstandardized agriculture products imports are the main problem for Afghanistan agriculture. Poverty is the other problem as CSO reported: country's poverty level has continuing to remain high, with 42% of the population living below the poverty line and the overall unemployment rate estimated at 46%⁷. The poverty level has increased to 54% in 2018⁸.

Marketing of agriculture products is a serious problem for small scale farmers and in rural area they don't have access for market. In rural area those who have much money have the most influence in rural market. Agricultural products are mostly perishable items including milk. Farmers are in weak economic condition, as in harvest time of crops and mostly daily milk production they urgently need cash for providing input materials and family daily livelihood expenses. As a matter of fact they have to sell the milk or other agriculture products in lower price compare to market to local retailers and middlemen

⁶ Kenneth (2015), Afghanistan: Politics, Elections, and Government Performance, p. 5.

⁷ Boros and McLeod (2014), empowering women in Afghanistan: reducing gender gaps through integrated dairy scheme, p. 14.

⁸ Afghanistan, CSO (2016-17) living condition survey, Analysis report, p,105. accessed July 07- 2018.

than any formal organization such as cooperative. Hence in this situation cooperative can play connector role to join cooperative members to market.

Livestock in Afghanistan

Animal husbandry through dairy cooperatives in developing countries play significant role in contributing to rural livelihood especially for small-scale farmers. Kaur stated: Dairy cooperative is one of the best examples of co-operative achievement in the developing economy⁹. WB reported: that in 2009 the sector was estimated to constitute approximately a third of agricultural gross domestic products (GDP) in developing countries and this share was rising¹⁰. Fast increase in livestock production in developing countries is attributed to a rapid-growing demand for livestock products resulting from an urban population as well as rising consumer income. Dairy production forms part of the livestock sector and is regarded as an important activity for rural people in developing country that provide supplementary income, employment and nutrition to a number of people the situation is similar to Afghanistan. Dairy development is one of the priorities of Afghanistan government livestock program.

Agriculture constitutes 23% GDP in Afghanistan and animal husbandry accounts 3% of Afghanistan's GDP in 2016¹¹. Recent investigations by the FAO programme have shown that for 85% proportion of the rural population, cattle are the most important animal species that increased milk production for sale and home consumption are seen by many families as an important part of their food security and an income generation opportunity¹².

According to FAO reports large number of households in Afghanistan had 1 or 2 milking cows since at beginning of the IDS project. During last 15 years these numbers have increased. Average KDU members have 2 to 3 milking cows and are engage in livestock practices besides of farming. Thus animal husbandry can play significant role in improving of small scale farmers' economy in rural area. Kaur stated: that the Dairy

⁹ Kaur (2014), A Detailed Analysis of Anand Milk Union Limited (Amul) in India, Indian Journal, p.1.

¹⁰Smallholder dairy farming in Asia - CSIRO publishing .publish.csiro.au/ebook/chapter/9780643095168_CH3.

¹¹ Afghanistan Central Statistic Organization Statistical Yearbook 2015-2016, <http://cso.gov.af/en>, accessed January 07- 2018.

¹² FAO (2010), Integrated dairy schemes project, Kabul Afghanistan, P, 74.

Cooperatives have helped in ending the exploitation of farmers and demonstrated that when our rural producers benefit, the community and nation benefits as well¹³.

Large numbers of farmers producing milk in Afghanistan are small scale farmers. They traditionally process the milk into dairy products such as yoghurt, chees, Quroot (milk mix with flour, some salt and dry it). Farmers in the remote villages don't have access to local market or difficult to have access. Most of milk producers in rural areas are trying to improve the quantity of milk production. Majority of the small scale farmers keep few animals include (cows, goats, sheep, mules, horses and etc.). Milk is always not produced the same quantity, it has fluctuation and differs in the seasons. During autumn and winter there is limited availability of feed for dairy cows hence, the supply of milk from the major Milk Collection Center (MCC) declines. During spring and summer milk production quantity is larger than winter. Small-scale farmers produce milk near Kabul city and through Kabul Dairy Union (KDU) the milk process to pasteurized by-products then sent to the stores for marketing. Actually it provides regular income through dairy cooperative to small scale farmers and it can also improve farmer's power in the market.

The livestock sector in developing countries can play important role. The rapid increase in livestock production in the developing countries include Afghanistan is one of the sustainable project to make changes in small-scale farmers life in rural areas. Dairy production is an important activity in Afghanistan and it is a source of income and empowerment generation for small scale farmers. Over the last several years, Afghanistan dairy industry has been expanding to meet the increasing demand for milk and dairy products. Provincial agricultural departments of MAIL reported: that number of cattle's are 5.2 million, sheep 13.3 million, goats 7.4 million and chicken 11.9 million in Afghanistan¹⁴.

FAO reported in 2015 the number of cattle in the four provinces of the IDS focus project, in 2003 Herat had the largest cattle population with approximately 186,000, followed by Kunduz with 158,000, Balkh with 75,000 and Kabul with 58,000. The latter also consumes milk from producers in two nearby provinces: Logar and Wardak¹⁵.

¹³ Kaur (2014), A Detailed Analysis of Anand Milk Union Limited (Amul) in India, Indian Journal, p.1.

¹⁴ Afghanistan Statistical Yearbook 2015-2016, <http://cso.gov.af/en>, accessed January 07- 2018.

¹⁵ Boros and McLeod (2015), empowering women in Afghanistan, reducing gender gap through integrated dairy schemes, p.7.

Problem Statement

For supporting Ministry of Agriculture Irrigation and Livestock (MAIL) policy of agricultural cooperatives, FAO and German government had done the project in the selected villages to establish agricultural cooperatives and set development goal to promote milk production and marketing in order to meet or at least partially meet local demand for milk and dairy products. Dairy product supply can't meet continues increase in local demand. This situation is mainly attributed to low production resulting from a number of challenges faced by small scale farmers as well as the prevailing marketing system in the country. In addition, the increase in the cost of meat and poultry which milk competes with as a source of protein in recent years has increased the demand for milk tremendously. MAIL reported: approximately 37% of milk supply was produced in the country¹⁶.

Efforts have been made in various aspects to help and develop the local industry, especially to help small scale farmers to improve their production and marketing capabilities. Previous studies conducted by the Food and Agriculture Organization (FAO), MAIL in the country concluded that the small scale farmers had the greatest potential to increase national dairy production. Despite this and decade of development, small scale farmers still lack essential inputs, limited access to guaranteed markets and credit for their products have been faced with high transaction costs. Cooperatives have been expected to play a major role in improving productivity, minimizing transaction costs, and improving marketing capabilities of farmers. As a result, a number of cooperatives have been established under KDU in the dairy sector and formation of these organizations is being encouraged and supported by the FAO, MAIL and German government.

For farmers to improve their productivity and access markets, they need to overcome the constraints they are faced. Considering the fact that farmers' producing milk in cooperatives can benefit the smallholder sector, the focus of the study therefore is to generate information on whether cooperatives in the context of Afghanistan are able to promote small farmers dairy production and marketing by minimizing the numerous constraints and the high transaction costs that characterize this sector.

¹⁶ Ministry of agriculture irrigation and livestock, (2017).

Importance and Benefits of the Proposed Study

Dairy production is an important activity in Afghanistan. It provides income-generating opportunities for the rural as well as urban population and contributes to the nation's nutrition. The study will provide useful information whether cooperatives benefit small scale farmers in dealing with challenges they are faced. Assessing the role played by dairy cooperatives, especially for the smallholder sector is crucial for the improvement of milk production and marketing in the country. Accordingly, the study sheds light on whether dairy cooperative indeed contribute to small scale farmers in dairy development with respect to milk production and marketing.

Kaur stated: ever since the movement was launched fifty-five years ago, Gujarat's Dairy Cooperatives have brought about a significant social and economic change to our rural people, the Dairy Cooperatives have helped in ending the exploitation of farmers and demonstrated that when our rural producers benefit, the community and nation benefits as well¹⁷. This information is vital for policy makers to take appropriate action towards facilitating the establishment and development of dairy cooperatives. Addressing constraints in the smallholder sector will enable more participation of farmers in markets and thereby satisfy the high demand milk in the country.

Kaur stated: that dairy cooperatives have been able to create a market perception of honesty & transparency with their clean management¹⁸. However, small scale farmers are unable to fully exploit this profitability because of challenges they face in rural area. For them to realize the profitability of the dairy enterprise, they need considerable support from government, NGO's and other development organizations. International experience shows that constructive partnership between government and cooperatives is possible and can be established. Movsisyan stated: in the spheres where Government provides social support to vulnerable groups, cooperatives can play a significant role¹⁹.

Development and implementation of policies as well as programs in the dairy industry to support the establishment, development and sustainability of cooperatives is imperative. This will help in increasing income because of guaranteed market and access to adequate inputs. Therefore, minimization of constraints will help farmers to be more

¹⁷ Kaur (2014), A Detailed Analysis of Anand Milk Union Limited (Amul) in India, Indian Journal, p.1.

¹⁸ Kaur (2014), A Detailed Analysis of Anand Milk Union Limited (Amul) in India, Indian Journal, p.4.

¹⁹ Movsisyan (2013), The Role of Cooperatives in the development of Agriculture in Armenia, Asian Countries & EU (Worldwide case studies), ICD, p.10.

productive and will result in an increase in milk production which will in turn help to curb the severe milk shortage in the country.

Evidence from East Asia and Africa such as India, Bangladesh, Pakistan and Ethiopia suggests that cooperatives are available strategy in which challenges in small-scale farmers sector can be addressed. Cooperatives play a major role in improving productivity, minimizing transaction costs, and improving marketing capabilities of farmers.

Limitation of the Study

The study was constrained by finances and time. In fact the survey was self-funded. The survey was done with many obstacles and time limitation. In addition, some of the farmers in the area were not eager to give out information related to their production and marketing activities. Furthermore, the study found that the majority of cooperative members keep records, but non-members didn't keep. Hence, some of the collected information was based on recollection of recent events, such as procurement rates. The inputs provided by farmers therefore, could not be checked for authenticity. Although KDU one out of five dairy unions in Afghanistan was selected for this study, results cannot be generalized for the whole population of small scale farmers in Afghanistan because of differences among the regions.

Research Objectives

Goal: The main purpose of this study is to evaluate the effect of KDU, which is the most successful agricultural cooperatives in Afghanistan, on improving small scale farmers' economy. In this research focuses on:

- The object cooperative is dairy cooperative.
- The members and non-members live in same area.
- To compare the farmers economic situation before establishment of the cooperatives and after.
- Analyze the activities, which affected the farmers' economy.
- Analyze the cooperatives financial management.

The main objective of this research is to assess the current condition of KDU through dairy cooperatives. Investigate the livestock role in rural area development and

show the importance of dairy cooperatives in improving small farmers' economy, effectiveness of mobilizing small milk producers around cooperative and find sustainable market through dairy cooperatives. The finding of this research through desk study international journals, papers along with field visit and own observations from the KDU will support and strengthen the development of dairy cooperatives in Afghanistan.

This study is going to assess the role of KDU in encouraging innovation and market oriented to small scale farmers' income. The study is limited to KDU which is located in Kabul province. In this study the role of dairy cooperative in improving small farmers' economy through using veterinary services, providing standard fodder, milk collection, processing and marketing will evaluate and farmers to get dairy cooperative membership to use input and output supply and enable the bargaining power of farmers in the market.

Outline of the Study

The thesis is organized into seven chapters. The first chapter gives general information of related to agriculture in Afghanistan. The second chapter contains Methodology. The third chapter gives general information related to agriculture cooperatives in developing countries and Afghanistan. Chapter four provide information about cooperatives history in Afghanistan. Chapter five describes KDU functions and organization system. Results and discussions on household characteristics, milk production and marketing in Kabul city and gives a summary of the findings, descriptive, econometric results on the effect of cooperatives are presented in chapter six. Conclusions and recommendations aim at solving the current problems in the dairy industry in Kabul have presented in chapter seven.

Chapter 2

Methodology

In this chapter description of the study area, types and sources of data, methods of data collection, sampling method and sample size determination, methods of data analysis are presented.

Description of Research

To understand the importance, impacts and influences of dairy cooperatives as marketing instrument that connect farmers to market, a case study of KDU (Effect of Dairy Cooperatives on Improving Small Scale Farmers' Economy in Afghanistan) was carried out in Ibrahim Khel village Maidan Shar, Wardak province. The survey in research field was conducted with 100 milk producers in one village. The selected small scale farmers were chosen randomly. The earliest interviews with KDU, FAO, MAIL and other related staffs paved the way to the researcher for general information on animal husbandry activities and marketing of dairy products through KDU. Among the milk producers, different methods were chosen to narrate their full success stories and thanks to both cooperative members and non-members that eagerly responded to questions and narrated their different success stories.

Personal observation was one of the important techniques used in this study, researcher visited KDU processing milk center asked about pasteurized dairy products in Kabul and the whole milk collection procedure in the village also heard story of changes in farmers' livelihoods that had occurred after KDU membership in the selected area. Comparing their previous traditional milk production with now, researcher personally observed milk collection that farmers have performing in the village. Meanwhile, researcher also observed marketing and other process of dairy products such as milk qualities check, collection, transportation system, packaging and shipping the products to the market. Also group discussion with cooperative members and non-members in Ibrahim Khel village were used in this research to obtain deep understanding of the subject.

The first group discussion with KDU and FAO staffs was conducted in development of dairy production regarding the current situation of animal husbandry and discussed more on finding ways to look for a wider adoption of dairy production in other provinces over Afghanistan. The second focus group discussion was done with both cooperative members and non-members in the selected village. In addition, both focus group discussions helped researcher to get the real picture of current improvement in dairy production in rural area and marketing of dairy products as well as obtaining the information on challenges in which small scale milk producers currently are facing.

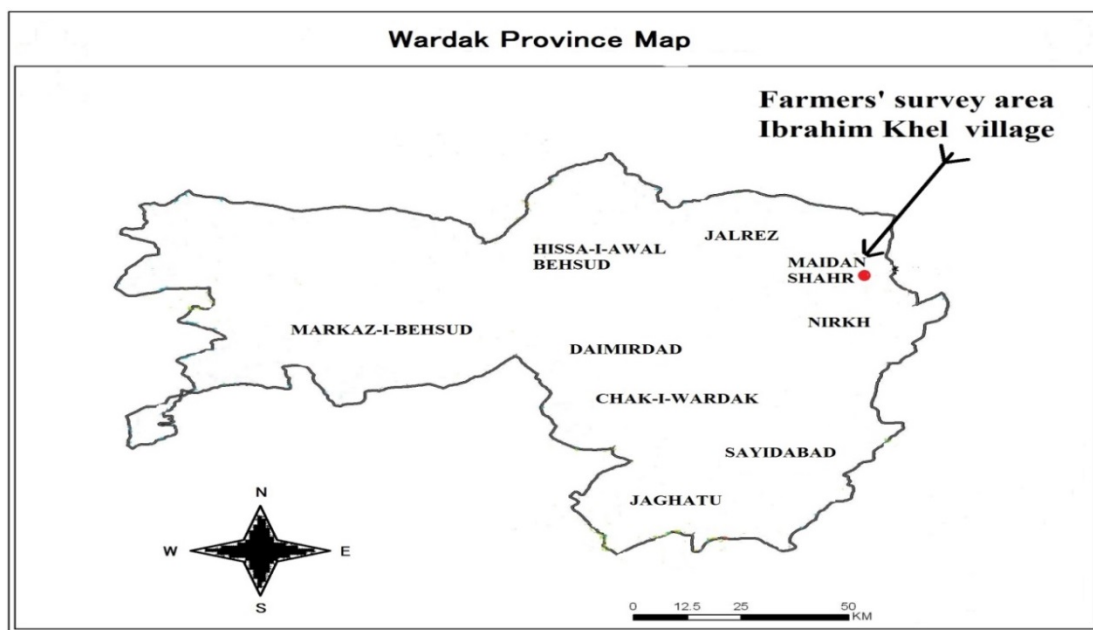
In general this study is mainly focuses on effectiveness of dairy cooperatives (KDU) on improving small scale farmers' economy in Afghanistan. This study describes the findings of the collected data to the lately improvement of farmers in Ibrahim Khel village and KDU role for processing, marketing of dairy products in Kabul city. Ibrahim Khel village was selected as the case study due to its better development and better security. The collected data from KDU, FAO, MAIL, other related organizations, cooperative members and non-members shows that how the farmers have been encouraged to start milk production for sale to increase their own income.

