



**ICDD**

Muhammad Younas

## **The Dairy Value Chain:**

A promoter of development and  
employment in Pakistan

The International  
Center for Development  
and Decent Work

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## 1 Preamble

By tradition dairy farming has been a prestigious occupation in the fertile lands of the Indus basin. In Pakistan, the practice of rearing dairy animals remained a complementary activity to crop production. Deeply embedded in the rural life, dairy farming still is a sign of prestige within the agriculture sector; it forms an integral part of the socio-economic activities in rural areas and plays a supportive role in mitigating the effects of poverty by providing essential food items of daily use, family income, and employment for family and hired labor. In addition, buffalo and cattle are the main source of fuel for cooking, an excellent organic amendment to maintain the soil fertility and a potential source of biogas production.

Livestock production is a major activity in Pakistan: about 30-35 mio rural people are engaged in raising animals and derive 30–40% of their income thereof (*ACO, 2008*). The national herd comprises 30.8 mio buffaloes, 34.3 mio cattle, 27.8 mio sheep, 59.9 mio goats and 6.2 mio other animals (*Pakistan Economic Survey, 2010–11*) with an increasing trend since 1961 (**Figure 1**). The main dairy animals are water buffalo, cattle and, to some extent, goats and camels. As a leading sub-sector of agriculture, the livestock sector accounts for 55% of agricultural value added with a share of 11.5% to the national GDP in Pakistan. While other sectors experienced saturation and decline, there was a growth in the livestock sector by 3.7% during in 2009–210 despite the damages caused by the devastating flood in August/September 2010 (*Malik, 2011*). Gross value addition of livestock at current factor costs has increased by 17.8% – from Rs<sup>1</sup> 1305 billion (US\$ 15 billion) in 2008/09 to Rs 1538 billion (US\$ 18 billion) in 2011 (*Pakistan Economic Survey, 2010–11*); at the same time the net foreign exchange earnings from the livestock sector accounted for 12% of the overall export earnings of Rs 53 billion (US\$ 608 mio).

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<sup>1</sup> Rs = Rupee(s)

Within the livestock sector, milk is the single most important commodity. Globally, Pakistan ranks fourth among milk producing countries (**Figure 2**), with a gross annual production of 45 billion litres of milk (*Malik, 2011*). Yet, while the country's annual milk demand is growing by 15%, the production has been increasing by only 3–4% per year and the supply gap is predicted to increase to 3.6 billion litres in 2015 (*Jano, 2011*). Therefore Pakistan imports powdered milk to meet the rapidly rising domestic demand (**Figure 3**).

Despite its importance, Pakistan's dairy sector has received very little attention from policy makers in the past (*Afzal, 2006*). In consequence, milk production per animal is very low and the genetic makeup of the animal stock is poor. The sector mostly operates on a non-commercial basis, and its organized segment covers only a small fraction of the country's total milk production.

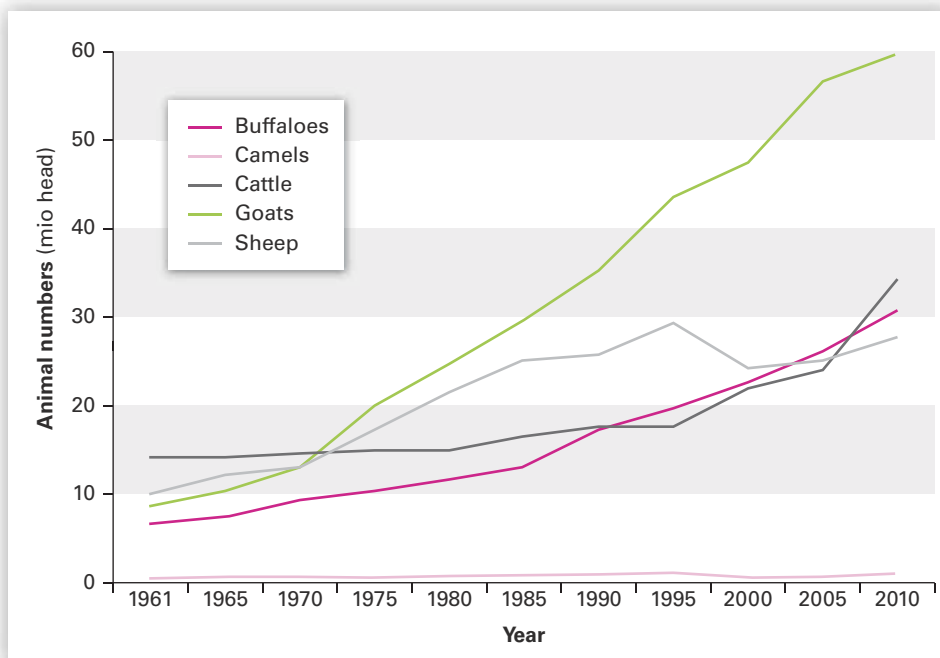


Figure 1: Evolution of ruminant livestock numbers in Pakistan from 1961 to 2010 (FAOSTAT 2012).

