

AMERICAN UNIVERSITY OF BEIRUT

SUSTAINABILITY OF FAMILY FARMING IN THE BEKAA  
AND THE INCLUSION OF YOUTH: DAMASK ROSE VS.  
SMALL RUMINANT PRODUCTION

by  
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# ABSTRACT OF THE PROJECT OF

Ghida Mohamad El Dirany for Master of Science  
Major: Rural Community development

Title: Sustainability of Family Farming in the Bekaa and the Inclusion of Youth:  
Damask Rose Vs. Small Ruminant Production

Introduction: Family farming as defined by the Food and Agriculture Organization (FAO) is the involvement of all family members in the farm activities. Family farming could take different shapes and can be defined differently according to the activities done by the family. Two value chains under family farming were chosen: Damask rose production and small ruminant herding. This study aims at exploring the factors affecting the sustainability of these two value chains in the Bekaa and the inclusion of youth.

Materials and Methods: The studied area includes two villages in Baalbeck-Hermel governorate which are Qsarnaba and Aarsal, to assess the sustainability of Damask rose production and small ruminants herding respectively. This study uses qualitative methods for an in depth description and analysis of the topic. Additionally, secondary research, desk review and literature review were adopted. Data was collected from scientific articles and published reports including resources from the Environment and Sustainable Development Unit (ESDU) at the American University of Beirut. Dissertations and online database were reviewed as well and referred to in collecting the needed information. Moreover, personal information from the researcher, an agricultural engineer and a rose farmer from Qsarnaba, and daughter of the land was also referred to in this study.

Results: The main and common challenge facing the two value chains is the exclusion of youth from farming activities. Moreover, there are specific challenges faced by Damask rose producers divided mainly into: logistics, services, and environmental challenges. The challenges faced by small ruminant herders are: feed cost, scarcity of land and pastures, lack of policies and climate change. Each sector has its own coping strategies like decreasing the herd size and increasing stocking rate in small ruminants. Coping strategies relevant to the area studied were not found. Instead, recommended coping strategies by farmers during Dirani's (2016) field work with Rose farmers in Qsarnaba were reported. The recommended adaptive strategies such as creating cooperatives, shortening market chains and making rose festivals for Damask rose producers. Moreover, there are impediments for youth inclusion in the system namely acquisition of land, monopoly of large scale farmers, lack of government support, risks

included in the agriculture sector, lack of previous involvement, fear of stigmatization and many others.

Conclusion: Youth are fundamental for the sustainability of food production in the world. There should be a comprehensive local and regional based intervention in order to promote farming with incentives for youth population. Both small ruminant herding and Damask rose production transitioned from being a family farm tradition into a practice that is dependent mainly on foreign workers. However, the Damask rose value chain is more sustainable due to the comparative advantages which are: the low initiation cost, the rapid return on investment, the short term commitment, the low maintenance cost, etc. Family farming ceased to be a tradition in rural areas, instead it became more reliant on foreign workers.

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# CHAPTER 1

## INTRODUCTION

### **1.1. Introducing Family farming and the topic**

Subsistence farming and commercial farming are two main agriculture types known across the world. Subsistence farming is small-scale, low-input, low-income farming where farmers plant crops for their own use and sell the surplus (Abele and Frohberg, 2003). Commercial or industrial farming is characterized by mono-cropping, mechanized, high-input farming with high profits (FAO, 2021). In subsistence farming, the farmers and the land are interrelated. Taking care of the land is a basic activity in the family's life. Family farming as defined by Food and Agriculture Organization (FAO) is the involvement of all family members in the farm activities (Garner and de la O Campos, 2014).

Family farming is considered subsistence with minor commercial tendencies. Graeub et al. (2016) declare that according to the census of the World Bank (2014), and regardless of the change in food systems and challenges faced by family farms, the latter contributes with about 2.2 trillion dollars to the worldwide agricultural economy. Moreover, the same authors add that worldwide there are up to 500 million family farms which are responsible for the production of 80% of the world's food.

The agricultural land in Lebanon covers 0.24 million hectares and only 23.5% is covered with rain-fed olive trees. Additionally, 40% of the land is cultivated with cereal, vegetables and legumes (Hamade, 2010). The Bekaa valley is considered the backbone of the agricultural sector in terms of production (Allam, 2011). Bekaa is the largest governorate in Lebanon and it constitutes five districts: West Bekaa, Rashaya, Zahle, Baalbeck, and Hermel.

The Damask rose, scientifically named *Rosa Damascena* Mill, is a fragrant flower with high economic value (Pal and Singh, 2013). This crop had a great influence on the rural economy of Qsarnaba, a village in Central Bekaa administrative subordinate of Baalbeck Hermel. The history of the village shows that farmers benefited a lot from the value chain of the Damask rose which became part of the village's culture and annual traditions (Dirani, 2016). Another type of family farming is small ruminant herding. It is commonly widespread in the Baalbeck-Hermel region mainly in Aarsal. Both value chains are facing serious obstacles threatening their sustainability. The most common challenge is the fact that the farming population is ageing while the new generation is being disinterested in agricultural production.

This study aims at exploring the factors affecting the sustainability of these two value chains in the Bekaa and the inclusion of youth in Damask rose production and small ruminant herding. The aforementioned study will provide a valuable assessment on the current status of family farms and agricultural systems in Baalbeck Hermel area. The most important is that it is assessing the probability of youth inclusion in the agricultural sector which secures future of the sector, sustainability of food production and decreasing the unemployment among youth.

## CHAPTER 2

### LITERATURE REVIEW

#### **2.1. Family farming**

##### ***2.1.1. Worldwide and Contribution to rural development***

Family farming is recognized as one of the main pillars to achieve the 2030 Agenda of Sustainable development (Brady and Pierri, 2019). Family farming could take different shapes and can be defined differently according to the activities done by the family. Generally, family farming was defined by the FAO as the "means of organizing agricultural, forestry, fisheries, pastoral and aquaculture production that is managed and operated by a family and predominantly reliant on family capital, including both women's and men's labor. Family and the farm are linked, co-evolve and combine economic, environmental, reproductive, social and cultural functions" (Brady and Pierri, 2019).