Research Site

This research study was conducted with farmers in same village that have pointed in Figure (2-1). Wardak province is located at the east of Kabul and has 9 districts include Maidan Shar where is the center of the province; it's about 30 minutes away from Kabul. Maidan Shar is the capital of Wardak which has 140 villages and Ibrahim Khel is one of that²⁰.

Figure 2-1: Wardak province map

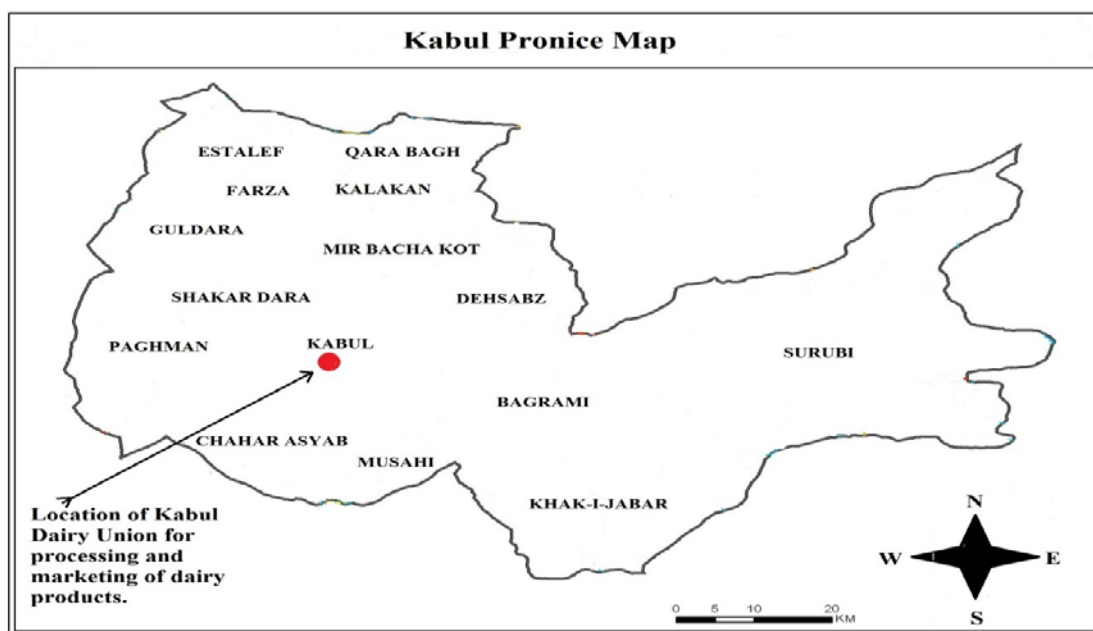
²⁰ Australia Government, (2010), Refugee Review Tribunal, Country Advice Afghanistan.



KDU as Channel for Marketing

KDU located in Kabul city and has good location for marketing of dairy products because of huge population. FAO, German government and MAIL in 2003 with the cooperation of each other installed processing machinery in KDU for processing and marketing of dairy products.

Figure 2-2: Kabul province map



Type and Method of Data Collection

Both primary and secondary data collected to analyze proposed research topic.

Farmers' Survey

Farmers' survey was conducted with cooperative members and non-members in Ibrahim Khel village, which is the member cooperative of KDU. 100 farmers were selected for the respondents of the survey from cooperative members and non-members respectively by random sampling. The survey was done during February to March 2018.

The Data of KDU Performance

The data were gathered from KDU and related organization such as FAO Kabul office, MAIL and KDU. Type of data was such as:

- The changes in number of members and milk production.
- The changes in milk price and payment to farmers.
- Annual balance sheets and the other financial documents.

The secondary data such as the statistics of dairy farming in Afghanistan were also used in analysis.

Sampling Procedure

A random sampling selection was applied using farmers list from the KDU coverage areas. As mentioned, these parts of the country were purposively selected because they have a higher percentage of small scale farmers. Moreover, these areas were selected because of the existence of KDU with huge dairy market potential, thus cooperative members and non-members were used for the study. Therefore, from 76 cooperative members and 100 non-members in two individual lists, 100 farmers were chosen as shown in Tables (2-1) and (2-2).

Table 2-1: Total number of farmers in Ibrahim Khel village

Region	Non-members		Cooperative members		Total
	Non-members	Number of members	Name of cooperatives	Number of members	
Wardak	Non-members	100	Ibrahim Khel	76	176

Source: Researcher survey from the field.

However, this number is not true reflection of small scale farmers producing milk in the country because most farmers are not-registered in cooperatives. Researcher own observation indicating that there are more independent farmers compared to cooperative

members in the study area as well as in whole Afghanistan. However for ease analysis the same number of cooperative members and non-members were used in the study.

Table 2-2: Selected areas and sampled respondents

Study area	Sampled cooperative members	Sampled non-members	Total
Ibrahim Khel	50	50	100

Source: Researcher survey from the field

Data Collection

Primary field survey of sampled small scale farmers who were cooperative members and non-members, were conducted to gather information on their milk production and marketing activities through the use of questionnaire. Data from secondary sources that include both published and unpublished documents were obtained from MAIL, FAO and KDU in Kabul Afghanistan as well as the internet.

Sample Size Determination

The study made use of primary data collected by means of an appropriate structured questionnaire. Both open-ended and closed-end questions were used in the questionnaire because of the nature of the data that had to be collected from small scale farmers. Data that were collected through questionnaire comprised of farmers' socio-economic characteristics, milk production, marketing, input and output level of milk, farm management practices, as well as income received from dairy activities.

Therefore, the results of sample size are 100 respondents. Once prepared, the questionnaire was discussed with researcher, supervisor and relevant personal; it was then pre-tested to ensure validity and reliability of data collected. Five farmers were selected from pre-tested of the questionnaire. After approval of the questionnaire, face to face interviews were conducted by the researcher to generate all the required data from farmers.

Data Analysis

Upon completion of data collection, two methods of analysis namely descriptive and economic analysis were used for analyzing the data. Prior to this data were first recorded in Microsoft Excel for ease of analysis. Then imported to Graphpad Prism online(www.graphpad.com/quickcalcs/ttest1.cfm) and Statistical Package for Social

Science (SPSS). Descriptive statistics were used to describe the general characteristics of sampled households, their production as well as their marketing systems in order to depict differences in performance between cooperative members and non-members. Econometric analysis was used to determine whether being cooperative members have any positive effect.

Descriptive Analysis

A descriptive analysis was used to compare characteristics of the different sampled households whereby frequencies, percentages, means, standard deviations and independent simple t-test were used to describe the socio-economic characteristics of small scale farmers, milk production and marketing, input and output levels, milk handling and farm management practices as well as income received from dairy activity. Tables and figures have created to illustrate trends, especially in performance indicators, such as age, education, household size, herd size, milk production and income levels among cooperative members and non-members. This provides a general insight into how cooperative members and non-members differ in terms of their production and marketing behavior. In addition, the descriptive analysis of the effect of cooperative participation on fodder costs and veterinary services was done. This was made possible by analyzing problems and constraints and differences in their marketing systems.

Economic Analysis

An econometric analysis was carried out to determine whether being a cooperative member has any positive influence on transportation, milk price, sub-income of livestock keeping, generating income cooperative members compare to non-members and daily income. This was captured through the amount of milk farmers' sell, whereby milk marketed by cooperative members is predicted to be higher than milk sold by non-members, as well as provision of fodder.

Chapter 3

Review of the Study

Previous Study in Afghanistan

Dairy cooperative in developing countries had success history. Therefore, evidences from the past in Afghanistan related to agriculture cooperatives have shown that agricultural cooperatives as ladder (step by step) was good source for small farmers to gather them in an umbrella and provide input and output supply facilities easily. But the local war and some other challenges have prevented cooperative development in Afghanistan. Even though, MAIL had tried many times to overcome the challenges by formation of cooperatives. Lack of skilled staffs, unawareness of members, weak management, lack of credit and some problems have harmed to success these projects. Beside of these constraints KDU the most successful union in Afghanistan have successful achievement.

The supply of good quality farm inputs with reasonable price through collectively in bulk purchasing, such as seed and fertilizer or the supply of sufficient and cheap credit is crucial for farming practice. Farmers can easily access to such kind of services through creation of agricultural cooperative. By establishing agricultural cooperatives, farmers hope to solve their farm problems jointly through discussing in cooperative meetings, to increase their farm income and strengthen their economic.

Dairy cooperatives in developing countries are the instrument to help small scale farmers and access them to input materials as well as marketing services. Few researches related to cooperatives in Afghanistan have been carried out, not exactly related to role of dairy cooperatives. There were only few studies about achievement of agricultural cooperatives in Afghanistan that showed the effect of agricultural cooperatives on farmers' economy, which was "The Effect of Agricultural Cooperatives on Farm Income in Rural Afghanistan (Miraqa Hussain Khail and Atsushi CHITOSE). This study pointed out:

- The members of agricultural cooperatives got more income than the non-members.

- The factors of more income were better product price and low production cost of the members²¹.

However there are some considerations in previous study:

- The study was the case study of only crop farming cooperatives.
- The study conducted comparative analysis between the members and non-members. Nevertheless these two groups locations were differed each other, for this reason, there is some possibility that the location influenced the difference in their income.
- The study compared only income of the surveyed year. It didn't compare their income before the cooperatives had been established. Probably it could not say the difference was because of cooperatives.
- The study didn't mention the activities of cooperatives which effected on farmer's income.

The objective of the current research (Effect of Dairy Cooperatives on Improving Small Scale Farmers' Economy in Afghanistan, A Case Study of KDU) have presented in chapter one page 8.

Hussain Khail and Chitose stated: that agriculture cooperatives have a potential to benefit farmers through supplying production input materials and marketing farm productions in favor of farmers and would contribute to reduction in rural poverty also the accomplishment of potential agriculture cooperatives have definitely requires continues supports from the government and international community²².

The last three decades local war in the country has deeply damaged all infrastructures, agriculture sector and cooperative is no exception. Therefore, limited research related to agriculture cooperatives have been carried out, not exactly about the title of this thesis. Lack of limited researches have caused that the researcher use references related to the review of the study from other developing countries that have similarity in culture and social living.

²¹ HUSSAIN KHAIL and CHITOSE, (2011) the Effect of Agricultural Cooperatives on Farm Income in Rural Afghanistan.

²² HUSSAIN KHAIL and CHITOSE, (2011) the Effect of Agricultural Cooperatives on Farm Income in Rural Afghanistan.

Mohamed stated: that development is one of the main goals that all communities try to achieve in order to improve the living standards for individuals in those communities²³. In this case agricultural cooperatives are the most important organizations in rural area that by launching training programs, workshops, awareness about farming and livestock, introducing new technologies and the mentioned organization encourages farmers to do jointly their agricultural activities through agricultural cooperatives services and surely its outcome will strength farmers economic mainstay.

Noor Muala stated: that India has basically an agrarian economy with 72% of its total population residing in rural areas and the rural people need lot of services in daily life which are met by the village cooperative societies²⁴. Barnabas stated: that agricultural cooperatives was playing an important role in improving of farmers' livelihood and economy by providing production inputs and marketing of agricultural products at favorable prices²⁵. As well as Popal report: that during 1973 to 1978, 6000 ton agricultural products such as fruits, vegetables, cotton and beet were sold through agricultural cooperatives in the national and international markets²⁶.

Previous Study in Developing Countries

Dairy cooperatives have played developing role in south Asian countries (India, Bangladesh, Nipple and so on). Pinto stated: that cooperatives have been privileged forum for discussing and finding solution to common problems²⁷. Developments in agriculture by the cooperatives have sustainable achievement in different sections. Cooperative has stable positive effect in improving of agriculture products and it's marketing as a cornerstone. If the cooperative activities manage honestly by the board of directors, executive manager and cooperative members it's extremely efficient. Otherwise it could be a problem related to the marketing of products resulting in low farm gate prices compare to cost price of products. Purchasing good quality input materials such as fertilizer, pesticide, access to input and output for farm products collectively would be

²³ Mohamed (2004), Role of Agricultural Cooperatives in Agricultural Development, Institute fur Agrarpolitik, p.1.

²⁴ Khan (2008), cooperatives in agriculture and its implications in less developed countries, Sarhad J. Agric, p.2.

²⁵ A. P. Barnabas (April, 1970), Farmers Characteristics I Koh-i-Daman, Pilot Area.

²⁶ Popal, (2012), Cooperatives in Afghanistan, p.2

²⁷ Pinto (2009), agricultural cooperatives and farmers' organizations, Swedish Cooperative Centre, p.3.

more efficient if farmers do it through cooperatives jointly. The main goal of establishing cooperative is to improve farming condition and carry out jointly marketing activities.

Chagwiza and Muradian (2016) stated: that dairy cooperatives in Ethiopia are strong in facilitating technological transformations and commercialization to cooperative members, annually cooperative members on average receive more income than non-members. The factors of development are that several governmental policies and interventions by the international cooperation which have been put in place recently aiming to foster the development of the incipient modern dairy value chain (which involves processing and pasteurization) supplying the growing urban market. Also government with stakeholders have provide suitable environment for intensification by facilitating and enhancing technologies and new varieties cows with animal feed and stable market. Sometime non-members may obtain indirect benefits from cooperatives' activities in the region²⁸.

Julius (2015) stated: that cooperative members have more access to farm inputs (labor, loan, herbicide, insecticide, rodenticide, fertilizer, tractor services, storage equipment and processing equipment) while the non-members had more access to land. The government has recommended formation of cooperatives in different levels in coordination with non-government organizations support cooperatives. The factors that cooperative members had more access to farm inputs implies that government and non-governmental organizations or agencies interested agricultural development should encourage the formation of viable cooperative societies by farmers.²⁹.

