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Traditional dairy goat value chain in Lebanon: an uneven distribution of values

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Abstract

Purpose – Small-scale goat farming and dairy goat productions are significant constituents in the livelihoods of marginal Lebanese rural communities. Reviving and supporting that sector is instrumental in creating value for rural communities to build sustainable livelihoods and safeguard climate-adapted value chains (VCs). The paper aims to describe the dairy goat VC in the Shouf and West Bekaa (WB) areas of Lebanon, which are traditionally popular for caprine production.

Design/methodology/approach – A socio-economic approach was employed to determine the perceived challenges, opportunities and context of goat farmers and dairy processor in the Shouf and WB casas as case studies, using the Heifer International's toolkit for goat value chains. Questionnaires were developed for the five actors of the VC: farmer, milk collector, processor, retailer and consumer. The data were analyzed quantitatively, using simple statistical analysis, and qualitatively through observation, gathering, coding and thematically organizing the responses.

Findings – In the Shouf, the chain is shorter, consisting of a farmer, processor and consumer, while in the WB the VC includes a milk collector and larger dairy factories. The value is unequally and unfairly distributed among the actors putting the small-scale farmers and processors in subordinate positions. In terms of enabling environment, the role of the state, authorities and organizations remains minimal in supporting the sector. The challenges facing this sector are economic, regulatory, operational, social and hygienic as perceived by the participants.

Research limitations/implications – The economic, political and social instability of the country hinders the performance of the sector.

JEL Classification — Q12

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Originality/value – Limited research is available on the small ruminants' VC in Lebanon, addressing the socio-economic status of goat farmers and opportunities available in the sector. On the other hand, the demand for traditional dairy products is increasing amid rising concerns related to intensive livestock systems and negative association of livestock systems with climate change. Accordingly, basic assessment and research on the existing small ruminant dairy chains is important as a first step for the sustainable development of the sector.

Keywords Small ruminants, Goat dairy value chain, Small-scale farmers, Goat dairy processing, Traditional dairy goat products

Paper type Case study

1. Introduction

The Lebanese agricultural sector is underappreciated, underdeveloped and poorly managed. Economic, environmental, regulatory, operational, social and hygienic concerns are threatening this sector and exerting pressure on existing farmers and hence leading to the decrease in interest and number of herders and dairy processors (Chedid *et al.*, 2018b; El Balaa and Marie, 2008; Hosri *et al.*, 2016).

Dairy goat VCs of traditional products are considered short VC s that come across many obstacles such as access to finance, access to proper technology, equipment and material, milk quality control, marketing and demand, inefficient distribution and others (Hajj-Semaan *et al.*, 2011; Hamadeh *et al.*, 1996). The size of actors and power relations at each level differ among areas and between different supply chains. Both small-scale farmers and processors are vulnerable and valuable actors, and hence empowering and enhancing their conditions is vital for the development of this sector and the rural communities it supports (Hamadeh *et al.*, 2001).

Small ruminant production, specifically goat farming, is an important agricultural activity in countries with low income where it has a socio-economic significance in rural life (Barua *et al.*, 2021; Dubeuf, 2011; Dubeuf *et al.*, 2004; Hamadeh *et al.*, 2006; Morand-Fehr *et al.*, 2004). Goat herding and dairy goat production are significant constituents in the livelihoods of Lebanese rural communities and are part of a larger local food system (Chedid *et al.*, 2018b; Hamadeh *et al.*, 1996). The dominant goat breed in Lebanon is the *Baladi* (96.8% of national herds), which is adapted to semi-arid conditions of Lebanese areas, sturdy in mountainous typologies, tolerant of poor nutritional conditions and regional diseases (Tabet *et al.*, 2016). Goat milk in the Levant area is largely transformed by households and small-scale processors into traditional food products (Hilali *et al.*, 2011). Similarly, in Lebanon, goat milk is transformed into an array of traditional products, which are common around the country such as *labneh* [1], *laban* [2], *baladi* goat cheese [3], *kishk* [4] and *shanklish* [5] among others (Chedid *et al.*, 2018a; Hosri and El-Khoury, 2004; Zurayk and Rahman, 2008). Goat milk products also represent cultural heritage and can be region specific such as *ambarees* [6] in the Northern and WB, *serdalli* [7] in the Shouf, *darfieh* cheese in the North Bekaa and *darfieh labneh* [8] in the South Bekka (Hajj-Semaan *et al.*, 2011), where they are produced following traditional and artisanal techniques. The seasonality of goat milk has resulted in the development of long-term preservation methods to make these dairy products available for consumption during the months when goat milk is not available.