According to Bush (2016), family farming has the capability to influence the political economy in the MENA region. The same author argues that preserving family farming or any kind of peasantry in the country helps countries with famines, social and economic instability to feed themselves to a certain extent. The aforementioned is supported by Brady and Pierri (2019) declare about the capability of family farms to achieve the 2030 Agenda of Sustainable development. Concurrently, Bush (2016) goes on to mentioned that the involvement of agribusinesses in food production weaknes family farming and creates an alternative for food production. Sam Moyo (2016), also asserts that the presence of large-scale commercial farms (LSCF's) diminishes family owned farms. Although agribusinesses produce massive amounts of cheaper food at a faster pace than small family farms, this alternative has several hidden consequences (Bush, 2016). Large agribusinesses have a downward effect on the economy of rural areas

by disturbing the farmer's livelihood. Furthermore, agribusinesses will cause harm to the environment by altering the purity of water and soil due to the increased use of pesticides and fertilizers. Moreover, it will decrease job opportunities in the agriculture sector due to mechanization in production (Bush, 2016). Family farming is also diminishing due to other factors such as including the increased reluctance of the descendants of ageing farmers to be involved in any farming activity (Hamadeh et. al, 2006) that could be attributed to the youths aspiration for rural migration toward the cities to find a more stable job.

Since the creation of modern Lebanon in 1920, the rural areas and agriculture as a sector were neglected from the plans of the French mandate. After the failure of the French to implement any rural development and with the arrival of President Fouad Chehabi in the early 1960s, he worked hard to reform the agriculture sector. Many governmental institutions were created, and some are still valid to our days (Hamade, 2010). The rural part of each country, the countryside, is the part of the country where agricultural practices dominate. Almost 20 to 25% of the population of the countryside works in agriculture to fulfill their daily expenses. ("Lebanon at a glance | FAO in Lebanon | Food and Agriculture Organization of the United Nations", 2021). The agriculture sector contributes up to 2.9% of Lebanon's GDP (Hamade, 2010). The Bekaa valley with Akkar covers more than half of arable lands which is 60%. Although Syrian workers benefit from agricultural activities, yet the sector employs up to 10% of the Lebanese labor force (International Rescue Committee, 2013).

In Lebanon, the rural population recorded a decrease from 58.8% in 1960 to 12.9% in 2010 (Abi Samra, 2010). Nowadays, in 2021, and due to the economic upheaval that is yet striking Lebanon, a reverse migration to the rural areas was witnessed

especially after currency devaluation, Beirut blast, and the increased COVID-19 outbreaks during 2019-2020 (Shehade, 2021). Shehade (2021) highlights that the returnees that are working in agriculture aim to ensure some of their basic food supply and to invest in selling the surplus. . According to Shibani (2021), reverse migration is due to the high expenses of living in Beirut; however, rural communities also face various socio-economic challenges affecting their livelihoods..

## **2.2. Small ruminant herding**

Small ruminant herding is defined as the act of caring for sheep and goats (Al-Khalidi et.al, 2013). It is a very old tradition and activity in the MENA region. Small ruminants herding has been recognized as a fundamental part of the farming systems in Lebanon. The Bekaa valley specifically hosts about half the population of both sheep and goats and represents 40% of the rangelands and secures up to 70% of the roughages, basic to the small ruminants' diet (Hamadeh et al., 1996). Rearing herds was one of the main livelihood activities in Aarsal, a village in the northern Bekaa where farmers used to rear up to 90,000 animals distributed under 150 flocks until the 1950s (Obeid, 2006) Hamadeh et al., 2006). The inhabitants of Aarsal consider herding one of their main traditions, yet the latter experienced a great decline. Many social, economic, and cultural causes triggered the decline of the agro-pastoral system, especially in Aarsal; these were first of all the deforestation under the Ottoman rule for the use of timber for fuel and for the purpose of road construction. Secondly, the introduction of cherry tree plantation shifted the farmers' livelihoods strategies from livestock keeping to orcharding (Hamadeh et. al, 2006; Obeid, 2006). Nowadays, cherry cultivation is dominant in Aarsal, as tree cultivation is much more satisfying and yet far less challenging (Obeid, 2006). Thirdly, the rural-urban migration of the young increased the demand for labor, thus, noting an increase in

cost of labor (Hamadeh et al, 2006). Additionally, Hamadeh et al., (2006), asserts that the family owned small ruminant farms could not meet the growing needs of the market-oriented economy. Hence, many Arsalis decreased their herd size and increased the stocking rate in search for better work options to meet their life expenses (Chedid et. al., 2020).

In summary, when it comes to small ruminant herding, Obeid (2006) asserts that the endurance of a pastoral system requires the support and cooperation of all farming family members.

### **2.3 Damask Rose production**

Damask rose or as it is called scientifically *Rosa damascene* is a hybrid between the two species *Rosa gallica* and *Rosa phoenicia* originating from the eastern Middle East (Widrlechner, 1981). In addition to its magnificent and attractive color, the Damask rose has different agronomic benefits. It is considered the main ingredient for attar of rose which is extracted by the distillation of volatile oils from fragrant flowers (Widrlechner, 1981). Rose industry and cultivation constitute a significant aspect in agricultural economies in several countries namely: Turkey, Bulgaria, and Mediterranean countries. (Widrlechner, 1981).

In Lebanon, the history of Damask rose distillation dates back to the 14<sup>th</sup> century during the Rule of the Ottoman Empire. Although rose cultivation prevailed in different Lebanese villages, Qsarnaba has been reported to be the leading village as the cultivation of roses was introduced to Qsarnaba in the early twentieth century (Dirani, 2016). According to the research conducted by Dirani (2016) there are various sources for the introduction of Damask rose cultivation in Qsarnaba of which most notably are: (1)

visitors of holy shrines in Iran who are farmers brought this plant to be used as a fence due to the thorns in its stem, for the preservation of crops in agricultural lands from livestock. (2) it was also reported that Ottoman soldiers brought the plant with them during the Ottoman rule to remember their homeland. Furthermore, (3) Dirani (2016) stated that a villager called Ali Mostafa El Dirany who worked on the train station from Lebanon to Turkey brought several cuttings after being fascinated with the roses' color and fragrance.

