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Problems Faced By Small Scale Farmers In The Dairy Sector Pakistan

- A case study of Punjab province

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- A case study of Punjab province**

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Khwaja Tariq Ziad

Abstract

The contribution of livestock in economic development of a country is vital. Pakistan is blessed with abundant natural resources, especially vast agricultural resources on account of its fertile irrigated land, four seasons and glorious history of old traditions of farming. The iron of the fact is livestock contributes almost 11 percent to GDP and 50 percent to the value addition in agriculture in Pakistan.

Pakistan is ranked as the 4th world's largest milk producer, where formal channels of marketing processed only 3 to 4 percent of milk, while the rest stretched to the consumers through unhygienic control and complex distribution system of middlemen.

The study is designed to analyze the consequences of participation in informal and formal supply chains for small-scale dairy farmers in Pakistan. The study aimed at explaining the costs of the chosen formal versus informal supply channels and their transaction costs, role of the mid-agent opportunistic behaviour in the relative milk supply chain.

The research is based on qualitative approach which includes: interviews and case studies with the aim to understand social aspects and seeks to find answers regarding various questions as how people behave. It is more about their behaviour and attitudes and how they are affected by different events that goes on their surroundings. Theoretical framework of present study consists of general understanding about the various issues related to small scale farmers with particular focus on transaction cost and agency theory. Different studies were reviewed for the deeper understanding of socio economic condition of the small farmer's and its characteristics.

The study shows a lack of coordination among small scale farmers, and associated high transaction costs. The case studies suggest that small scale farmers are illiterate and not properly trained. The way they handle and produce milk shows the dominance of informal mid-chain agents, where producers face high uncertainty caused by the opportunistic behaviour of middlemen.

Abbreviations

CF	Commercial Farmer
DDO	Dairy Development Officer
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
UHT	Ultra High Temperature
MDO	Milk Development Officer
MTO	Mobile Testing Service
PF	Progressive Farmer
SLU	Swedish University of Agricultural Sciences
SNF	Solid Not Fat
TCE	Transaction Cost Economics
TS	Total Solid
TST	Total Solid Test

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1 Introduction

Pakistan annual production of milk is about 33 billion liters and stood fourth among milk producing economy of the world (Fakhar and Law Walker, 2006). Out of the total milk production 97 percent is brought to consumers through informal channels, with little control on hygienic conditions and milk quality. The reason behind this situation is that a massive number of farmers are lacking connection to formal markets. Dairy farming practices in the country are very primitive and traditional. Lack of advisory services, poor infrastructure, general negligence by the government of the dairy sector and specifically small scale farmers are the key issues at present in the country like Pakistan (Hemme and Otte, 2010).

Milking animals are poorly organized and mostly their milk production and marketing activities are largely carried out in isolation from one another. It has been stated that 33 percent of total milk is sold to urban families and related industries. The formal channel of marketing comprised only three to five percent in the country. The formal channels are processing only three percent of the total milk, while the rest of the milk is processed through informal chain of marketing (Zia, 2006). For small farmers in Pakistan, these poorly developed market channels may be inhibiting the development of their milk production and farm business.

1.1 Background

Punjab is one of the major producer of milk in Pakistan, where small scale farmers and landless farmers produces a huge amount of total milk production (Hemme and Otte, 2010). Punjab Province contributes 70 percent to the total milk supply in the country (Burki and Khan, 2008). Dairy industry in Pakistan is dominated by small scale dairy farmers who keep three to five milking animals, in the rural areas. These farmers are not organised and consequently rely on the middle men (*Gawala* or local *Dhodhi*). In addition, the farmers are not in a position to bargain with large companies in Pakistan like Nestle and Haleeb. A small portion of total milk supply is processed through formal channels. Therefore, in the complex system of collection and distribution milk, little quantity produced by the small farmers is processed by the large commercial enterprises.

At the same time, it is estimated that demand is growing at seven percent annually and supply is only increasing at a half rate. The country is also importing a huge amount of powdered milk every year (Zia, 2006).

1.2 Problem, aim and research questions

Small scale dairy farmers in Pakistan are generally located in rural areas, whereas the consumer markets are in urban areas. Under such conditions, two general approaches to solving the problem of collection, eventual processing and delivery of milk is evolved. The milk marketing channels in the country can be classified into two categories. On the one hand, there are informal dairy supply chain with multiple intermediary independent actors fulfil the supply chains. While, on the other hand, there are formal supply chains, where the large corporate actors coordinate and controls the supply chain functions. It has been noted that, the informal supply chains consisting of various agents are suffering from low milk productivity, little hygienic control and distribution inefficiency. Whereas the formal supply chains are claimed to be more efficient in production and quality control (Burki, Khan and Bari, 2004).

The internal production, processing, marketing and distribution channels are the key issues which need to be examined and analysed in case of Pakistan. The scope of the work is to look into the problems and issues associated with the milk supply chains in Pakistan.

1.2.1 Aim

The aim in this study is to develop understanding of the consequences of participating in informal supply chains versus formal supply chains for small-scale dairy farmers in Pakistan.

1.2.2 Research Question

What are the consequences of participating in formal supply chain versus informal supply chains for small scale dairy farmers in Pakistan?

1.3 Limitations

The present study is limited to small scale farmers, and due to the resource limitations of the study, the empirical focus has been limited the Punjab region, the most populated and high milk producing province of the country.

The case study is limited to dairy farming practicing to rural and peri urban farmers which do not cover all the districts of Punjab province. Cultural rigidity was the major factor which exclude female as participants in this study. The respondents hardly shared the information regarding females, especially information about women working in the dairy fields.

Most of the respondents were either illiterate or less educated, for the researcher it was difficult to educate the small farmers regarding the theoretical perspective of this research project. According to Murthy (2009) during the course of conducting social survey, where data has been collected from the traders, farmers and different wage earners may not reveal their business secrets which also placed certain limitations. In current study, being a less developed in nature, people of Punjab were rigid and they were reluctant to share their business secrets.

The study is limited to Punjab province only, it is only sharing the information about the rural and peri-urban areas of the country and it was not possible to conduct interviews in the whole country due to limited resources and time constraint.

2 Methodology of the Study

The rationale of this section is to present the design and methodology of the study. It further explains the complete mechanism of conducting interviews and how the data was analysed.

2.1 Approach

This study is based on a case study approach. Yin (2009:18) writes that case study method is suitable when one wants to “understand a real-life phenomenon in depth, but such understanding encompass[es] important contextual conditions. The empirical case being studied is the milk supply chain in Punjab, Pakistan, as revealed primarily by interviews with eight chain actors. The empirical case is analysed with an explanation building technique (*ibid.*), supported by a theoretical framework based on transaction cost theory and agency theory.

The eight actors interviewed include five farmers, one local middle-man, and two large dairy companies. Interview data is supplemented with information from publications and prior case studies to build a full understanding of the supply chain case. The information collected through these different sources provides the grounds for the analysis and discussion.

2.2 Qualitative versus Quantitative research

Murthy (2009) describes the difference between qualitative and quantitative research, where qualitative research is said to be about discovering and underlying motives of human behaviours, desires, and a concept involving a kind or quality of a variable; whereas the measurement of variables in numeric or absolute terms is referred as quantitative research. A qualitative approach primarily focuses on developing understanding of social phenomenon, seeking to find answers regarding various questions of how people behave, their behaviour and attitudes, and how they are affected by different events in their surroundings (Hancock, *et al.*, 2007). This stands in contrast to a quantitative approach, where focus lies in achieving a statistically accurate description of a population as expressed in discrete, measurable variables (Murthy, 2009).

As the aim in the present study is to understand the social aspects in the consequences of the informal and formal supply chain paths, a qualitative approach has been used.

2.3 Interview study

To obtain information about the key issues a questionnaire was designed and used to guide interviews. All the respondents were also asked open-ended questions with the aim to acquire more detailed information. The interview guide was constructed with an aim to accumulate a detailed information from the individuals engaged in the dairy sectors mostly located in the rural, peri-urban and urban area of Punjab province. The interview guide was themed in a variety of questions to obtain information on the issues of interest.

Due to geographic distance (Sweden–Pakistan), interviews were conducted by telephone with different stakeholders involved in the dairy chain from producer to the processors and retailers, with prior appointments arranged through emails. According to Sekaran and Bougie (2010), “conducting telephone interviews has the main advantage of access to different people across the globe easily and relatively in a short period of time”.

In total, five farmers, one local middleman, and representatives of two dairy companies, Haleeb and Nestle, participated in the interview study. The five farmers were selected to represent a range including average, progressive, and commercial farmers respectively. These eight key informants each has a specialized role and varying experience in dairy sector in both rural and peri-urban areas near to capital city Lahore, Punjab.

2.4 Literature review

A literature review can not only provide an idea about describing or summarising previous facts in the field but can also involve an active process of constructing points of comparison or conflict between earlier work (Murthy, 2009).

The process of locating literature addressing major issues and challenges faced by small scale farmers in the dairy sector for this project was obtained through a systematic search from different sources which include SLU main library at Ultuna campus, web services, books and other e-articles, reference data bases, SLU digital library, HEC Pakistan digital library, FAO website e/articles archives like, Science direct, Scopus, Emerald etc. Different articles were identified based on search using the key words in the research project. Most of the included literature is from studies of the dairy sector in developing countries, with points of conflict and similarities.

2.5 Reliability and Validity

It is important in qualitative research to make sure that conclusions derive from an analysis are reliable, credible, valid if they are to have a scientific value (Murthy, 2009). Reliability relates to how consistent we can expect the findings to be: If the study were repeated, would we arrive at the same results? Credibility relates to how believable the results are: Do we accept the case and analysis as presented? Validity relates to how trustworthy the results are: Can we generalize the results beyond the specific research context?