Limited research is available on the small ruminants' VC in Lebanon, addressing the socio-economic status of goat farmers and opportunities available in this sector. On the other hand, the demand for traditional dairy products is increasing amid rising concerns related to intensive livestock systems and their negative association with climate change. Accordingly, basic assessment and research on the existing small ruminant dairy chains is important as a first step for the sustainable development of the sector. This paper aims at describing the dairy goat VC in the Shouf and WB areas of Lebanon, as a case study, through the analysis of its strengths, weaknesses, threats and opportunities. The relations between the different actors is studied to allow a better understanding of this VC as well as appreciating the socio-economic role of goat milk production in the livelihoods of small-scale farmers and processors. In addition, analyzing the VC is used in recommending interventions for a sustainable and profitable chain of local products with improved market exposure and benefits that would be useful for many stakeholders concerned with the development of this chain.

2. Material and methods

2.1 Study areas

The VC analysis (VCA) was conducted in the Shouf and WB areas of Lebanon, which were selected as pilot case studies. The Shouf is known for its diverse mountainous typology, climate and fertile soil which made this area an attraction for agro-food investments (olive oil and wine) and as a touristic destination with its natural landscapes and cultural, architectural and historical sites (IDAL, 2017). The WB, one of the most fertile areas in Lebanon, is mainly occupied by agricultural lands (wheat and grains in rotation with vegetables, vineyards and fruit orchards), with few main cities and relatively small villages. The villages chosen from the WB lie on the West Bank of the Qaraoun Lake.

Both areas are historically known to host farming communities, which are centered on small ruminants, mainly *baladi* goats. Actors along the dairy goat VC are mostly small-scale, relying on locally available inputs and traditional tools and methods of production.

2.2 Data collection

Different questionnaires were developed for the five actors of the VC: farmer, milk collector, processor, retailer and consumer. The questionnaires were written in English and then translated to Arabic to accommodate the participants. Data were gathered during single individual interviews using pre-tested questionnaires. To that end, several visits were conducted in 12 villages in Shouf and 7 villages in WB that are known for goat rearing and dairy goat productions. In the Shouf, the villages are smaller in size and population than the WB, so more villages were selected to reach the target number of participants in that area. The total of collected questionnaires was as follows: 23 farmers, 2 milk collectors, 22 processors, 20 retailers and 18 consumers.

The questionnaire comprised close- and open-ended questions that tackled different themes related to goat production, dairy processing and marketing (Table 1).

The goat milk VC section in each questionnaire included questions regarding the "value" of the product at each level, in addition to questions regarding what was perceived as challenges and opportunities of the VC. The participants were also given the opportunity to discuss different aspects of the VC, their views, comments, struggles, needs and success stories.

Contacts of interviewees were obtained from previous projects done by the Environmental and Sustainable Development Unit at the American University of Beirut (ESDU-AUB) and key informants including the Ministry of Agriculture (MoA) extension office in Deir El Qamar–Shouf, municipalities of the targeted villages, local non-governmental organizations (NGOs) involved in agriculture and development projects in both target regions. Snowball sampling was also used as interviewees shared contacts of people they knew (processors, farmers, collectors or retailers). The majority of the provided names were contacted (around 70%), and following the collection of data, the team decided that the homogeneity of the responses was consistent enough to consider the collected data representative for each study area. The approval of AUB's Institutional Review Board (IRB) was obtained before the implementation of the interviews and proper ethical conduct was maintained throughout the study.