According to Dirani (2016) 70-80% of farmers in the village are Rose farmers where most of them are small-scale farmers cultivating less than 4 dunums. Damask rose production season creates a good economic boost for farmers, mainly because its harvest season comes after a long passive winter period lacking agricultural activity (Dirani, 2016). Furthermore, Dirani (2016) states that rose water distillation was introduced during the Lebanese civil war as a lucrative way to discharge the huge amounts of roses due to difficulty to reach the village and sell the fresh roses. The same author found that today, family members' commitment to farming is fading. This is demonstrated in Dirani (2016) field work, through interviews conducted with old aged rose farmers in Qsarnaba. The interviewees reported that along with being their source of income, harvesting roses was a family tradition that every family solely depended on its members. It was also noted that it was a union for all rose farmers on the rose hills, where lovers meet and housewives negotiate daily life expenses. Dirani, (2016) added that the older generation is dissatisfied with the youth exclusion in rose harvest production, where only 30% of farmers work by themselves and the remaining hire Syrian workers, mainly girls.



## **2.4. Youth and Agriculture**

### ***2.4.1 Role and interest of youth in agriculture worldwide and in Lebanon***

In societies, youth population is considered to be the country's future and the promised hope for a developed nation (Phyo, 2018). Furthermore, the youth plays a significant role in a country's agricultural sector and upholding family farming in particular. However, with the emergence of technology, the rapid urbanization, and the notion of the world as one small village, fewer youth are being interested in staying in their village resulting in a decline in rural population and rural workforce (Phyo, 2018).

According to White (2012) it is reported worldwide, that youth unemployment rates has escalated in the past two decades, with a higher percentage of rural unemployment from that of urban areas. Furthermore, youth unemployment is observed as an evident phenomenon in the rural areas of the MENA region. In Lebanon Chaaban and el Khoury (2016) have found the highest youth unemployment rate with 20.6% of the Lebanese who are between the age of 14-24 years. According to the authors, 25% of the resident population in Lebanon consists of youth.

In Lebanon, especially in the Bekaa area and due to the economic crisis and the currency devaluation, it is difficult to initiate a new business or to invest in land especially that herding and agricultural production practices are considered informal and do not fall under the Lebanese work law (Hamade, 2010). This issue impedes youth's motivation to invest time in agriculture especially that this work field does not guarantee any health coverage or a retirement plan while youth are searching for ready-made jobs with no risks taken and with a standard fixed salary (Hamade, 2010).

In addition, the "Laissez- faire" economy adopted in Lebanon created unbalanced and chaotic development. The inequality in wealth and income distribution between rural

areas and urban areas triggered people and especially youth to migrate from rural to urban cities and created roots for social unrest (Hamade et al., 2015). On the other hand, cities are not offering better solutions than rural areas as cities are already overpopulated due to the internal migration of rural people from the countryside in search of work and income.

In a nutshell, White (2012) affirms that the agricultural sector is one of the sectors that youth repels from or dislike. Yet, it can also be one of the sectors that offers a vast array of opportunities. The challenges impeding youth inclusion to agriculture will be assessed in the upcoming parts of the research for the importance youth have in the sustainability of the agricultural sector.

## CHAPTER 3

### METHODS AND MATERIALS

#### **3.1 Description of the Study Area: Baalbeck-Hermel**

The studied area is the Baalbeck-Hermel area, Lebanon's largest district with an area of 2,319 km<sup>2</sup> spread over 63 villages (IDAL, 2021). It is divided into two districts Baalbeck and Hermel. The Hermel district, having low soil fertility and low precipitation rate, farmers tend to cultivate rain fed crops like barley and wheat mainly (IDAL, 2021). Compared to Baalbeck soil which is more productive with increased precipitation (IDAL, 2021).

The precipitation differs in the Bekaa between the central and the northern parts being 610 mm and 230 mm respectively (Srour, 2006). Furthermore, Hamade (2010) claims that agriculture in Baalbeck-Hermel area is the main livelihood for medium scale farmers. Being the area with the highest share of cropped land and 55% of the agriculture is irrigated. Qsarnaba is a village in the Bekaa valley, administrative subordinate of Baalbeck hermel governorate. Qsarnaba's municipality is considered part of the Federation of Gharbeh baalbeck municipalities. It is known as the "Rose village" due to the history of Damask rose cultivation. It is 65 km far away from Beirut, Lebanon's capital with an area of 623, 495, 6 m<sup>2</sup> (Dirani, 2016). The village open out over the Bekaa valley, located on the top of the Lebanese Western Mountain range with an altitude of 1250 m (Dirani, 2016).

Arsal is a marginal Lebanese village in Baalbeck Hermel governorate, located in the northeastern part of the Bekaa with an area of 47,500 hectares (Hamadeh et. al, 2006). Arsal hosts Syrian refugees more than its own Lebanese inhabitants being 37,000 and 35,000 respectively. It is 124 Km away from the Lebanese capital Beirut (Social

Promotion Foundation and the Bekaa Intersector SPF, 2019). Aarsal was known historically for its pastoral activities, add to this it was the primary resting station for Bedouins (Hamadeh et. al, 2006).

### **3.2 Methodological Approach**

Qualitative methods are applied in this research to identify the factors affecting the sustainability of family farming in the Bekaa area. The significance of qualitative research is that it provides "an in-depth, socio-contextual and detailed description and interpretation of the research topic" (Vaismoradi, et.al, 2016).

At the onset of the research, a detailed literature review was conducted. The approach adopted is the grounded theory, where a rich variety of related literature is collected and reviewed. This would produce a more rich evidence based project, for "studies that incorporate grounded theory approach are basically a step towards conceptual thinking and theory building rather than empirical testing of the theory." (Khan, 2014)

The method utilized in this research is a secondary research or a desk review. The aforementioned method entails collecting existing data from the literature. According to Sileyew (2019), desk review is time-saving, effort and cost efficient, and it could result in better conclusions as it focuses on missing data. The resources used in this research are from scientific articles and published reports including resources from the Environment and Sustainable Development Unit (ESDU) at the American University of Beirut. Dissertations, online databases were reviewed as well and relied on in collecting the needed information to explore the key factors affecting the sustainability of family farming in the Bekaa valley: Damask rose and small ruminant production. Furthermore,

grey resources were referred to since they would enrich the researcher's background and familiarize the researcher with the topic since they are produced by practitioners in the field. Above and beyond, the researcher lives in the village Qsarnaba, is an agricultural engineer, a rose farmer, and the daughter of the land.