Ghosh and Maharjan (2014) stated: that dairy cooperatives have made a significant impact on milk production and household income for the dairy cooperative members. Artificial Insemination (AI), veterinary services, animal health, fodder provision, higher milk price for cooperative members, higher milk production, hygienic milk are the factors cooperative members could receive more income than non-members. They have set up their own milk processing centers, own veterinary services, milk marketing channels and established their own transportation system with the assistance

²⁸ Clarietta Chagwiza and Roldan Muradian (2016), Cooperative membership and dairy performance among smallholders in Ethiopia, <http://www.elsevier.com/locate/foodpol>.

²⁹ Ajah Julius (2015), Comparative Analysis of Cooperative and Non-cooperative Farmers' access to, European Journal of Sustainable Development. Farm Inputs in Abuja, Nigeria

of the government. On the other hand, non-members are unable to receive available dairy inputs from government sources and do not have organized market to sell milk and often they sell their milk at low price³⁰.

One of dairy cooperative aim is to increase efficiency of dairy marketing system and transfer the milk from rural to urban. Moreover dairy cooperatives can play an important role to enhance newer innovation approaches to production, technology transfer, input supply, credit and output marketing, information generating and utilization continuum. Therefore, investigating the role of dairy cooperative in accessing market oriented for small farmers' to develop their income and access input and output supply services easily than individual farmer. In addition finding of this research work will give awareness for the researchers and other students in similar research theme for further investigating in other area.

³⁰ Ashoke Kumar GHOSH and Keshav Lall MAHARJAN (2014), Development of Dairy Cooperative and Its Impacts on Milk Production and Household Income: A Study on Bangladesh Milk Producers' Cooperative Union Limited

Chapter 4

Review of Cooperative History in Afghanistan

Cooperative from 1955 to 2000

According to International Cooperative Alliance (ICA), cooperative is an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and democratically controlled enterprise³¹. In both developed and developing countries cooperative have the success and failure histories in the world. Koopmans stated: that certainly in different parts of the industrialized world the formation of agricultural cooperatives have played a major role in development of agriculture during the last 150 years³².

In addition for the first time in 1955, 13 silk and Qaraqul (sheep skin) cooperatives were established at the northern provinces of Afghanistan by silkworm and Qaraqul producers with financial and technical support of FAO and the International Labor Office (ILO). These cooperatives were created to sale farmers products jointly in the market. Barnabas stated: the cooperatives functions were finding a stable market for farmer's products and providing materials inputs jointly at lower prices³³. Unfortunately on that time unawareness of members about cooperative principles, lack of technical staffs and weak management caused cooperatives to discontinue.

As the first principle of ICA, cooperatives establish voluntary and according to the Afghanistan cooperative law everyone can have membership in cooperative and use the services, however the past experience in Afghanistan have illustrated that cause of cooperative failing was unawareness of members and somewhat compulsory membership. In the past the plan was designed from the top to bottom to establish cooperative, on that time Afghanistan rural society (farmers) were not appropriate to establish cooperative, MAIL did not train farmers about concept and aim of cooperative establishment. People were religious and resistance, they were opposite of cooperative idea and were thinking

³¹ International Cooperative Alliances, <http://old.ica.coop/en/whats-co-op/co-operative-identity-values-principles>, accessed 20/1/2018.

³² Koopmans (2006), Starting a cooperative, Farmer-controlled economic initiatives, Netherlands, ISBN Agromisa: p. 6.

³³ A. P. Barnabas (April, 1970), Farmers Characteristics I Koh-i-Daman, Pilot Area.

that cooperative is opposite of their religion and culture. So this was one of the reasons of failing cooperatives. Furthermore, farmers in Afghanistan weren't aware of cooperative principles such as an organized economic, social and cultural organization. Still some farmers aren't aware of cooperative concept and they think to be member of cooperative can receive grants and assistance from governmental organizations and NGO's or donor countries. The reason is this, cooperative have introduced to farmers such a charity organization.

The past background have made clear that working collectively for the farmers were common way to find solution to the problems related agriculture and livestock in rural areas for the developing of agriculture activities, for instance cleaning of raceway, canal for drinking water and traditional agriculture irrigation system, traditionally it's called Ashar (team work). Pinto stated that: due to the compulsory membership system, farmers never understood the meaning of cooperative organizations and were not prepared to defend it³⁴.

In 1963 Afghanistan government comprehended the importance of cooperative society in the globe. ILO sent few cooperative technical staffs, but this time again they hurriedly established five depreciation cooperatives in Logar province in Afghanistan. Once more lack of cooperative law, inadequate fund, weak management and unawareness about cooperative have caused that cooperatives couldn't continue their activities and in a short term smashed.

Afghanistan government has understood the significant role of cooperatives and always endeavors to establish cooperatives and consolidate farmers around cooperatives in every village. In 1974 extension directorate of MAIL started Programme on Agricultural Credit and Cooperatives in Afghanistan (PACCA) with FAO technical assistance and financial support of Swedish International Development Assistance (SIDA) the project was running through agricultural cooperatives. The aim of the project was to inform farmers' about cooperatives base and principles to understand the real meaning of cooperative and to access input material and they can supply output easily than individual farmers. PACCA project had three centers, 1st center was agricultural cooperative institution in Badam Bagh-i-Kabul province that inaugurated 6 months

³⁴ Pinto (2009), agricultural cooperatives and farmers' organizations, Swedish Cooperative Centre, p.2.

courses for agriculture bachelor new graduates and 18 months for agriculture institute graduates. Also this center was responsible to design plan for cooperatives development and train technical staffs. The 2nd center was in Koh-i-Daman Mir Bachakoat, there were 30 staffs to provide credit for cooperative members, to increase grapes and raisins productions, provide agriculture input materials and to teach bookkeeping, record of transactions for cooperative board directors, audit board and other members.

The 3rd center was in Baghlan province which was very important for the Baghlan farmers who had were producing beet. This program was efficient for improvement of cooperatives. After assessment few cooperatives were established in different places according to farmer's interests. Meanwhile, in 1974 Directorate of Agriculture Cooperative Development (DACD) was created independently in the formation of MAIL. Contemporary on that year the agriculture cooperative first law was approved by the parliament.

Consequently, cooperative directorate made a wide plan for creation of cooperatives. The decision was to cover one province in a year. Until 1978, 135 cooperatives (4 depreciation cooperatives, 1 beekeeping, 6 industrial cooperatives and 124 agricultural) were registered in cooperatives directorate. The mentioned cooperatives could succeed to have plan and based to their plans they could succeed to have access to credit from Agricultural Bank for their economic activities. The cooperatives economically and socially had achievements for its members³⁵.

Also educational institute was established in cooperative directorate chart. In 1979 the training institute started and was responsible to launch training programs for cooperatives staffs and members. Every year some cooperatives staffs trained, annually educational institute had plan to send DACD staffs abroad for obtaining experience from the foreign countries. In 1981 agricultural cooperative law was revised in 6 chapters and 30 articles, till 1993, 1271 agricultural cooperatives were registered³⁶. Unfortunately, by starting the civil war all Afghanistan's basement destroyed.

In the past the goal for Afghanistan government was to mobilize the farmers especially small scale farmers in forum of agricultural cooperatives in every village to

³⁵ Popal (2012), Cooperatives in Afghanistan, p.5.

³⁶ Directorate of agriculture cooperative development, (2016).

improve agricultural products quality and productivity. For this purpose, MAIL with understanding DACD made a wide national plan for creation of agricultural cooperatives.

Cooperative from 2001 to 2017

The Taliban governed Afghanistan for five years, in 2001 Taliban regime was defeated and the new government of Afghanistan established. Afghanistan government as usual paid more attention for creation of agricultural cooperatives. Based on that MAIL master plan from 2008 to 2013 had planned to establish 5000 agricultural cooperatives in Afghanistan. Till mid-2013, 2812 agricultural cooperatives had been established, though most of cooperatives hadn't gone well. Thus the government decided to modify the cooperatives law and constitutions, in addition required all agricultural cooperatives to register again. Table (4-1) indicates new reregistered cooperatives from 2014 to 2017, nearly 1000 cooperatives already dissolved and remain cooperatives are in procedure to dissolve or reregistration³⁷.

Table 4-1: List of cooperatives from 2001 to 2014

No	Number of cooperatives	Number of Members	Capital	Land size/Hectare
1	2,812	399,734	205,276,396	228,679
Number of liquidated Cooperatives				
2	958	73,039	126,098,913	187,357
Number of cooperatives are not active				
3	1,854	326,695	78,477,483	41,322

Source: DACD, MAIL 2017

Until 2013 none of the cooperatives had business plan. For this reason MAIL appointed a committee to revise cooperative law. The committee revised law and send to ministry of Justice. Up to date cooperative law is in process. Weak management and leadership of DACD could not follow the procedure for revising of the law. The med-

³⁷ Directorate of Agriculture cooperative development, and MAIL master plan 2008.

term evaluation of the project in 2008 suggested that the dairy activities of the cooperatives can be profitable³⁸.

Agricultural cooperatives and especially dairy cooperatives have been played an important role in the development of the country's economy. Vicari stated: the role of cooperative enterprises in fighting global poverty has been broadly recognized in the last decade within academic community as well as international institutions³⁹. Therefore, gathering of small scale farmers in dairy cooperative have played significant role in strengthening of their economic condition. FAO reported: that smallholder dairy farming has become a good income generator throughout Asia but the cost price squeeze of low milk prices and high production costs still have limited farming profitability levels⁴⁰.

Table 4-2: List of registered cooperatives from 2014 to 2017

No	Type of cooperative	Number of cooperative	Members	Cash assets	Movable and unmovable assets
1	Grain production	18	766	2,957,386	132,038,238
2	Fishing	1	15	750,000	7,014,883
3	Cotton production	11	2,412	6,300,383	46,988,500
4	Milk production or dairy	9	1781	2,230,000	52,535,436
5	Potato production	6	140	2,833,400	16,818,895
6	Honey production or Bee keeping	8	176	4,888,030	19,305,778
7	Cereal	2	100	650,000	6,633,096
8	Meat production	6	220	1,898,600	158,876,540
9	Horticulture	2	103	922,500	10,168,975
10	Onion production	1	100	728,600	14,281,141
11	Vegetable	2	69	776,737	7,558,517
12	Total	66	5,882	24,935,636	472,619,999

Source: DACD, MAIL 2017

According to the new system, as shown in Table (4-2), only 66 single purpose cooperatives reregistered and 58 others were in procedure. The Afghanistan government

³⁸ FAO and MIAL (2010), Integrated Dairy Schemes Project in Afghanistan, Kabul, p.7.

³⁹ Vicari (2014) Co-operatives' role to fight poverty in developing countries: the commitment of Leg coop, Pasquale De Muro, p.1.

⁴⁰ FAO, Business Management 28 for Tropical Dairy Farmers, www.publish.csiro.au/ebook/chapter/9780643095168_CH3

policy for agricultural cooperatives must be revised. For restructuring the policy, it is important to clarify the performance of the existing agricultural cooperatives.

Hence, due to many challenges on the way of agriculture cooperatives, for instance lack of awareness of members regarding cooperative concept, lack of government funding for developing of agriculture cooperatives, and the most important complicated business plan is the barriers in the way of cooperative development. Based on the researcher surveyed area and CSO data most of farmers in Afghanistan are not educated even though some of them can't read and write. It's difficult for small scale farmers to put the business plan in practice, even it's hard for some cooperatives staffs. Thus, needs for professional business plan organizer to launch training programs for the cooperative staffs and farmers as well.

Membership Regulation in Afghanistan's Cooperatives

As provided in the cooperative law, all Afghanistan's citizens who have completed 18 years old and are able to pay the share capital could be a cooperative member⁴¹. Meanwhile, the cooperative member must accept cooperative statues and should not be against commonweal of cooperative. The members' right and duties are the matters to be mentioned in the bylaw of each agricultural cooperative.

It's mentionable that a cooperative member can't have membership in other cooperative with the same objective at the same time, but can have membership in two cooperatives which have different activities. The members must have commitment for transaction through cooperative. Members have right to participate in general assembly meeting and vote to select board members, use business of cooperative, dividend and to withdraw from cooperative.

Cooperative Functions

When a cooperative is going to establish in a village, district or province level it has important functions for developing of rural societies through launching training programs regarding new methods, joint marketing and introducing new technologies. Raheen stated: a cooperative must have the following functions:

- Technical (Production)

⁴¹ Official Gazette (2008): Law of Cooperatives: series Number (949, 1387/04/03).

- Marketing (Buy, sell and services delivery)
- Financial (Exploit cooperative capital)
- Administrative (Planning, organizing training programs, recruitment of staffs, leadership, coordination, control and monitoring).
- Bookkeeping (Recording of cooperative's daily transactions)⁴².

Production is one of the important prior steps in a cooperative and in developing countries its necessary to appoint professional and skilled employee is needed to advices and technical guidance for cooperative members. Technical staffs must arrange training programs regarding production system (providing input materials and services) for its members and be aware cooperative members related to advantages of cooperative. Both members and staffs must have the commitment for developing of cooperative. It is the responsibility of agriculture extension staffs for encouraging farmers to increase production through using new information and technologies regarding their agriculture operations.

Cooperative steering committee is responsible to have contact and communication with markets and other agricultural products traders to dispatch cooperative member's products to the market at the harvest time. Most of agricultural products are perishable. Therefore, it requires to have contact with committed stakeholders for achieving to its goals.

In addition individually it's difficult for small scale farmers to carry out all the agricultural practices. Therefore, in a cooperative they can jointly access to input materials and services such as providing facilities for members and mobilizing them around cooperative is a stable method to increase the small scale farmer's income. Independently in developing country small scale farmers don't have much ability to invest individually, as well as in a group as cooperative member through guidance from government and NGO's can find access to input and output services. Further cooperative members can easily access to credit organizations and banks. It is essential step for supporting farmers' to provide loan and buy input supply jointly.

Cooperative management is the most important task, thus business plan could be a complete document in a cooperative. A business plan includes planning, organizing,

⁴² Raheen (2011), Agricultural cooperative management and leadership, MAIL Afghanistan. P. 7.

recruitment of employee, leadership, coordination, control and monitoring of all cooperative activities. Business plan is the skeleton of a cooperative which arranges all the cooperative's activities.