The aim of the questionnaire was to collect data to describe the VC and the activities (advantages and struggles) of each actor and determine the relationships and activities across

Table 1.
Questionnaire theme division

	Enabling environment	Value chain	Input supplier
Farmer	- Hygiene - Socio-economic info - Challenges and opportunities	- Goat milk value chain (farmer's level) - Output volume, cost, revenue, etc.	- Animal husbandry and herd management - Input suppliers
Milk collector	- Hygiene - Socio-economic info - Challenges and opportunities	- Goat milk value chain (milk collector's level) - Volume, cost, sale price, etc.	–
Processor	- Hygiene - Socio-economic info - Challenges and opportunities	- Goat milk value chain (processor's level) - Output volume, cost, revenue, demand, etc.	- Input suppliers
Retailer	- Socio-economic info - Networks, demand and sales	- Goat milk value chain (retailer's level) - Cost, sale, demand, etc.	- Input suppliers
Consumer	- Economic and social info - Preference/consumption	- Goat milk value chain (consumer's level)	–

and among the whole VC. The data were analyzed quantitatively, using simple statistical analysis, and qualitatively through observation, and gathering, coding and thematically organizing the responses.

2.3 Heifer International's toolkit for goat value chains

The goat value chain toolkit (Heifer International, 2014) is a "compilation of best practices and suggested tools/methodologies for value chain analysis in the goat sector." This toolkit was developed by Heifer International as commissioned by the International Fund for Agricultural Development (IFAD) and the International Goat Association (IGA) for "conducting value chain analysis on goat production through which activities can be planned for strengthening mutually beneficial connections between actors in the value chain." This framework is adopted in this study to highlight the actors of the VC and their relationships with each other and with their environment and communities. The toolkit and analysis methods suggest the breakdown of the structure and characteristics of the chain and its reassembling in a manner to enable growth in pro-poor ways. Using this method, the poor and disadvantaged individuals and small enterprises can play a larger role in the VC to render higher profitability and benefits.

The toolkit's dairy goat value chain framework is divided into three categories. First, the enabling environment consisting of external factors affecting the VC such as policies, markets, institution, etc. Second, the VC actors whereby the actors are mapped into a diagram to better understand the value flow and existence of actors. As such, the VC was mapped highlighting significant opportunities and challenges to improve the VC performance, profitability and relationships. The third category includes the input suppliers covering the input needed for the VC to exist, including goods, services and knowledge.