The data collected and the literature reviewed are analyzed following a longitudinal analysis which allows researchers to track the change and the evolution of a phenomenon along time in some cases over several years (Farrall et.al, 2016). This method is used as this study explores change over time for practices that stretched throughout the history of rural communities in the Bekaa area until the present time.

To assess the sustainability, the factors affecting the two value chains small ruminant herding and Damask rose production are explored in the next section, in addition to the coping strategies developed by the farmers.

## CHAPTER 4

### RESULTS AND DISCUSSIONS

#### **4.1 Small Ruminant Production: A Fading Family farming**

##### ***4.1.1 Factors affecting the sustainability of the small ruminant herding***

The factors affecting the small ruminant herding and production were extracted from five different studies, four from Lebanon by Hamadeh et al. (1996), Hamadeh et al. (2001), Hamadeh et al. (2006) Chedid et al. (2019), and one from Europe by Belanche et al. (2019).

The high heterogeneity in the small ruminant sector allows for an array of distinctive challenges. From the studies reviewed, the factors affecting the sustainability of small ruminant herding can be classified into two main themes mainly: On farm and off farm factors. The challenges reported by Hamadeh et al. (2001) and (2006) in Aarsal and marginal Bekaa areas with those reported by Chedid (2019) in West Bekaa showed comparable results.

Regarding the off farm factors, Chedid et al. (2020) and Hamadeh et al. (2006) mentioned the feed availability, feed prices, and availability of land. The availability of grazing lands and rangelands is a struggle especially due to the civic expansion, increased population, and the use of lands for crop cultivation. These issues hence impede animal movement resulting in rangeland overgrazing (Chedid et al., 2019). The issue of land as an increasing challenge affecting the sector and one of the factors threatening the sustainability of small ruminant production was also mentioned by Hamadeh et al. (1996). Besides, due to the lack of policies for land tenure or land-use policies, the issue of owning or renting land becomes critical. Hamadeh et al. (2015) mentioned that in Zahle

and West Bekaa, up to 69.1% of the land is owned by a few landlords and used for intensive cropping and cash crops. These landlords often do not work in their lands but depend on foreign labor. Not all farmers or shepherds own land, thus they are obliged to either rent or lease land for grazing purposes which in return increases the cost of feed expenses on the producer (Chedid et al., 2019).

Both Hamadeh et al. (2001) and Chedid et al. (2018) focused on the transition of the grazing lands into orchards as the case of Aarsal where cherry trees plantation dominated most of the Aarsali's lands; Or in the case of West Bekaa reported by Chedid et al (2018) where lands are used for crop production or transitioned to natural reserves. Chedid et al. (2020) named this phenomenon as "Crop encroachment" as the acquisition of land for human food production and crop plantations instead of animal pasture and grazing. Chedid et al (2018) added to the pasture access, the quality and availability of pasture as an additional major constraint. The quality of pasture referred to the available wild species like white and red clover and wild lentils that are absent or in decreased patterns. Chedid et al (2018) linked the aforementioned to climate change whereby high temperatures during the spring affect shedding seeds.

Furthermore, climate change affected the precipitation rate and the availability of water in springs and rivers. The latter obliges shepherds and farmers to buy water and fill their water tanks for ruminants' drinkers (Chedid et. al, 2018). In return, production costs will increase, affecting the margin of profit. Belanche et al. (2019), added the production factor which includes the low farm income and the difficulty to access capital. Al-Khalidi, et al. (2013) divided the production costs which hinders the economic performance of small ruminants into both fixed and non-fixed costs. The fixed costs are the devaluation of the equipment, animal, and land rental fees. The non-fixed costs are the feed, the

veterinary services, supplements, and the cost of labor. The aforesaid could be summarized under two main categories which are environmental factors and production factors.

According to their research in Europe, Belanche et al. (2019), added the milk and meat prices for the off farms factors. In addition to the fluctuation in commodities prices and the monopoly of actors in the market. The aforementioned affects the revenues from the flock. The market and political uncertainties with the fluctuation in market prices were also mentioned by Chedid et. al (2018). In addition to the aforementioned factors which are related to market, there are some factors on the social level. Belanche et. al (2019) recognized the minimal knowledge level about farming, the importance of farmer role affects the purchasing power and the demand on dairy products.

Regarding the policy level factors, Chedid et al (2020) assert that the major challenges for the sustainability of pastoral systems in the Arab dry region is the lack of policies or any laws related to pastoralism. Furthermore, in Lebanon, both Chedid et al (2018) and Hamadeh et al (1996) add the absence of any kind of government support whether subsidies, veterinary services or any other support to the sector as an off farm threat to the sustainability of the sector. Nonetheless, Belanche et. al (2019) linked subsidies' dependency as an on farm factor, for it is a weakness in the internal farm system to be totally dependent on subsidies with no independent production strategy.

Concerning the on farm factors, the authors (Belanche, Chedid, Hamadeh et. al, 2019, 2018, 1996) agreed on the animal health problems. Hamadeh et. al (1996) listed the diseases and parasites that are threatening the health of small ruminant flocks especially in the absence of adequate veterinary services. On the sector level, Belanche et al (2019) mentioned the absence of cooperation between the farmers in the form of cooperatives to



unite their voices toward better achievements. The youth exclusion from the sector is mentioned by all the authors. Belanche et al (2019) claimed that the sector in Europe is not motivating for young farmers who already practice farming. While, Chedid et. al (2020) and Hamadeh et al (2001) mentioned the increased rural migration and the decrease in the youth population in the rural areas as a major problem threatening the family labor force. The small ruminant sector being one of the least profitable sectors discourages youth from entering it and creates a kind of aversion. Chedid et al (2020) adds that there is a significant change in the "social aspect" and nature of the sector. It has been a common trend to depend on foreign laborers to overhand the farming activities, while farmers are going toward other job options. Hence, the availability of manpower, from the family is diminished and transitioned from being a family farm tradition into a practice that is dependent mainly on foreign workers. On the farm level, Belanche et. al (2019) claims that absence of innovations in the sector and the weakness in management and professional skills endanger the sustainability of the sector. Chedid et al (2018) continues to mention the lack of enhancement and technology use hinders the farmers from advancement. In addition to the lack of technical skills and data for range management.