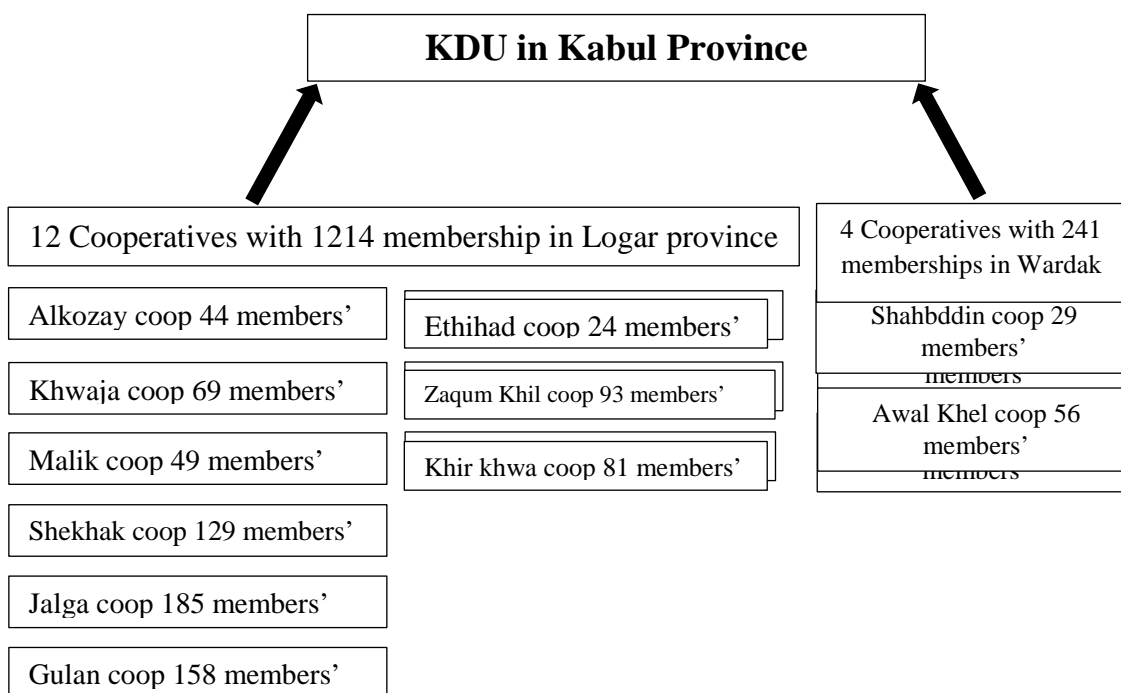
Cooperative operational practices is explaining in a business plan, meanwhile if cooperative has more activities, it must hire clerk to record the farmers' daily transactions. Arranging the cooperatives function according to cooperative's principles and characteristics, helps its members to have strong marketing power, low cost production material, joint use facilities (machinery, warehouse, grading center, processing unit) to reduce costs and add value to the products, enough fund for farm management, adequate guidance to improve quality of produce, efficient use of farmland, stable price of produce, production control, and democratic control by members.

Chapter 5

KDU Organization Formation

According to Afghanistan cooperative law one cooperative can be established in a village and only farmers resident in the village can participate in cooperative. Farmers who want to participate in cooperative can participate in only the cooperative established in their village. In the surveyed area not every village had cooperative. The proportion of the villages with cooperatives is still very low. The participated farmers must pay the membership fees to their cooperatives. KDU consists of the 16 cooperatives and each cooperative pays the membership fee to KDU. Each cooperative holds MCC which is milk storage and farmers bring their milk to MCC by themselves. Cooperatives don't have professional staffs and it's managed by the board of director and audit board of cooperatives.

Figure (5-1) KDU formation



Source: FAO office in Kabul

KDU holds milk processing facilities and trucks for collecting milk from the MCCs and transportation. The sales of KDU dairy products are paid back to the farmers through the cooperatives excluding required cost.

Cooperative Functions

Dairy cooperative in the village doesn't have skilled staffs; hence it's unable to provide services professionally. Some services which procure in the village to members of cooperatives coordinated with KDU are as follow:

- Services: Technical guidance and advice to cooperative members related to animal husbandry.
- Milk collection: Every day milk collection in MCC from farmers.
- Check milk quality: The milk quality and quantity checks daily each individual farmer.
- Facilitation: Weekly payment of milk cost to every individual farmer.
- Meetings: Arranging annual meeting and other meetings of cooperative in case if necessary.

KDU Functions

KDU provide technical services to cooperative members in contact with the stakeholders such as:

- Services: Feeding, breeding, animal health, housing, training and cattle management, these services deliver to cooperative members regularly.
- Transportation: Transferring milk from 14 MCCs to KDU every day.
- Processing: Processing milk to different types of dairy products (pasteurized milk, yoghurt, cheese, butter, sour milk, quark and cream).
- Marketing and dairy distribution: Distribution of dairy products to 28 shops in Kabul city also KDU have contract with some governmental organizations:
 - 1- Presidential palace.
 - 2- A hospital.
 - 3- Few hotels.
- Managing financial system: Managing KDU financial system with shops and MCC.

Growth in KDU Membership

In 2003, 7 dairy cooperatives with membership of 396 members were established in surroundings of Kabul. For realizing the effective marketing, dairy products processing, and the other activities, 7 cooperatives have established KDU as the union. After that,

another 9 cooperatives have been established and joined. Table (5-1) indicates number of members increased to 1455 in 2016. KDU and the 16 dairy cooperatives have become as the model of dairy cooperatives and 4 similar organizations have been established in the other areas.

Logar and Wardak provinces where KDU located are close to Kabul city approximately with less than 50 kilometers. Kabul city has good market for milk and dairy products with the huge population in the country. Therefore, Kabul has setup place for processing and marketing of dairy products. It must be mentioned Afghanistan government have plan to install new milk processing center which has capacity of 30000 liters milk per/day.

Figure 5-1: Increase in KDU membership from 2003 to 2016

Year	2003	2004	2005	2006	2007	2016
Members	396	416	412	550	650	1455

Source: FAO office in Kabul, Afghanistan.

Milk Production Growth and Increase in Annual Payment to Farmers

According to Table (5-2) over the last 15 years, milk production has been increased steadily from 355,046 liters in 2003 to 1,363,515 liters in 2017. Meanwhile payment to farmers have increased from 3,908,105 in 2003 to 41,169,824 Afghani (Afg) in 2017 (1 US \$ = 71 Afg, 2018). KDU is the largest dairy processing union in Afghanistan. The aim of this project was to encourage small scale farmers in rural areas for improving milk production by feeding, breeding, veterinary services. FAO stopped supporting KDU In 2010. After that, the union has operated its activities independently.

Table 5-2: Milk production, annual payment to farmers

Years	Milk production	Payment to farmers
2003	355,046	3,908,105
2004	696,749	9,265,764
2005	728,749	9,998,462
2006	927,910	14,598,069
2007	1,142,440	19,117,261
2008	1,146,768	22,804,187
2009	984,840	19,757,538
2010	1,111,622	23,680,861
2011	945,676	22,461,455
2012	983,694	25,349,281
2013	1,231,334	34,685,893
2014	1,261,036	35,046,685
2015	1,363,298	38,661,927
2016	1,383,094	38,832,720
2017	1,363,515	41,169,824

Source: FAO office in Kabul, Afghanistan.

Milk Price

Evidence in Table (5-3) indicated that the price which has been paid to individual farmer per liter milk is suitable for the KDU members. In 2006 the Livestock Business Report calculates the price a farmer receives for the milk at 9.45 Afs/kg. This was much lower than what farmers received from the FAO supported dairies that paid average prices of 13 Afs/kg raw milk⁴³. KDU pays an average price of 13 Afs/liter (\$ 0, 26) to the suppliers, while the Balkh dairy in Mazar paid an average price of 12 Afs/liter⁴⁴. The demand is more for native dairy products in Kabul city and also consumers are willing to pay higher price for the good quality and convenient domestic dairy products.

⁴³ John J. M. Bonnier (2007) Study on Dairy Production and Processing in Afghanistan For the Horticulture and Livestock Project/HLP Ministry of Agriculture, Irrigation and Livestock/MAIL Afghanistan

⁴⁴ John J. M. Bonnier (2007) Study on Dairy Production and Processing in Afghanistan For the Horticulture and Livestock Project/HLP Ministry of Agriculture, Irrigation and Livestock/MAIL Afghanistan

Table 5-3: Average price per/liter milk paid to farmers

Year	Average price
2003	11
2004	13
2005	14
2006	16
2007	17
2008	20
2009	20
2010	21
2011	24
2012	26
2013	28
2014	28
2015	28
2016	28
2017	30

Source: FAO office in Kabul, Afghanistan.

Milk Collection

Most milk in Afghanistan is produced by small farmers, who are widely scattered in rural areas while the markets for milk are located in urban areas. Afghanistan people particularly in rural area tend to think selling milk is shame. FAO launched training programs related to animal husbandry for the small farmers and encouraged them to produce milk to support your economic condition. Katawazy stated: trading milk in most areas is even considered shameful and is known as a disgrace⁴⁵.

In remote areas milk processing method is traditionally and it's not possible to send and process the milk in to pasteurized dairy products. Many problems prevent this insecurity is the biggest one. Every day in the selected areas, families early in morning send milk to MCC by the children or by the family elder. Milk price paid to farmers' according to percentage of fat at the end of every week.

Milk Transportation to KDU

Transportation of milk from rural to urban is the challenge for milk producers. KDU Setup MCC in every village and in coordination with FAO appointed technician and driver to check milk quality and quantity then transport it to KDU in Kabul city. For

⁴⁵ Katawazy (2013), Investment opportunities in Afghan Dairy and Livestock, P.11.

checking the quality of milk, collection and transportation to KDU farmers must pay 3 Afg per/liter. The truck drivers submit the milk in the containers to KDU for processing.

Milk Processing

Processing milk to other dairy products is one of the important procedures, for value addition to the products, better market and some advantages to the product. The main objective of processing milk is to extend live. Tessema stated: processing add advantages to dairy products:

- Provides regular income.
- Improves nutrition.
- Selling processed milk products is more profitable than selling fresh milk.
- Generates employment.
- Improves quality and safety⁴⁶.
-

Figure (5-2) Milk processing procedure, milk and yoghurt packages



Source: By the researcher, 2018.

Therefore, every day average between 5500 to 6000 liters milk collect and process to different kind of dairy products include (pasteurized milk and yoghurt in different

⁴⁶ Abebe Tessema and Markos Tibbo(2009) Milk Processing Technologies for Small-Scale Producers,p.5.

packages, butter, cheese, sour milk, quark and cream)⁴⁷. For the processing KDU appointed dairy processing supervisor and dairy plant technician.

KDU Link Farmers to Market

The main purpose of farmers coming to gather is to access market. Before the IDS project farmers individually sold their milk to the local village shops, to the neighbors and to middlemen. Provision of assured marketing outlet sufficient to milk producers was an essential function of the KDU. Through KDU (dairy cooperative) modern market created to farmers. This has generated regular income for the farmers, connected milk producers to the market and to final consumer. KDU members have stable market. Unless for non-members its big problem, they don't have access to stable market. KDU is the main marketing channel for village cooperative members. The aim is to reduce the inherent weakness of farmers who operates as an individual in the market. To solve marketing problem of rural farmers, important role played by the KDU is to transport milk from rural in bulk and process to different kind of dairy products.

Still in most remote areas, small scale farmers produce the milk separately. Sell to the local markets in fluctuate price and unstable market. Sometimes the market need for milk or yoghurt but some other time there is no consumer in rural areas. So it must be kept at home to consume or may be spoiled. Since launching the IDS project in the selected rural areas small farmers could find sustainable market and regular income through the year. The small scale farmers' through dairy cooperatives are conceptualized and framed to profitable milk units. This approach aims at maintaining and enhancing the groups so they become independent entities at the communities' level through cooperatives membership.

Kaur stated that: thus cooperatives have not just been instrumental in economic development of the rural society of India but it also has provided vital ingredient for improving health & nutritional requirement of the Indian society⁴⁸. At the beginning of this project, KDU doesn't have any store in Kabul city. But after passing years, it has hired stores around Kabul city. In 2018 KDU dairy processed products were sold through 28 dairy stores.

⁴⁷ FAO, (2016) Main office in Kabul Afghanistan

⁴⁸ Kaur (2014), A Detailed Analysis of Anand Milk Union Limited (Amul) in India, Indian Journal, p.2.

Members Marketing Participation

With an increasing part of the population living in the cities and growing incomes there is also an increasing demand for livestock products, which offers a good opportunity to invest in to this sector and produce for the urban markets⁴⁹. Farmers had long distance from the market and were scattered in different far away villages. FAO report that, milk and dairy products consumption per capita is estimated at 66 kg annually and daily 180 gram which is much lower than in most countries⁵⁰.

Therefore, it's needed to develop the mentioned project in all Afghanistan. Now KDU doesn't have enough capacity to produce the milk according to the demand of the Kabul market. The population growth rate is estimated 2.34 % and is increasing day by day and needs for more food and dairy products as well⁵¹.

Transaction Costs

The nature of raw milk is highly perishable and need rapid transportation to MCC and then to KDU for processing to less perishable products. Market for milk in rural area in Afghanistan is limited and the raw milk requires to collect and in bulk send to the market, but this is not even limited it's not exist in most rural areas. Searching market for raw milk outlets is very difficult for small scale farmers. Seasonal variation of milk production is the other problem. Individually to small scale farmer it is not possible to transport milk to urban market, if transport it costs higher than expenses such price increases the value of milk per/liter. Dairy cooperative can reduce transaction costs for small scale farmers and provide facilities.

KDU Value Chain System

The functions are doing regularly explain in the below:

Figure (5-3) milk production to marketing

⁴⁹ FAO and MAIL (2010) Final report, integrated dairy schemes project, p.3.

⁵⁰ Bonnier (2007), appendix 4, p.3.

⁵¹ Afghanistan Statistical Yearbook 2015-2016, <http://cso.gov.af/en>, accessed January 07- 2018.

1- Provision of services



2 - Milk collection



3 - Milk transportation



4 - Milk processing



5 - Marketing



6 - Financial management



Source: Survey photo and FAO.

KDU Benefits to the Society

KDU provided stable and regular market for dairy products to 1455 families and meanwhile have created 35 different positions as permanent job for its staffs. The types of the duty with the monthly salary for the positions are shown in Table (5-4). As well as, 17 person working part time as milk collators. The payment is done by farmers 2 Afg per liter of milk. According to the data provided by FAO, 314,014 Afg or 4225 US \$ (1 US \$ = 71.5 Afg) is the total salary per month for the KDU staffs. Providing job opportunities with stable salary by KDU is a significant achievement in case of poverty in the Afghanistan. On the other hand, the incomes for the KDU have been increasing since 2011 to 2017 from 4,096,289 to about 10,066,190 Afg. Further details are shown in Tables (5-5 to 5-10). According to the KDU Annually balance sheets, it is seen that the income increased since it established. It is therefore can be said that, increase in net income is indicating that KDU have the capacity to improve, collect more milk and provide more job opportunities.

Table 5-4: List of KDU staffs and their monthly salaries

Personnel	No of person	Salary per person (Afs)	Total Salary (Afs)
KDU chairman	1	8,000	8,000
Dairy Plant Manager	1	15,000	15,000
Animal health and AI technicians	2	5,000	10,000
Marketing officers	3	8,000	24,000
Cooperative management officer	1	5,000	5,000
Electricians	1	15,000	15,000
Dairy processing supervisor	1	15,000	15,000
Dairy plant technicians	10	10,000	100,000
Drivers	7	10,000	70,000
Cooks and cleaners	2	7,000	14,000
Shopkeepers	4	8,500	34,000
Guards	2	9,000	18,000
Total	35		314,014
Milk collectors	17	2 Afs/Liters	

Source; FAO main office Kabul. (1 US\$ = 71 Afg).

