2015

Value Chain Analysis of Almonds in Lebanon

Green Almonds, Semi-mature Almonds, Shelled Almonds, In-shell Almonds…

FAIR TRADE LEBANON

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EXECUTIVE SUMMARY

This study provides a value chain analysis of almond cultivation in the regions of Aakkar and Donniyeh of Northern Lebanon. It aims to identify the bottlenecks present in the value chain of almond cultivation and processing that prevent the development of the industry, and the leverage points that can be used to improve the quality of the fresh product and processed products derived from almonds. The study aims to suggest the production of products that add value to the fresh almonds usually sold on the market and are able to compete in an economically viable way in the regional and international markets.

The study brings to the forefront the state of almond cultivation in Aakkar and Donniyeh, from cultivated areas to varieties present to cultivation techniques used. The supporting organizations, machinery available, processing centers, and cooperatives present are also indicated. In addition, this value chain analysis suggests steps for the improvement of cultivation techniques, in addition to ways to improve the processing, packaging and storage activities in order to ensure the production of the highest quality product possible in the context of the designated area.

Moreover, this study gives an overview of the marketing activities carried out in Aakkar & Donniyeh for almonds and other products derived from almonds, while showing the main actors of the industry in this area, keeping in mind the regulatory framework in which the industry operates. It also pinpoints the markets available on the national, regional, and international levels, through an analysis of the evolution of imports and exports in Lebanon, the main importers and exporters of the region and internationally of both shelled and in-shell almonds, in order to bring to light the opportunities of marketing the almond products of the Aakkar and Donniyeh regions.

In addition, this study indicates the direct and indirect competitors to the locally produced almonds in Lebanon. Also, this study reveals the currently interested clients and conditions of sale of the Lebanese Fair Trade certified almonds, in addition to attempting to explore future markets locally and internationally.

Finally, the study conducts a financial analysis of the cultivation of almonds, and production of almond products in Aakkar & Donniyeh in order to analyze the profitability of the sector, estimate producer costs that will project consumer and market prices, and study the value adding activities and the value chain to understand where costs can be deducted and where additional revenues can be gained for maximum marketability, profit, and market share.

REASONS FOR SELECTING THE SUBSECTOR

PRODUCTION

Tree nut production has been on the rise in the last decade. In season 2014/15, tree nut production achieved 3.7 millions of metric tons, 8.5 percent up from the previous season and 56 percent up compared to 2004/05. Almond was the tree nut that had experienced the greatest growth, doubling its production in only ten years to reach 1,077,000 tons in 2014 (kernel basis). Walnuts and Pistachios were the second and third most produced tree nut.

Tree nuts accounted for a supply value of 33,706 million dollars in 2014, 25 percent up from 2013 and 146 percent up from 2006. Almonds were the tree nut which accounted for a high supply value, 8,320 million dollars, a quarter of the total tree nut supply value.

The most recent information from the Ministry of Agriculture indicates that average local production of almonds in Lebanon for the years between 2007 and 2010 was around 30,500 tons. This is roughly 1% of the global almond production. In fact, Lebanon was ranked the 15th largest producer of in-shell almonds in 2009. In 2013, 24,757 tons of in-shell almonds were produced in 2013 in Lebanon.

EXPORTS

According to information gathered from the Ministry of Agriculture, Index Mundi and Lebanese customs, there is an increasing trend in exports of Lebanese almonds, both shelled and in-shell, to international markets, with an average of 222 tons/year, worth 628 million LBP, with a value of 2.8 million LBP/ton.

In fact, exports of in-shell almonds have more than doubled (125% increase) over the last 4 years, from 155 tons in 2011 to 349 tons in 2014, respectively their worth has also increased

from 293 M LBP to 415 LBP; however their value decreased (37%) from 1.890 M LBP /ton to 1.189 LBP/ton. In the case of shelled almonds, the value of exports increased (15 %) from 9.4 M LBP/ton in 2011 to 10.766 M LBP/ton in 2014.

The Lebanese market is exporting in-shell more than shelled almonds. This is probably due to shelled almonds being unable to meet its high local demand, while in-shell is less desired by the Lebanese market than shelled; explaining its relatively higher export capacity. This disparity may also be explained by the unavailability of the almond cracking machine that our producers lack. In 2014, exported shelled almonds were valued at 10.766 M LBP/ ton, while exported in-shell almonds were only valued at 1.189 2M LBP/ ton, which is about 11 times less than the shelled amount. Ultimately, this shows that shelled almonds are preferred and the removal of the shell definitely adds value in both the local and international markets.