In summary, both themes, on-farm and off-farm factors, are interlinked and correlated. For instance, climate change which is an off-farm factor can have direct effects on small ruminants' health which is an on farm factor. Lallo et al. (2017) declare that the main cause behind the direct effects on small ruminants comes from heat stress which in return causes a decrease in feed intake and affects the growth rate of animals. The ability of the animal to be homoeothermic will be altered due to high heat. Lallo et.al (2017) mention the case of animal loss in the United States due to heat loss which is

approximately between 1.7 to 2.4 billion US dollars. Moreover, climate change can also have indirect effects: for example, less precipitation means less pasture which in return affect the quality of nutrition. Undernourished and unimmunized small ruminants are more susceptible to diseases and parasites (Chedid et. al, 2020). Furthermore, climate change affects the availability of water in springs and rivers that sustains for animals their source of drinking water (Chedid et al, 2018). Farmers are obliged to buy water and fill their tanks, especially in drought periods.

#### ***4.1.2 Coping Strategies***

Leke Olaleye (2010) claims that a coping strategy is the ability of individuals to respond to a challenging situation. These coping strategies are convenient responses to challenges faced and to sustain the livelihood or income activity. The small ruminants' sector is a major component of the economy of the border areas in Lebanon (Chedid, 2019). In the West Bekaa, four different small ruminant exist. The semi nomadic, the semi sedentary with the support of mountain pastures in spring and summer, semi sedentary being dependent on crop residues and sedentary depending on pastures and available common rangelands (Chedid, 2019). Small ruminant herding has been reported to be unstable in the past years, in terms of the fluctuating herd size and management strategies due to various challenges. Nonetheless, farmers are following different adaptive strategies to cope with the existing constraints (Chedid, 2019). Due to the listed challenges above, the main adaptive strategy was to decrease the herd size. Al-Khalidi et al. (2013) state that changing the herd size is also a strategy in Jordan that depends on the revenues. They added that specializing in one kind is more profitable. Chedid (2019) mentioned that 61% of the interviewed farmers from 14 villages in the West Bekaa area

decreased their herd size. The cost of the feed is the main factor affecting the sustainability of the small ruminant herding. Thus, to decrease the cost of feed, reducing the herd size was one of the first coping strategies. Chedid (2019) declared that farmers sold their animal stock to cover their household expenses or their farm expenses.

The second coping strategy was relying more on pastures and grazing. The strategy was indicated by both Hamadeh et al. (1996) and Chedid. (2019), the latter recorded up to 88% of the farmers counting more on pasture for their herd feed. Nevertheless, during the drought season, which is the period between December and March, hand-feeding accounted for 85% of the animal feeding due to the pastures' scarcity (Hamadeh et al., 1996). Moreover, the third coping strategy is altering the feeding strategies. Increasing supplementation and adopting a sedentary system is more advised to prevent destocking and to preserve energy spent during movement in search of pastures (Hamadeh et al., 2001). Furthermore, the fourth and final coping strategy was mentioned in the study of Hamadeh et al. (2001) who investigated the use of feed blocks' imitation made from by-products on the economic sustainability of small ruminant production systems. This experiment was done on the four production systems (semi-nomadic, sedentary, semi-sedentary with grazing in mountains, and semi-sedentary with grazing on crop residues). The introduction of feed blocks in small ruminants' diets showed enhanced economic performance, weight gain and sheep production efficiency where less barley and supplements are needed (Hamadeh et al., 2001). The high labor costs accounted for the highest share of inputs/expenses in the four systems (Hamadeh et al., 2001).

## **4.2 Damask Rose Cultivation: A Flourishing tradition**

### ***4.2.1 Factors affecting the sustainability of Damask rose Production***

The results of Dirany (2016) were based on field work in Qsarnaba a village in Baalbeck Hermel area. In order to compare the results with other countries, the research will explore a study from Isparta-Turkey.

Dirany (2016) did the interviews with farmers and local authorities mainly. While Giray and Kart (2012) interviewed and extracted data from different stakeholders mainly producers, Cooperatives Union for Agricultural Sales of Rose Oil, academic professionals and experts in the field of Agriculture and crop production in their paper on the Economics of Rosa Damascena in Isparta-Turkey.

Regarding the introduction of the rose to Isparta, it was introduced by Ismail Efendi in the late 19<sup>th</sup> century as a thoughtful example for entrepreneurship (Giray and Kart, 2012). In contrast to Qsarnaba, Isparta is considered one of the leading countries for rose oil production along with Bulgaria. Roses in Qsarnaba are mostly used for rose water distillation. Isparta case study was chosen since it is comparable with Qsarnaba in different ways. Both are 950-1050 m<sup>2</sup> high from sea level, thus the climatic factor is similar for rose crop production. Add to this in both locations, Damask rose production is considered a traditional activity and related to the culture and history. Both Dirany (2016) and Giray and Kart (2012) declare that rose harvest needs patience and dedication. Add to this Giray and Kart (2012) assert that it was considered a family farming with no expectation of high income. Damask rose has a great value, and it is a widely spread activity among the farmers in both Qsarnaba, and Isparta. Yet, many factors hinders the sustainability of the sector and challenge farmers' continuity.

The challenges affecting the rose production value chain in both Qsarnaba – Lebanon and Isparta- Turkey are classified into two themes, external (off farm) factors and internal (on farm).