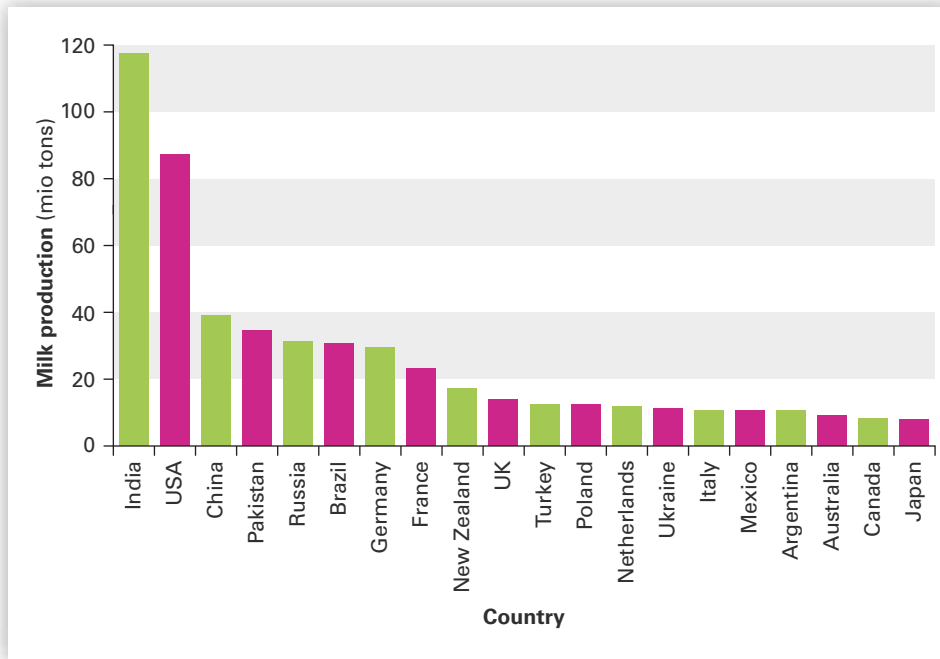


Figure 2: Production of raw milk (buffalo and cattle) of the twenty most important milk producing countries in 2010 (FAOSTAT 2012).

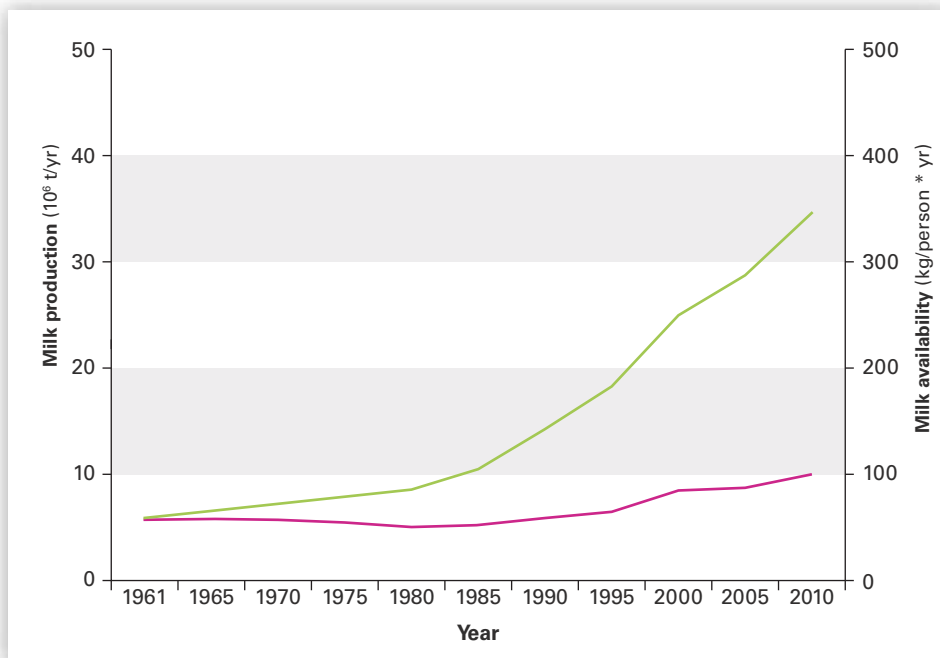


Figure 3: Total annual production of raw buffalo and cattle milk (green line, left-hand y-axis) and annual per caput raw milk availability (pink line, right-hand y-axis) in Pakistan (FAOSTAT 2012).

## 2 Status Quo of Milk Production in Pakistan

The major dairy animal in Pakistan is the water buffalo: as its milk is relished throughout the country, it provides 62 % of the total milk produced, and buffalo numbers currently increase by 2.8 % annually. At a production in 2011 of about 23 mio litres, Pakistan ranks second in global buffalo milk production after India (62 mio litres) (*FAOSTAT 2012*). The rest of the milk comes from cattle (34 %) and 4–5 % from goats plus camels (*ACO, 2009*). Of the dairy buffaloes, 98 % are producing less than 10 litres of milk per day, and most of the recent increase in the national milk yield (17 % from 1966 to 2002) was due to an increase in the number of dairy animals (15 % from 1966 to 2002), while production increase per animal contributed relatively little (*Habib et al., 2007*). Yet, considering that most of this increase stems from small-scale holders, there is a great opportunity to improve the livelihoods of these producers by providing enabling framework conditions (*Garcia et al., 2003*).