GROWTH POTENTIAL

The global market for almonds is large, and global demand for fair trade products is increasing. According to USAID in 2010, “global consumption of almonds has almost doubled during the decade from 1000 million pounds in 2001 to over 2000 million pounds in 2009”.

One of the reasons is the continual increase in demand of healthy foods (Figure 1). In fact, “health and wellness is a major factor affecting purchase decisions, and retailers worldwide are now adopting the health and wellness trend into their products”. Many consumers are aware that almonds are highly nutritious nuts that are rich in anti-oxidants, which reduce the risk of heart disease. Therefore, a significant global market for almonds is available and likely to grow in the coming years.

"Global almond production reached 2,420 thousand tons in 2009 with the United States accounting for 58% of the total production". It is clear that US production dominates the market for almonds; however, the situation is more favorable for developing countries with regard to fair trade almonds. Countries such as Pakistan, Afghanistan, and Uzbekistan among others are almond producers that export fair trade almonds. Demand for fair trade products is growing rapidly. In fact, according to Fairtrade International, "Shoppers spent €5.5 billion on Fairtrade products in 2013, 15 percent more than in 2012." Thus, it can be inferred from this information that demand for fair trade almonds, like that of many other fair trade products are likely to increase in the coming years.

For processing industries and consumers who choose to buy fair trade products, the Lebanese almonds possess unique organoleptic qualities that differentiate them from similar products. These qualities result from a blend of factors that include suitable climate, soil composition, and farmers' cultural practices. Most farmers in Lebanon do not irrigate, but rather rely on rain-fed farming, which in the case of Lebanese almonds results in tastier and sweeter produce that is high in soluble solids content.

The average total consumption of almonds in Lebanon in the years 2011-2013 can be calculated at around 30,231 tons annually. Though none of these values includes information on the fair trade almond market, which is in fact unavailable in Lebanon, they can still be used to understand the estimated size of the domestic almond market. Also, the fact that 3,609 tons of shelled and 1,285 tons of in-shell almonds (4,894 tons combined) were imported in 2014 implies that in the future there is potential for FTL to supply the local market given that the quality and prices offered are competitive.

ROOM FOR IMPROVEMENT

Shelled almonds are value added products that can be sold for much higher prices than in-shell almonds. Once the shell is removed, almonds can be used as ingredients for many other products such as almond milk, ingredients to confectionaries, and several other food items, or they can be eaten whole as healthy snacks. So as a first step to add value and reach more markets abroad, it is recommended to help the almond producing cooperatives of WadiFissane and Barka get the almond cracking machine, instead of relying on the relatively costly manual labor. This would on the long run decrease the labor costs and speed up the process, so that the almonds can reach local and international markets without delays, right after they have been harvested.

THE MARKETS

THE DOMESTIC MARKET

According to information gathered from the Ministry of Agriculture, Index Mundi and Lebanese customs, the Lebanese market has more than doubled its imports of almonds from the years 2007 to 2014 inclusive by around 112%, which shows that the growth of demand for almonds in Lebanon is very high, where the domestic production is unable to meet the local demand. This gives an incentive to Lebanese farmers to participate more in the production of almonds because clearly there is a market for it that exporting countries have already started to benefit from. In addition, the value of imported almonds has also increased from 5.747M LBP/ Ton to 10.581M LBP/Ton, which gives an advantage to domestic producers to provide a more steady supply of almonds at an adequate price to Lebanese consumers.

Imports of in-shell almonds might have increased in the years between 2011 and 2014 from 144 tons to 1,285 tons respectively, however their value had suffered a 66% decrease from

1.958 M LBP /ton in 2011 to 0.6708 M LBP/ton in 2014. The average value of in-shell almonds is around 1.304 M LBP/ton relative to the data gathered between 2011 and 2014 from the Lebanese customs website.

Imports of shelled almonds might have decreased in the years between 2011 and 2014 from 4,432 tons to 3,609 tons respectively, however their value has seen a 79% increase from 7.899 M LBP /ton in 2011 to 14.110M LBP/ton in 2014. The average value of shelled almonds is around 10.78M LBP/ton; relative to the data gathered between 2011 and 2014 from the Lebanese customs website.