Table 5-5: KDU balance sheet 2011

Item/Assets	Debit	Item	Credit/cash
Noorani/Person	4,589,669	Member share	35,000
National Bank	35,000	FAO	2,245,178
Vehicles	2,600,158	Depreciation	1,167,860
Yoghurt Machines	319,500	Net Income	4,096,289
Total	7,544,327		7,544,327

Source; FAO main office Kabul.

Table 5-6: KDU balance sheet 2013

Item/Assets	Debit	Item	Credit/cash
Noorani/Person	2,190,799	Member share	84,000
National Bank	35,000	FAO	1,279,500
Dr.Khirullah	1,700	temporary coop capita	35,000
National Bank	85,500	Net Income	3,973,612
Vehicles	2,434,064	MAIL/Hiring	420,000
Yoghurt Machines	125,915		
Transformer	177,840		
Machine for making cream	616,824		
Machine for pumping	124,470		
Total	5,792,112		5,792,112

Source; FAO main office Kabul.

Table 5-7: KDU balance sheet 2014

Item/Assets	Debit	Item	Credit/cash
National Bank	35,000	Member share	84,000
National Bank	85,500	FAO	1,279,500
Dr.Khirullah	1,700	MAIL/Hiring	210,000
Noorani/Person	3,791,324	capital/past	35,000
6 Vehicles	2,958,464	Depreciation	536,680
Yoghurt Machines	764,280	Net Income	7,215,157
Transformer	177,840		
Machine for making cream	1,341,759		
Machine for pumping	124,470		
Pashtani Bank	80,000		
Total	9,360,337		9,360,337

Source; FAO main office Kabul.

Table 5-8: KDU balance sheet 2015

Item/Assets	Debit	Item	Credit/cash
National Bank	35,000	Member share	84,000
National Bank	85,500	FAO	1,279,500
Dr.Khirullah	1,700	capital/past	35,000
Noorani/Person	5,031,241	Depreciation	816,680
7 Vehicles	2,958,464	Net Income	8,385,074
Yoghurt Machines	764,280		
Transformer	177,840		
Machine for making cream	1,341,759		
Machine for pumping	124,470		
Pashtani Bank	80,000		
Total	10,600,254		10,600,254

Source; FAO main office Kabul.

Table 5-9: KDU balance sheet 2016

Item/Assets	Debit	Item	Credit/cash
National Bank	35,000	Member share	84,000
National Bank	85,500	FAO	1,279,500
Dr.Khirullah	1,700	capital/past	35,000
Noorani/Person	6,003,919	Depreciation	816,680
7 Vehicles	2,958,464	Net Income	9,357,752
Yoghurt Machines	764,280		
Transformer	177,840		
Machine for making cream	1,341,759		
Machine for pumping	124,470		
Pashtani Bank	80,000		
Total	11,572,932		11,572,932

Source; FAO main office Kabul.

Table 5-10: KDU balance sheet 2017

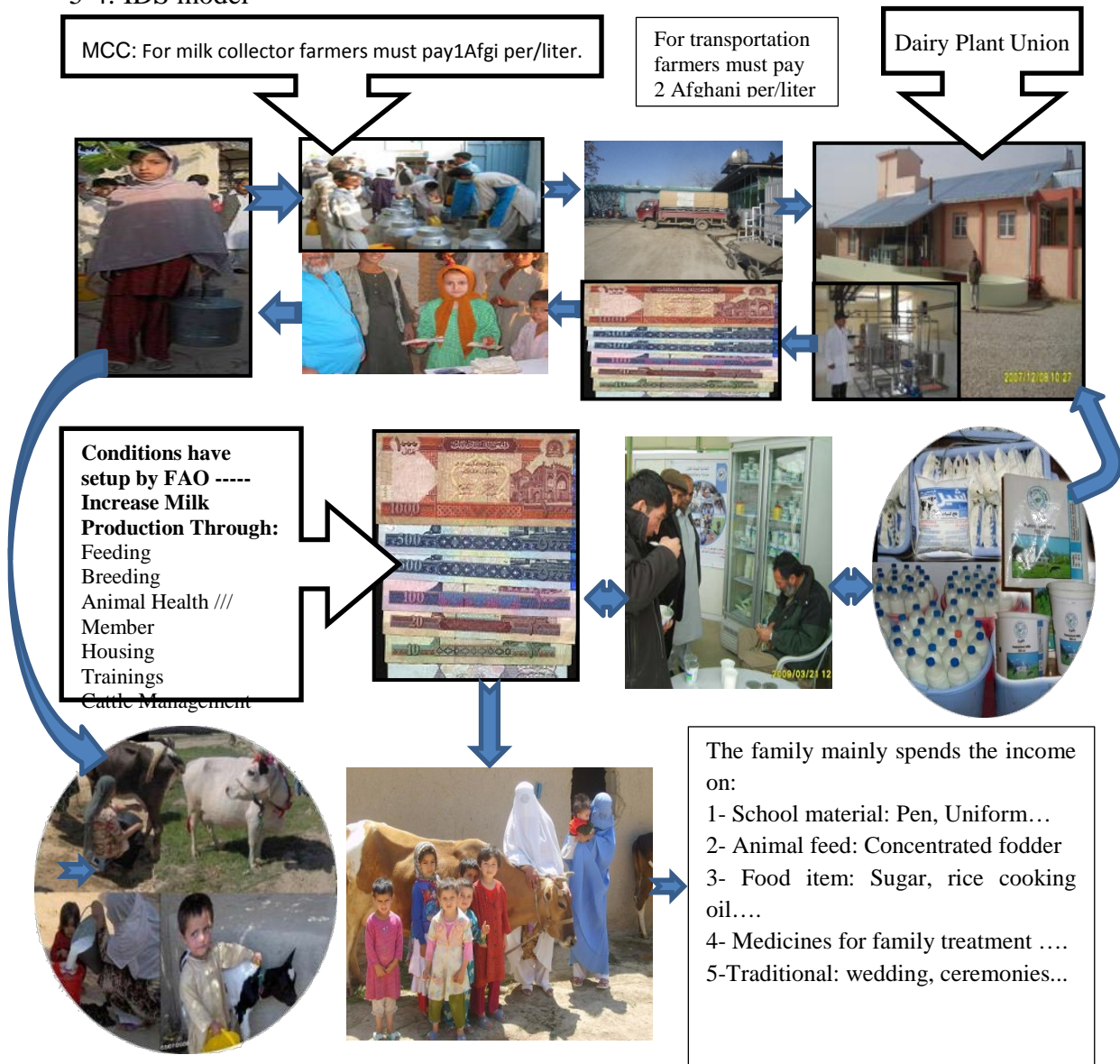
Item/Assets	Debit	Item	Credit/cash
National Bank	35,000	Member share	84,000
National Bank	85,500	FAO	1,279,500
Dr.Khirullah	1,700	capital/past	35,000
Noorani/Person	6,712,357	Depreciation	816,680
7 Vehicles	2,958,464	Net Income	10,066,190
Yoghurt Machines	764,280		
Transformer	177,840		
Machine for making cream	1,341,759		
Machine for pumping	124,470		
Pashtani Bank	80,000		
Total	12,281,370		12,281,370

Source; FAO main office Kabul.

IDS Model Implemented in Afghanistan

Kabul was the place for marketing of dairy products of the two provinces that IDS project have implemented. The aim was to increase the farmers' income by improving of milk production through feeding, breeding, animal health, housing, training and cattle management. Livestock has direct and indirect benefits. Directly it benefits to small scale farmers from selling milk, meat, manure (fuel and fertilizer) and indirectly to other enterprise such as leather, wool and provision of job (provided 35 regular jobs for KDU staffs and 17 part time jobs). This is the model have implemented in the surveyed area.

5-4: IDS model



Chapter 6

Result and Discussion

In this chapter case study collected data analysis, result and discussion are presented.

6.1. Households Socioeconomic Characteristics

6.1.1. Age of Household Head

The age of households for both cooperative members and non-members is described in Table (6-1). It shows that 6% and 14% of cooperative members and non-members are less than 30 years old. Respectively 20% and 34% are between 31-40 years old, 24% of cooperative members and 40% of non-members are among 41-50 years old, also 38% and 10% of cooperative members and non-members are between 51-60 years old respectively. Further 12% and 2% both groups are more than 60 years old.

Table 6-1: Age of households

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Age	<30	3	6	7	14	0.000
	31-40	10	20	17	34	
	41-50	12	24	20	40	
	51-60	19	38	5	10	
	>60	6	12	1	2	
Total cooperative members and Non-members		50	100	50	100	

Source: Computed survey data, 2018.

The proportion of the farmers less than 30 years in the non-members was 8% more than that in the members. While the proportion of the farmers more than 51 in the members' was 28% more than that in the non-members. The result indicates that cooperative members were older than non-members. The difference of age structure

between the members and non-members was statistically significant by p-value (0.000). It therefore found that, the age of the households head is very important when it comes to decision making. Because older farmers have more experience than younger farmers and younger farmers are not expert enough. Decision making is very important for economic development. Many decisions hold in the household level influence the welfare of the individuals living in the household as well the societies. Furthermore, older farmers were cooperative members before local war and they know the importance of being cooperative member.

6.1.2. Education Level

The education level of both cooperative members and non-members are described in Table (6-2). The value in the table shows that, 64% of cooperative members and 84% of non-members have not formal education. The sequences from primary to tertiary level for cooperative members were 10%, 6% and 12% respectively. While for non-members were 6%, 8% and 2% respectively. As a highlighted point with cooperative members which had 8% higher education level, whereas for the non-member was 0%. The two-tailed p-value equals (0.005) by conventional criteria, this difference was considered to be very statistically significant.

Table 6-2: Education level of cooperative members and non-members

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Education	No formal education	32	64	42	84	0.005
	Primary education	5	10	3	6	
	Secondary education	3	6	4	8	
	Tertiary education	6	12	1	2	
	Higher education	4	8	0	0	
Total		50	100	50	100	

Source: Computed survey data, 2018.

This could be one of the positive points. Hence, the result of the survey indicating that cooperative members are more educated than non-members. According to Raheen (2011), knowledge and education is the light for cooperative and successful cooperative implements its activities based on the light of its member's education⁵². Therefore, it can be said that more educated number in cooperative members was the key for success in their operation based on our survey results.

Education is very important and significantly effects in adoption of new technologies as well as educated member of the cooperative have the significant role in management of cooperative.

6.1.3. Household and Labor Size

The household size of cooperative members and non-members explained in Table (6-3). Result in the table shown that, household size of cooperative members and non-members consisted of more than 6, 6 and 4 members on average. 16% of cooperative members and 6% of non-members households were 4 people. Steadily 46% and 56% of both groups had family size of 6 people and 38% of both groups had more than 6 people in the family. Respectively for 48%, 48% and 4% of cooperative members' full time worker was 1, 2 and 3 people. While for 22% and 78% of non-members full time worker was 1 and 2 people. For 96% and 4% cooperative members' part time worker was 1 and 2 people, whereas for 100% non-members part time worker was 1 people.

The p-value (0.443) for family size was not significant, while p-value (0.031) full time worker was statistically significant and p-value (0.156) for part time worker was not significant.

Consequently the important point is that, cooperative members had higher number of full time workers in family size. In developing countries family members commonly use as a source of labor. Therefore, hired labor is not required for dairy activities meanwhile hired labor is costly for small scale farmers because it results in higher costs of production.

⁵² Raheen (2011), Agricultural cooperative management and leadership, MAIL Afghanistan. P. 8.

Table 6-3: Household composition of cooperative members and non-members

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Family size	4 people	8	16	3	6	0.443
	6 people	23	46	28	56	
	>6 people	19	38	19	38	
Total		50	100	50	100	
Full time worker	1 people	24	48	11	22	0.031
	2 people	24	48	39	78	
	3 people	2	4	0	0	
Total		50	100	50	100	
Part time worker	1 people	48	96	50	100	0.156
	2 people	2	4	0	0	
Total		50	100	50	100	

Source: Computed survey data, 2018.

6.1.4. Farm Size in Hectare

Farm size for both groups have described in Table (6-4). It's indicating that 52% of cooperative members and 66% of non-members had less than 1 hectare, steadily 38% and 20% of both groups had 1 hectare and lastly 10% of cooperative members and 14% of non-members had more than 1 hectare land. P-value (0.479) for land was not statistically significant

Considering to the result it can be said that, there is no much differences in land size for both as it can be seen in the Table (6-4). Land is the most important asset for providing green hay for the animals, all the cooperative members and non-members had piece of land.

Table 6-4: Farm size in hectare

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Farm size	< 1 Hectare	26	52	33	66	0.479
	1 Hectare	19	38	10	20	
	> 1 Hectare	5	10	7	14	
		50	100	50	100	

Source: Computed survey data, 2018.

6.1.5. Main Source of Income

Table (6-5) shows the major source of income for both cooperative members and non-members. 100% of members and 94% of non-members answered their main occupation was livestock. Also 100% of cooperative members and 84% of non-members answered their main income was obtained from livestock activities. The two-tailed p-value (0.000) by conventional criteria this difference was considered to be extremely statistically significant. Meanwhile, the two-tailed p-value equals (0.002) by conventional criteria, this difference was considered to be very statistically significant.

According to the survey data, this was founded that livestock was the main occupation of cooperative members and non-members which stood as the main source of income. This is because the situation for rising cattle is suitable and providing regular income compare to farming.

Table 6-5: Main occupation and source of income for both groups

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Main Occupation	Livestock	50	100	47	94	0.000
	Farming	0	0	3	6	
Total		50	100	50	100	
Which one has more income	Livestock	50	100	42	84	0.002
	Farming	0	0	8	16	
Total		50	100	50	100	

Source: Computed survey data, 2018.

6.2. Effect of KDU on Members Economy

6.2.1. Average Daily Net Income Obtained

Daily income cooperative members and non-members have obtained presented in Table (6-6). The result indicated that 8% of cooperative members and 16% non-members received less than 100 Afg. Steadily for 16% of cooperative members average daily income was 100 Afg and for 48% of non-members. While 20% of cooperative members and 36% of non-members gained 150 Afg. Lastly 28% of cooperative members received 200 and 28% of other more than 200 Afg. The two-tailed p-value (0.000) by conventional criteria, this difference was considered to be extremely statistically significant.

This research found cooperative members received nearly twice larger income than non-members. The important point is this increasing income of cooperative members has encouraged other village farmers to get KDU membership.

Table 6-6: Average daily net income from milk selling

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Average daily net income through milk selling	< 100(Afg)	4	8	8	16	0.000
	100(Afg)	8	16	24	48	
	150(Afg)	10	20	18	36	
	200(Afg)	14	28	0	0	
	> 200(Afg)	14	28	0	0	
Total		50	100	50	100	

Source: Computed survey data, 2018.

6.2.2. Milk Selling to Market

The cause of motivation to sell milk through KDU data is presented in Table (6-7). It appears that 2% and 4% of cooperative members and non-members answered cause of milk selling was existence of MCC in the village. While for 80% and 84% of both groups of farmers' cause of milk selling was obtaining regular income respectively 18% of cooperative members and 12% of non-members answered they need income to feed

their family. The two-tailed p-value equals (0.330) by conventional criteria, this difference was considered to be not statistically significant.