Regarding the off farm or external factors, the absence of government support is a great challenge affecting sustainability of rose production. In Lebanon, there is no official support from the Ministry of agriculture, nor extension programs for the rose sector. Agricultural extension services are the introduction of new knowledge, skills and technologies to end up with informed and appropriate farming decisions (Ali et al., 2012). The lack of government support is common between all value chains in Agriculture sector. Farmers do not have unions that represent them and fight for their needs. Moreover, Vinay Kumar (2005) declares that rose farmers are facing additional challenges related to the prolonged market chains and the corruption of the middlemen, traders, and rose collectors, an additional external factor. In addition, the main issue is the production/yield discharge which make farmers in return vulnerable to the control of traders and collectors. Dirany (2016) declared that during the rose season, the rose price is controlled by the rose collectors and traders. Most of the time rose collectors set the price that suits them the most. Since they are the ones who use roses as raw material for rosewater or other by-products, they try their best to decrease the price for their own benefit.

In regard to the environmental factor, it could be considered both an external and internal factor. Externally, climate change exacerbated the variation between day and night temperatures in the Bekaa. Internally, Damask rose is sensitive to frost and may have an irregular flowering pattern (Dirani, 2016). The flowering of roses is temperature-sensitive, as temperature beyond 24 °C can decrease flowering which is inhibited when

the temperature goes below 10°C at night (Pal and Singh, 2013). The aforementioned, highly affects the rose's flowering yield. . Hence, farmers cannot forecast their daily yield easily.

In addition to the environmental factor, other internal factors challenge the sustainability of Damask rose production. The production factor is considered an internal factor. Production includes harvest and post-harvest practices.

The harvest of this plant is delicate. Harvesting should prolong mainly between dawn and early morning, better before 9:00 am (Pal and Singh, 2013). The harvest time and the weather temperatures affect the quality and quantity of oil content in roses (Baydar and Baydar, 2005), hence yield discharge is urgent to preserve the quality of roses. The cause behind early morning harvesting is the dewy texture of the rose which facilitates plucking it. When harvesting is delayed, the number of bees in the field will increase, making it difficult for the workers to achieve their work safely and peacefully.

The second internal factor is labor. Rose harvest requests a high number of labor force (Rusanov.et.al, 2011). The latter makes it an activity for the family to come together, bond and harvest their daily yield once per year. The farmers in Qsarnaba village assert that, in the past years when they were children, they used to help their families and neighbors in the harvest before going to school early in the morning. Nowadays, labor-intensive agricultural activities are not appreciated anymore by farmers, as they will burden the farmer with labor costs in the absence of family labor. As Dirani (2016) mentions that only 30% of rose farmers are working by themselves as a family, the remaining especially farmers with large scale lands are hiring Syrian labor, mainly girls. The latter, which increases the cost of labor in the harvest season.

The third internal factor, is the land availability as claimed by Dirani (2016). Rose farmers bestow their lands for a once per year, single short season. Around the year, the harvest season extends from mid-April till mid-May depending on the weather, only around 25 days. In addition to land availability, land degradation and the creation of small land pieces by inheritance, farmers are replacing this crop with high economic value crops (Dirani, 2016). On the other hand, the presence of smaller land pieces will decrease the cost for youth to start their rose production project by decreasing the labor cost, investment and land rental cost. The fourth internal factor is the absence of active agricultural cooperatives for Rose farmers in Qsarnaba. While in Isparta Turkey, it is different.

In Isparta there is what is called GULBIRLIK (Union of Agricultural Sales Cooperatives for Roses, Rose Oil and Oil Seeds) which was founded in 1954 and it includes about 8000 farmer who benefit from it. The main task for GULBIRLIK is to buy the production from its registered members. This type of cooperatives and unions is absent in Qsarnaba for rose farmers. This union has its own production and processing plants to produce the byproducts of roses under two main brands (Giray and Kart, 2012). Producers or rose farmers are given the chance to either sell their produce to GULBIRLIK to sustain their membership or to private companies who pay ahead of 9-10 months of harvest. Although GULBIRLIK is essential however it failed to afford the desired services to the producers due to internal problems in management (Giray and Kart, 2012).

The final internal factor is that farmers' involvement of in both Qsarnaba and Isparta is limited to the basic production of roses as declared by Dirani (2016) and Giray and Kart (2012). Most of farmers are not involved in the profit gaining by products of rose for instance. Giray and Kart (2012) they cannot benefit from the added value.

In Isparta's example, Giray and Kart (2012) compare the prices of the rose blossoms which is approximately: "Unit (kg) prices for each product in 2010 are following: € 0.90 for rose blossom; € 3 for rose water; € 548 for concrete; € 1300 for absolute; € 6100 for rose oil". The discrepancy between the prices shows the low profit for the farmer who cares for the crop all year round and the benefit that the traders and processors gain. Similarly, in Qsarnaba when the price per kilogram of rose was 1500-2500L.L, the price of 350 grams of rose jam or 570 ml of rose water was 15,000L.L (Dirani ,2016) . This shows the difference in the price of processed rose by products in comparison of one kilogram of fresh roses. Additional internal factor is the farmer's mindset. The rejection of farmers to introduce recording systems for data collection and archiving is an important internal threat for innovation and advancement (Giray and Kart, 2012). The latter helps in strategic planning and finding solution for fluctuation in yield. Moreover, the weak farming skills and knowledge in the use of new technologies (Giray and Kart, 2012).

#### ***4.2.2Recommendations for Coping Strategies***

Coping strategies relevant to the area studied were not found. Instead, recommended coping strategies by farmers during Dirani's (2016) field work with Rose farmers in Qsarnaba were reported. To identify efficient recommendations for coping strategies, the main challenges facing the sector and the farmers, should be identified. As mentioned in the previous section, challenges include the market chains, production/yield discharge, and lack of extension services or developmental projects (Dirani, 2016 and Kumar, 2005), in addition to the decreased family labor and decreased young generation inclusion (Dirani,,2016).



Whenever the agricultural activity is not sustaining a decent income, one of the coping mechanisms is to search for complementary activity (Olaleye, 2010). The latter is the case with rose farmers in Qsarnaba. Damask rose production creates only a once per year income for Qsarnaba farmers therefore, it is not a sustainable source of income to rely on for a prolonged period of time (Dirani, 2016). The rose season merely represents an economic boost after a long-dormant winter season (Dirani, 2016). Searching, for a complementary job is needed as the first strategy.