Cattle are kept by about 5–6 mio rural households that manage 97 % of the country's cattle population. In these systems, cattle are kept primarily to provide draught power for crop production with milk as a by-product for family consumption or sale. However, the mechanization of crop production especially in the irrigated areas of the country, and crossbreeding of local cattle with exotic breeds (mainly Holstein Friesian), have generated interest in keeping cattle for dairy purposes. Currently, crossbred cows surpass the indigenous Sahiwal breed in per animal milk production as well as in total numbers. In addition, a new type of progressive cattle breeders has entered the system, raising pure exotic breeds for commercial production (*Qureshi et al., 2004*). So far, the latter category of entrepreneurs manages an insignificant part of the national herd and contributes little to the nation-wide milk supply.



## 2.1 Systems of Dairy Production

Obviously, Pakistan's dairy animals are bred and raised under different production systems, depending on location, purpose of the breed, available feed resources, population pressure and structure, and marketing opportunities (Younas, 2003). In a recent report Morgan (2009) mentioned additional drivers for the dairy sector, namely (i) changes in management, (ii) changes in demand, (iii) advances in production as well as (iv) progress in transportation and communication technology. Except for nomadic ruminant husbandry and some peri-urban milk units, all ruminant production systems are closely integrated with crop production. Traditionally, livestock rearing has been based on free grazing, absorbing a lot of family labor for herding. In rural areas, common systems of buffalo and cattle production are: (i) rural subsistence smallholders, (ii) rural market-oriented smallholders, (iii) peri-urban semi-commercial producers and (iv) peri-urban commercial farmers (Qureshi et al. 2004, Raja, 2004). Gill (1994) and Afzal (2006) also mentioned some additional dairy systems.

In rural dairy systems grazing provides 50–60% of the feed resources; although this reduces fodder costs, (family) labor is required for herding the animals. The remainder part of the feed comes from green fodder (10–15%) and wheat straw (25%), while concentrates (<5%) are offered only during lactation. Per lactation milk yield of a buffalo is 1,200–1,500 litres, and families try to ensure that one female is in milk at all times of the year. In such rural subsistence systems, surplus milk is not marketed but processed into butter, butter oil (ghee), or other long-lived products. Population increase along with the increasing demand for milk and the establishment of chilling units near smaller towns has recently encouraged rural farmers to engage in commercial dairy farming (Qureshi et al., 2004). A typical dairy unit of this type consists of about 50 buffaloes (or mixed herds with 90% buffaloes and 10% cattle) of which 50–60% are in milk. In such more market-oriented systems, the average production per buffalo is 2,000 litres of milk during 250–400 days of lactation, with up to 3,000 litres produced by high grade animals on commercial farms (Burki et al., 2004).

Smallholders owning land devote 10–20% of their cropped area to fodder crops and are able to provide a considerable share of their herd's roughage requirements from this source, whilst landless families have to purchase green fodder as well as straws. The major forage crops are multi-cut oats, berseem, alfalfa, sorghum, sorghum x Sudan grass hybrids, maize, and millets (Dost, 2003). Yet, average on-farm forage yields are very low compared to yields obtained at research institutes and on well-managed farms. Improved forage varieties and production technology have been slow in reaching the small-scale farms which account for the bulk of forage production; seed production has lagged behind plant breeding (Bhatti et al., 1992). In a country where arable land and access to water and irrigation facilities are the major limiting factors to agricultural production, intensification is the only way to meet the growing needs for forages and livestock products (Younas and Yaqoob, 2005). With dairy units growing rapidly, the demand for forage is increasing and achieving importance compared to other crops (Dost, 2003).

In extensive systems of production, 30–50 kg of green fodder is fed daily to individual buffaloes. Wheat straw invariably constitutes a significant part of the dairy ration (4–6 kg/head/day). During periods of feed shortage, the daily allowance of green fodder is reduced to about 10–15 kg and that of wheat straw increases to >8 kg. For easy management and to save labor, all lactating buffaloes are given a relatively fix amount of concentrate feed (4–6 kg/head/day) without taking into account their daily milk production. Yet, such feeding practices deprive the potentially high milk producing animals of energy and protein, and on the other hand overburden the low milk producers with nutrients (*Qureshi et al., 2004*). The easiest way to correct such imbalances would be group feeding of lactating buffaloes according to daily milk yield, offering each group 1 kg of concentrate for every 2 litres of milk (*Younas and Yaqoob, 2007*). This practice would not only increase total daily milk output per farm but would also reduce costs of feeding and health care of over- and underfed animals, respectively.

Peri-urban dairy units have developed rapidly in the recent past in response to (i) the increasing price of milk, (ii) the growing urban population and its demands for dairy products, and, related to this, (iii) the difficulties of collection and transportation of milk from remote areas to consumption centres. The availability of vehicles, improved infrastructure and effective input-supply networks has helped the peri-urban dairy sector to grow rapidly (*Garcia et al., 2003*). Feed accounts for more than two thirds of the operational costs since animals are stall-fed year-round with purchased roughages and concentrates. As the systems are highly intensive and profit-oriented, lactating animals are also fed large amounts of concentrates. Commercial peri-urban producers can be divided into large-scale and small-scale entrepreneurs: the former operate in and around major cities, the latter are generally found close to smaller towns. Smaller herds range from 10–200 heads (the average being 50), larger herds comprise 20–1,500 milk animals (the average being 125). Adult female buffaloes dominate these herds (90–95%), of which more than 95% are in lactation at any time of the year (*Hagmann, 2012*). Selected third or fourth lactation buffaloes with an average yield of 2,500 litres per lactation are bought into the herd, either close to calving or with a calf on foot; they are kept for a lactation period of 250–300 days to guarantee a high milk output. The calves are generally weaned after one week and sold at the age of 1–2 years for slaughter. Dry animals are sold for meat but a minority that gets pregnant earlier is kept in the herd or is returned to rural areas until the next parturition. Although a few breeding males are kept, many females are not served during lactation because of the fear of lowered milk production. The wasteful usage of a considerable portion of its elite dairy animals is expected to contribute to a reduction of the genetic potential of the country's dairy sector (*Hagmann, 2012*).