According to the result, for majority of cooperative members and non-members cause of milk marketing was obtaining of regular income from milk production. The important point is the establishment of a stable market through the KDU. Before the establishment of KDU farmers were faced with difficulties in milk marketing. By establishment of KDU cooperative members found stable and regular market for milk. Provision of market have benefited for cooperative members and as well as some non-members.

Table 6-7: Cause of motivation selling milk to this union

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
	MCC in village	1	2	2	4	0.330
	Regular income	40	80	42	84	
	Needed income for feeding family	9	18	6	12	
	Total	50	100	50	100	

Source: Computed survey data, 2018.

6.2.3. Providing Technical Services

Technical services which were provided by KDU supported by international NGO's and government are shown in Table (6-8). The non-members received some of the services and missed some others. For instance, 14 numbers of cooperative members were trained breeding skill, whereas the number of non-members was 0. As well as, housing and cooperative training did not deliver to non-members. P-value (0.002) by conventional criteria, this difference was considered to be very statistically significant.

Based on the results, we have found that cooperative members have received more training which made them more skilled. Therefore, it is found that stably provided services in different fields for cooperative can be one of the strong points in case of improving their economic condition. Furthermore, the relationship between FAO and KDU could lead to introduce a complete value chain which covering the production, collection, processing, marketing of milk and dairy products. To produce high quality and quantity of milk on villages' level, it is important to provide stable technical services to small scale farmers.

Table 6-8: Services provided to milk producers

Milk producers (Farmers)		Cooperative member N=50		Total	Non-member N=50		Total	P-value
		Yes	No		Yes	No		
Services	Feeding	21	29	50	2	48	50	0.002
	Breeding	14	36	50	0	50	50	
	AI	21	29	50	14	36	50	
	Animal health	29	21	50	27	23	50	
	Housing	6	44	50	0	50	50	
	Cattle management	23	27	50	6	44	50	
	Cooperative training	1	49	50	0	50	50	

Source: Computed survey data, 2018.

6.3. Herd Size and Reproduction Performance of Cows

6.3.1. Herd Size

The number of herd size for cooperative members and non-members have presented in Table (6-9). It's indicating that 8% of cooperative members and 30% of non-members had 1 milking cow, steadily 62% and 58% of both groups had two milking cows, 30% of cooperative members and 12% of non-members had three milking cows. Total number of local and improved breed cows for members were 3.83 and for non-members

were 3.31. P-value (0.003) by conventional criteria this difference was considered to be very statistically significant.

This implied that slightly cooperative members had more herd size than non-members. The reason was that cooperative members had larger number of dairy cows was due to having higher income from their productions. According to FAO reports at the beginning of the IDS project farmers had 1 to 2 milking cows⁵³. Hence finding of this research showed that the number of cow for cooperative members have increased, even for some non-members. Meanwhile cooperative members have bigger herd size which can be attributed to an improvement in access to improved breeds and other animal veterinary services through KDU. Cooperative members had more improved breeds' cows, whereas most of non-members had local cow that cause to produce less milk compared to cooperative members.

Table 6-9: Number of milking cows during the last few years

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Number of milking cows	1 cow	4	8	15	30	0.003
	2 cows	31	62	29	58	
	3 cows	15	30	6	12	
Total		50	100	50	100	

Source: Computed survey data, 2018.

The number of cooperative members and non-members bought cow has shown in Table (6-10). Survey data implied that 82% and 40% of cooperative members and non-members bought new improved breed cows or calves. Hereon, 60% and 40% of cooperative members and non-members bought one cow in the last few years, whereas 22% of cooperative members bought two cows. The numbers of cows have bought by cooperative members and non-members p-value (0.010) was statistically significant. The

⁵³ FAO, Kabul office, 2018.

research found that cooperative members had better economic situation compared to non-members.

Table 6-10: # of cows cooperative members and non-members bought

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Did you buy cow	Yes	41	82	20	40	0.010
	No	9	18	30	60	
Total		50	100	50	100	
# of cows bought	1 cow	30	60	20	40	
	2 cows	11	22	0	0	
Total		41	82	20	80	

Source: Computed survey data, 2018.

Comparison of herd size before KDU membership and after between cooperative members and non-members describes in Table (6-11). The result of survey shows that in 2003 average cooperative members and non-members had 1.50 and 1.52 local cows. Hereon, p-value (0.935) by conventional criteria, the difference was considered to be not statistically significant. While number of improved breed cows' average for cooperative members and non-members were 2.33 and 1.79 in 2018. Furthermore, p-value (0.000) by conventional criteria, the difference was considered to be extremely statistically significant. Total numbers of both local and improved breed cows that cooperative members and non-members had were 3.83 cows and 3.31 cows, the p-value (0.003) indicated by conventional criteria the difference was considered to be very statistically significant.

Table 6-11: Comparison of herd size before KDU membership and after

Herds	Cooperative member N=50		Non-member N=50		P-value
	Frequency	Mean	Frequency	Mean	
2003 local cows	12	1.50	33	1.52	0.935
2018 breed cows	40	2.33	24	1.79	0.000
2018 local and breed cows	50	3.83	50	3.31	0.003

Source: Computed survey data, 2018.

6.3.2. Feeding Systems and Management

Provision of fodder, feeding system and cost of fodder are presented in Tables (6-12), (6-13) and (6-14). Table (6-12) indicated 100% of cooperative members used two methods (buy concentrated fodder from KDU and cultivate on their own field). Whereas 80% of non-members used the same method as cooperative members and 20% of other non-members just cultivate on their field. P-value (0.001) was statistically significant.

Finding of this research showed it seemed to be the reason that cooperative members had received training programs related to animal husbandry, better method cooperative members fed the animals compared to non-members. This could be one of the reasons of more milk production by cooperative members.

Table 6-12: Provision of fodder

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
How do you provide fodder to feed the animals	Cultivate (%)	0	0	10	20	0.001
	Buy (%)	0	0	0	0	
	Both (%)	50	100	40	80	
Total		50	100	50	100	

Source: Computed survey data, 2018.

Feeding systems of cooperative members and non-members explained in Table (6-13). Table (6-13) showed 88% and 82% of cooperative members and non-members used stall feeding, steadily 10% and 18% of both groups used grazing and stall feeding. While just 2% of cooperative members used only grazing. P-value (0.320) was not significant.

The research pointed, cooperative members have received certified seeds from FAO and cultivate on their own field, have access to both stall feeding and grazing methods, whereas non-members did not have access for such seeds.

Table 6-13: Feeding system

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Feeding system	Stall feeding	44	88	41	82	0.320
	Grazing	1	2	0	0	

	Both	5	10	9	18
Total		50	100	50	100

Source: Computed survey data, 2018.

Cost of fodder per cow daily is presented in Table (6-14). Table (6-14) indicated, 28% and 68% of cooperative members and non-members daily cost of fodder for one cow was more than 100 Afg. Steadily for 48% and 30% was 100 Afg and 22% and 2% of the two groups cost 70 Afg per day, while just 2% of cooperative members cost less than 50 Afg.

Average cost of fodder to feed a cow daily was 99.60 Afg for cooperative members and 113 Afg for non-members. P-value (0.000) by conventional criteria, this difference was considered to be extremely statistically significant. Finding of this research shows that lower cost of fodder for cooperative members suggested that KDU provided standard concentrated fodder for cooperative members in lower price than non-members. It's found in this research that cooperative members paid lower cost for fodder than non-members.

Table 6-14: Cost of fodder per/cow daily

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Feeding cost	< 50 (Afg)	1	2	0	0	
	70 (Afg)	11	22	1	2	
	100 (Afg)	24	48	15	30	
	> 100 (Afg)	14	28	34	68	
Total		50	100	50	100	
Average cost of fodder per cow daily						
		Count	Mean	Count	Mean	0.000
Fodder cost		50	99.60	50	113.00	

Source: Computed survey data, 2018.

6.3.3. Water Sources

Table (6-15) described water resources used by both cooperative members and non-members. This showed that 22% and 68% of cooperative members and non-members had access to river and stream water. Steadily 76% and 32% of both groups had access to piped water from the well while just 2% of cooperative members had access to boreholes. P-value (0.000) by conventional criteria, this difference was considered to be extremely statistically significant.

In addition, finding of this research implied that lack of access to enough water was a problem for farmers which might partly explain poor performance of dairy cows. Furthermore, cooperative had made an improvement in water availability and quality by ensuring that farmers had access to piped water from the well. Therefore, recent MAIL reported: Afghanistan faced draught in the last few years and this had caused in decrease of animal husbandry in some provinces⁵⁴. Limiting water availability to dairy cows lowered milk production, as in the survey farmers stated that: at least a cow need 5 liters water to produce 1 liter milk. Also quality of water had to be considered because poor water quality often contributed to low production as well as negatively affected health of milking cows.

Table 6-15: Sources of water supply

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
What resources do you use to provide water for the animal	River and stream	11	22	34	68	0.000
	Piped from well	38	76	16	32	
	Boreholes	1	2	0	0	
Total	50	100	50	100		

Source: Computed survey data, 2018.

6.3.4. Record Keeping

Milk production records keeping explained in Table (6-16). It's implying that 100% of cooperative members and 24% of non-members respectively had milk

⁵⁴ MAIL (2018) Afghanistan.

production records. The two-tailed p-value (0.000) by conventional criteria, this difference was considered to be extremely statistically significant.

KDU with cooperation and coordination of MAIL and FAO have procured record keeping book for cooperative members to make sound decisions, control production and reproductive performance of dairy cattle as well as help to determine their profit. While non-members did not keep records, it is difficult for them to control their activities.

Table 6-16: Milk production records keeping

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Records	Yes	50	100	14	28	0.000
	No	0	0	36	72	
Total		50	100	50	100	

Source; computed survey data, 2018.

6.4. Milk Production and Consumption

6.4.1. Average Milk Production per Cow Daily

Average milk production between cooperative members and non-members describes in Table (6-17). The analyzed survey data indicated that average milk production of local cow for cooperative members and non-members were 6.09 liters and 5.48 respectively. Whereas, improved breed cow was 9.93 liters and 7.58 respectively. Therefore, p-value (0.000) for local cow and p-value (0.000) improved breed cow by conventional criteria, these differences were considered to be extremely statistically significant. Hereon, it can be said that cooperative members produced higher milk compared to non-members and obtain higher income daily.

Table 6-17: Milk production per/day local cow and breed cow in 2018

Herds	Cooperative member N=50		Non-member N=50		P value
	Frequency	Mean	Frequency	Mean	
Local cows/liter	11	6.09	33	5.48	0.000
Breed cows/liter	40	9.93	24	7.58	0.000

Source: Computed survey data, 2018.

6.4.2. Family Milk Consumption

In this section Table (6-18) presented milk consumption by the household. The survey data show that, daily average milk consumption for cooperative members' and non-members were 2.02 and 1.72 liters. Therefore, consumed milk the p-value (0.003) indicated by conventional criteria, the difference was considered to be very statistically significant.

Hence this research found, higher milk production can be attributed through better access to services provided by the KDU and FAO to the farmers as shown in Table (6-8). Furthermore, higher amount of milk 1,363,515 in 2017 have sold to the market by KDU which had collected from cooperative members and some non-members. It can be said that, this is an indication that cooperatives have played a positive role in increase of milk marketed by cooperative members compared to non-members.

Table 6-18: Family milk consumption daily

	Cooperative member N=50		Non-member N=50		P-value
	Frequency	Mean	Frequency	Mean	
Family milk consumption	50	2.02	50	1.72	0.003

Source: Computed survey data, 2018.

6.4.3. Comparison Analysis on Effectiveness of Being Cooperative Member

This part describes milk production between cooperative members and non-members. Table (6-19) indicates that in 2003 both cooperative members and non-members daily produced average 2.92 and 3 liters milk. Average milk productions have increased to 8.98 liters for cooperative members and 7 liters for non-members per cow. Before KDU membership the p-value (0.436) by conventional criteria, this difference was considered to be not statistically significant. Whereas, p-value (0.000) by conventional criteria this difference is considered to be extremely statistically significant.

It can be thought that, the training programs related animal husbandry (breeding, animal health, feeding, cattle management, capacity building for farmers, and extensions

services) can be contributed in larger growth of milk production to the members. Overall, milk production per cow for non-members is less than cooperative members. Low milk productivity was a serious constraint among milk producers and there is a need for improvement of productivity in order to boost the availability of milk in the country.

Table 6-19: Comparison of average milk production per/day/liter at the beginning and now

Milk production	Cooperative member N=50		Non-member N=50		P-value
	Frequency	Mean	Frequency	Mean	
Before cooperative membership	50	2.92	50	3.00	0.436
After cooperative membership	50	8.98	50	7.00	0.000

Source: Computed survey data, 2018.

6.5. Benefits of Cooperative Participation

6.5.1. Milk Transportation

Milk transporting system has explained in Table (6-20). It shows that 100% of cooperative members transported their milk to MCC on foot close to their house. Steadily 24%, 26% and 50% of non-members transported milk to MCC, local market and to local middlemen by public transport, their own vehicles and on foot respectively. The two-tailed p-value (0.000) by conventional criteria, this difference was considered to be extremely statistically significant.

Table 6-20: Milk transportation to MCC

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
How do you transport the milk to MCC	public transport	0	0	12	24	0.000
	own transport	0	0	13	26	
	on foot	50	100	25	50	
Total		50	100	50	100	

Source: Computed survey data, 2018.

Result of survey data related to milk transportation to MCC, local market or to middlemen clearly showed that 100% of cooperative members had easy access to MCC and market compared to non-members. While non-members faced many challenges to transport milk to MCC, local market or middlemen. Milk transportation was one of the main problems for all farmers in the past. Whereas non-members face problem related to milk transportation. Therefore, KDU have created MCC in the villages for cooperative members. Cooperative members have access to MCC close to their house and even some of non-members. On the other hand establishing of cooperative and MCC provided marketing facility for cooperative members to have easy access for the current market. Even provide market to some non-members for encouraging them to become member.

6.5.2. Price Determination

Information related to milk market price described in Table (6-21). It indicated that for 100% of cooperative members' main source of milk market price was MCC. While for 36%, 44% and 20% of non-members source of market price information were MCC, farmers and village people respectively. MCC is confident source of market price information for milk to cooperative members. While for non-members it was differed and was one of the important problems. The two-tailed p-value (0.000) by conventional criteria, this difference was considered to be extremely statistically significant.

Regardless of the high demand of milk in the country for local dairy products, farmers are unable to get profitable prices for their milk. Because the government does not intervene in price setting in the dairy industry as well as doesn't even control dairy imports to protect local dairy products and support rural productions.

However cooperative members can sell at fixed prices that setup by cooperation of cooperatives representatives' and KDU, while non-members must sell at fluctuation prices throughout the year and set their own prices at the time of selling; however, at times they have to negotiate prices when selling to local middlemen, local shops or direct to consumers and this negotiation need for time. The marketing channel also has an influence on price determination. Farmers who sold through KDU, which were mostly cooperative members, received slightly higher prices for their milk.