Second, creating a cooperative for rose producers in Qsarnaba since cooperatives have different added values. This strategy is already practiced in Isparta-Turkey. The main aim of a cooperative is to maximize the member's profit gain and to enhance the welfare of its members (Bijman and Iliopoulos, 2014). Cooperatives help farmers to unite their voices in asking for their demands. In her dissertation Dirani (2016) claimed that the government should ban the import of artificial rose essence, to sustain a market for the increasing rose yield in Qsarnaba and the other producing villages. This can only happen when farmers unite their voices through a cooperative. Moreover, a rose farmers' cooperative will have a greater influence on the government and non-governmental organizations to support their activities. Another potential benefit of the cooperatives is that rose by-products would be produced with collective efforts, namely, rose water, rose jam, dried roses for herbal tea, soaps, and artisanal crafts. Furthermore, when the rose farmers' cooperative is initiated, it will be able to set the rose price and limit the monopoly of rose collectors and price manipulation. Second, setting yearly local festival for roses. The latter is done on yearly basis in Bulgaria a rose producing country. Obreshkov and Ivanov (2012) declare those rose festival's play a great role in the economic development and cultural knowledge of the producing village. Such traditional events can introduce

the tourists to the destination in a creative way, hence developing rural and agricultural areas. It is possible to buy a rose water bottle from the grocery shop; however, visiting the rose village, taking part in the rose harvest, engaging with rose farmers in a rose festival and buying a rose water bottle freshly made, have indeed a better taste and lasting memory. Third, shortening the market chains and connecting directly with farmers and producers (Obreshkov and Ivanov, 2012). The latter was already done by some of farmers reported by Dirani (2016) who tend to search for outer markets and connect with outside wholesalers. Fourth, in response to the issue of land availability, farmers could cope with this by practicing intercropping. The latter maximizes the land availability and productivity by planting between the rows of rose. A farmer could plant a winter/ summer crop to sustain an all-year-round return from the land. Most of the aforesaid coping recommendations are practiced on individual levels but not as a widespread practice among farmers.

### **4.3 Youth and Family Farming**

#### ***4.3.1 Challenges facing youth participation in farming***

Youth participation has been hindered by different challenges stated below. In addition to the results aforementioned, White (2012) continues to describe the reasons for youth to remain aloof from Agriculture. First, youth are not well included in the system and they are not interested in actually practicing agriculture. Dirani (2016) mentioned that the youth do not help their families in rose harvesting. One of Dirani's (2016) interviewees declared that: "it is better for my grandchildren to help in rose harvesting rather than to get confused on how to lose weight". To further elaborate on this, the lack of previous involvement in farming activities by their parents creates disconnected youth

generation. It should be axiomatic for the elder generation to involve their children and all the members of the family in their land keeping, from cultivation to regular follow up then to harvest. The latter sustains for parents the proper preservation of their cultivated land and a source for livelihood. Second, Latopa and Abd Rashid, (2015) assert that the causes behind declined participation is the fear of stigmatization by their peers. As well as the persistence of the mentality that considers working in the agriculture sector as an uncivilized act and the target to displace to the city to find a quick income job (Latopa and Abd Rashid, 2015). In addition to this, there is a trend of devaluating farming and considering it as an aged profession. The former is linked with the "disliking" of rural culture (White, 2012). Agricultural work and farming are considered a tough work with low return, especially with the increased expenses of youth (Phyo, 2018).

Agriculture extension services which should be offered by the Ministry of Agriculture are missing. Ali et. al (2012) claim that agricultural extension services aid in the development of the sector. Through education and communication, a good extension agency enhances the abilities of farmers to adjust their adopted techniques to the varying environmental and social changes. Moreover, it provides farmers with knowledge about sustainable agriculture and green projects (Ali et. al, 2012).

Lack of governmental support to small-scale agriculture and rural areas plays a great role in the decreased interest of investors in the sector and the exclusion of youth (White, 2012). As mentioned in the previous parts of this study, none of the workers in agriculture sector can have a social security since it does not fall under the work law (Hamade, 2010). The fact that impedes and discourages youth inclusion in the sector.

In addition, Chaaban and el Khoury, (2016) declare that employment for agriculture is the lowest between the sectors in Lebanon. It takes plentiful time for

agriculture graduates to find a job. Hence, youth are facing challenges whether they plan to work in agriculture or farming by inheritance or after earning an agricultural degree (Chaaban and el Khoury, 2016).

Moreover, another challenge affecting rural youth participation in the sector is the acquisition of land (White, 2012), the heterogeneity of the actors in the agricultural sector and the distribution of land tenure. Hamade, (2010) claims that "10% of landlords owns up to 60.6% of the total agricultural land." He adds that especially in Zahle and West Bekaa where intensive agriculture takes place for export, 69.1 % of land is owned by the ruling class decile. In this context, Hamade (2010) based on the Lorenz curve, recording the Gini index, which shows the deviation of income distribution between individuals from the equal distribution. Hamade (2010) applied the Gini index on the land distribution in Lebanon which recorded 0.773; however, it recorded 0.821 in Bekaa governorate. The latter shows a polarized and unequal manners of land distribution and types of agriculture within the same region. Any Gini index value less than 0.2 shows equal distribution, which is unfortunately absent in Lebanon. In addition, the fragmented pieces of land due to inheritance impose extra challenge on land tenure (Dirani, 2016).

Moreover, the monopoly of large-scale producers and the limited market access by youth is an added challenge (*Youth and Agriculture: Key Challenges and Concrete Solutions*. Fao.org, 2021).

Besides the lack of success stories from the elder generation working in the sector demotivates youth in entering the sector. None of the farmers are grateful, most of them are discouraged. Farmers are searching for alternatives and complementary activities with farming to cope and sustain a livelihood (Leke Olaleye, 2010). What preceded is

predicted resulting in youth absence in agriculture; the situation that Phyto, A., (2018) named as the "ageing of the system".