To ensure reliability and credibility in this study, the study design has been presented and the interview questionnaire is included in an appendix; the empirical data from the interviews has been supplemented by secondary sources (triangulation), and both are presented chapters 4 and 5; and the analyses is presented in chapter 6. This structure allows the reader to follow the research process. Validity has been ensured by basing the analysis on well-established academic theory and discussing the implications and limitations of the empirical results.

A significant problem regarding the reliability and validity of the research is language. For instance, a respondent may not understand what the researcher is asking or a researcher may misinterpret an answer. This can lead to communication gap and this gap is apt to be exasperated if the researcher and the respondents do not speak the same language. In this study, sometimes the dairy farmers have a less theoretical understanding and approach to the problem, while at the same time they have considerable practical experience dealing with the other stakeholders involved in the chain. However, the language of communication with respondents was the native national language of Pakistan, Urdu. As the researcher is a native speaker of Urdu, it was easier for the author and the respondents to have a clear understanding of what was being asked and what was being responded in an open dialogue, reducing the risk of misinterpretation of information due to language problems and supporting reliability and credibility.

Additionally, the information collected in the interviews with the eight different key informants has been rather consistent, further supporting the reliability of the study. The other perspective developed from this project has emerged with a belief that, most of this work is a sensible combination of theories from institutional economics along with agricultural marketing in a developing country like Pakistan. The empirical findings make sense in this theoretical paradigm, and therein can be extended productively to the study of agro food marketing and its allied areas with more market orientation in case of dairy products in the developing world.

3 Theoretical Framework

When it comes to the analysis of agricultural markets, New Institutional Economics (NIE) a robust approach in this regard. In case of Pakistan which is developing in nature, milk production, its distribution and marketing are costly ventures in practice. Looking into the dairy sector of Pakistan where small scale farmers, who looks different the way they handle and deliver makes sense that they have different kinds of transaction costs. These transaction costs in milk market indeed influence farmer's decisions in different ways to enter or exit the market. Since transaction cost is considered a backbone while analysing the marketing channels and its effects on the development of a country.

3.1 Transaction Costs

In the 1930's, Coase identified the existence of costs in addition to costs of production that firms face, which he called transaction costs (TC). He defines transaction costs as, the cost incurred by the trading partners associated with the exchange of goods and services. These costs comprised of bargaining cost, decision cost, information cost and law enforcement related cost (Cobia and Anderson, 2004).

The transaction cost approach has three main characteristics (Williamson, 1979). The frequency of their occurrence is subject to its degree of specificity and assets allocation. Some key factors which influence the transaction costs and its types of institutions are the asset-specificity uncertainty and externality.

Assets are specific to a definite use and make them useless in another setting (Cobia and Anderson, 2004). In case of dairy farming, there are many things that have high specificity and that's why it is not an easy task to change the ways of production. It makes the farmer quite vulnerable for economic fluctuation in the market as farmers are usually in the hands of lenders and banks because of the investment. The more specialized is the asset, higher is the cost of its transferring (Birtal, *et al.*, 2007) the main determinant for the TC is the actor's transaction specific investment or relationship specific investment (Krstevska and Nilsson, 2009). If an actor invests in assets having high value in a specific use but may have lower value if they were deployed in any other use, such kind of investment have the effect of limiting the actor's range of alternative trading partner, just like a farmer may be linked to one specific dairy processor or locked in (Nilsson, 2001).

Dedicated asset is a certain specific investment, so the trade can take place with a specific partner. Furthermore Key *et al.* (2000), highlighted this type of transaction cost as high transport cost and obstacles to different opportunities to enter the market.

The frequency of the transaction is important in several ways that is for the uncertainty of being deceived. It is most important to have a trustworthy partner that will not behave in opportunistic way.

Uncertainty arises due to the unexpected changes in the surrounding environment. It can be of different types but more specifically found in behavioural and environmental factors. The uncertainty in behavioural approach is due to human actors and also affected by human opportunistic attitude. Uncertainty a factor that can affect the TC as the vertical integration is preferred. (Krstevska and Nilsson, 2009). So, you will have to look for a partner with the right connections/partners and they will act upon your will or interest.

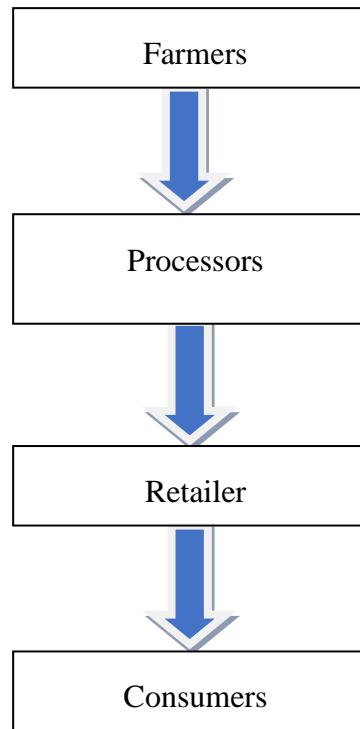


Figure 1 Vertical Market System Channel

Small farmers are the victim of transaction cost. The government needs to intervene the market and minimize the transaction cost through subsidies and other regulations. Otherwise, it will increase the sufferings of small farmers. Moreover, private sector response to combat costs faced by individual farmers needs to be enhanced. Swinnen and Maertens, (2009) report that the big challenge specially in the agricultural food system is the enhancement of vertical coordination process: It can facilitate the flow of information and balancing the decisions and actions of farmers; while at the same time, in the absence of this system, there is a chance of high misallocation of economic inefficiencies and enhancement of production and marketing risks.

Summing up, Williamson theory of transaction economics has three main propositions how environmental and human factors affect the level of TC.

p₁, bounded rationality and opportunism emerges TC.

p₂, TC are higher because of higher uncertainty and asset specificity

p₃, the organic activity which is the most effective and market based governance mechanism

3.2 Agency theory

Agency theory highlights the main problems that occur in the agency relationship between principal and agent. Agency theory argues that due to incomplete information and uncertainty the agency problem arises (Eisenhardt, 1989).

Agency theory involves various incentives and analyse its internal factors. For example, the owner of a company or manger can divert the behaviour of its employees based on certain conditions. The manager can also avoid the opportunistic behaviour of its employees using various tactics. With principals and agents having conflicting goals, the asset specificity, frequency, and uncertainty discussed above in combination with human factors such as bounded rationality and opportunism, lead to a risk of very high transaction costs. The positivist agency theory is primarily concerned with describing the governance mechanism which solve the agency problem. Furthermore, the positivist stream highlighted two key propositions in this regard: Firstly, when principal is behaving against the norms of agency theory, and secondly, when the curb agent responds negatively. When principal is more likely work in the interest of agent and possess full information's about the agent is the best example of opportunism (Nilsson, 2001).

Agency theory highlighted two main aspects of the agency problems, Moral hazards and adverse selection (Eisenhardt, 1989). Moral hazards situation occurs due to principal-agent problem when agent is not put forwarding upon the efforts agreed upon. The misrepresentation of agent capabilities is referred to adverse selection. The agent has been hired for work without putting his skills on test. In such cases adverse selection or moral hazards has the option to analyse the information system for various purposes.

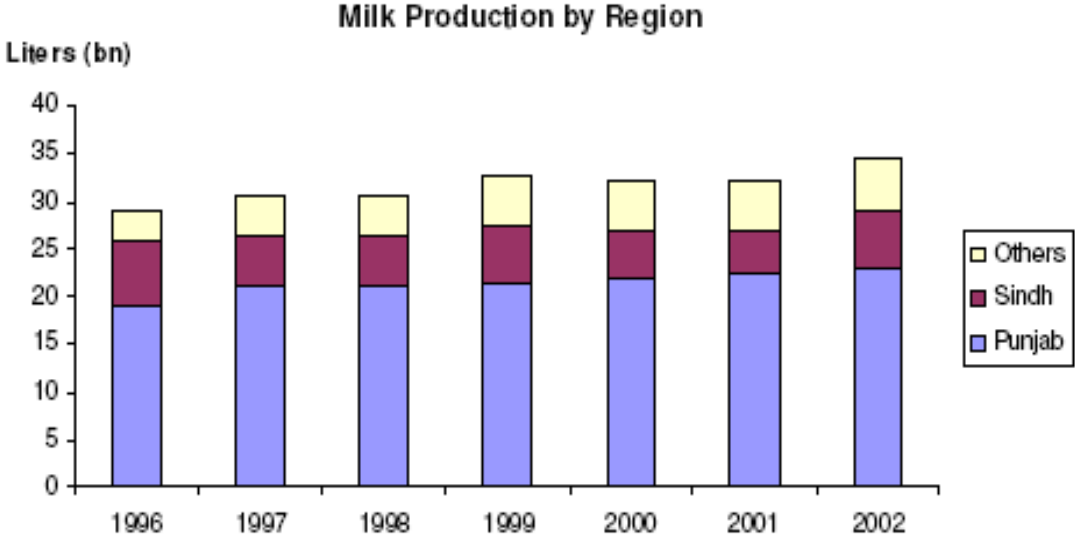
Both the agency theory and transaction cost perspective have similarities and both theories share bounded rationality and self-interest assumptions (Williamson, 2000).