Therefore, in 2006 the Livestock Business Report calculates the price a farmer receives for the milk 9.45 Afs/kg. This is much lower than what farmers receive from the

FAO supported dairies that pay average prices of 13 Afg/kg raw milk. KDU pays an average price of 13 Afs/liter (\$ 0, 26) to the suppliers, while the Balkh dairy in Mazar paid an average price of 12 Afs/liter⁵⁵.

Table 6-21:Source of market information

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Price information for milk	MCC	50	100	18	36	0.000
	Farmers	0	0	22	44	
	Village people	0	0	10	20	
	TV & Radio	0	0	0	0	
	News	0	0	0	0	
Total		50	100	50	100	

Source: Computed survey data, 2018.

6.5.3. Manure as a Source of Income

Table (6-22) described about manure usage between cooperative members and non-members. It showed that 74% and 100% of cooperative members and non-members used manure for three purposes (sell, fuel and fertilizer), while just 4% of cooperative members' used manure as fertilizer and the other 8% as fuel. The two-tailed p-value manure use as source of (fertilizer, sell and fuel) equals (0.820) by conventional criteria, this difference was considered to be not statistically significant.

The survey data indicate that 20% and 14% of cooperative members and non-members gained more than 1000 Afg in average per month, steadily 38% and 70% of both groups received 1000 Afg from selling manure, 28% and 16% of cooperative members and non-members obtained 800 Afg monthly from manure. Just 14% of cooperative members received less than 500 Afg from manure. Selling of manure for

⁵⁵ Bonnier (2007), Dairy Production and Processing in Afghanistan, MAIL, HLP, p.8, 22.

getting better income the two-tailed p-value equals (0.032) by conventional criteria, this difference was considered to be statistically significant.

Table 6-22: Animal manure usage

Milk producers (Farmers)		Cooperative member N=50		Non-member N=50		P-value
		Count	(%)	Count	(%)	
Manure usage	Fertilizer (1)	2	4	0	0	0.820
	Sell (2)	4	8	0	0	
	Fuel (3)	0	0	0	0	
	1,2,3	37	74	50	100	
	1,2	7	14	0	0	
Total		50	100	50	100	
Manure sell	< 500 (Afg)	7	14	0	0	0.032
	800 (Afg)	14	28	8	16	
	1000 (Afg)	19	38	35	70	
	> 1000 (Afg)	10	20	7	14	
Total		50	100	50	100	

Source: Computed survey data, 2018.

This research showed that manure was good source of income for cooperative members and non-members as well as manure as source of fertilizer and fuel in the surveyed area. Katawazy stated; Cows dung is currently collected and used for many different purposes, currently sold at 6000 Afg (84 US \$) per ton and if it process the price rise much higher⁵⁶.

6.5.4. Comparative Analysis and Changes between the Members and Non-members

Table (6-23) describes the comparison between cooperative members and non-members. It's indicated that KDU members' dairy income per day was 476 Afg (6.8 US\$) on average, while the non-members' income was 262 Afg (3.7 US\$) on average in 2018. The p-value (0.000) by conventional criteria, the difference was considered to be extremely statistically significant. The members earned near twice larger than the non-members. Such difference was mainly caused by larger number of keeping cows, higher proportion of bred cows in total keeping cow, larger amount of produced milk per cow

⁵⁶ Katawazy (2013), Investment opportunities in Afghan Dairy and Livestock, P.23.

and cost of fodder. The cost of fodder per one cow for cooperative members were 99.60 Afg and for non-members 113.

Table 6-23: The differences of dairy performance between the members and non-members

			Members	Non-members
Net dairy farming income per day	Afg		476	262
Daily milk production	Liter		32	21.6
Number of keeping cows	Local cows	Head	1.5	1.5
	Bred cows	Head	2.3	1.8
	Total	Head	3.8	3.3
Daily milk production per cow	Liter		8.4	6.5
Percentage of farmers using concentrated fodders more than 50%		%	33	20
Percentage of farmers who keeping production records		%	100	28

Source: Computed survey data, 2018.

Furthermore, the change between the two groups is described in Table (6-24). There were no significant differences in these factors before KDU had established. KDU seemed to contribute to improvement of the members' dairy farming practice. The provision of bred cows, concentrated fodder and technical training are thought to be important factors for the improvement.

Table 6-24: The changes in milk production

Cows type and milk production	(Head, Liter)			
	Members		Non-members	
	2002	2017	2002	2017
Number of keeping local cows	1.2	1.5	1.1	1.5
Number of keeping bred cows	—	2.3	—	1.8
Number of keeping total cows	1.2	3.8	1.1	3.3
Daily milk production per local cow	2.9	6.0	3.0	5.4
Daily milk production per bred cow	—	9.9	—	7.5

Total daily milk production	3.5	32.0	3.4	21.6
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Source: Computed survey data, 2018.

6.6. Milk Production and Marketing Problems Statement of Cooperative Members and Non-members

In the survey in Ibrahim Khel village, both of cooperative members and non-members stated: that they are small farmers and faced many challenges related to milk production and dairy marketing for instance, lack of loan for buying production inputs and lack/inadequate of transportation facilities for products (rent is high). As shown Tables (6-25) and (6-26), the problems divided in three categories (most important, somewhat important and not important) that cooperative members and non-members mentioned in the area.

Table 6-25: Main problems of milk production

No	The main problems of milk and dairy production	1= Most important		2 = Somewhat important		3 = Not important	
		Member	Non-member	Member	Non-member	Member	Non-member
1	Existence of animal diseases	24	18	25	32	1	0
2	Inadequate of animal feed (straw, clover, concentrate and etc.)	12	20	38	30	0	0
3	Lack of loan for buying production inputs	16	25	34	25	0	0
4	High price of animal feed	23	29	26	21	1	0
5	Lack/Inadequate of trainings regarding farm management	32	30	18	20	0	0
6	Inadequate vaccination and medicine for animals	31	31	19	19	0	0

7	Inadequate artificial insemination	25	28	25	22	0	0
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Source: Computed survey data, 2018.

Table 6-26: Main problems of milk and dairy marketing

No.	The main problems of milk and dairy marketing	1= Most important		2 = Somewhat important		3 = Not important	
		Member	Non-member	Member	Non-member	Member	Non-member
1	Inadequate domestic market for milk and dairy products	21	33	28	17	1	0
2	Lack of credit for marketing of milk and dairy products	11	31	39	19	0	0
3	Lack of cold storages for milk and dairy products in village	20	35	30	15	0	0
4	Lack/inadequate of transportation facilities for products (rent is high)	24	33	26	17	0	0
5	Weak bargaining power of farmers in different markets	29	31	20	19	1	0
6	Lack of training for processing of milk and dairy product	26	36	24	14	0	0

7	Lack or inadequate of (bucket, other) for milk collection in cheap price	22	41	28	9	0	0
8	Cheap milk price received by farmers	22	45	27	5	1	0

Source: Computed survey data, 2018.

Chapter 7

Conclusion

Afghanistan is landlocked country and depends on agriculture. More than half of the population is engaged in agriculture practices and get their livelihood income from agriculture-related activities. Therefore, agriculture development is important and play essential role in rural development as well as play significant role in national economy. Animal husbandry is the sub-sector of agriculture based on international reports such as FAO 2011, 2012 most people in rural area had 1 or 2 cows. Farmers in rural area produce milk, at the first step use for family consumption and the remaining sell to market. According to the survey data numbers of cattle have increased in surveyed area to 2 or 3 cows each farmer. This was the reason of supporting government and FAO through IDS project. The project was efficient for farmers, increased milk production and gained regular income.

Agriculture in developing country have played development role in rural area such as India and Bangladesh. Milk production through dairy cooperatives had positive impact on rural livelihood and income in developing countries. In developing countries small farmers live in remote rural area. By creation of dairy cooperative they can join from rural to urban markets, this causes farmers easily access to input and output supply. IFAD reported: that in India Amul started with 2 village societies and 247 liters of milk collected per day. The movement grew and, in 1973, the Gujarat Cooperative Milk Marketing Federation (GCMMF) was established, an apex organization responsible for marketing the milk and milk products of cooperative unions in the state of Gujarat. In the

'80s the word Amul was converted into a brand. Currently, in the state of Gujarat, Amul produces 10.16 million liters of milk daily, which is collected from 2.7 million farmers, processed through 30 dairy plants, and distributed through 500,000 retail outlets. The annual sales turnover has reached USD 1,504 million (2008-2009)⁵⁷. Therefore, dairy cooperatives are the organizations that can provide better situation for milk collection, procession, marketing, in total increases milk production and farmers income.

Dairy production is continually source of income for small farmers in rural area through dairy cooperatives. But low education level in rural, lack of standard roads from rural to the urban cities, lack of credit organizations, lack of professional staffs in DACD in the center Kabul and other provinces are the limitations for cooperative development in Afghanistan. Therefore, dairy cooperatives under KDU structure have the function of facilitator such as:

- Milk collection in rural area.
- Provision of inputs supply such as fodder and technical services to farmers by cooperation and coordination of KDU.
- Launch training programs for farmers.
- Submission of milk cost from KDU and payback to each individual farmer.
- Arranging annual meeting and other meetings of cooperative in case of need.

A survey was conducted in February and March 2018 in Kabul for data collection from KDU and farmers in Wardak province of Afghanistan. The research was done to show the effect of KDU (dairy cooperatives) in increasing milk production and as well as their income. In the survey 100 small farmers (50 cooperative members and 50 non-members) was selected randomly and interviewed through using questionnaire. Data on their milk production, marketing and income was collected and analyzed by SPSS and Prism Graphpad (<https://www.graphpad.com/quickcalcs/ttest1.cfm>).

1. Household Characteristics

⁵⁷ IFAD, (2010) <http://seasofchange.net/wp/wp-content/uploads/2015/07/Case-study-4-IFAD-dairy-Indiadocx1.pdf>, accessed June/2/2018

It therefore found that, factors such age of the households head is very important when it comes to decision making. Because older farmers have more experience than younger farmers, younger farmers are less experienced. Many decisions hold in the household level influence the welfare of the individuals living in the household and the society. As well as it can be said that more educated numbers in cooperative were the key for success in their operation based on our survey results. Educated members of the cooperative have the significant role in management of cooperative and are adoptable in accepting of new technologies.

In developing countries family members commonly work as labor. Therefore, hired labor is not required for dairy activities meanwhile hired labor is costly for small scale farmers because it results in higher costs of production. Consequently the important point is that cooperative members had higher number of full time worker in family size compared to non-members.

In Afghanistan having of land is the sign of power for the society people mostly in rural area. Considering to the result it can be said that there was no much differences in land size for both. Land is the most important asset for both groups and have important role in providing green hay for the animals.

Also result founded that livestock was the main occupation of the cooperative members and non-members, which stood as the main source of income. This is because the situation for rising cattle was suitable compare to farming.

2. Milk Marketing Channel and Technical Services

For majority of cooperative members and non-members cause of milk marketing was obtaining of regular income from milk production. Before the establishment of KDU farmers were faced with difficulties in milk marketing important point is that, establishment of stable market for milk selling through KDU was very significant. Provision of market have benefited for cooperative members and as well as some non-members to avoid milk spoilage. Therefore, it is found that stably provided services in different fields for cooperative can be one of the strong points in case of improving their economic condition. Furthermore, KDU could lead to introduce a complete value chain which covering the production, collection, processing, marketing of milk and dairy

products. To produce high quality and quantity of milk on villages' level its need to provide stable technical services to small scale farmers.

3. Number of Milking Cows and Milk Production Performance

Finding of this research show that the numbers of cow for cooperative members have increased, even some non-members received benefit indirectly. Cooperative members have bigger herd size which can be attributed to an improvement in access to improved breed cows and other animal veterinary services through KDU. For this reason cooperative members had better economic situation compared to non-members. Further it can be said that cooperative is not only create economic benefits for members but also as social group which improves social networks among rural farmers.

Training programs related to animal husbandry for cooperative members caused to fed better the animals compared to non-members. This could be one of the reasons of more milk production by cooperative members as well as provision of fodder is the other important part to feed animals. Finding of this research is that lower cost of fodder for cooperative members is this, KDU provide standard concentrated fodder for cooperative members in lower price compared to non-members.

In addition, lack of access to enough water was the other problem for farmers which might partly explain poor performance of dairy cows. Furthermore, cooperative had made an improvement to water availability and quality by ensuring that farmers had access to piped water from the well.

Furthermore, record keeping for cooperative members were important to make sound decisions, control production and reproductive performance of dairy cattle as well as help to determine profit made that KDU have provided Record Keeping Book. While non-members did not keep records, it was difficult for them to control their activities.

4. Milk Production and Consumption

Cooperative members produce higher milk compared to non-members and obtain higher income daily. This is an indication that cooperative members consume more milk compare to non-members. The training programs related animal husbandry (breeding, animal health, feeding, cattle management, capacity building for farmers, and extensions services) can be attributed cooperative members produce higher liters of milk. Overall, milk production per cow for non-members was less than cooperative members. Low milk

productivity was a serious constraint among farmers and there is a need for improvement of productivity in order to boost the availability of milk in the country.

5. Benefits of Cooperative Participation

Transportation was one of the main problems for cooperative members in the past. Whereas still non-members face problem related to milk transportation. Therefore, KDU have created MCC in the villages for cooperative members. On the other hand establishing of cooperative and MCC provide marketing facility for cooperative members to have easy access for the current market. The marketing channel used also has influence on price determination. Farmers who sold through KDU, which in this case were mostly cooperative members, received slightly higher prices for their milk. Furthermore, this research show that manure was good source of income for cooperative members and non-members as well as manure as source of fertilizer and fuel in the surveyed area.

Cooperative members received nearly twice larger income compared to non-members. The important point is this increasing income of cooperative members has encouraged other village farmers to get KDU membership. Such difference was mainly caused by larger number of keeping cows, higher proportion of improved bred cows in total keeping cow, larger amount of produced milk per cow and cost of fodder that for cooperative members per one cow cost of fodder were 99.60 Afg, while for non-members it was 113, this was significant for cooperative members. KDU seemed to contribute to improvement of the members' dairy farming practice. The provision of technical services, concentrated fodder and trainings thought KDU were the important factors for the improvement.

Summary

For making clear the effect of KDU, the comparative analysis between the members and non-members of KDU was conducted by the farmers' survey data. The members' dairy income per day was 476 Afg (6.8 US\$) on average, while the non-members' income was 262 Afg (3.7 US\$) on average in 2018. The members earned near twice larger than the non-members. Such difference was mainly caused by larger number of keeping cows, higher proportion of improved bred cows in total keeping cow, and larger amount of produced milk per cow.

There were no significant differences in these factors before KDU had established. KDU seemed to contribute to improvement of the members' animal husbandry practices. The provision of improved bred cows, concentrated fodder and technical training are thought to be important factors for the improvement.

KDU which is the most successful agriculture cooperatives in Afghanistan seems to play the important role for improvement of farmers' economy by joint marketing and technical support. Development of agricultural cooperatives can be thought effective policy for improvement of farmers' economy in Afghanistan. But most of cooperatives haven't gone well, though a large number of cooperatives had established since 2003. The important issue for development in agricultural cooperatives is to spread the effective systems and management of cooperatives which contribute to improvement in farmers' economy.