Importation of shelled almonds is 2.8 times greater than in-shell almonds, which means that the Lebanese market demands shelled almonds more than in-shell almonds, and that there is a market for it locally only if the value proposition offered by Lebanese almonds is able to replace that of the imported amount in quantity and quality. Also, imported shelled almonds were valued at an average of 10.78 M LBP/ ton, while imported in-shell almonds are valued at only 1.304 M LBP/ ton, which makes imported shelled almonds 8.26 times more valuable than in-shell almonds.

Shelled almond imports have decreased from 4,432 tons to 3,609 tons in the past 4 years from the years 2011 to 2014 inclusive, yet the amount imported remains high compared to in-shell, however the in-shell almonds have shown an increase from 144 tons to 1,285 tons in those 4 years. Taking the demand to be constant for analytic purposes, this information tells us that local production has started to replace the imported shelled almonds, while importers have found a way to stimulate the demand for in-shell almonds in the Lebanese market or certain importers have found it to be a profitable business to import in-shell almonds and then crack them in order

to benefit from their value added, and consequently to be then sold to the local market and possibly abroad.

THE EXPORT MARKET

According to Lebanese customs, exports had increased by 6 times from 10 tons to 60 tons for shelled almonds, while exports for in-shell almonds had increased by 125% from 155 tons to 349 tons during the years 2011 to 2014 inclusive. However, as graph 8 above shows, shelled almonds remain more valuable (since their value per ton is much higher) than in-shell almonds in both the international and local markets. So the dramatic change in the exports is most likely caused by a rise in demand for shelled almonds and a drop in demand for in-shell almonds locally, so traders have found it more preferable to supply the demands of the local market instead of exporting because it is harder to compete and raise prices in the export market due to international competition, which makes it in the case of shelled almonds more profitable and marketable to sell in the local market, unless in a situation where clients outside of Lebanon are willing to buy and pay slightly more for Lebanese fair trade almonds, and by then it would be more profitable to export shelled almonds rather than distributing the production to the local market.

Also, the value of the exported in-shell almonds from Lebanon is as shown in graphs 8 and 9 has mostly been higher than the value of imported in-shell almonds. In-shell almonds suffered a decrease in their value over the years in both local and international markets; however exported in-shell almonds were more resistant to the change and have caused in-shell almonds to become more valuable to export than to import.

In addition, exported shelled almonds were valued at around 10.767M LBP/ ton, while imported shelled almonds were valued at around 14.110M LBP/ ton in 2014; a 3.35M LBP/ton difference .This indicates that it is more likely less costly to produce and distribute locally than importing the required amount of shelled almonds, and it is more profitable to export in-shell almonds to foreign countries and import the demanded amount from the international market to remove their shell or sell them as is.

Exports of almonds from Lebanon are significantly lower than the imports, which creates a trade deficit of 2,194 tons in 2007 reaching its peak to 5,945 tons in 2009, and most recently 4,485 tons in 2014. Overall, indicating a 104% increase in the trade deficit for almonds between 2007 and 2014. This shows that the demand for almonds is on the rise and importers have taken this opportunity to enter the market because local production alone is unable to meet the Lebanese market's demand for almonds. So, Lebanese farmers are encouraged to produce more almonds, since there is a market for it, but only if the producers are able to compete with the already established exporting competitors.

Looking at things more closely, the trade balance of in-shell almonds in 2011 was positive at 10 tons; however in 2014 the balance became negative; where imports have sky rocketed above exports reaching a trade deficit of in-shell almonds of 936 tons. Decreasing the gap between the imports and exports is not really vital in the case of in-shell almonds because as discussed earlier it has become more profitable to import in-shell almonds and remove the shell for a profit, rather than using the in-shell almonds that are set for export in the local market.

In the case of shelled almonds, the deficit is huge, where exports are next to null compared to the imports, where in 2011 the trade deficit was 4,422 tons and 3,549 tons in 2014. In order to close the gap, exports should increase drastically to keep up with the imports through

the encouragement of local production of shelled almonds, which would first decrease the amount of imports when local demand is satisfied and the excess would be sent for export.

In terms of international markets, the top 5 importers of shelled almonds are Germany, Spain, UAE, France and China. Total global imports have increased by 71 % from 389,438 tons back in 2004 to 655,145 tons in 2013; a 265,707 ton increase in the last 10 years. Furthermore, the top 5 almond consuming nations are USA, Germany, Spain, Australia and France. Total global consumption has increased by around 50 % from 735,699 tons in 2009 to 1,102,492 tons in 2013; a 366,793 ton increase in the last 5 years.