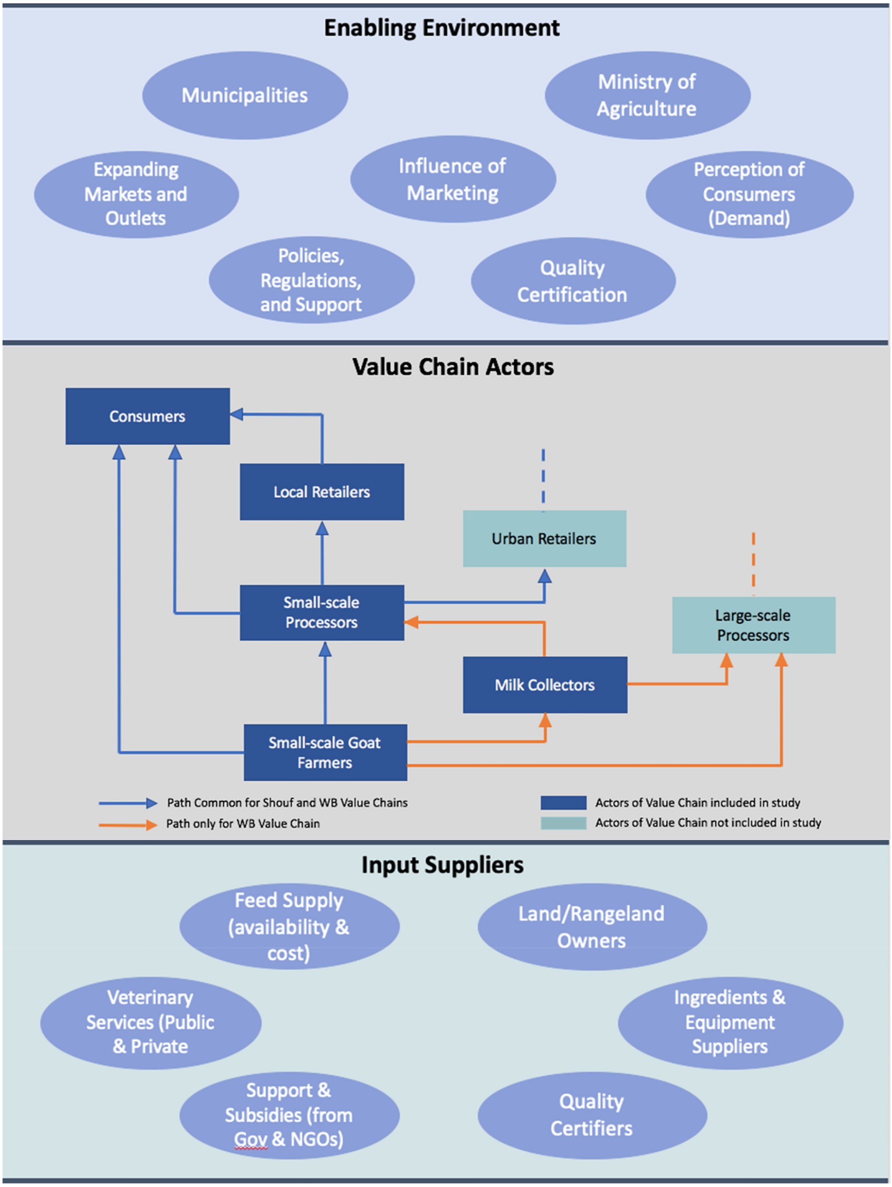
3. Results

The Heifer International (2014) framework for dairy goat VC was adapted for the traditional dairy goat products in the Shouf and WB. The results were based on the input and the participants' perception of challenges and opportunities in their sector allocated to the diagram. Figure 1 maps the enabling environment factors, actors in the VC and the input suppliers.

3.1 Mapping of the dairy goat value chain in the Shouf and West Bekaa

The VC differs between the Shouf and WB; however, in both regions, the chain is relatively short when compared to more industrial and complex VCs (Figure 1). The VC in the Shouf is shorter than in the WB. A typical Shouf VC comprises a farmer, processor and consumer. Occasionally, a retailer is needed since commonly the villages are small and processors have direct contact with the consumers, thus bypassing the retail link in the chain. There are no milk collectors and no large dairy factories. On the other hand, the VC in WB is longer were many farmers sell milk to *Hallabs* (milk collectors), who are, in turn, farmers themselves from the villages and who distribute the milk to big dairy factories. There are only a few milk collectors who work with networks of farmers in the surveyed area, explaining why only two milk collectors were selected to participate in the study.

3.1.1 Farmers' livelihood. Farmers are dominantly male. More than three-quarter of the participants reported that goat farming is not their sole source of income (Table 2). The average age of full-time goat farmers and processors is 58 and most have had only intermediate level education. It can be implied that full-time farmers are the older generation with lower levels of education. In both regions, all the farmers are also dairy processors; they use around 63% of their milk to produce dairy products for household consumption while the rest is sold for extra income.



Source(s): Inspired by Heifer International (2014)

Figure 1.
Goat sector value chain diagram in the Shouf and WB

3.1.2 Milk customers. Due to the existence of dairy factories in the WB, farmers mostly sell their milk directly to the dairy units or to the milk collector who delivers the milk to the factories (Table 3). While in the Shouf, the farmers mostly sell their milk directly to their customers who consist mainly of a fixed set of customer pool of neighbors and acquaintances.

3.1.3 Help in farm work. The majority of participants employ workers (Table 4) to help with the goats: maintaining the farm, herding, taking care of goats, milking, etc. Most of the workers are Syrian labor, while the rest rely on family members to help.

The average age of farmers without any workers is 60. It is evident that younger farmers have help in farm work, mostly because they are not full-time farmers.

In total, 14 out of 23 farmers reported that their kids are not interested and are not or will not be working in this sector.

3.1.4 Herd size. The average herd size in the Shouf is 200 goats, while the average herd size in the WB is 260. In total, 14 out of 23 farmers reported that their herd decreased over the past 5 years due to selling their goats either because (1) they are getting old and no longer able to work in such a tiring job and they are considering selling the whole herd soon; (2) they are thinking of changing their livelihood choice or (3) expenses are very high compared to profit.