A special case is presented by the approximately 4,000 large dairy enterprises in the various dairy colonies of the city of Karachi. Landhi Buffalo Colony is the largest dairy colony of the world established initially (1958) on 4.1 km<sup>2</sup> of land for 15,000 buffaloes. The aim was to expel livestock from metropolitan living quarters while meeting the growing milk demand of the urban population (DFA, 2010). Currently there are more than 1,500 farmers on 6.5 km<sup>2</sup> of land, keeping >400,000 dairy animals at one location. Individual units in the colony may comprise >300 lactating animals owned by small-holders and/or leased from larger owners and managed co-operatively (Wynn et al., 2006). At present a plant installation is underway at Landhi Buffalo Colony to convert the >7,000 tons per day of fresh dung and other organic wastes into biogas; this will be one of the largest manure biogas plants worldwide (HiRAD, 2008). The demand for milk in Karachi of about 8 mio litres per day is opposed to an average production of 8 kg milk per buffalo and day, leading to a shortfall in supply of 4 mio litres daily (DFA, 2010). Milk supply deficits such as in Karachi provide peri-urban dairy farmers with significantly higher milk prices than those achieved in rural areas. This situation leads to the creation of a number of employment opportunities (Figure 4) in the peri-urban dairy sector, with about one milker employed for every 10 milking animals. The need of Dairy Managers has also been felt very badly in the country to handle the dairy production sector and to cater the needs of very expensive exotic dairy animals.

Milk supply deficits and concomitantly higher milk prices do also occur nation-wide, due to seasonal phenomena: high ambient temperatures in summer (May–July) strongly reduce the availability of irrigation water and hence of fodder, provoke heat stress in dairy animals, along with lowered number of parturitions and lactation yields (Raja, 2004). The reduction in raw milk supply leads to price increases but is partly also fostering a dilution of milk with water (Hagmann, 2012), since milk consumption (via ice cream and cold yoghurt) is at its peak in summer.

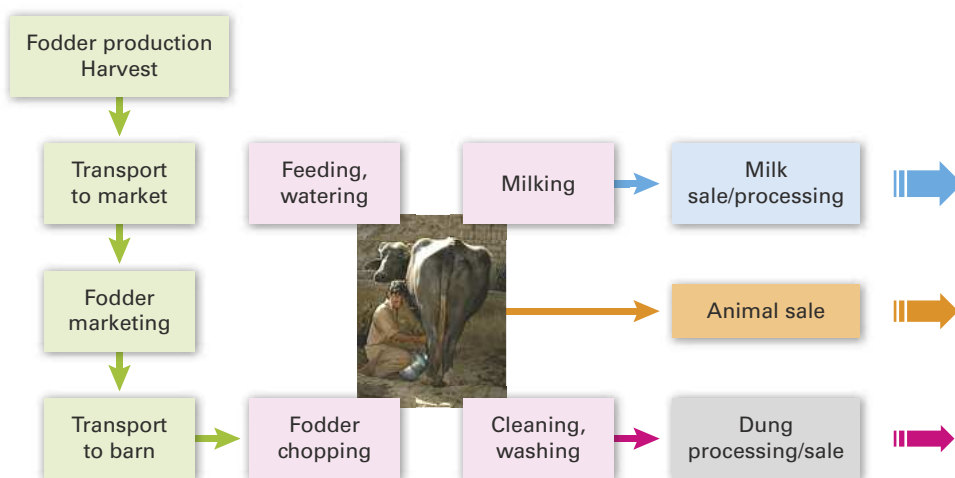


Figure 4: Schematic representation of the fodder, milk, animal and dung value chains (until first raw products only) available for improvement and employment creation in Pakistan.

### 3 The Dairy Value Chain

A value chain is a set of businesses and their interactions that brings a product (or service) from raw material to final consumption stage. Though it may not meet the norms of the decent work agenda (see section 4), a vibrant value chain system exists in the dairy sector of Pakistan, which is growing and continuously incorporating new businesses, generating jobs, income and assets. As pointed out earlier (section 2), the dairy value chain system is especially fuelled by the rapidly growing urban food demand.

Value chain development forms a core part of a range of private sector development strategies, from local economic development and clustering strategies to export promotion. At the heart of value chain development is the effort to strengthen mutually beneficial linkages among enterprises so that they can take advantage of market opportunities (*Burki and Mushtaq, 2007*). Most value chain initiatives work with a range of business types to strengthen both vertical linkages – among enterprises that buy from and sell to one another – and horizontal linkages – among enterprises that serve the same functions in the value chain (*ILO, 2008*). Positive outcomes occur when there is a strong market drive for linkages, strong investment from many enterprises in the chain and a market system in place to replicate successful models and practices. Clearly, a value chain will only develop if driven by strong consumer demand.