REGIONAL COMPETITION

In season 2014/15, world production of almonds reached 1,077,000 metric tons (kernel basis), 7 percent up compared to the five-year average and 96 percent compared to 2004, which confirms the upward trend over the last years. In 2014, more than 80 percent of almonds were produced in North America, followed by Oceania and Europe. Almonds accounted for around 80% of Oceania's nut production and around 65% of North America's nut production.

The United States of America with 834,000 metric tons (MT), Australia with 65,000 MT and Spain with 48,000 MT remain the major producers, accounting for 87 percent of world's almond production. World almond exports have witnessed an increasing trend since 2004. More than 650,000 MT of almonds (shelled) were exported in 2013, which represents an important increase compared to the 390,377 MT in 2004. USA was the main exporter. The United States of America has the largest exporting capability for almonds among all other nations, where in 2013 alone, USA was able to export 655,145 tons of shelled almonds globally (INC, 2015). The top destination of US almonds was Spain, accounting the 16% of total exports, followed by

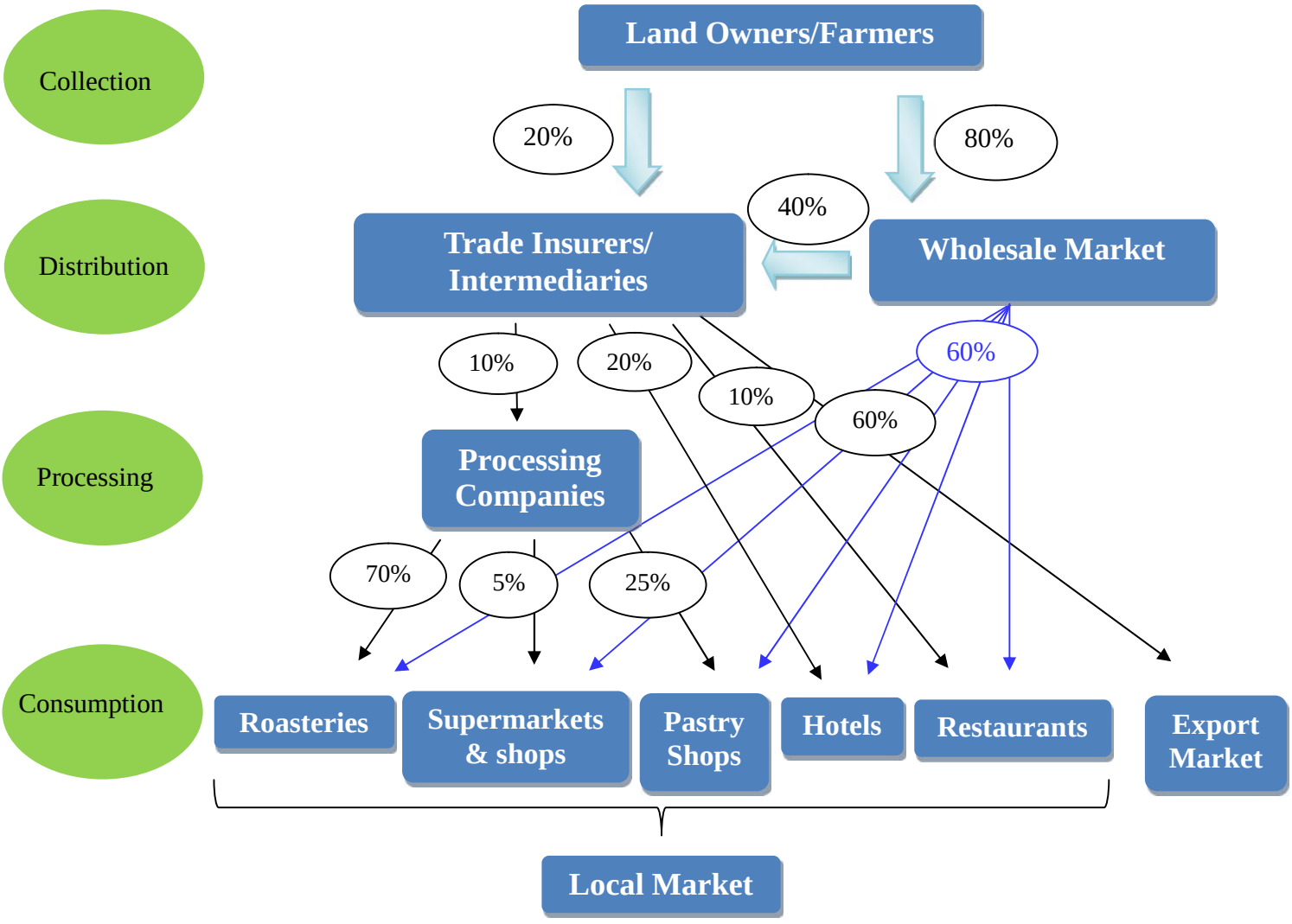
Germany and China with the 13% and 8% respectively. Spain was the second-largest exporter (6%). Its exports went, principally, to Germany (25% of total), France (23%) and Italy (23%). According to the International Nut and Dried Fruit Council , Australia exported 5% of the world's supply.