In addition creation of 35 different positions as permanent job for KDU staffs as well as 17 people working part time as milk collators. The payment is done by farmers 2 Afg per liter of milk. According to the data provided by FAO, 314,014 Afg or 4,225 US \$ (1 US \$ = 71.5 Afg) is the total salary per month for the KDU staffs. Providing job opportunities with stable salary by KDU is a significant achievement in case of poverty in the Afghanistan. On the other hand, the incomes for the KDU have been increasing since 2011 to 2017 from 4,096,289 to about 10,066,190 Afg.

Recommendations

In order to tackle the main constraints of dairy cooperatives identified during the survey study, improve marketing of cooperative members in surveyed area through dairy cooperatives and in whole Afghanistan, the following recommendations have been made.

The IDS project was one of the successful projects which has been implemented in the surveyed area and had achievements. Therefore, the stakeholders (FAO, MAIL, DACD and other related organizations) must implement this model in whole Afghanistan and should think of better to improve milk production and marketing by technical supporting small farmers in rural area and connect them to urban market. Hence, to support farmers MAIL must launch training programs, provide input and output supply to small farmers.

Moreover DACD and MAIL with cooperation and coordination of each other must implement agriculture development programs through cooperatives. The mentioned organizations must ask NGO's and donor countries to do their agriculture programs through cooperatives which will cause stable development in rural economic through agriculture development. It must be mentioned that in most developing countries government and non-government organizations support farmers through cooperatives. The government must recommend formation of cooperatives in different levels and support them. One of agriculture cooperative aim is to increase efficiency of agriculture marketing system and transfer the products from rural to urban. Moreover cooperatives can play an important role to enhance newer innovation approaches to production, technology transfer, input supply, credit and output marketing, information generating and utilization continuum.

Further farmers are scattered in remote areas and produce milk. MAIL with cooperation of DACD and other MAIL directorates must establish dairy cooperatives and arrange village farmers in agriculture cooperatives to access market, inputs supply and other animal husbandry services. This could be more advantageous and supportive for farmers' economic situation than individual farmers.

Policy Recommendations

Marketing of milk in rural is the most important problem, hence MAIL and DACD must organize committee from governmental organization and sign contracts among cooperatives and the government organizations (hospitals, military bases, police bases, schools and so on) to buy rural agriculture products than imported. This will encourage farmers to produce more native products and support rural economic as well as national economic. Small scale farmers are receiving low price for their products, which is attributed to the prevailing marketing system in the country. This discourages investments in milk production and quality improvement. Therefore, there is a need for a pricing policy improvement which will incentivize farmers to produce and sell more as well as invest in quality improvement.

Regardless the high demands of milk in the country for local dairy products, farmers are unable to get profitable prices for their milk. Because the government does not intervene in price setting in the dairy industry as well as doesn't even control dairy

imports to protect local dairy products and support rural productions. However cooperative members sell at fixed prices that setup by cooperation of cooperatives representatives' and KDU while non-members sell at fluctuation prices throughout the year and set their own prices at the time of selling; however, at times they have to negotiate prices when selling to local middlemen, local shops or direct to consumers and this negotiation need for time.

Cooperatives have smaller membership base and they aren't effective in promoting dairy production and marketing of small milk producers. Therefore, complementary institutions need to be designed to address the specific needs of the small farmers. This will motivate more farmers to join cooperatives and hence improve their membership base.

Recommendations for Further Research

The study on the effect of dairy cooperatives (KDU) about small scale milk producers and marketing was undertaken only in Ibrahim Khel village, which may not be representative of dairy cooperatives in the whole country. Therefore, it is suggested that similar study be undertaken in other parts of Afghanistan.

Due to limited time and funding allocated for undertaking the study, the performance of cooperatives could not be studied with more details. Therefore, it is also suggested that a study on the performance of cooperatives be undertaken in the country in order to focus on development programs of cooperatives in specific areas. This will also enable the identification of success factors to enable replication of successful cooperatives.

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Appendices

Questionnaire for KDU members and non-members (farmers)

1. Personal information of the farmer

1. Name ()
2. Gender of farmer 1. Male 2. Female
3. Age (year) 1. <30 2. 30-40 3. 41-50 4. 51-60 5. > 60
4. Education level 1. No formal education 2. Primary education
3. Secondary education 4. Tertiary education 5. Higher education
5. Main occupation 1. Livestock 2. Farming
6. Experience in animal husbandry and farming (years).
1. <5 2. 5 -10 3. > 10

2. Household characteristics

- 7, Family size. 1. 4 people 2. 6 people 3. > 6 people
- 8, Full-time family workers engaging in animal husbandry.
1. 1 people 2. 2 people 3. 3 people
9. Part-time family workers engaging in animal husbandry.
1. 1 people 2. 2 people 3. 3 people
10. Monthly average household expenditure 1. 8000 Afg 2. 9000 Afg
3. 10000 - 12000 Afg 4. 15000 Afg 5. > 15000 Afg

3. Main source of household income

- 11, Which one has more income? 1. Livestock 2. Farming
- 12, Please tell me about your farm size?
1. < 1 Hectare 2. 1 Hectare 3. > 1Hectare 4. No land
13. Who do the activities feeding, cleaning and animal curing?
1. Family members 2. Hired labor
14. What were the major sources of income of your family during last year?
1. Dairy 2. Other agricultural activities 3. Off farm employment

4. Remittances

5. Pension

6. Grant, gift and.....

4. Livestock economy

- How many animals did you have for production and for working in your farm during last years?

No.	Animal	Number of animals			Revenue per animal or value of work of one animal during last year (Afg)	Income per animal (Afg)
		Cross breed	Local breed	Total		
15	Milking					
16	Dry cow					
17	Ox					
18	Calf					
19	Donkey					
Total						

5. Dairy production, consumption and marketing from (February 20, 2017-February21, 2018)

20. Milk production / 1. 200 liters 2. 250 liters 3. 300 liters

Milking Cow	Cow number (head/farm)	Milk yield (liter/cow/day)	Lactation period (month)	Consumption (liter/day/family)	Surplus milk for market (liter/day)	Milk price (Afg/liter)	Total revenue of dairy farm (Afg/day)
Local							
Cross							

21. How do you provide fodder to feed the animals?

1, Purchase 2. Cultivate 3. Both

22. Percentage of hay from field feed one cow?

1, < 40 % 2. 5 3. > 50

23. Percentage of concentrate fodder feed one cow?

1, < 40 % 2. 50% 3. > 50

24. Average cost of fodder and hay feed per/day for one cow?

1, < 50 Afg 2. 70 Afg 3. 100 Afg 4. > 100 Afg

25. Which kind of feeding system do you use?

1, Stall feeding 2. Grazing 3. Both 4. Others...

26. Liters of milk a cow produced per/day at the inception of IDS project?
 1, < 2 Liters 2. 3 Liters 3. 4 Liters 4. 5 Liters
27. Liters of milk a cow produce now?
 1, 3 Liters 2. 4 Liters 3. 5-8Liters 4. 10 Liters
28. Average liter of milk consumed by the family?
 1, 1 Liter 2. 2 Liters 3. 3 Liters 4. > 3 Liters
29. To whom do you sell the milk?
 1, MCC 2. Direct to consumer 3. Middleman 4. Local market 5. KDU
30. Which one is better for selling of milk?
 1, MCC 2. Direct to consumer 3. Middleman 4. Local market 5. KDU
31. Average liter of milk sell to the market?
 1, > 5 Liters 2. 5 Liters 3. 6-8 Liters 4. > 8 Liters
32. What motivated you to sell milk through this union?
 1, MCC in village 2. Regular income 3. Need for income to feed family
33. Did you buy any kind of cows after membership or joining in KDU?
 1, Yes 2. No
34. If yes, please tell the number of cows you bought?
 1, 1cow 2. 2 cows 3. 3 cows 4. > 3 cows
35. Average daily net income from milk selling?
 1, < 100Afg 2. 100Afg 3. 150Afg 4. 200Afg 5. > 200 Afg
36. How do you deal with spoiled milk?
 1, Use for home consumption 2. Feed to calves 3, Use to make sour milk 4. Garbage
37. What is the source of market price information for milk?
 1, MCC 2. Farmer 3. Village people 4. TV or Radio 5. News paper
38. How do you transport the milk to MCC?
 1, Public transport 2. Own transport 3. Hiring 4. On foot
39. Do you have milk production records?
 1, Yes 2. No
40. What purpose do you use animal manure?
 1, Fuel 2. Fertilizer 3. Sell 4. 1, 2, 3 5. 1, 2
41. If sell, how much average income gain per month?
 1, < 500 Afg 2. 800 Afg 3. 1000 Afg 4. > 1000 Afg
42. Do you incur milk losses?

1, Yes

2. No

43. If yes, how much losses per/month?

1, 2 Liters

2. 3 Liters

3. 4 Liters

4. 5 Liters

44. What resources do you use to provide water for the animal?

1, River and stream

2. Piped from well

3. Boreholes

4. 1&2

45. Milk production cost per cow during last year (one lactation period)

1, 3000 Afg

2. 3500 Afg

3. 4000 Afg

Production input	Local breed cow				Cross breed cow			
	Amount	Unit	Price (Afg/unit)	Total price (Afg)	Amount	Unit	Price (Afg/unit)	Total price
Concentrate (animal feed)								
Artificial Insemination								
Vaccination								
Medic. & animal health								
Total cost								

46. Number of milking cows during the last few years

1, 1 cow

2. 2 cows

3. 3 cows

Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Local																
Cross																
Total																

6. Marketing channels of milk and dairy products

47. During last year to whom you sold your milk and dairy products?

Marketing channel	Milk (%)	Prices received by farmer (Afg/liter)	Dairy products (%)	Prices received by farmer (Afg/kg)
To MCC				
To local traders and				
To wholesalers				
To retail shops				
Direct to consumer	In Kabul city			
	In village or			
	To ice cream			

To ice cream					
To restaurant					

7. Main problems of milk production and marketing

- What are your main problems of milk production? Please check mark

(✓) Ranks as follow: 1. Most important 2. Somewhat important 3. Not important

No.	The main problems of milk and dairy production	1	2	3
48	Existence of animal diseases			
49	Inadequate of animal feed (straw, clover, concentrate and etc.)			
50	Lack of loan for buying production inputs			
51	High price of animal feed			
52	Lack/Inadequate of trainings regarding farm management			
53	Inadequate vaccination and medicine for animals			
54	Inadequate artificial insemination			

- What are your main problems of milk and dairy marketing? Please check mark

(✓) Ranks as follow: 1. Most important 2. Somewhat important 3. Not important

No.	The main problems of milk and dairy marketing	1	2	3
55	Inadequate domestic market for milk and dairy products			
56	Lack of credit for marketing of milk and dairy products			
57	Lack of cold storages for milk and dairy products in village			
58	Lack/inadequate of transportation facilities for products (rent is high)			
59	Weak bargaining power of farmers in different markets			
60	Lack of training for processing of milk and dairy product			
61	Lack or inadequate of (bucket, other) for milk collection in cheap price			
62	Cheap milk price received by farmers			

8. Training, education and advisory services for farmers

63. Have you ever participated on dairy production and marketing related training or advisory courses during the last years? 1, Feeding 2. Breeding 3. AI

4. Animal health 5. Housing 6. Cattle Management 7. About cooperative

64. If Q.1 is yes, please name the organization.

1. MIAL

2. FAO

3. NGO's

4. 1,2

9. Government and international grants and subsidies for farmers

65. During last year did you receive any subsidy and grant either from government or international organizations and NGOs?

1, Yes

2. No

66. If Q.1 yes, from which organization

1, MAIL

2. FAO

3. International NGO's

4. PRT

5. Other....

67. Kind of subsidy and grant: 1. concentrate (animal feeds) 2. AI 3. Vaccination

4. Medication and animal health services 5. Fertilizers 6. Improved seeds

7. Processing machineries 8. Establishing cattle housing 9. Buckets for milk collection,

No.	Name of organization	Kind of subsidy		Kind of grant	
		Item	Low price from market rate at (%)	Item	Value (Afg)
1					
2					
3					
4					
5					
6					
7					
8					
9					

10. Farmer and cooperative

68. Do you have local cooperative membership? 1. Yes 2. No

- If Q.1 no, what are the main reasons? Please check mark (✓): Multiple responses possible

No.	Item	Check mark
69	Negative perception of farmer regarding cooperatives	
70	Social insecurity	
71	Cooperative is under control of Malaks, Khans, commanders and landlords	
72	Cooperative does not have any effect on farm income	
73	Government uses cooperatives for employing their policies	
74	I do not believe on cooperative's director and board directors	

75	I have association membership and do not need to get cooperative membership	
76	The cooperative's director did not accept my application	

Note: After this point the questionnaire is only for farmer who has cooperative membership (for both case studies).

- If Q.1 yes, what are the main reasons for getting cooperative membership? Please check mark (✓):

Multiple responses possible.

No.	Item	Check mark
77	Preparing agricultural production inputs at low prices	
78	Providing a certain market for farmers' products	
79	A good source for getting international donor and government subsidies and grants	
80	Cooperative has effect on unity of the communities	
81	Cooperative can save farmers from exploitation	

82. How much do you think that cooperative has contributed in increasing your farm income?

- 1, Substantial increased 2. Moderate increased 3. A little increased 4. Not changed
5. Decreased

83. Are you satisfied with the activities or services which have been provided by cooperative?

- 1, Satisfied 2. Fairly satisfied 3. Not satisfied

- What are the main problems and obstacles that the cooperative faces nowadays? Please check mark, Ranks as follow:

- 1, Most important 2. Somewhat important 3. Not important

No.	Problem and obstacle	1	2	3
84	Insufficiency budget and finance necessary to the activities of the cooperative			
85	Inadequate production inputs (seeds, fertilizers, agrochemicals, animal feed, AI)			
86	Inadequate physical assets (machines, tractors, warehouses, vehicles, cold storages)			
87	Poor management of the cooperative			
88	Inadequate credit necessary for farmers			
89	lack of training programs for farmers			
90	Inadequate supporting from government			

91	Inadequate supporting from donors and international organizations			
92	Lack of rational policy and programs for rural development			
93	Lack of marketing information on local and international levels			

- Farmer attitude towards the dairy cooperative: do you agree on the following statements? Please check mark:

1, Agree

2. Fairly agree

3. Disagree

No.	Statement	Farmer's opinion		
		1	2	3
94	Most members of the cooperative are in a good relation with the cooperative manager, employees and board directors			
95	The cooperative supplies its services for all farmers who have the cooperative membership			
96	The cooperative supplies agricultural production inputs at reasonable prices for farmers			
97	The cooperative supplies agricultural production inputs on suitable time for farmers			
98	Some of the cooperatives activities are exclusively provided to board directors, their relatives and friends			
99	Cooperative cannot solve dairy problems of farmers on time			
100	The production inputs provided by private Ag. companies and traders are better and cheaper than those provided by the cooperative nowadays			

6- Farmer suggestions for development of dairy cooperative

What are your suggestions for development of dairy cooperative? Please explain:

No.	Suggestion	No.	Suggestion
1		3	
2		4	

5		6	
---	--	---	--

End: Bundle of thanks for your kind responses and cooperation.