4 Literature Review

Milk is considered to be an important source of balanced nutrition which offers a marketable product for small scale farmers. In developing world milk is produced mainly by small scale farmers, where demand is predicted to increase by 25 percent by 2025 (Ali, 2006). Pakistan is currently ranked as the world’s fourth largest dairy producer, producing in excess of 40 million tons annually, mostly coming from small rural farms with two to four animals (Ajmal, et al. 2015; Zia, et al. 2011). These many small producers, remotely located from the concentration of urban consumers, presents a challenge in coordinating a supply chain.

4.1 Milk production in Pakistan

Dairy production in Pakistan, which is predominantly in the province of Punjab (see Fig. 2), is mostly dominated by small and landless farmers. Zia, et al. (2011) report that 95 percent of Pakistan dairy producers have two to four animals. At the same time, Ajmal et al. (2015) report that farms with up to 50 animals only represent one third of the total number of animals, indicating a strongly skewed industry structure.



Source: IFCN, 2003.

Figure 2 Distribution of milk production in Pakistan (Ali, 2006)

In general, research in the dairy sector in Pakistan is very limited, as very few institutes are involved in this sector to promote dairy sector and develop the socio-economic conditions of the small scale farmers engaged in the dairy sector. In order to improve the dairy sector of Pakistan, government institutions must ensure the information flows through research and development to reach the small scale farmers, in order to improve productivity of this sector (Qadri, 2009).

Small and poor farmers face main constraint in the form of seasonal fluctuations concerning milk production in Pakistan, affecting the milk quantity in summer and winter seasons. Low milk productivity also accredited to low genetic potential of majority of animals, poor

infrastructure and inadequate health control, refrigeration and transportation facilities are the other key issues need to be addressed (Jalil, *et al.*, 2009).

Generally, the dairy sector in Pakistan is considered to be suffering from poor animal nutrition, mismanagement, failure to control disease and lack of proper marketing system. At the same time, the government as well as large scale private initiatives are promoting the dairy sector: Milk and dairy products are considered to be an essential part of the daily diet and a mass consumed drink in Pakistan, and livestock enterprise is seen as something in which small farmers can successfully engage to improve their socio economic condition and livelihood, moving from subsistence to market orientation (Qadri, 2010).

Pakistan, in spite of largest milk producer in the world, still imports powdered milk to meet the domestic demand. The livestock in Pakistan consist of 50 percent of value added products and 11 percent to GDP (Ali, 2006).

4.2 Milk marketing chains in Pakistan

The situation of distribution and collection of milk in Pakistan is complex (Ahmed 2010). Much of the dairy sector works on non-commercial basis in the informal sector while the organized and formal sector processes only a small portion of milk in the country. The subsistence dairy farmers keep cows and buffaloes in small herd sizes, with limited sales of what the family does not consume, while market oriented households keep large herd sizes for commercial milk production (Burki *et al.*, 2005). The milk market in Pakistan is comprised of urban, rural and process sectors. Only some processors and agents in these three sectors have access to basic infrastructure for effective handling and distribution of milk, and almost 15 percent of milk is lost due to lack of cold storage and unviable processing channels (Zia, 2006).

Ishaq, *et al.* (2016) identify two general milk marketing systems in Pakistan, which they refer to as *traditional* and *modern* milk marketing. The traditional system is informally organized, and is based on local collectors who link small scale producers with consumers. The modern system is based on large dairy processing companies, who mostly produce ultra-high temperature (UHT) processed milk and powdered milk for urban markets.

While noting that most of the milk produced by small farms is consumed at the household or local community level, Ahmed (2010) identifies two main types of milk collection systems used by the large scale dairies that supply urban markets: self-collection, where the large dairies purchase and process milk directly from farmers or via a community collection point; and contract-collection, where intermediaries are contracted to provide milk. These different systems operate under very different conditions, with the self-collection system having a formal structure and control determined by the dairies and Pakistan laws and the contract-collection system operating much more informally with weaker control and adherence to rules and regulation.

The intermediaries or middlemen in the contract-collection system, who are called *dhodhi*, play a significant role in the rural dairy sector and marketing supply chain of Pakistan. In addition to contracting with the large scale dairies, many of the estimated one million *dhodhi*, depend upon their financial and technical efficiencies to redistribute the milk from many small producers to a wide range of paying customers, including sweets shops and other retailers, and end consumers.

Generally, the *dhodhi* offer many services, including for example collection and transport, relationship management, credit, and advising, but the nature of their role is basically exploitative. They argue that since they are taking various risks in various stages of marketing, they are entitled to a considerable share of the revenues from their sales. The more they can limit the explicit cost they are paying farmers for the milk, the greater their profits. (Badar, 2008). However, Ahmed (2010) also notes that the *dhodhi*, operating in a largely informal system, may not always follow good hygiene practices, nor may they adhere to the practices of the formal economy (paying taxes, etc.).

While some effort has been made to understand the role the *dhodhi* are playing in the dairy supply chain (Ahmed, 2010; Badar, 2008; Ishaq, et al., 2016), most interest has focused on milk quality and supply. Little focused attention has been given to the consequences for farmers of selling their milk through the *dhodhi* versus other channels.

5 Empirical Findings

The following presents the empirical data collected in the interviews.

5.1 Milk Marketing Chains

The collected data, supplemented by the literature reveals that there are two types of milk marketing chains: one for small scale rural farmers and one for larger scale peri-urban farmers. Small scale farmers, who are largely present in the rural areas, sell their milk directly to *dhodhi* (middlemen). They rely on *dhodhi* to market their milk produce and they have no other alternative channel to process their milk. Also, the *dhodhi* are usually equipped with cooling equipment, helping to preserve milk quality and value until it can be sold. The *dhodhi* collect milk from the small farmers, paying about 40-45 PKR per liter after checking the milk quality and fats ingredients. Sometimes the *dhodhi* travel to the farms to collect the milk, and the farmers bear no direct responsibility for transportation costs. Other times, however, farmers who are very far from the *dhodhi's* place of operation bring their milk to the *dhodhi*, and therein must face transportation costs themselves. Both the farmers and the *dhodhi* are typically not satisfied with each other, and they are often involved in conflict situations. According to farmers, the *dhodhi* cut their milk price by complaining about adulteration and low fats ingredients. The farmers are often bound to the *dhodhi* as the *dhodhi* are the only source in the area to provide short term loans. The *dhodhi* often have a monopoly in their area, ensuring their position and power in the chain. The *dhodhi*, in turn, further transports the milk to cities or towns, where he sells the milk to sweets shops/ bakers, milk shops, restaurants and home-deliver consumers. The following chain shows rural milk supply chain. Where small scale farmers direct sell their milk to middlemen (*Dhodhi.*) The following chain shows that farmers directly sell their milk to the middlemen.

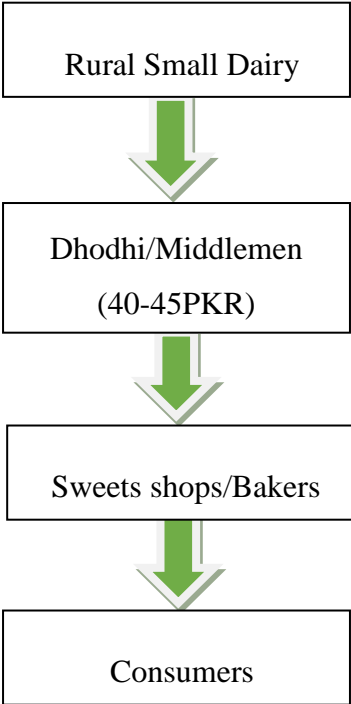


Figure 3 Small-Scale Rural Dairy Farmer Chain (Author's illustration)

The larger scale peri-urban/urban farmer chain is different from the rural subsistence farmer's chain. The peri-urban or urban dairy farms are usually owned by market oriented, progressive farmers, with larger herd size. These larger dairy farms sell their milk directly to commercial dairy companies at the farm gate. Dairy milk processing companies like Haleeb and Nestle have their own mid agents who collect milk in the peri urban areas from direct and progressive farmers. Haleeb and Nestle have milk collection points in the peri urban areas where farmers bring their milk to the company agents in the nearest towns or villages sub centres. Nestlé and Haleeb are competitors in Punjab, they approach to large dairy farmers whose herd size comprised of 250 or above at their farm gate. It is depicted in the following milk marketing chain, that instead of relying on middlemen the farmers sell the milk directly to the commercial companies.