Despite serious neglect in the past and little attention by previous governments (see section 1), the value of the single commodity milk (Rs 375 billion/US\$ 4.39 billion) exceeds the value of the country's four major crops (wheat, rice, sugarcane and maize, Rs 243 billion/US\$ 2.84 billion; **Table 1**), which emphasizes the necessity of developing Pakistan's dairy sector. However, out of the total governmental budget of Rs 106 billion (US\$ 1.24 billion) for agriculture, only Rs 6 billion (US\$ 70 mio) were allocated to the livestock and dairy sector in the past (*State Bank of Pakistan, 2006*). At present this unfavourable situation is under correction and financial institutions are in the process of modifying their credit schemes for dairy production, processing and marketing (*SBP, 2006*).

Commodity	Production (Mega tons)	Value (Billion Rupees)
<b>Milk</b>	<b>27.8</b>	<b>375.4</b>
Wheat	19.2	143.9
Rice	4.5	33.5
Sugarcane	53.7	55.0
Maize	1.7	10.9
<b>Total of four crops</b>	<b>69.1</b>	<b>243.3</b>

**Table 1:** Gross production and value of raw milk (from buffaloes and cows) as compared to that of the four major crops in Pakistan in 2002–2003. Source: Agriculture Statistics of Pakistan, 2002–03

About 70% of the produced milk is used for domestic consumption, 30% are marketed through various channels within the country. Processed milk accounts for only 4-5% of total production; the rest is sold as raw milk or used for making sweets and various other traditional products (*Afzal, 2006*). Of the processed milk, 50% are converted into UHT milk, 40% into powdered milk and the remaining 10% into pasteurized milk, yoghurt, cheese and butter. There is currently some emergence of a market for fresh milk, but the integrity of the milk collection system in terms of hygiene and chilling has so far limited the development of this sector. Additionally, while consumers of fresh milk prefer high fat buffalo milk to cow's milk, the high proportion of buffalo milk presents some technical challenges for the processors (*Raja, 2004*). Overall, Pakistan's milk transformation and marketing system is under-developed by standards of developed countries, which reflects the aforementioned policy constraints.

### 3.1 Traditional Milk Processing and Marketing Systems

After independence, around 90% of the people in Pakistan lived in villages, and they traditionally considered it taboo to sell milk or milk products. Urban milk shops, which procured supplies of milk from poor families selling their produce due to economic pressure, were only serving strangers and passersby. Commercial dairy farming, therefore, remained dormant in the early years of the country. The rural to urban drift that gained momentum in the last quarter of the previous century brought about certain changes in dairying patterns: rural migrants brought with them their food habits, including milk consumption, to their adopted urban abodes. The new demand situation encouraged enterprising rural farmers to bring their lactating animals to urban and peri-urban areas and sell milk to the city dwellers. By now, the taboo on selling milk and milk products has diminished almost to the point of vanishing.

Un-pasteurized and un-chilled milk is mostly sold directly to consumer households. The distribution system is based on milk collectors (dodhees) operating as individuals or as contracted groups distributing milk from a major producer. Usually the morning milk is sold (by volume), while the evening production is used for domestic consumption. A dodhee usually collects the milk from 10–15 smallholders (80–100 litres) by using a bicycle, motorcycle, or horse cart. This may take 3–4 hours, and the distance covered (10–20 km) depends on the mode of transport. Monthly or seasonal delivery contracts with producers are usually made by the dodhees; they may also grant interest-free monetary advances by fixing the price of the milk with the producers to (i) ensure the daily production, (ii) avoid or cover seasonal fluctuations of quantity and price, and (iii) stay in competition with other milk buyers.

This traditional raw milk collection and marketing system is supplying rural and urban consumers quite effectively but its capacity is limited by the perishable nature of the product. Different marketing channels are employed (Zia, 2009) to procure and market the raw milk (**Figure 5a and 5b**). This variation is due to the different production systems at various locations of the country. The channels involve the purchase of fresh milk from rural areas or remote milk pockets, and its supply to consumption centres on a daily basis, either for raw milk use or for conversion into milk products at small-scale dairy shops (**Figure 6**).

In cities the milk shops often also exercise distribution functions by supplying further small retailers; they also transform milk into local yoghurt (dahi), yoghurt drinks and a simmered, sweetened concentrate (khoa) for sweet dishes or ice cream. However, the major part of raw milk reaching the milk shops is sold untreated within one to two hours after arrival. Some shops, particularly those operated by commercial milk producers, keep the milk in cooling tanks or fill a certain proportion into plastic sachets, which after sealing are kept in a refrigerator. Milk that is not sold immediately (about 20% of the purchased volume) is boiled for later sale or converted into dahi, khoa etc. Ghee is mainly produced by farmers in areas that are not penetrated by milk collectors. The major part of ghee is home-consumed, but an estimated annual volume of 34% is marketed through wholesalers, vendors and shopkeepers, both in rural and urban areas.

