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USAID/LEBANON LEBANON INDUSTRY VALUE CHAIN DEVELOPMENT (LIVCD) PROJECT

HONEY VALUE CHAIN ASSESSMENT IMPACT REPORT
DRAFT
APRIL 2017

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Overview of the impact of LIVCD on Honey Value Chain

Lebanon has witnessed a shift in its honey value chain given the different interventions that have taken place since the launch of the LIVCD project in 2012. The weaknesses and threats of the honey value chain assessed in 2012 by LIVCD were taken as issues to be addressed by the five year LIVCD project. In 2011, the production of honey was estimated to be low as 1,800-2000 Metric tons (MT) per year, with a market value of between 27 and 30 Million USD annually; since then the number of hives has increased from 168,000 hives in 2011 to 360,000 hives end of 2016. The latter provides evidence of the scale of growth of the entire sector, where large investments were made by large number of stakeholders during this period. The increase in number of beehives has impacted the volume of honey production nationally. As estimated by Ministry of Agriculture the average productivity of honey per beehive for years 2011 to 2014 was 11kg/hive, however following adverse weather conditions in 2015 there was a decrease in productivity per beehive to 8kg/hive and 9kg/hive in respectively in 2015, 2016. Note that the observed decrease in honey productivity in years 2015 and 2016 as a result of the unpredictable weather conditions was compensated by an increase in both the number of beehives and the value of swarmed beehives.

These numbers led to an estimated market volume of 3,300 MT in 2016, with a market value of 65 Million USD as per Ministry of Agriculture. From another perspective, input suppliers, cooperatives, and large honey producers provide slightly different numbers where the estimated number of beehives in 2016 is 320,000 and the productivity per beehive was 12kg/hive leading to national production of 3,800 MT with a market value of 76, Million USD.

Based on figures received, the sector has had a minimum of a 36%, increase in the number of beekeepers in parallel with a minimum of a 70 % increase in number of beehives nationally.

Throughout this study, the average numbers between the Ministry of Agriculture and the private sector will be used to ensure consistency. The average production in year 2016 is estimated with confidence to be 3,500 MT with an estimated value of 70 Million USD; number of beehives to be 320,000 and number of active beekeepers to be 7,500.

Over the last two years sales volume and value of Lebanese branded honey has increased with increased access to domestic retail distribution networks. The first industry driven national honey awareness campaign held during the first quarter of 2017 has accelerated consumer preference for Lebanese honey.

In addition exports to higher value GCC markets are also increasing, as commercial brands transition from bulk to branded exports in Saudi Arabia, and other GCC countries. The upswing in commercial branded honey volumes has been bolstered by investment and upgrading of quality testing facilities, with growing consumer confidence in Lebanese brands in retail

markets in both export and local markets. Honey exports increased by 102% from 2011 to 2016.

The new regulation issued by LIBNOR and signed in March 2016 protected Lebanese honey against inferior quality imported honey by stating levels of HMF, sucrose and humidity to be in the favor of Lebanese honey.

The new decree issued by the ministry of agriculture in February 2016, related to Antibiotics and pesticides is as well in the favor of Lebanese honey. Annex1

Summary of LIVCD Intervention & Results

LIVCD Intervention

Trained 3,600 beekeepers on best practices, through training of trainer (TOT) with local 70 experts. Developed a new Curriculum on Beekeeping, tutorial videos and training manuals in collaboration with beekeeping experts

Launched a cost-share program with honey cooperatives that assisted beekeepers to purchase hives, LIVCD co-invested in 6,238 hives with 1,497 beekeepers

Established with private sector the Arab world's first center for artificial insemination of queen bees and supported the development of a professional center for natural queen breeding

Established with private sector the first professional wax sterilizing and recycling center in Lebanon

Improved honey processing services through leveraged investments in extraction, storage, packaging and wax equipment

Supported brands in marketing activities, upgrading labeling and branding

Supported two existing honey brands Jabal el Cheikh and Kaddoum in increasing access to local and export markets

Implemented a national multimedia honey awareness campaign in partnership with syndicate of Lebanese dieticians and private sector

Introduced high-tech spectroscopy capabilities to test the quality and botanical origin of honey for quality and purity Equipped ESIAM lab with the first of its kind FT-NIR spectrophotometer which detects honey adulteration and botanical origin. This service will be launch in May 2017

Collaborated with, LIBNOR, the Ministry of Agriculture and the private sector to issue a new regulation against low-quality honey

Collaborated with USJ, ESEK, and UL universities on improving the testing standards of honey. Through this project, ESIAM coordinated with USEK and UL universities to provide accurate tests as prerequisites to the FT-NIR spectrophotometry. In addition, LIVCD collaborated with the Dean of Veterinary Sciences at the Lebanese University to develop a honey training manual.