3.1.5 Milk collectors. Locally known as *Hallab*s, only present in the WB, they are farmers as well. They buy the milk from the small-scale farmers and sell to the big factories.

3.1.6 Processors' livelihood. In total, 17 out of 22 processors do not depend on dairy goat processing as their sole source of income (Table 2). Some also process cow milk, while others depend on employment or other careers.

In total, 11 out of 22 processors have inherited this profession, while the other half started their own processing business, mostly due to economic needs.

Farmers are dominantly male and processors are mostly female. Rearing goats is done by males since it requires more endurance and longer hours away from home, while women stay at home and transform milk into dairy products. In many cases, processing is considered as a house chore for women and part of preparing food for the family.

Although milk transformation can be considered as a livelihood to women, the majority of participants revealed that women do not get their own salary from the profits. The income is added to the household income and in many cases given to the husband to save.

% income from Goat Sector	≤20%	21–40%	41–60%	100%
Farmers				
Shouf (10)	3	3	2	2
West Bekaa (13)	8	0	2	3
Processors				
Shouf (12)	5	3	2	2
West Bekaa (10)	4	0	3	3

Table 2. Percentage of household income generated from goat farming activities

	Milk collector	Small dairy unit	Dairy factory	Direct consumers
Shouf (10)	0	1	0	9
West Bekaa (13)	7	5	1	3

Table 3. Distribution of milk customers of goat farmers (more than one option is applicable)

Help in farm	Worker(s)	Family member(s)	No help
Farmers (23)	16	7	0
Processors (22)	3	12	7

Table 4. Distribution of helpers in goat farming and processing

3.1.7 Product customers. All processors sell their products to direct consumers. Only 3 out of 22 sell their products to local retailers as well.

3.1.8 Help in processing work. Almost all processors (except one) process dairy products in their homes (Table 4). The processing takes place in the common room, kitchen or a designated room within the house or on the same property (basement, shed, etc.). Unlike farm work, the participants have more help from family members rather than outsourced workers. Since processing mostly happens at home, it is less likely to have external help.

3.1.9 The products. The commonly transformed and consumed products are *Labneh*, white cheese, *Laban*, *Kishk* and *Ambarees*. Since these are produced by small-scale processors, they all follow traditional techniques. The average quantities and prices are listed in Table 5.

Processors get their milk either from their own goats (14 of 22) or buy it from a local farmer (8 of 22). In WB, processors stated that they buy milk for a common price of 1.07US$/kg, while in the Shouf processors buy their milk for an average price of 0.98US$/kg. As shown in Table 5, selling prices differ between WB and Shouf for the same product. It is most evident in *Ambarees* where in WB the kilogram is sold for 174% more than in the Shouf.

As per the participants, produced quantities are either based on demand (63%) or fixed on a yearly basis (26%) or based on availability of milk (11%; processors who are also farmers).

3.1.10 Retailers and customers. Mouneh [9] products, such as dairy goat products, that are homemade and produced by small-scale processors can rarely be seen at retailers, especially that these products do not have a brand and label (nutritional value and ingredients). They are usually bought directly from the source by a set pool of loyal customers who are mainly acquaintances or have heard of the processor through word of mouth. Very few processors sell their products to the local retailers/markets (*Dekaneh*). *Kishk*, goat cheese and *Labneh* can be found in a few local markets, while it is rare to find *Ambarees*. In addition, as reported by retailers, homemade goat products are more expensive than other substitutes; therefore, market owners hesitate to trade those products because their profit margin and demand is low. *Ambarees* and *kishk* are typically bought from the processor. Since *Ambarees* is delicately made, customers base their choice on trust. Demand for dairy goat products is mostly intentional, meaning that the customers know when the products are in season and they intentionally place their orders or visit the source to buy the products, thus bypassing the marketing or advertising process.