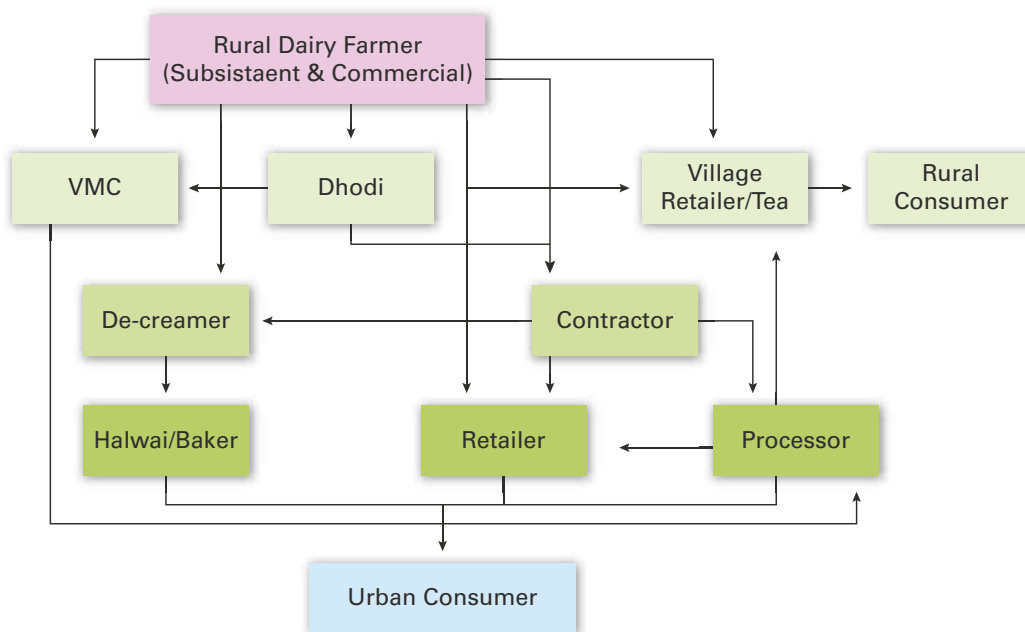


Figure 5a: The rural marketing chain. Adopted from Zia (2009).



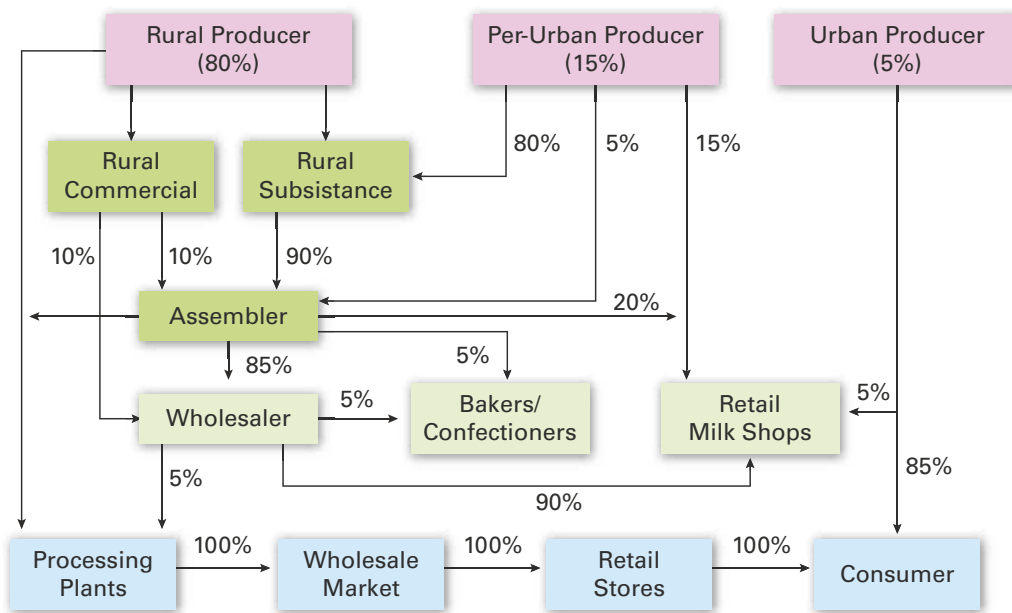


Figure 5b: The general milk flow chart for the country of Pakistan. Adopted from Zia (2009).



Figure 6: An urban milk kiosk (left) and a shop where milk is skimmed (right) in Faisalabad, Pakistan (courtesy by A. Buerkert).



### 3.2 Modern Milk Processing and Marketing Systems

The dairy industry has been growing by 20–25% annually during the past 5 years, and the commercial sector is heavily investing in the development of a farm-to-factory cold chain distribution system. At the moment there are 15 milk processing plants in the country, mainly producing UHT milk, milk powder, yogurt and very little cheese (see above). The industry is dominated by the private sector with multinational as well as national companies involved. *Nestlé* is the largest company in dairy business, while *Idara-e-Kissan* (“*Halla*” brand) is the only dairy cooperative collecting and processing milk. In all cases milk is sourced from larger producers in rural areas that are located close to the major transport routes. Since there is some competition for milk supplies, these producers have alternative market outlets which can generate higher farm returns; however, they still face the constraints of inadequate feed supplies, low milk output per animal, the lack of a premium price for summer milk and for milk with a higher fat content (*PDDC, 2006*). Other authors indicated that price does vary with season in the traditional marketing systems as *dodhees* compete for milk to meet their supply commitments (*Raja, 2004*). There are also conflicting reports of pricing policy interventions at the retail level (*Younas and Yaqoob, 2007*) which is an important issue to investigate in view of the success of poverty alleviation strategies that are based on improvements in livestock production.