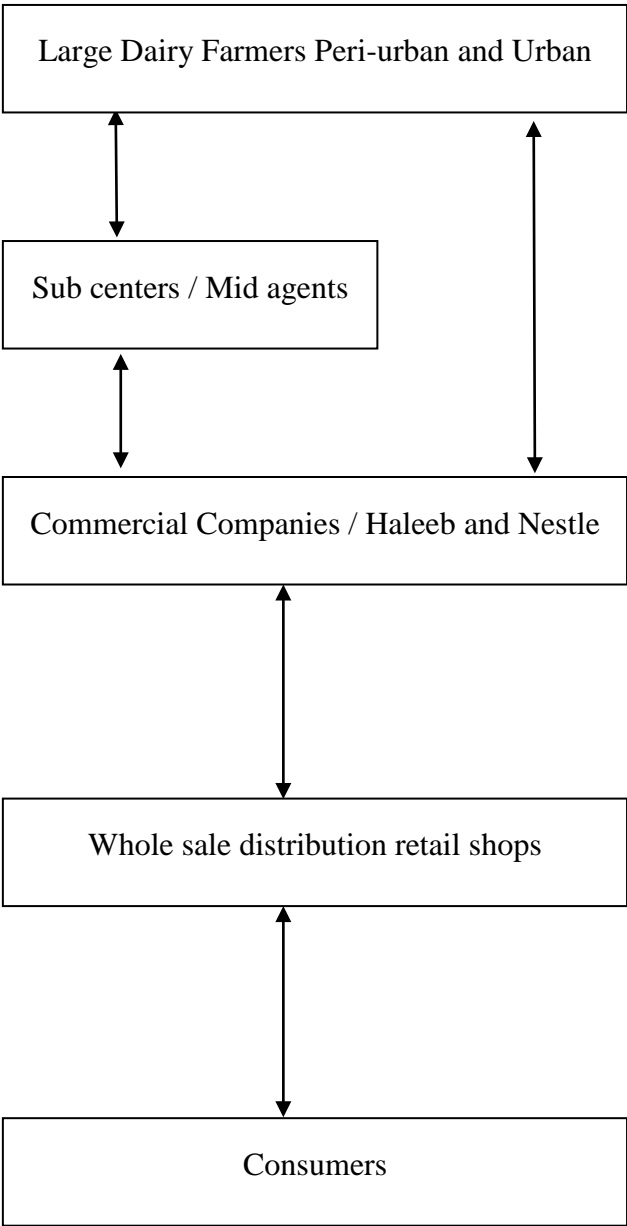


Figure 4 Large Scale Peri-Urban Farmer Chain (Authors Own Illustration)

5.2 Representation of respondent cases

The following table shows the classification of respondents based on gender, age, herd size milk production at farm level, milk price, channel of marketing and contract type. It shows that a major portion of the respondents were in the age group of 25-50 years. Furthermore, the type of farming was mainly dairy and they were producing milk in the range of 40 to 3350 liters.

Table 1 Summary of bio data of the respondents

Presentation of Respondent									
Code Name	Gender	Age	Type of Farming	Herd size	Milk production farm level (In Liters)	Milk price PKR	Milk price SEK	Channels used	Contract Type
A	Male	32	Dairy Farming	10	50-55	40-45	3.19-3.59	Middlemen	Verbal
B	Male	40	Dairy farming	12	40-45	40-43	3.19-3.43	Middlemen	Verbal
C	Male	35	Dairy farming	17	40	50	3.99	Haleeb	Verbal
D	Male	27	Dairy farming	104	450	50	3.99	Haleeb	Written
E	Male	36	Dairy farming	520	3350	50-55	3.99-4.39	Nestle	Written
F	Male	48	Middle-men	Nil	300	40-45	3.19-3.59	Sweets shops Cities/ homes	Verbal

Source: Author's own calculation from survey.

5.2.1 Farmer A

Farmer A is an average farmer who is 32 years old man. His main source of income is dairy farming. Farmer A has total herd size 10, having 6 milking animals. Farmer A stated in his interview that he sells his milk produce to the middle men (*Dhodhi*), which is the only way in the area to sell his milk produce. Farmer A, produce approximately 50 to 55 liters of milk per day and sell it with an unhygienic form to middle men at 40 to 45 Pak Rupees (3.19-3.59 SEK) per liter. Farmer A has no access to commercial company in the area as there are no commercial or large companies operating in the area. Price is fixed with a middleman on the

quality and all fats ingredients. If the quality of milk is up to the satisfaction of middleman then the milk is sold. Farmer A is uneducated farmer holds no written contract with the middleman and all agreements are verbal. The farmer added that the middleman in the area exploit all the small farmers, as the farmers have no other alternatives to process their milk. The middleman has a monopoly in the area, and in addition to providing the marketing services, also provides loans to small farmers, further putting the small farmers in the hands of the middleman. Sometimes the middleman is late with payments to the small farmers, up to two weeks. The middleman exploits his position especially at the time of purchasing milk by complaining milk quality and fats ingredients and charge low price per liter. The farmer further added in his interview that he has no proper tools and refrigerators or cooling tanks to process his milk to the big city, and to avoid extra costs like transportation cost and electricity cost, he chooses to use the middleman. Farmer A stated the following barriers to growth in the interview.

In order to investigate farmer A, perception of the relationship with middlemen and other stakeholders involved in the chain, his farm development, dependency in the relative chain and other problems different questions were asked from farmer A.

Farmer A stated different problems and challenges to his farm development during his interview completely dependent on middlemen, he has no veterinary services available in the area and his financial position is so weak to invest in his farm. He further added in his interview that he does not receive any benefit or support from government and he is encountered with another problem which is Seasonal variation, especially in summer when milk production increased and he has no chillers or refrigerator to store the extra milk.

5.2.2 Farmer B

Farmer B is an average farmer, 40 years aged man. Farmer B main source of income is agriculture dairy farming that grows wheat and rice as well on his land. His herd size comprised of 12 animals having 6 milking animals. Farmer B total milk production at farm level is 40-45 kg per day. Farmer B stated in his interview, that he sells his milk in the village to a middleman at 40 to 45 PKR Rupees (3.19-3.59 SEK) per liter. Farmer B only self-markets his milk to sweet shops and backers in the city during summer, as according to him the milk production increased in summer. Farmer B stated in his interview, that he prefers middlemen as he has no other alternate channel to process his milk. According to the farmer if he sells the milk in the cities he will have to bear extra cost of transportation which is approximately 200 PKR per day. He bears some cost of transportation, anyway, as the middleman is not coming to his farm place to purchase the milk. The farmer cover 10 km distance to middlemen place to sell his milk produce. The middleman exploits the farmer as he is the only person in the area to purchase milk. The middleman purchases milk from farmers at low price as he has monopoly in the area and advanced loans to the farmers, farmers are in the hand of middlemen. The farmer receives his payment from the middleman on time. According to the farmer B he has no formal contract with the middleman or sweets shops. The contract between them is verbal. The farmer B further added that there are no other companies in the area to sell his produce, the big commercial companies operate in Lahore capital city of Punjab.

Farmer B indicates several barriers to his farm development, which includes: lack of investment, technical skills, education, no government support, availability of better breeds of animals and veterinarian treatment for his animals. During interview study from farmer B, he indicated other serious issues and concerns for farm development which is access to milk

collecting companies and resource scarcity for example, lack of technological equipment's for the farm development, lack of building for the farms to keep animals safe, middlemen exploitation, availability funds or loans for the dairy development from government or non-governmental organisations. Farmer B further added that he is an average farmer and cannot afford higher rate of interest on loan for dairy from private banks that's why he ultimately lend from middlemen.

5.2.3 Farmer C

Farmer C is a progressive, male farmer with an age of 35. His main source of income is agricultural dairy farming. His herd size is comprised of 17, having 7 milking animals. Farmer C total milk production at farm level is 40 liters per day. Farmer C uses 5 liters for domestic consumption and the rest he sells to Haleeb Company. According to farmer C Nestle and Haleeb are the competitors with each other's in the area. So, they access to the farmers by themselves. Farmer C stated in his interview that he incurs no transportation cost however he has some other costs like energy cost, animal health treatment cost and feed cost. Farmer C directly sells his milk to Haleeb at 80 rupees per liter, the company purchases milk from farmer C in hygienic format, total solid test procedure. Farmer C stated in his interview that he is not hundred per cent satisfied from the company as the company sometimes deduct price after TST procedure. Farmer C hold s no written contract with Haleeb. The farmer further added that however he enjoys other services received from the company. Farmer C receives his payment on time. The company provide him technical and advisory services regarding animal health, feeding, breeding, management etc. Farmer C prefers business with commercial dairy processor

According to farmer C interview he faced different problems associated with price adjustment with the respective company when some times the company test the quality of milk on TST basis.as according to him, price adjustment and agreement with the company is on good quality milk regarding fat and SNF (solids not fat) ice free milk, without foreign particles.

5.2.4 Farmer D

Farmer D is a large scale dairy farmer he is 27 years old farmer. His total herd size is 104 having 42 milking animals. Farmer D total milk production at farm level is 450 liters per day. Farmer D save 4 liters of milk for domestic use and the rest is sold to Haleeb Company. Farmer D bears no transportation cost. The company approaches his farm gate and collects milk from his farm. According to farmer D, though he has no transportation cost specifically for his milk processing but he incurs some other costs which consists of management cost, animal health cost, energy cost and feed cost.

According to the farmer he stated in his interview, that Haleeb and Nestle are the close competitors and they approaches the farmers by themselves. Farmer has a written contract with the company Haleeb. And the company provide him various services that comprised of technical and advisory services, chillers technician for vet maintenance. The price is fixed with the company as 50-55 after TST is run. The farmer stated in his interview that the price adjustment /agreement with the company is on total plate count milk temperature that must be 3 degree, applying all best farm practices no residues of antibiotic in milk according to the Total Solid Test. The farmer further added that he has been equipped with cooling tanks and other storage facilities by the company.

According to Farmer D interview, he faces various barriers to his farm growth which includes, lack of capital to invest in his dairy farm, lack of high school for educating his children who can contribute in future for dairy development, good nutrition especially feeding and governmental support. The farmer further stated in his interview about his discontent on account of low price offered by the trading partner.

5.2.5 Farmer E

Farmer E is a 40 year old male commercial farmer, who is in contract with Nestle. He has a Livestock and dairy product farm, located 65 KM on Lahore Multan Road, Bhipheru (NESTLE Farm). His total herd size is consisting of 520 animals having 230 milking animals. His total milk production at farm level is 3350liters per day. He bears no transportation cost but face high feed cost per day. The farmer also mentioned some other costs in his interview which consists of management cost and energy cost especially due to the uncertain energy shortfall and recent energy crises in Pakistan, the farmers bear extra cost of fuel for generators to produce electricity. According to farmer D Nestle and Haleeb are competitors so they access to the farmers by themselves. The farmer sells direct his milk produce to Nestle at farm gate without involvement of any other agent or middlemen. The company purchase milk from the said farmer at 50-55 PKR at total solid and fat percentage. According total solids basis price is fixed, contract is made with company. The farmer holds written contract with Nestle Company. The price adjustment/agreement with the company is Hygiene, chilled milk according to total solids.