Area	Freq	Avg qt per year (kg)	Avg price (US$/kg)
Cheese			
WB	3	1,970	7.66
Shouf	1	170	10.66
Laban			
WB	2	730	1.66
Shouf	0	–	–
Ambarees			
WB	7	582	19.66
Shouf	10	1,235	11
Labneh			
WB	8	227	10.33
Shouf	0	–	–
Kishk			
WB	7	160	19.33
Shouf	8	167	18.33

Table 5.
Average quantity and price for each product in West Bekaa and Shouf areas

3.2 Enabling environment

The main challenges pertaining to the enabling factors as perceived by participants are as follows: (1) decrease in demand for dairy goat products, (2) finding markets and outlets for products, (3) lack in marketing for goat products, (4) quality of products and lack of monitoring and inspection, (5) low productivity and (6) unequal distribution of value within the VC where the small-scale farmers and processors profit the least.

3.2.1 Demand. Almost two-thirds of participants reported that there is not enough demand for their products.

3.2.2 Markets. In total, 17 of 22 dairy goat processors have a set customer pool and prefer to process limited quantities based on expected demand for fear of leaving unsold stock to the next season.

3.2.3 Marketing. None of the participants has a brand for their products. The products are sold in bulk in plastic bags or boxes with neither a brand name, expiry date nor nutritional information.

3.2.4 Quality and food safety. Currently, no standards for quality production are implemented or monitored. All participants confirmed to follow food safety guideline when asked; but due to the lack of inspection and quality control by the state or the private sector, the results cannot be confirmed. As per the processors, consumers are hesitant to buy goat products, especially *ambarees* since it is a fermented non-pasteurized type of cheese, in fear of contracting diseases.

3.2.5 Productivity. Goats in WB and Shouf, which are commonly *Baladi* breed, produce between 0.5 and 1 kg of milk per day during milking season.

3.2.6 Distribution of power within the value chain. Small farmers in both areas reported that input suppliers control the market and set feed and medical supplies prices that are too high. Additionally, in the WB specifically, large dairy factories that buy milk from the farmers lobby and control the price of milk. Milk is bought by the factories at 0.4US$ (while the market price is 1.07US$), which farmers consider to be too low in reference to the costs incurred.

3.2.7 State support. In the case of this study, participants unanimously reported the absence of any state support, especially through the MoA; such as subsidies for feeds and medications, in addition to the absence of policies, regulation and monitoring on pricing of milk and inputs.

3.3 Input suppliers

Participants reported that input suppliers, such as for feed, veterinary service, land and equipment, are operated or owned by larger players that utilize monopolies to control the prices which are often exploitative. More than three-quarters of participants reported that costs of inputs are very expensive leading to lower profits and even deficits.

4. Discussion

4.1 Value chain in the Shouf vs the West Bekaa

The VC is considered as a business transaction of value where each actor wishes to make profit by buying the product (finished or in progress) as cheaply as possible and sell the product as expensively as possible to increase return. This aspect automatically structures the VC in a vertical manner with the farmer at the bottom (Kaplinsky and Morris, 2000) and a downward pricing system (McMichael, 2013). Small-scale farmers are treated as interchangeable and exploitable input suppliers withholding the risks. In a short VC such as in the Shouf, the value or revenue is distributed approximately equally among the actors, which is because that all the actors have relatively the same power over pricing, reaching markets and customers and accessing resources. In the Bekaa area which is more known for agriculture and agro-industry, and where several large industrial dairy factories operate, it is clear and well conveyed that the large-scale industrial processors have a potent power over the farmers through pricing and providing sales market for the milk.

Input suppliers, such as land, feed and medical suppliers, also have a superior position over the small-scale farmers and processors. Lack of bargaining power leaves small actors in vulnerable positions to be taken advantage of and can affect overall performance.

The sector is unregulated and thus milk and products can be priced freely. The presence of large factories and milk collectors in the WB provide a stable and consistent demand from farmers to dispense their highly perishable output; on the other hand, they buy milk at a low exploitative price. A previous study, in the same area, showed that 62.5% of farmers sell their milk to collectors (Chedid *et al.*, 2018b) at the low price while any direct milk sale to the consumers is priced with an extra margin of profit. The small number of collectors gives them advantage in monopolizing this link in the VC, including an important influence on the raw milk price received by small farmers. Adding to this, and as reported by Haddad *et al.* (2014), milk collectors are powerful players in this VC since they also provide farmers with financial loans, technical support and also fodder.