More immediate competitors for Lebanese almonds are regional exporters like Pakistan, Afghanistan, and Uzbekistan, who are currently supplying our interested clients. In addition, according to a trader from the wholesale fruits and vegetables market in Lebanon, mature almonds are being imported from Turkey and Syria, and sold in the Lebanese market for either direct consumption as green or sent for further processing to roasteries or pastry shops. The competitive advantage of these countries is price due to their relatively low labor costs, so Lebanese producers cannot compete with them on the basis of price alone. Though it is important to note that Fair Trade Lebanon has a very important advantage, which is that Lebanese almonds are of high quality and possess superior organoleptic properties. This advantage along with the effort to achieve competitive prices will allow products of disadvantaged producers in Lebanon to penetrate the local market as well as more markets abroad.

SUBSECTOR MAP

VALUE CHAIN MAP

Diagram 1 -Value Chain Map



CHANNELS AND GOVERNANCE STRUCTURES

CHANNEL 1 – FRESH PRODUCTS

Almonds are sold in two forms: around 45% is sold in the mature form ('frik') and around 55% is sold in its green form. Most of the almond yield is sold green during season (soft or hard shell), to be eaten as a whole in the local market. The advantage of this practice is the obtainment of fast cash, while the disadvantages include a risk of market saturation which leads to sale at low prices or no sale at all. Around 40% of the supply of the wholesale market is purchased by traders, while the rest is purchased by shops, roasteries, confectionaries, restaurants & hotels.

The majority of the almonds in Aakkar are insured (daman), since there is no set price for almonds. Traders/intermediaries usually pay the costs of harvesting and proceed to selling the produce in Beirut. Payment for the almonds is 100% ensured at harvest. In Lebanon as a whole, an estimated 20% is ensured, while the remaining 80% is sold to the wholesale market.

CHANNEL 2 – FRESH FINISHED PRODUCTS (MATURE ALMONDS)

Almonds are rarely left on the tree to mature, since it is easy to sell in their green or semi-mature form (freek). The produce that was not sold semi-mature is usually sold a couple of months later for its hard pulp, when the outer shell has become hard. For pricing, one thing to take into consideration is that that when the almonds mature, the weight of the almond becomes around 50% less when the shell is removed. The exported almonds, although in small quantities, are partially processed to ensure added value**.** Traders usually sell an estimated 60% to the export market, 20% to restaurants, 10% to hotels and 10% to processing companies.

Almonds are rarely processed, however some pastry shops and roasteries purchase almonds to be used in their production. Processing is very little, since the local supply is small, therefore price is acceptable for farmers: 2000-3000 LBP/kg. In fact, pastry shops and roasteries prefer the

American variety because of its larger size, the local variety come in small sizes. In fact, the chocolate industry requires almonds of size 30-35nuts/28g. The few processing companies that do exist sell an estimated 70% to roasteries, 25% to shops & supermarkets and 5% to pastry shops.

DISCUSSION BY FUNCTION

Production

Production Overview

The Mediterranean climate is optimal for almonds (warm, dry summers and mild, wet winters). The optimal temperature for growth is between 15 and 30°C. The trees begin bearing an economic crop in the third year after planting, and reach full bearing at the fifth or sixth year.

In Lebanon, the in-shell almond harvested area witnessed an overall decrease of 37% in the last 11 years from 2003 to 2013. 6,410 Ha were harvested in 2003, and later decreased to 4,042 ha in 2013; therefore, not surprisingly, the production quantity of almonds with shell has seen a decrease by 9.6% in the last 11 years. It was around 27,400 tons in 2003and decreased to 24,757 ton in 2013. However, it is interesting to note that yield has shown an overall increase of 43% in the last 11 years from 2003 to 2013, from 42,745.710 Hg/Ha in 2003 to 61,249.380 Hg/Ha in 2013.