Farmer E also faced various problems and challenges to his farm growth which includes fluctuations in feed prices, financial support from the government side, availability of good quality semen from government side, good knowledge about farm management, availability of progeny tested bulls, good breeds of animal.

5.2.6 Middleman F

This middleman, or *dhodhi*, is a 45 years age man. His main source of income is dairy milk and has no animals. Middlemen only purchase milk from small-scale farmers in the villages and further distribute it to the main city milk shops, sweets shops, bakers and door to door homes in the city. According to middleman, he purchases milk from the local milk producers at 40-45 PKR per liter in unhygienic condition and sell it in the city milk shops, sweets bakers and homes in the same form at 55 PKR per liter. Middleman only visit to the near farms and collect milk. Farmers who live in distance approach him by their own cost. The middleman has roughly estimated his transportation cost from 200 to 300 PKR approximately per day. Middleman is only equipped with refrigerators and small size cooling tanks. Middleman stated in his interview that there is no written contract made with the local farmers, the contract between middleman and local farmers is verbal. However, he prefers trustworthy farmers, as according to the middleman mostly the farmers add water and ice to milk and sometimes he is deceived by the farmers. According to middleman, milk price is fixed mostly on quality of milk. Middleman further added in his conversation that he helps the local farmers by providing them loans and also visit their farms if they need any assistance regarding their farm management.

According to middlemen *local dhodhi* interview, he faces various problems in his dairy business regarding milk handling and delivery process on daily basis which are load shedding /electricity shortfall, his level of education which is only primary level, risk regarding collection of greater quantity of milk and transportation cost. Furthermore, it is difficult to

find an honest and trustworthy farmer to purchase better quality of milk. He further added that he has no proper tools to collect greater quantity of milk, due to lack of chillers or big size refrigerators.

5.3 Interview details and summary from commercial companies Haleeb & Nestle Pakistan.

The following table shows the interview results from the two commercial companies Nestle and Haleeb

Table 2 Comparison of marketing channels of Haleeb and Nestle companies

Company Name	Milk Collection main Centers	Milk collection sub centers	Mode of payment	Contract type With small farmers	Contract type with large farmers	Business area
Haleeb	15	40	Payment is made on TST procedure	Verbal	Written	Checha watni Punjab
Nestle	65	50	Payment is made on TST procedure	Verbal	Written	Lahore Punjab

Source: Author's own calculation from survey.

5.3.1 Haleeb foods Pakistan

Haleeb foods industry was established in 1984 in Pakistan. It is one of the pioneers in dairy sector in the country. Haleeb foods primarily focuses on nutrition, health and customer care in the country. It produces world class dairy processing products. Haleeb Foods Pakistan endures to be at the front position in the dairy sector of Pakistan towards packaging and product innovation. Haleeb Foods Company with a strong portfolio achieved market leadership in several categories of leading multinational brands.

To know the clear stance of Haleeb about various issues and business relationship with small and large scale dairy farmers. A questionnaire was designed to obtain detailed information about their business operations in the different areas of Punjab province. During interview study Milk Development Officer (MDO) was contacted for obtaining information regarding company relationship with farmers, ways of collecting milk, mode of payment, price adjustment mechanism with trading partners, type of contract and other services like some basic and specified services provided by the company. According to the Milk Development officer Haleeb he stated that we use different channels to collect milk from different producers at different levels. Which are as follow.

- (i) At small scale Direct Farmer (DF) producing milk up to 15 liters each day and taking it to the nearest Sub Centre in village or nearest village.

- (ii) At large scale comes, Progressive Farmer (PF) producing milk 16 to 25 liters each day and bring it to the chiller.
- (iii) Commercial Farmer (CF) producing milk more than 50 liters each day and bring it to the Sub Centre.
- (iv) *Dhodhi* the middle men collect milk 150 to 200 liters each day from farmer at farm level & then selling it to the Company. (Dhodhi (middlemen) collect milk only from those villages where Sub Centre for milk collection is not available.)
- (v) Sub Centre Agent, is the employee of Haleeb, who is responsible for collecting milk from farmers and receives fixed salary from company per month. The sub agent also charges fixed commission from farmer for the milk collection and transferring milk to the company unit.
- (vi) Collection of milk at farm directly, if a farmer is producing more than 250 liters of milk each day.
- (vii) The type of contract is verbal and there is no written contract with farmers.

The MDO further added in his interview, that the company provide some basic and specified services to the farmers which includes, free vaccination and treatment to animals, veterinarian services, free of cost at farm, weekly trainings. Seasonal used fertilizers, pesticides, herbicides etc. at discount rate, with an agreement with some companies, chillers at farm level, if a farm's milk production exceeds 250 liters per day. Cooler tanks at farm level, if the milk production exceeds 250 liters per day. Free transportation at farm level, if milk production exceeds 250 liters per day the company provide mobile testing service (MTO) at farm gate.

5.3.2 Interview Details from Nestle Pakistan.

Nestlé Pakistan operates in the country since 1988 in a joint venture with local Milk producing companies. Nestlé Pakistan has achieved extra ordinary distinction in product quality and safety, value. The company with a strong portfolio in milk related products aimed to achieve excellence in marketing and value addition products in the country (Nestle Pakistan).

To know the clear position of Nestle about business relationship with small and large scale dairy farmers, a questionnaire was designed to obtain detailed information about their business operations in the different areas of Punjab province. During interview study Dairy Development Officer (DDO) was contacted for obtaining information regarding company relationship with farmers, ways of collecting milk, mode of payment, price adjustment mechanism with trading partners, type of contract and other services like Some Basic and specified Services Provided by the company etc. According to the Dairy Development officer Haleeb stated, that we use different channels to collect milk from different producers at different levels. Which are as follow.

When question was asked about the way of payment made to their trading partners they stated that, Bank Account payments are on weekly basis. With the cooperation of Zarai Taraqati Bank Limited (ZTBL), Agricultural Development banks. NESTLÉ helps farmers to get some

loans at lower possible interest rates that the farmers can improve their dairy farms According to nestle representative, the prices of Milk Paid to farmers depends on the total solids (TS) present in the milk. If the total solids (ingredients) number 14, then the price for milk per liter is paid Rs.50 to 55. But, if the TS number lowers than 14 then price paid is also decreased. When the TS number increases more than 14, then price is also increased depending on the increase in TS. Like Haleeb foods, Nestle Pakistan provide some basic and specified services to farmers regarding their farm management and animal health care which includes free vaccination and treatment to animals, arrange training workshops and seminars for their farm management, provide seasonal used fertilisers, pesticides at a discount rate to the contracted farmers. The other specified services comprised of chillers at farm level if a farm's milk production exceeds 250 liters per day. Free transportation at farm level, if milk production exceeds 250 liters per day. Nestle also provide mobile testing service (MTO) at farm gate if milk production exceeds 250 liters per day.

6 Analysis and Discussion

This section summarises the analysis of each individual farmer, comparative group analyses of farmers and discussion on institutional economic theories with special focus on transaction cost economics and agency theories.

6.1 Farmer A – *A typical landless farmer*

Farmer A is an average landless farmer. His main source of income is dairy farming. Farmer A belongs to the rural area of Punjab and completely depended on the informal 'Dhodhi' channel. Farmer A does not have adequate financial resources and other farm inputs to increase his milk production. His poor farm inputs and traditional ways of dairy farming stop him to invest in his farm. The site specificities cause the transaction cost high. Farmer A farm is geographically located in the rural area and it's very difficult for him to move it from one place to other where he can find the alternate trading partner or transport his milk to the formal corporate dairy channel. The high fixed transportation cost or distance etc. makes the transaction cost high. Farmer A other specific cost to consider is his human resources e.g. the right skills education etc., are the major hurdles in his way to strengthen his milk production and connect to the formal dairy supply chain. There are no formal corporate companies operating in the rural areas which has bound Farmer A completely to middleman, the local *Dhodhi*. The local middleman enjoys a monopoly in the area and purchase milk from Farmer A at low price as the middleman exploits farmer A during the price adjustment process. Both the trading partners holds verbal contract. The middleman is fully aware of farmer A's weak financial base as farmer A sometimes takes loans from the middleman, this situation binds farmer A to middleman. Where middlemen take the advantage of Farmer A socio economic conditions and his dependency on the middlemen. Here farmer A is bounded to his trading partner when he takes the loans from the middlemen. Middlemen show his opportunistic behaviour at the time of purchasing milk from the farmer. Middlemen criticize Farmer A milk quality and pay low price to farmer A. The situation refers to Williamson Transaction cost economics "bounded rationality and opportunism makes the transaction cost high. Farmer A has not signed any written contract with middlemen and the type of contract is verbal. Farmer A is risk averse and certainly not ready to take any risk. The middlemen have the monopoly in the chain and can break the contact at any time if farmer A does not act on middlemen interest. They have no signed agreement or contract where the farmer can challenge middlemen in courts "Agency theory", examine such situation as, the relationship between the supplier and buyer is identified by contracts. Principal can persuade and agent to behave according to his will and interest. Opportunism and bounded rationality makes the transaction cost high.