A major challenge for the dairy sector is the introduction of and adherence to standard food safety regulations and hygiene standards in milk production, processing and marketing, not only on the national market but also to exploit the country’s export potential. A nation-wide campaign is needed to create awareness about milk safety and quality issues and to establish and implant standards for milk production, handling and processing. Having realized the importance of dairying for the rural economy, and the role of smallholders and other stakeholders, the public sector has launched several initiatives that address these issues (*Wynn et al., 2006*).

## **4** Employment and Working Conditions in the Dairy Sector

Subsistence-oriented smallholders employ family labor for their dairy activities and in return get milk and other products (dung, fuel, meat, draught power) for own consumption or reinvestment on the farm. Commercial units also employ family labor, but in addition often hire labor. These laborers are employed on a seasonal or yearly contract and receive payment in cash and/or in kind. The remuneration is generally affected by (i) investment in / rent of animal houses; (ii) utility charges (electricity, water); (iii) size of the dairy unit; (iv) type and amount of equipment used and of veterinary services; (v) quantity of milk produced; (vi) marketing opportunities and frequency and (vii) skills and training/experience of the laborer (*Raja, 2004*).

### **4.1 Decency of Work**

The *ILO (2008)* has provided norms and guidelines for decent work that provide a framework for addressing the multiple challenges of employment of the mostly poor family members (on small-scale rural and peri-urban farms) as well as the poor hired laborers working on medium-to-large-scale commercial farms, mostly in peri-urban settings. There are thus strong linkages between the implementation of decent work standards and poverty reduction efforts (*Vandenberg, 2006*). Both agendas emphasize the dependency of people's well-being on income derived from productive employment and on social security, and on the rights and influence they can exercise through representation and dialogue. However, decent work standards *per se* do not supply prescriptive mechanisms, policies or targets, but provide criteria against which policies, development programs or regulatory initiatives might be assessed. Although decent work is a universal concept it does not imply uniformity; rather there will be variations in policy approaches adopted to achieve decent work – depending on national, local and sectoral circumstances.

Poverty of family and hired labor can be reduced through the development of productive dairy enterprises that provide an adequate income for entrepreneurs and workers. As low productivity is characteristic of many small dairy enterprises in Pakistan (see section 2), this limits wages and income and reduces the overall viability of the enterprises. Success in establishing a productive and competitive dairy value chain (see section 3) is therefore the key to sustain livelihoods, create new jobs and raise wages. For small enterprises additional policies are needed to safeguard their legitimate business activities, including basic property rights, the right to conduct business in an environment that is free from harassment, administrative barriers, corrupt practices and the illegal seizure of property backed by a sound judicial system (*Vandenberg, 2006*).

Systems of social protection address the vulnerability aspects of poverty and tend to do so by supporting incomes. They are especially applicable for larger enterprises that are however not too numerous in Pakistan's dairy sector yet. A key aspect in this regard is the provision of social security (pensions and insurance programs), which can take public, private or semi-private forms. It can also involve the support of the establishment and expansion of private and association-based businesses through adequate insurance programmes. In view of improving the sector's performance, social protection has to become part of the employment rules in the dairy value chain, as it is already practiced in larger textile units and ISO certified factories in the country (*ILO, 2008*).

Social dialogue, based on effective and democratic member-based associations, can allow small enterprises to dialogue with the government on policies and programs that are needed to support their development. It can also help to improve the situation of the poor, as poverty is partly based on the lack of an effective voice. By communicating better and giving them due representation in the dairy value chain, it will help to know the concerns of (hired) workers and small entrepreneurs.

A recent survey in Faisalabad indicated that decent work criteria are not known nor applied by dairy farmers. Most of the time family and hired workers receive low payment, and are not taken care of as far as their basic needs – e.g., health and maternity requirements – are concerned (*Akhtar et al., 2008*). Overall, earnings from dairy wage labor are low and volatile, and opportunities for regular employment appear to be in decline as workers are increasingly engaged on a casual or temporary basis. As far as female dairy workers are concerned, many hired laborers are not paid in cash by the animal owners but rather receive remuneration in kind (dung cakes, milk, wheat flour, food or clothes). Sometimes the residence at farm is also counted among the benefits. In addition, many female laborers are treated in an unfair manner, suffer from unhealthy working and living conditions, lack social protection and have limited access to health services and child education (*Erbach, 2012*). Some workers do however get a certain attention during sickness, maternity, ceremonial occasions, religious holidays, or at old age. Especially small-scale dairy enterprises may surpass the limits of propensity to help their employees.

The specific situation of male dairy laborers in Pakistan as well as in Kenya is currently investigated within the ICDD (PhD research of Ms Saadia Hanif and Mrs Jane Sawe); in addition the ILO prepares an overview paper on the decent work situation in (peri-) urban agriculture (*P. Hurst, personal communication July 2012*). Income insecurity especially of migrant and seasonal labor constitutes a key factor leading to decent work deficit (**Table 2**). Casual labor provides few opportunities for households to invest in developing skills and building assets, and unequal power relations with the employers limit the households' capacities to improve their security or working conditions (*ILO, 2008*). Efficient labor markets can contribute to raising the quantity and quality of employment; nonetheless, improving the functioning of labor markets for unskilled labor (see Figure 4) remains a major challenge.