Existing Varieties & their Distribution

In broad lines, the following regions provide almond supply: the Hermel mountainous area, with around 30 tons of single nut almonds (for high-end processing like sweets) and 170 tons of double-nut almonds (to sell fresh or processed (diced or grinded almonds)), the Beqaa valley (Ablah, Ferzol, Aitanit…), Baalbek, North Lebanon (Zgharta, Berqayel, Ibdel, Deir Aamar,

Btaaboura, Jdabra…), Mount Lebanon (Fghale, Nammoura, Bdadoun, Draya & Sfayneh), and small amounts in the Shouf region (Bourjayne).

The spacing between the trees varies between 4 meters and 6 meters, depending on the area. There are at least 36 almond varieties existing in Lebanon, like Awja, Khalwani, Khachabi, Istanbouli, Oum Omsar, Metwi, Nahali, Abou Soumegh and Bandouk. Other mentioned names are: Libbayn, Tuono, Super Nova, Pepparudda, Filippo Ceo, Genco, Farrangnes, and Texas. According to the cooperative in Menjez, "Currently, the existing variety for almonds is the *Halwani* that comes in small sizes however have a large seed. It could be sold as green or mature.

Input Supplies

Irrigation:

Out of the total area planted with green almonds in Aakkar, only 11% is irrigated. A stream or a source is the most used irrigation type; captivating around 49% of the total irrigated area, followed by water reservoirs with 25%, wells with 21 %, and hillside lakes with only 3%. In Donniyeh , we have a similar picture. Out of the total area planted with green almonds, only 10.86% is irrigated. A stream or a source is the most used irrigation type; captivating around 77% of the total irrigated area, followed by water reservoirs with 14%, wells with 8 %, and hillside lakes with only 1%.

The same goes for Semi-mature almonds, 12.5% of the planted areas of which is irrigated in Aakkar and 8.21% in Donniyeh. River source is the most used irrigation type; followed by wells. The form of the final product is not considered when it comes to irrigation.

Harvesting

Green almonds are harvested starting from mid-March till June, according to the altitude. The harvest of mature almonds (yebis) 7 to 8 months after flowering and may start around July and last through third week of September, depending on the altitude.

LEVERAGE POINTS

ECONOMY

The United States being the largest supplier of almonds worldwide and California being its top producer, the international almond supply was reduced tremendously as a result of affected the North American Drought that started in 2012 and is still ongoing in 2015. The reduced supply of Almonds worldwide was followed by an increase of prices. It is in therefore possible for Lebanese producers to fill in gap both in the local and international market.

PROCESSING

In terms of processing, simply removing the shell increases the value of the almond, but expanding the value chain further can increase the benefits to the producers. In fact, there are many ways to consume or further process almonds, which can increase their value allowing for better marketable yields and higher value sales due to the many benefits that they can offer. These products include: roasted almonds, water-soaked almonds, almond flour, almond milk, almond oil, and almonds as ingredients in pastries.

MARKETING

Almonds are densely filled with nutritious components that are considered healthy, which is a factor that has increased total demand worldwide due to the healthy trend that people around the world are taking part of. Also, Almonds are native to the Middle East and therefore grow best

in the region. The environmental factors in Lebanon enable the production of the highest quality of almonds in terms of taste and organoleptic qualities. This advantage along with the effort to achieve competitive prices will allow products of disadvantaged producers in Lebanon to penetrate the local market as well as more markets abroad.

SUBSECTOR DYNAMICS

MARKET TRENDS, DRIVERS, GROWTH RATES, AND SUPPLY GAPS

"In the early- to mid-90s, nuts in general and almonds in particular were felt to be unhealthy because they had so much fat," says John Talbot, vice-president of global market development for the Almond Board of California. However, research has shown that the fat that almonds contain is the good fat, and greater understanding of the beneficial effects (decreased the risk of heart disease, improved blood cholesterol…) of monounsaturated fats has changed people's perceptions. Moreover, almonds are a densely nutritive food (rich in B vitamins riboflavin and niacin, vitamin E, and essential minerals like calcium, iron, magnesium, manganese, phosphorus, and zinc). These qualities are in sync with the 'healthy' trend in the market, whereby people are getting more engaged in diets containing nutritious elements. Almonds resonate with weight watchers too, since it has the highest amount of protein among all tree nuts.