In the Shouf, there are no factories to buy the milk so farmers sell their milk directly to consumers. As a consequence, milk price is higher reflecting the higher risk in marketing the daily production.

4.2 Optimizing linkages among the VC actors: the input suppliers and enabling environment

4.2.1 Quality certifiers. Food safety is becoming increasingly demanded among urban dwellers in developing countries (Ortega and Tschirley, 2017). Due to awareness and fear of diseases such as brucellosis, consumers today are hesitant to buy goat products and would rather consume other safer options. Previous studies show that caprine milk and dairy products lack food safety measures (Boyazoglu and Morand-Fehr, 2001; Salameh and Hosri, 2015; Serhan and Mattar, 2017). These goat products which are homemade with traditional techniques passed on through generations do not have minimum hygiene and sanitary assurance for food safety.

In the absence of an effective role of relevant ministries and absence of any quality control system customized to small-scale production, the responsibility of insuring quality is left to local and international NGOs who are building the capacity of small producers on food safety and are developing food safety standards and protocols that can be adapted to small-scale and artisanal homemade productions. Certificates can be given to farmers and processors to empower their marketing and encourage farmers to abide by these standards. Both consumers and producers agree that ensuring the quality while emphasizing the health benefits of goat products (McCullough, 2003) will increase their marketability.

4.2.2 Demand. Being a perishable product, securing a daily market for milk is essential. This study showed different solutions that the farmer resorted to increase demand for their products. The first option consists in dispensing all their output to milk collectors though at lower price. This option seems best fit for larger farmers who cannot secure regular alternative outlets for their production. Alternatively, the Shouf small farmers rely on a regular customer base with a relatively stable demand. Finally, it is expected that any small discrepancy between supply and demand can be consumed or processed at the household level. At the consumer's end, this study showed that low and limited demand for goat milk and dairy products can be linked to multiple factors: price, quality assurance, availability, preference and competition. Many of the drivers are interlocked and affected by each other. Although both areas have great touristic potentials that can attract local and international visitors toward rural traditional products (ESDU, 2020), the current results suggest that "word of mouth" and personal connections remain the main marketing strategies for traditional dairy products. Accordingly, markets are limited to the local customers.

Proper marketing strategies can be implemented to augment market access while influencing consumer preference to increase sales and demand for artisanal and local productions. Moreover, products like *Ambarees*, *Serdele* and *Kishk* can be trademarked for their originality and regionality and marketed as protected designation of origin (PDO). The added value can create opportunities for the region and its inhabitants.

As Morand-Fehr *et al.* (2004) explains, the return to "land and nature" movement and the respect for authentic original products that are linked to specific geographic areas has brought goat products back into good fashion, whereas in the past goat products were considered as commodities for the poor or lower classes. As such, research and development in this sector can create opportunities by absorbing the current interest through the establishment of a participatory strategy to capitalize on local resources.

4.2.3 Governmental support and policies. The agricultural sector in Lebanon is underdeveloped and neglected. Little to no support from the Government is provided. The importance of this sector remains underappreciated and minimal and no development strategies are being implemented (Hamade, 2020). As explained by Kassie *et al.* (2019), market inefficiencies can also be linked to government policies that often sideline the small producers.

The goat sector is unregulated and places small-scale actors in weak positions against the market. A central role of the MoA in designing a strategy to monitor prices across the VC would help in protecting the interests of vulnerable farmers overpowered by monopolizers and lobbyists as reported in this study.

The rise of the economic crisis in Lebanon and worldwide highlights the deficiencies in the modern day processes. Crises greatly affect the marginalized and most vulnerable. As Van der Ploeg *et al.* (2012) explains, rural development policies are considered as responses to major "market failures" and goes against the concept of economic growth as a benchmark and need to be put in place in efforts to aid vulnerable communities. The large discrepancy between what the consumers are paying and what the farmers are receiving as remuneration creates room for new systems and markets to emerge. These new markets will put the farmer first instead of the "middle-man" and the big food firms and create reciprocity between consumer and supplier. Local food systems will thrive within the new rural development policies if achieved. Local food systems encourage local communities to take control of their own food economies (Feenstra, 1997). Conducive policies and development initiatives can support local food systems and help improve the position of the farmers in the VC by increasing demand for the local products and the bargaining power of farmers and thus revenue.