	Fodder supply chain	Diary barn	Milk delivery	Milk processing
Unskilled labour	yes	yes	yes	
Trained labour				yes
Educated labour		vets		sometimes

Diary value chain requires mostly unskilled labour → low wages

	Fodder supply chain	Diary barn	Milk delivery	Milk processing
Physically easy	no	no	maybe	quite ok
Physically safe	no	no	maybe	depends
Hygienically safe	depends	no	acceptable	quite ok
Acceptable working hours (timing/duration)	depends	no	depends	depends
Days off/vacation	?	?	?	?
Socail security schemes	no	no	?	?

Problematic conditions on the supply side (field/barn):  
better conditions on the delivery side (processing/marketing)

**Table 2:** Requirements for educated labor (above) and schematic assessment of working conditions (below) along the dairy value chain in Pakistan.

## 4.2 Gender Aspects

Women can be particularly affected by poverty, and probably constitute the majority of the >1.3 billion people living on a maximum of US\$1 per day (Vandenberg, 2006). Poverty especially affects female-headed households for whom it is difficult to raise children, run the household and generate income at the same time. More generally, lower school attainment and cultural barriers limit women's ability to obtain well-paid employment or generate income from enterprises in the formal or informal economy. Accessing credits and securing premises for rental or freehold business space may pose particular problems for female entrepreneurs. Women also often earn less in the informal economy than men.

Women's activities in Pakistan's livestock and dairy business cover all sorts of tasks such as fodder collection, fodder chopping, feeding, cleaning and watering the animals, milking, selling milk to retailers and making dung cakes. These activities absorb around 30% of their daily labor time (Akhtar *et al.*, 2008; Erbach, 2012). In a recent initiative to empower women, the UNDP initiated a three-year project of Community Empowerment through Livestock Development and Credit (CELDAC, 2009). In partnership with two major private dairy processing corporations (Nestlé and Engro) this intervention targets smallholders and aims to promoting women's role in livestock development. To this end, female community livestock health workers are receiving technical training in animal management, including feeding, housing and basic health care. In addition, credit is provided for female enterprise development through links with financial institutions. The project is expected to increase the involvement of women in the dairy sector and promote a modernization of the later. Currently however, the acceptance of the work of female laborers in dairy operations is low and their work is undervalued; in addition working conditions are inadequate.

## **5** Conclusions

The dairy sector plays a very important role in Pakistan's economy as well as in the life of a common farmer, dodhee, and milk shop keeper, and need exists to increase the production of milk and its products in order to meet the rising domestic demand and produce exportable surplus as well. To increase individual animals' milk output, dairy farm economics and the performance of the country's dairy sector as a whole, governmental and private efforts that target the sector's production, health, extension and marketing wings need to be harmonized at national and regional level. To complement each other, these areas of intervention must have strong linkages but clear cut working domains. The FAO model of handling production and health as separate entities could thereby guide activities in the respective domains. To speed up the pace of development, the efforts of the Dept of Livestock and Dairy Development (L&DD) need to be strengthened to improve service delivery to producers, expand production opportunities and achieve sustainable economic growth. In addition, the country's livestock production database needs to be made as accurate and efficient as possible for a meaningful and sustainable planning and execution of dairy development activities.

On the marketing side, efforts need to explore milk procurement, transformation and distribution chains to the ultimate consumers of this highly perishable commodity. Creating awareness of the needs for a wholesome and hygienic product at the level of smallholders and dodhees will support their successful competition in the national milk market and may in the longer run allow the country to participate in international trade. Such improvements along the dairy value chain and its full development are viewed as central stimulus for a viable and modern dairy sector. Thereby, keeping smallholder producers and retailers in business and creating new and decent employment opportunities along the value chain must be a focus of public and private interventions.

Owing to the current deficit of adherence to decent work standards all along the dairy value chain, there is need for elaboration and implementation of a comprehensive strategy that promotes employment in line with decent work criteria, thereby accounting for gender-specific issues wherever needed. Such an endeavour calls for the integration of economic and social objectives and for a well-orchestrated combination of measures in the areas of employment promotion, rights at work, social protection and social dialogue. Addressing decent work deficits will promote both productive employment and decent work in a mutually reinforcing manner on the one hand, while on the other it will ultimately offer a pathway out of poverty for many smallholder producers and retailers, their family employees and hired laborers.

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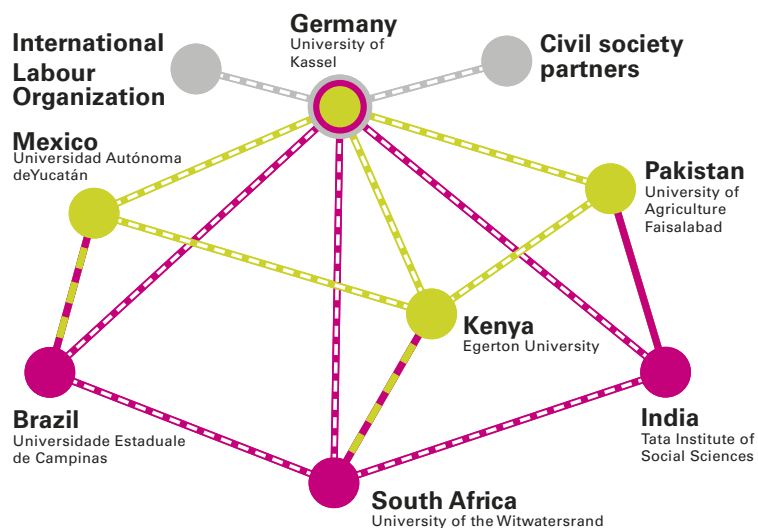
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