Finally, the risks in agriculture as a sector could be a barrier for youth inclusion. Farmers encounter different risks that they try to cope (Komarek et al., 2020).

Komarek et al. (2020) mentions that the risks farmers could undergo are production, financial, market, institutional and personal risk. For instance, one of the main challenges is the production risk where the farmer cannot always predict his/her yield due to climate change. The latter can lead to the other risks. The market risk as declared by Komarek et al. (2020) comes due to fluctuation of seeds and fertilizers prices or even in the price of selling of the goods.

Klerkx et. al, (2012) claims that innovation is not only a matter of technology but also an inclusive strategy of the future of the sector. He adds that innovation includes the people's needs, ambitions and prospects from the sector. Nonetheless, Diederens et.al, (2003) declares that adoption of innovative technologies takes time especially if the technologies are superior to what they previously adopted. This is the case of old aged farmers. The issue that plays a role in youth repel from the sector.

#### ***4.3.2 – Comparison between both value chains***

Both value chains, Small ruminant production and Damask rose production are facing similar challenges. First, the lack of youth inclusion. Second, the lack of social security and retirement plan since neither herding nor farming fall under work law. Third, the absence of government support and extension services for the two sectors. In addition to the need of investment in both value chains and the need for innovation.

Although in both sectors farmers or entrepreneurs can benefit financially and gain revenues from selling the processed byproducts, in Damask rose production the margin of innovation and creativity is broader. Here is an example of an innovative way to benefit from roses in an untraditional and unusual way. Jeevitha and Jadhav (2021) introduced silica gel drying method for roses to develop value added by products of roses. In addition to this they assessed the customer's acceptability to such crafts which showed acceptance to the new technique since it is recyclable, ecofriendly and the result of this technique is dried roses used in bookmarks, key chains, frames, decorations and potpourris. This technique is used to preserve the rose for years with its natural shiny color (Jeevitha and Jadhav, 2021).

There are advantages for Damask rose production over small ruminant herding:

- First, rose harvest is a once per year season that lasts for 25 days only (Dirani, 2016).
- Second, rose harvest only requires work in the early morning hours. Hence, it is a short term commitment. Youth could have the opportunity to be involved in other agricultural or non-agricultural activities for additional revenues.
- Third, the inclusion of youth in Damask rose production is easier due to the low initiation cost or low capital. No need to have a land, a youth can primarily lease a planted land for one season. Moreover, a rose field gives yield from the year following the plantation in case a youth chose to plant his/ her land instead of renting a previously planted land. Rose as a crop has a high and rapid production pace.

- Fourth, Damask rose is a rain fed crop, hence no irrigation cost.
- Fifth, the easy agricultural practices meaning that the rose field only needs one pruning per year that takes place in February. Moreover, it requires once per year fertilization depending on the soil quality and analysis. In a nutshell, owning or working in a rose field is less hectic and less time consuming than any other type of farming or herding.

In contrast, initiating either a small ruminant farm or a free range herd needs a huge investment. This is detailed in the report by the United Nations Development Program (Slijepčević & Dosović - Medić, 2011) on Goat farm feasibility study. Slijepčević & Dosović – Medić (2011) mention that the main costs are divided into “ 40% facilities, 30% machinery and equipment, 25% reproductive animals and replacements and 5% others which cover forage, feed replacement and medicines”. These are general percentages that may change, but give a general overview on the investment needed. In addition to labor cost, depreciation, veterinary services, transport, bedding and other indirect costs. All the mentioned costs are all year round.

## CHAPTER 5

### CONCLUSIONS AND RECOMMENDATIONS

#### **5.1 Family farming: A fading tradition**

Family farming seized to be a family tradition in rural areas; instead, it became more reliant on foreign labor. Family members are merely included in the farm activities. This is asserted by Chedid et. al (2020) who reported that the social feature of the pastoral system in the Bekaa is being endangered by the desire of farmers to search for better work options and hand over the herd for foreign labor. Nonetheless, it appears that the Damask rose value chain is more sustainable due to the comparative advantages which are: the low initiation cost, the rapid return on investment, the short term commitment, the low maintenance cost, etc. Moreover, the aforesaid advantages make the Damask rose value chain more motivating for youth inclusion.

#### **5.2 How can farming be sustained among youth?**

With youth abandonment for rural areas and farming, the latter necessitates a national and regional based intervention in order to promote farming with incentives for young population. For youth to be more interested in entering the agricultural sector, they should witness success stories and the profit this sector returns on investment (Phyo, 2018). Creating a well -tailored and inclusive program that finds solutions for all youth's challenges and alleviate their fears is complex (White, 2012). Nonetheless, some actions could be taken to attract youth and make their inclusion a source of mutual benefit between them and the agricultural sector. First, youth should be oriented through vocational trainings that fulfil their ambitions and fits their age group. Second, connect



youth with successful entrepreneurs that worked in agriculture and made a good return. Add to this, link them to actors in public sector so they can express their needs and aspirations, for instance the Minister of agriculture or Minister of youth. The link could be done by local Non-governmental organizations that are concerned with and address local youth issues. Moreover, the link between youth and public sector could be governed by the Ministries of Agriculture and Ministry of youth with collaboration of United Nations agencies, civil activists and think tanks. Finally, the government should take into consideration, youth needs during nation's policies and future strategies. Regarding land tenure, youth can be renting land to start their project on. There is what is called "Daman mawsam" which is leasing the land for one production season. Dirany (2016) declared that: the prices of renting a land are not really high, after the return of the "Daman" money, the land will return back a good money. Concerning, the lack of access to market, it's much better for youth to enter small farmers' market or to create accounts on social media to market their products. Youth inclusion to the agricultural sector should be different than that of their parents and ancestors as every generation has its unique way in practicing its economy. "The market" is not an impediment for their products' marketing. Hence, youth will not sell their products traditionally in the wholesale market and fall a victim of greedy traders. Instead youth will find new markets and up to date methods. Youth do not need wholesale markets since they already have a limited access to land, they are small producers. To conclude, youth could specialize in a niche product that is not available everywhere and not produced by everyone.

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