Moreover, the food industry is benefitting from the versatility of almonds by processing them and using them as ingredients in different sweets, snacks and foods, in order to satisfy consumers' tastes and preferences.

According to the Almond Board of California, sales in the UK had increased by 18% from 2010 to 2012. "Americans put away more than 2 pounds of almonds, per person, a year,

from raw and roasted to ground up and milked. California almond farmers estimate they'll have grown 2.1 billion pounds of almonds by year's end; twice as many as a decade ago, while Bloomberg Businessweek reported that sales of "alternative milks" are expected to hit $1.7 billion by 2016, with almond milk leading that growth". In fact, in 2011, almond milk sales increased by 79% on the previous year. With the publication of new reports that cow's milk can increase the risk of early death and the increase of lactose intolerance, almond milk sales have been increasing exponentially.

The value of each kernel has gone up dramatically and growers looking for the best return on their investment end up planting almond trees at an alarming rate. This is an issue because it takes 1.1 gallons of water to grow a single nut. This became a problem when the North American drought hit in 2010. Trees yielded less than expected, while attempts to save crops had some experts estimating that 10 percent of the California's water supply that is around 1.1 trillion gallons went to almond farming . As mentioned before, this has caused a global shortage since most of the global almond production originated from the USA.

Just like other agricultural sectors that rely on honeybee pollination, almond trees are threatened by the risk of extinction of honeybees. In fact, nearly a third of honeybee colonies across the U.S. are at risk of extinction. Some companies like Whole Foods are therefore supporting almond growers in encouraging bee-friendly production practices.

CHANGES IN THE ENVIRONMENT

As mentioned before, almonds trees are known to consume large amounts of water. This characteristic translated into a really big problem in the USA, when the North American Drought hit California and caused a huge shortage of almonds in the international market. There has been

very little rain for the past three years and reservoir levels are dropping. The Middle East, in turn, is considered to be one of the most water stressed regions in the world. Since almond trees in Lebanon are mostly rain-fed, and irrigation systems are not well-organized , supply mainly depends on the season's rainfall, which varies from year to year. It is worth noting, for instance, that in 2014, Lebanon faced a serious drought due to insufficient rain. Weather has become increasingly unpredictable partly due to global warming and should be a major factor to keep observing to prevent its harmful impact on supply.

BOTTLENECKS

One of the major bottlenecks is the lack of almond crackers in cooperatives. The purchase of these machines will decrease the relatively high labor costs.

Another threat is the high competition from already established fair trade almond producers in Pakistan, Afghanistan, and Uzbekistan that offer low prices due to cheaper labor costs.

Finally, the spread of diseases, weather fluctuations, and other risks usually associated with agriculture, threaten the consistent and smooth supply of almonds. As members of the agricultural cooperative of Menjez say: "The tree is subject to many pest outbreaks, such as the appearance of worms".

AUTHOR'S RECOMMENDATIONS

- Encourage the production of almonds with fair trade standards, and acquire fair trade and organic certifications (organic is very desirable and will reach the almond lovers' market who may also follow a healthy lifestyle).

- Promote cooperation between different cooperatives and small businesses in order to split big costs like the acquisition of an almond cracking machine.
- Find clients in Europe and act as wholesalers to sell in bulk to processing facilities there at a price of around $10.25 / kg
- Consider markets in big importer countries like Germany, Spain, UAE, France and China.
- In terms of marketing, highlight the almonds' nutritious benefits and focus on the Lebanese origin of the almonds to differentiate their taste from that of the widespread American variety and also to attract Lebanese consumers who have become more willing to buy local agricultural products to support local farmers and therefore the national economy.
- Compete on the basis of quality by persistently ensuring optimal growing conditions.
- Try to reduce costs and ultimately prices of the almonds that will further allow the organization to compete with current direct and indirect competitors
- Study and acknowledge pests threatening the almond tree along with their corrective or preventive measures to protect the health the yield.
- Constantly monitor the weather fluctuations, which are an uncontrollable factor, and take the required action when available, in order to maintain a smooth and stable supply as much as possible.