6.2 Farmer B – *A typical small-holding farmer*

Farmer B, is an average farmer of rural area with a small land holding. His main source of income is dairy farming. Farmer B sell his milk to the informal *Dhodhi* dairy supply chain. Farmer B stated in his interview that he is not satisfied with the middlemen opportunistic behaviour as he cuts the price of milk at the time of selling milk to the middlemen. The middlemen is the only person in the area who not only purchase milk from the same farmer but also provide loans to farmer B, taking loans from the local *Dhodhi* not only bounds the farmer to *Dhodhi* but make him in fear all the time to back the loans due to his weak financial position. The middlemen take the advantage of the situation and act opportunistically towards farmer B in the time of purchasing milk. According to Farmer B interview he stated that

middlemen behaviour towards him is opportunistic and he is always in conflict with middlemen especially on price adjustment. The middleman knows farmer's socio economic condition and the absence of other trading partner. There is no formal corporate dairy channel in farmer B area to process his milk and this situation bound farmer B to rely on middlemen. Farmer B farm is located in a distance from middlemen place and the farmer bear transportation cost to sell his milk to middlemen. That is an extra cost and thus the farmer incurs transaction cost. The type of contract between the two trading partners is verbal. Farmer B does not want to break the contract his poor financial position stops him to take any risk. Middlemen opportunistic behaviour and farmer dependency on middlemen make the transaction cost high. If farmer B does not behave in the interest of middlemen the middlemen can break the contract at any time. Agency theory highlighted such situation that if the contract between the principal and agent is out based, agent behaves in the interest of principal (Einsthardt, 1989).

Farmer B is uneducated and having no skills and has no adequate financial resources to invest in his farm, the asset site specificity makes the transaction cost high. Having so many problems and no corporate formal channel in the area compels him to rely on the informal *Dhodhi* channel.

6.3 Farmer C – *A Progressive Farmer*

Farmer C is a progressive farmer from peri urban area of Punjab. His farm is geographically located in such a place where the formal corporate dairy channel exists. Farmer C sells his milk directly to the corporate channel Haleeb without involvement of any local *Dhodhi* in the chain. According to the corporate channels interview they defined progressive farmer (PF)¹.

As progressive farmer is the one who produce milk 16 to 25 liters each day and bring it to the chillers for sale. Farmer C brings his milk to the nearest sub chillers where the company mid agent inspects the milk quality after total solid test (TST) process is run. The company purchase milk after (TST) from progressive Farmer C. According to Farmer C interview, he stated that he cannot say that he is fully satisfied from the company as the company deduct price in the time of TST. Here comes the company opportunistic behaviour towards Farmer C. Farmer C is not educated and not skilled person the company might take advantage of his low knowledge and skills and can easily deceive Farmer C in TST procedure. The farmer also knows that there is no other trading partner in his area who can provide other free services. The farmer has no alternate trading partner which completely bounds him to the company. Such situation makes the transaction cost high, Farmer C holds verbal contract with company. The type of contract is verbal and company knows its strong position and the farmer's weak position that farmer is bounded to company, as the company provide other services to Farmer C.

6.4 Farmer D – *A young commercial dairy farmer*

Farmer D is a young commercial dairy farmer connected to the formal corporate dairy supply chain. The corporate dairy company Haleeb purchases milk from farmer D at his farm gate so there is no transportation cost on the part of farmer D, which makes the transaction cost high key et al., (2000), highlighted that the high fixed transaction due to transportation and communication infrastructure or distance obstacles make it costly for the farmer to find trade opportunities and enter into the market. The farmer D farm is located in the peri urban area

¹PF: Acronym of Progressive farmer

and has easy access to the corporate channel. Haleeb and Nestle are close competitors with each other's in the area and commercial farmers like farmer D has the advantage to trade with formal dairy supply chain. Farmer D herd size is large and comprised of 42 milking animals and produces 450 liters per day. The reason behind his large scale production is his farm inputs and good breed animals. Farmer B is equipped with cooling tanks and other necessary farm tools and equipment. He also receives various kind of services being linked in the formal supply chain as the company provide him technical services and vet maintenance services free of cost. However, farmer D spoke about in his interview, that the recent energy shortfall in the country has severely affected his farm profitability. In such situation the farmer is facing uncertainty. Environmental uncertainty is a factor that can affect the transaction cost high Nilsson, (2009). The type of contract between farmer D and corporate dairy company Haleeb is written. Farmer D is uneducated farmer and can be easily cheated by the company. Farmer D stated in his interview that the company sometimes shows disagreement and violate the contract by charging low price when the TST is run. The farmer has no access to TST procedure. The company takes the advantage of farmer dependency on the relative chain. And act opportunistically towards farmer D. The behaviour uncertainty emerges due to bounded rationality of human actors, which consist of information asymmetry problems and is affected by the opportunistic behaviour of human as well Nilsson (2009). Farmer D is not ready to take any risk and loose the contract with company as he stated in his interview that he has no sufficient funds to invest more in his farm or find other trading partner who act according to his interest.

6.5 Farmer E – *A large commercial dairy farmer*

Farmer E is large scale commercial dairy farmer in the peri-urban area of Punjab who is directly linked to the corporate dairy supply chain without involvement of any mid agent. His farm is located in such a place that the company can easily approach farmer E gate and purchase milk at farm gate. In this case, he bears no transportation cost which makes the transaction cost high. However, he faces the uncertain situation of load shedding or bad weather conditions which is more costly for him to buy fuel for generators to produce electricity for his farm. One of the postulates of transaction cost approach is, that environmental uncertainty can create transaction cost. The contractual arrangement between the two trading partners is another problem, which makes the transaction cost high. As the two trading partners hold written contract. The price is fixed with the company after TST² is run. Farmer D is uneducated and unskilled person who has no knowledge about the TST procedure and the company can easily deceive farmer D at the time of TST. The Farmer stated in his interview that the company charge low price after TST is run. In such situation the company act as opportunist and cheat farmer D in the test procedure. The company knows its own testing procedure where the farmer has least knowledge and can be deceived by his trading partner easily. Even though the relationship between the buyer and supplier is identified by contracts but contracts are always incomplete which makes transaction cost high. It is difficult for the involved partners to prevent each other's from opportunism contracts as these types of contracts are imperfect because of bounded rationality of human actors (Nilsson, 2001). Farmer D is aware of the fact that being linked in the formal supply chain, he is receiving various services from the company free of cost and if he does not act in accordance to the company's will and interest he can easily loose his contract. He is bound to his trading partner. Having this fear in mind he would not want to break the contract or take any risk.

²TST: total solid test material

6.6 Middleman F – A typical local “dhodhi”

Middleman known as “*Gawala* or *Dhodhi*” is a key player in the informal dairy supply chain. According to the literature, the *dhodhi* or middlemen community is million in numbers and depend upon their financial and technical efficiencies (Fakhar and Law Walker, 2006). Middlemen collect milk in the rural area of Punjab from the rural subsistence farmers and sell it in the cities milk shops, sweet bakeries and at door step homes. A Middlemen F is equipped with few metallic containers cans or plastic drums. Middlemen F transport the collected milk in containers to the cities. The middlemen F and the rural subsistence small scale farmers have shown their discontent with each other’s in their interviews. According to the middlemen F interview, he stated that he does not trust the local farmers; according to him the farmers add ice and water to milk and cheat him. It is obvious from both the farmers A, B and middlemen F interviews that they have conflicting goals. The farmers have complete dependency on the middlemen in the rural area and unpleased with the opportunistic behaviour of the middlemen. On the other side middlemen is not satisfied with the farmers and looking for some trust worthy trade partner with better quality of milk. Middlemen also provide short term loans to the farmers where he is bound the local farmers. The middlemen know the socio economic conditions of the farmers and is fully aware of the budget constrained life of the farmers. He has a monopoly in the area, as there is no formal corporate channel in the rural area. Here middlemen take the advantage of being monopolist in the area and act opportunistically and so bound the local farmers.

6.7 Group-wise comparative analysis of the respondents

From the field data collection through interviews, it’s obvious that there are two milk supply chains. The informal *Dhodhi* and the formal corporate dairy supply channels face dissimilar agency problems and transaction cost. The informal supply chain which is mainly characterized by the presence of a number of small scale subsistence farmers, middlemen (*Dhodhi*) milk shops, sweets bakers operating at different stages of milk value chain. It is important that middlemen are the main intermediaries linking small scale farmers in the rural area with consumers in the urban areas. Farmer A, B are using the informal supply chain selling milk directly to *Dhodhi* F, whereas, the progressive farmer C and large dairy farmers D and E using the corporate formal channel. Both the field interviews showed that Small scale farmers are abundantly present in the rural areas where no corporate dairy company operate and the small scale farmers rely on the local middlemen. The farmers from peri urban areas C, D and E have advantage of being linked in the formal corporate dairy chain.

The transaction costs of chosen channel in case of informal market raised the transaction costs as a result of opportunistic behaviour of middleman. As the lower prices offered by monopolist *dhodhi* F, the local *Dhodhi* knows the socio economic condition of the small scale farmers and take the advantage of being a monopolist in the area, so acts opportunistically towards small farmers A and B.

Secondly, in the proximity to urban market, the size of dairy operations has a strong influence on market channels and product market used by producers in the dairy products. The cost of transaction is high due to information cost and risk associated to dairy products.

Milk is a perishable commodity, referring to time pressure in the cost of transaction in comparison to large dairy farmers D and E, the small farmers’ farm infrastructure is completely different. Farmers A and B have poor farm infrastructure having no information

about how to invest in their farm. They have no proper tools and equipment like chillers and refrigerators to strengthen their milk production.