The majority of small-scale farming and processing is done informally and defined as a family business. Support policies to empower and fight poverty of farming livelihoods should not be directed toward intensifying the farming practices but rather be focused on access to resources, enhancement of infrastructure, organization of the sector in a way to keep the most added value at the level of the small-scale farmers and processors and encouragement of farmer organizations (associations, cooperatives, informal groups etc.) (Marzin *et al.*, 2017). The cooperative sector remains underdeveloped in Lebanon. Communities and social networks are strengthened by successful cooperative efforts through asset sharing, fair distribution of resources, improved access to markets and strengthened bargaining power of collective small and medium actors (Abdul-Rahaman and Abdulai, 2020; ILO, 2011, 2018).

This study showed that the dairy goat sector is mainly dominated by older males, with females and youth contributing to the workforce but with little role in decision-making. This is in line with previous observations on the challenges facing the goat sector (Dick *et al.*, 2008) where the declining interest of youth in agriculture was noted along with an increased diversification of income generating activities to support the household, combining on farm and off-farm and rural and urban revenues (Darwich *et al.*, 2017): what Van der Ploeg (2009) refers to pluriactivity. Rural communities that are retaining traditional food production practices contribute to the decrease of food insecurity and building resilience on a household and community level (Ghattas *et al.*, 2013). This highlights the potential impact of improving women's skills, as the main actors in traditional dairy production, on providing sustainable development and livelihood for these rural communities. Capacity building in hygienic processing and marketing are important areas for improvement as highlighted in the results.

Research and censuses that are especially participatory in addressing small-scale farmers' needs remain lacking. The farmers and processors themselves are best able to depict the challenges and opportunities of their sector. New policies are needed that help recentering decision-making on rural livelihoods while including the farmers in the process. Inclusive VCA and development utilizing a holistic approach to identify the opportunities and challenges of the small-scale farmers is recommended. This approach should also consider large-scale producers and buyers to effectively incentivize and encourage them to engage with small-scale producers to build mutual beneficial business relationships (Devaux *et al.*, 2018; Donovan *et al.*, 2015).

5. Conclusion

In the current system, small-scale goat farmers and processors in the Shouf and WB areas remain vulnerable in the face of more powerful players controlling the VC. Based on this case study, key areas for development were identified that could improve the livelihoods of the small holders. The first area covers capacity building of the farmers/producers to develop their technical and business skills, including cooperative action, which would enhance their market access and profitability. Another area that was identified is the policies framework that is currently unconducive for the sustainability of this traditional sector. Finally, the role of women and youth in the sustainability of the sector was highlighted, noting the absence of targeted action for their support. This case study can serve in guiding future research and interventions aiming for the sustainable development of the dairy goat chain in areas with similar sector structure. Marketing, finding new market outlets and driving demand are important challenges that can be addressed through different channels such as obtaining quality certification and optimizing the supply chain. Reviving and aiding this sector is central for creating value, building sustainable livelihoods and safeguarding traditional functioning VCs for the rural communities. A comprehensive bottom-up development strategy should ideally be implemented that includes efforts from the Government, districts and municipalities, institutions, households and other stakeholders of the dairy goat VC.

Notes

1. Strained yogurt with a creamy texture that is similar to spreadable cheese.
2. Yogurt.
3. A local white cheese.
4. A powder form of fermented milk (cow or goat) mixed with burghul (cereal).
5. A local type of blue cheese.
6. A traditional non-pasteurized cheese prepared by fermenting milk in jars.
7. Same as Ambarees [6] but produced in the Shouf. The word "*serdalli*" refers to the earthenware jar.
8. A type of creamy cheese fermented in cow or goat skin and preserved in olive oil.
9. Comes from Arabic word "to store": food tradition of preserving products by processing fruits, vegetables, animal by-products and other to last usually for an annum or more.

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