Income Statement (in LBP)

GREEN ALMOND PRODUCTION (for 10 dunums=1 ha)

Area/tree (in m2)	25	
Fresh Fruit Yield/Area (in kg/m2)	0,4	
Land Area (in ha)	1	
Total yield (in kg)	4000	
Total Yield without hull (in kg) (47.3% of fruit)	**1892**	
Sales Price of green almonds per kg	2500	
Harvesting cost per kg	571	
Investment Costs		
Scissors-type harvester (Masht)	4 000	
Seeds (per unit)	3 500	
Drip Irrigation Installation Cost (optional, for steady yearly yield)	1 950 000	
Revenue (LBP)/ 10 dunums		**2014**
	Sales revenue	10 000 000
	(Less sales returns and allowances)	-
	Service revenue	-
	Interest revenue	-
	Other revenue	-
Total Revenues		**10 000 000**
Expenses (LBP)/ 10 dunums		**2014**
	Ploughing	
	Pruning	-
	Pesticides Application	131 250
	Fertilizers cost	1 200 000
	Harvesting Cost (Manual)	2 285 714
	Irrigation	-
	Packaging	-
	Labelling Expenses	-
	Advertising Expenses	-
	Rent of Land	3 500 000
Total Expenses		**7 116 964**
	Net Income Before Taxes	2 883 036
	Income tax expense (15%)	-
Income from Continuing Operations		**2 883 036**
Below-the-Line Items/ 10 dunums		**2014**
	Income from discontinued operations	-
	Effect of accounting changes	-
	Extraordinary items	-
Net Income		**2 883 036**
Profit Margin		**29%**

Income Statement (in LBP)

SHELLED ALMOND PRODUCTION (67% of weight in-shell) (14.5%of fruit) (for 10 dunums=1 ha)

Area/tree (in m2)	25	
Yield/area (in kg/m2)	0,4	
Land Area (in ha)	1	
Total yield (in kg)	4000	
Total Shelled Almond Yield (14.5%)	**580**	
Sales Price of Shelled almonds per kg	8 655	
Harvesting cost per kg	571	
Investment Costs		
Scissors-type harvester (Masht)	4 000	
Seeds (per unit)	3 500	
Almond Shelling Machine	4 500 000	
Drip Irrigation Installation Cost	1 950 000	
Revenue (LBP)/ 10 dunums		**2014**
	Sales revenue	5 019 900
	(Less sales returns and allowances)	
	Service revenue	
	Interest revenue	
	Other revenue	
Total Revenues		**5 019 900**
Expenses (LBP)/ 10 dunums		**2014**
	Ploughing (once or twice per season)	
	Pruning	-
	Pesticides Appication	131 250
	Fertilizers cost	1 200 000
	Harvesting Cost (Manual)	2 285 714
	Irrigation	-
	Electricity	
	Packaging - Gallons	-
	Labelling Expenses	-
	Advertising Expenses	-
	Rent of Land	3 500 000
Total Expenses		**7 116 964**
	Net Income Before Taxes	(2 097 064)
	Income tax expense (15%)	-
Income from Continuing Operations		**(2 097 064)**
Below-the-Line Items/ 10 dunums		**2014**
	Income from discontinued operations	-
	Effect of accounting changes	-
	Extraordinary items	-
Net Income		**(2 097 064)**
Profit Margin		**-42%**

Cost Structure (in LBP)

GREEN ALMONDS cost structure per kg

Yield per tree (in kg)	20	
Area/tree (in m2)	25	
Yield/area (in kg/m2)	0,4	
Land Area (in m2)	2,5	
Price of Green Almonds per kg	2500	
Harvesting cost per kg	571	
Investment Costs		
Scissors-type harvester (Masht)	4 000	
Seeds (per unit)	3 500	
Almond Shelling Machine	4 500 000	
Drip Irrigation Installation Cost (optional, for steady yearly yield)	1 950 000	

Revenue		**2014**
	Sales revenue	2 500
	(Less sales returns and allowances)	-
	Service revenue	-
	Interest revenue	-
	Other revenue	-
Total Revenues		**2 500**

Expenses		**2014**
	Ploughing (once or twice per season)	
	Pruning	-
	Pesticides Application	33
	Fertilizers cost	300
	Harvesting Cost (Manual)	571
	Irrigation	-
	Electricity	
	Packaging	-
	Labelling Expenses	-
	Advertising Expenses	
	Rent of Land	875
Total Expenses		**1 779**
	Net Income Before Taxes	721
	Income tax expense (15%)	-
Income from Continuing Operations		**721**

Below-the-Line Items		**2014**
	Income from discontinued operations	-
	Effect of accounting changes	-
	Extraordinary items	-
Net Income		**721**
Profit Margin		**29%**