The progressive farmer C and large farmers D and E are equipped with *dedicated* assets like, chillers, cooling tanks and refrigerators; they also receive other services from formal corporate companies. The reason behind farmer C, D and E using corporate formal channel is their farm geographic location as they belong to the peri-urban area of the province where Nestle and Haleeb the major dairy processors are the close competitors with each other's. The transaction between D and E with large corporate channels is organized with written contract. Contracts are imperfect and the contract is easily manipulated by any of the trading partner. Even though contracts formally link the large commercial dairy farmers D and E with corporate dairy processors, may be hard to manipulate farmers. But farmers C, D and E are not taking any risk to break their contract. They know that they have been awarded dedicated assets by their respective companies and are receiving other services from the corporate dairy channel so they are risk averter. The reverse relationships exist when small farmers A and B are engaged with the local *Dhodhi*, the local middlemen F provide loans to the rural subsistence farmers A and B, and bounded the local farmers. The local middleman knows the farmers complete dependence on them and acts opportunistically towards A and B. The type of contract between middlemen F and Farmers A and B is verbal. The local farmers are not willing to break the contract as they know that there is no alternate dairy supply chain or other trading partner in the area for a trade.

6.8 Assessment of transaction costs

Williamson's transaction cost theory suggests that the main factors influencing transaction costs and the types of institutions that will develop are *asset-specificity*, *uncertainty and externality* (Williams, 2000). The theory puts asset specificity the most important element for describing transactions. Assets are specific to a certain use and it's making them useless in another setting (Anderson and Cobia, 2004). For example, a chilling cistern for milk will be almost useless if there is no milk. In a dairy farm there are many things that are high in specificity and therefore it is not easy to change the way of production. The dairy farmers become more susceptible due to fluctuations in economic activities in the country. The investment made by one party in assets to facilitate the transaction done by another party. The exchange in this particular case is unique as this contains a value of exchange.

Williamson identified the other key dimension of asset specificity as, the location *or site specific assets*. For example, natural resource available at a certain location may be movable only at a great cost. Small scale farmers are mainly found in the rural areas and it is costly for them to transport their milk produce to large scale dairy farms or big commercial companies. Because the infrastructure and the geographic conditions of the area, the transportation cost makes the transaction cost high. The site specific assets create high costs of milk collection and investment for the trading partners. Site specificity, example can be a farm, it is located on a certain place geographically and it's very difficult to move it, you can always sell and buy a new, but that is easier said than done. This means that the farmer will incur transport costs as well as only a limited numbers of trading partners. Milk is a time specific product that refers to a time limitation and because of it perishable nature, frequent deliveries need to be done to protect its quality. This factor was not found to be a crucial problem in case of large commercial farmers. Dedicated assets as suggested theory is a certain dedicated investment, so the trade can occur with a specific partner. Since it has been given the dedicated assets so the milk quality is exposed to less frequent transactions.

The cost pertaining to chosen channels and the two milk marketing channels (TC) were thoroughly investigated. The implications to be drawn from such empirical cases shows that, the increased transaction costs arise from opportunistic behaviour, for instance the lower prices offered by the monopolistic *Dhodhi*.

Williamson argued that two human factors leads to TC, which are (1) bounded rationality and (2) opportunism. Considering the problems of small scale farmers where they are encounter to dedicated assets, like proper tools and equipment to ensure milk quality, no transportation system and no cold storage facilities to safeguard and strengthen milk production. As the amount of milk is too small to connect the formal milk supply channel, the farmers have to rely on middlemen *dhodhi*. This creates the potential problem of opportunism, as the local *dhodhi* middlemen can behave opportunistically as they control supply flow in the informal market and farmers are lacking any alternate channel and trading partner for their milk.

From the empirical study, it can be seen that the small scale farmers are the ones most exposed to the threat of opportunism. This is evident in the interviews with the small scale farmers, where they describe their transactions with the *dhodhi* as being organized through informal agreements with fixed prices dictated by the *dhodhi*. The interviews show that there are conflicting goals, with both the partners expressing dissatisfaction with each other. The local *dhodhi* usually offer only a low price, complaining about poor milk quality. At the same time, they may offer incentives in the form of small loans, making the farmers vulnerable towards *dhodhi*. There is a risk for farmers in taking loans in that their ability to amortise them in due time is largely dependent upon the price they receive for their milk. Such scenarios bind the small farmers to behave in accordance to the will of local *dhodhi*.

That small farmers enter into such situations can be explained with bounded rationality: The focus on getting their milk into a supply chain means that their business planning process breaks down and they expose themselves to socio economic and political risks. According to the empirical data in this study, this is one of the crucial problem the small farmers face, and this problem arises as the small farmers have no other trading partner or alternative channel to choose for their milk supply.

At the same time, the middleman in his interview stated that the farmers cheat him by adding water and extracting fats ingredients from the milk, showing that the agreement between them can be opportunistically abused by both the trading partners.

According to Williamson's theory, if opportunistic self-interest prevails, then clear rules and standards must be drawn up to provide a basis for trust. Trust is a key concept in explaining transaction costs: If one can trust that a trading partner will not behave opportunistically, and that trust is not breached, transaction costs will be lower. Yet cooperation and working towards a united common goal, such as a shared set of rules and standards, is difficult to achieve without trust in one another (Golovina and Nilsson, 2009). The small farmers experience opportunistic behaviour by the middlemen but see no alternative trading partner. This leads to distrust, which increase their transaction costs and perhaps also their own opportunistic interests. In contrast if farmers had a trust worthy partner, the transaction between them could be more efficient, spreading benefits all along the supply chain.

The conditions in the supply chain of larger farmers and Nestle and Haleeb are rather different. The actors have relatively higher investment costs in high selective breeds, hygienic and management practices and their larger herd size. These conditions increase the potential value and also the bargaining power of the farmers. The large scale farmers hold formal

written contract with large dairy processors, and Nestle and Haleeb offer higher prices than the small scale *dhodhi*. But there is also a threat of opportunism in this large scale supply chain because of the need of dedicated assets.

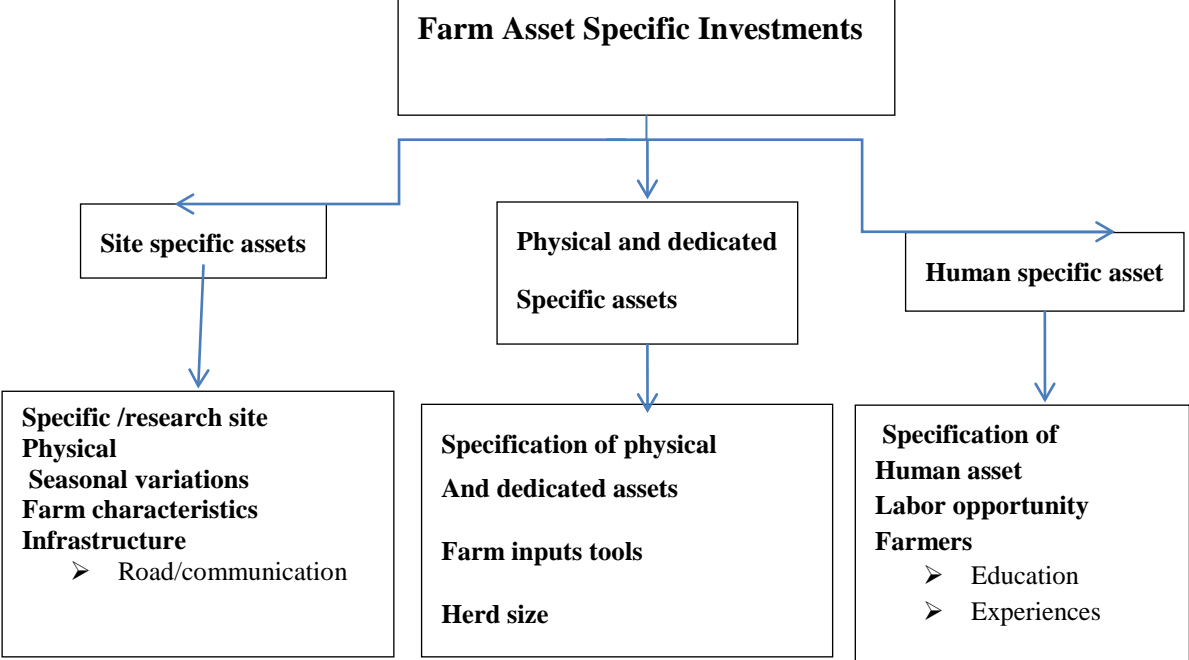


Figure 5 Division of Farm Asset Specific Investments

It is also important to highlight the role of socio economic characteristics of the farm which affect the transaction costs. The other transaction specific costs to consider are human asset specificity. Like the right skills or education, age and experience in the relative field. Education matters a lot in terms of reducing the costs of seeking information. Knowledge about available sources and the way how to get it. The respondents were asked about their age gender, education and experience in the dairy farming. The small scale farmers are either illiterate or having a very low level of education, they have no modern skills and knowledge to develop their farms. Mostly the farmers’ age ranges 30-45 and they possessed the old ways of traditional farming being taught by their fathers. Due to illiteracy it gives rise to transaction costs of searching for information and negotiation. As earlier mentioned in the theory, the presence of TC is monitoring and information. Higher level of education can reduce the cost for searching information and negotiations with trading partners. The more highly they are educated and technically sound, the more correctly information will be processed, and will enhanced its implementation value.

Uncertainty also affects the transaction costs (Willamson, 2000). One type of uncertainty that arises is due to the unexpected changes in the environment. It is the source of disturbances to which transactions are subject to, as the transactions are prone to several disturbances like unexpected environmental changes, bounded rationality, and opportunistic behavior. Small scale farmers in the rural and peri-urban areas are often landless farmers who must borrow or lease land for feeding animals. In the event of climate changes, such as floods and other

unexpected environmental changes, the farmers must buy feed for their animals from the market which is very costly. Some other behavioral uncertainty emerges due to trading partners as well. It is important to highlight the role of middlemen, where they may act opportunistically. In the absence of large companies, the farmers rely on middlemen. The middlemen provide loans to small scale farmers and bound them. The middlemen exploit the farmers in different ways by cutting price of milk complaining that the milk quality is not good. The average farmers have no other alternative channel to process their milk. Owners of small firms feel insecure about increasing production as still they have no proper channel to deliver. Which means they are not in the position to sell the increased amount of milk. what if they invest and expand their production, their limited budget and financial position make them quite vulnerable and prone to future investment.in such scenario they are risk aversive for future investment as it will not pay off for them in the near time.

According to farmer's interviews, the farmers stated that during summer the middlemen offer very low prices as it is very difficult and too costly to sell their milk in the cities. In such circumstances farmers have not been provided with dedicated assets, like cooling tanks or refrigerators to store the milk and the middleman has the monopoly in the area to discriminate the local farmers.

Regarding the contractual arrangements small farmers hold verbal contract with their trading partner *dhodhi*. The transaction between them is organized with informal contract and are subject to cancellation at any time by the *dhodhi*. As nothing is written formally between them and milk is paid with a fixed price set by the *dhodhi*.

The contracting costs are important, as good relations between them is to be maintained. However, trust is still the key element to be addressed. Trust is established through sustaining better social relationship which will reduce the opportunistic behavior up to some extent. In case of large scale farmers, they are equipped with dedicated assets, i.e. cooling tanks and chillers. They also show their concerns regarding the opportunism where dedicated asset make them vigilant about the expected opportunism by their trading partners regarding the issue of TST procedure.

Apart from the theoretical perspective regarding opportunism, transaction cost theory is not without it critiques. We have found in the empirical studies that both the formal and informal channels shows variation in the prices offered by their respective trading partners, as the large farmers receive high price for their milk produce engaged with big commercial companies comparatively to those farmers who have dependency on local *dhodhi*. Foss and Klein (2010), argued that the basic assumption of opportunism ignores the relative ground of human action and outside force behaviour is transaction cost economics, for example monetary payment expectations. Modern studies suggest that TCE is unable to point out that how opportunistic behaviour is minimized through alteration in governance structures. The difference exists between psychological state of opportunism and propensity to behave opportunistically. Cases observed that since self-interest opportunism is moderate and not potentially severe. Furthermore, milk is also exposed to environmental uncertainties. Like bad weather seasonal variations and natural calamities which push the prices for feed crops as they buy feed for their animal at higher cost.

7 Conclusions

This case study suggests that the dairy sector in Punjab province can be classified into two major categories namely, the informal Dhodhi supply chain and the formal corporate dairy chain. The two channels show dissimilar functions and operations from the classification of two milk marketing channels it has been concluded that which party is benefiting from the relationship and which milk marketing channel provides better arrangement for the farmers, with reduced transaction costs. At one level the small scale farmers in the rural Punjab, who are not coordinated properly, having low herd size, low bargaining power, middlemen opportunism, distance and limited budget had reduced milk supply to the modern chain. The results from studied cases indicated, that small scale farmers who rely on the informal middlemen face high uncertainty caused by the opportunistic behaviour of middlemen. The type of contract with small farmers is not run under legislation so, both the involved partners in the transacting process may deceive each other's. From the empirical results it has been seen that, the socio economic conditions of the rural small farmers differs from the peri urban farmers connected to the formal corporate dairy chain. Their farm structure, lack of capital, government support, feed management, hygienic standards and traditional marketing practices leaving them exposed to high uncertainties. The prices offered to the small scale farmers and large scale farmers by their respective producers' shows variations. The large farmers get high price for per liter of milk as indicated in the empirical table where as small scale farmers get low price for their per liter milk from middlemen as they have middlemen as their last resort. This has been observed in the case study that there is no government support for small scale farmers. Government is not playing an effective role to uplift the small farmer from lower yields and low profit to higher yield and more profits. On the other hand, the private sector is supporting farmers in some indirect ways like paying large farmers comparatively high prices than small farmers and providing basic facilities for the farm management. All these challenges attribute to small scale farmers in the rural areas contribute to high transaction cost. At the other side the large scale farmers of peri urban farmers connected to the corporate dairy supply chain, possess good marketing practices and/are equipped with Dedicated assets like cooling tanks, chillers and refrigerators, receive additional services from their contract companies free of cost.

Furthermore, large scale farmers connected to the formal supply channel have long term written contract which minimize the cost of maintaining contracts, while the small scale farmers' show relative dependency on Dhodhi channel, and their type of contract (verbal) face high transaction costs. Therefore, when the farmers choose a dairy channel, they need to take into account the preceding attributes or challenges. In such state of affair small scale farmers operating in an uncertain environment, their relative dependency on middlemen opportunistic behaviour (middlemen as their last resort), the theory suggests, between the small scale farmers and the buyer a third party should intervene, where vertical integration is evident to be lowering the transaction cost between the partners. The large farmers engaged in a governance environment similar to the governance form in practice in the country is totally different. Then that participant as large farmers are seen to be benefiting from the chain where as small scale farmers are benefiting from the alternate form of governance operates in Vertical integration is preferable, which will make the transaction easier between the trading partners.

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APPENDIX.

QUESTIONNAIRE:

QUESTIONNAIRE FOR FIELD PROBLEMS FACED BY SMALL FARMERS IN THE DAIRY SECTOR PAKISTAN (CASE STUDY PUNJAB PROVINCE)

Questions from farmers:

Name of the farmer: _____

1. Gender: (a) Male _____ (b) Female _____

2. Age _____

3. Total household size _____

4. What is the present monthly income of the household? PKR. _____/month

5. What is the source of household income? (Please \surd the appropriate blank)

(i) Agriculture: _____

(ii) Retail/small shop: _____

(iii) Retail/medium shop: _____

(iv) Skilled labour: _____

(v) Unskilled labour: _____

(vi) Others (specify): _____

6. Do your family own a piece of land? (i) Yes _____ (ii) No _____

7. What are the Total number of animals _____

Cattle's: _____ Buffalo: _____ Small animal: _____

8. What is the average milk from cattle: _____/day, buffalo: _____/day

(i) Total milk production at farm: _____/day

9. How you use the milk

i) Own purpose _____

ii) sold in the local market _____ liters

10. The selling form of milk is

i) Hygienic _____, ii) Unhygienic _____

11. Is there a market for animal products (milk) in the village?

12. Where are you selling your products (if they are sold)?

13. How many milking animals do you have?

14. What is the total milk production per day? liters/kg

15. daily?(milk average, liters per day)

16. What is the total cost per day for feed?

17. What is the total milk production at farm? Lit/kg per day

18. How much you sell/how much is saved for domestic use?

19. Location to sell? Village /city?

20. Transportation cost?

21. What other costs you have?

22. Is there any district veterinary hospital? Village? City?

23. What channels you use to sell your product?

24. Middlemen/shopkeepers' / companies?

25. How the middle men get milk from the farmers/in what conditions?

26. How the middle men exploit you? Do you prefer middle men?

27. If yes, why?

28. Are you satisfied from middle men or dhodhi?

29. Do you receive any services from middle men?

30. What kind of services do you receive from middle men or dhodhi?

31. How the price is fixed with middle men? Any contracts with middle men?

32. Do you have any contract with any company?

33. What is the type of contract? Written/verbal/other

34. What is the price adjustment/agreement with the company?

35. Is the farmer receive payments on time?

36. Is the company provides cooling tanks or other equipment to the farmer?

37. What are Barriers for the growth of your farm?

i) _____

ii) _____

iii) _____

iv) _____

Any other(s): _____

QUESTIONS FROM NESTLE AND HALEEB

Questionnaire From NESTLE, Pakistan

CONTACT PERSON _____ POSITION _____

AGE _____ SEX (M/F) _____ PLACE _____

1. What is the price of milk per liter the company purchase from farmer?

2. What is the way of collecting milk?

3. How many milk collecting points or centres in Punjab. Rural/urban?

4. Location for main milk centre?

5. Location for sub milk centres?

6. Number of chillers in the city/village?

7. Is this accessible and near to the farm sites? i) Yes _____ ii) No _____

8. Number of employees in each chillers?

9. Location of processing plants or units in Punjab?

10. What is the way of payment to the farmers?

11. What basic services and specific services the company provides to the farmers?

12. Who is your contract partner?

13. What kind of support the company give to the farmers?

14. What agreement the company hold with the farmer?

15. Logistics or financial?

16. What are the criteria for the farmers to be in contract with the company? (Like how much animals the farmers needs to have/farm size)

17. Do the company arrange any community workshops training etc. for the contract farmers?

18. Who conduct this activity?

19. What kind of training and other skills do you provide to the farmers?

20. What equipment the company provides to the farmers?

21. Do the company provide cooling tanks other equipment to the farmers?

22. What is the milk collecting process and procedure?

23. Who go and collect the milk from farmers?

24. What channels the company use?

25. What is the procedure of payment between farmers and company?

26. Do the company provide loans to the farmers?

27. What is the condition the company provides loan and what is the policy of the company?