LIVCD intervention tackled 4,030 beekeepers impacting 24% of the total value

of the sector, considering a sector value of USD 70 Million. Thus, LIVCD's impact is USD 16.8 Million.

Result

Honey production increased by over 70% between 2011 to 2016.

To reach 3,500 MT, with an estimated market value of USD 70 million dollars.

Number of beekeepers increased by 36% from end of 2011 to 2016, to reach 7,500 Beekeepers in 2016

Number of hives increased by more than 70% to reach 320,000 in 2016

Honey exports in Lebanon witnessed a growth of 102 % between years 2011 and 2016 to \$680,000 in 2016

Large private sector investments were made, LIVCD partners invested in more than 2 millions of dollars on improving quality, ISO certification, Artificial insemination center, marketing, Laboratories, and more than half a million in new hives. LIVCD's co-investment in hives will yield approximately a total 3 years' value of honey of around \$4,480,000

VISION AND RECOMMENDATION

Lebanon being a diverse and optimum country for beekeeping will play a leading role and become a reference in beekeeping in the Arab world. The first artificial center of queen bees in the Middle East was established in Lebanon with the support of LIVCD. This was paralleled by an increase in number of beekeepers, in beehives, in addition to an issuance of a new honey regulation protecting the Lebanese honey. A honey training program that trained more than 45% of beekeepers in Lebanon has introduced newcomers into the sector and has strengthened the knowledge of existing beekeepers. Currently, the sector is working on unifying beekeepers through a union which will be representing Lebanon in all activities outside the country, and in the government. The honey Value chain in Lebanon is expected to achieve the below numbers if the trend in beekeeping remains as it has become in the past five years. In 2020, Honey market size is expected to reach a production of 5,000MT for an estimated value of 100 million USD, in addition to number of hives to exceed 400,000 hives with productivity of 14kg/hive, in parallel to an increase in exports to an average of 2 Million USD.

Since market demand for honey is increasing, there is a need for beekeepers to move from hobby to profession. Consequently, number of beehives per beekeeper should increase. Expected number of large beekeepers is expected to reach 2700 vs. 1350 in 2016.

By achieving the above, the:

Export Market will increase, led by Private Sector, Kaddoum and Jabal el Sheikh Honey, by increasing investments and marketing activities in GCC, in addition, to introduction of new brands into the export markets.

GCC is the target market for honey as it lacks high quantities of domestic honey production.

Increase Market share of Lebanese honey in Local Market

The national honey awareness campaign and the education of citizens on the importance of honey consumption as a sugar replacement and for health benefits increased the demand of honey in the local market. Several honey companies are now leaders in the local market and few are emerging as small start-ups.

Increase honey Productivity:

Promote the availability of high quality queen bees that will have as essential effect to increase quality and volume of honey produced as we already have established centers for production of high quality of Queen Bees.

Increase honey production by increasing pasture land through preserving current lands and cultivation of arid areas

Honey Market Opportunities

LEBANESE EXPORT MARKET ANALYSIS

Lebanon exports relatively small volume of honey to a diverse set of trade partners around the world. Lebanese honey exports do not claim a significant market share in any of its destination markets, and generally are among the most expensive honeys in the world marketplace, competing with other expensive honeys from New Zealand and the EU. The majority of honey exports are sold in branded bottles by commercial processors to retail markets; but unlike other agricultural value chains in Lebanon, small quantities of unbranded product are commonly exported through family and social networks throughout the region. (Estimates for this activity are hard to be establish accurately).

Lebanon exported 17 MT of honey in 2007, peaking at 34 MT in 2010, before dropping to 26 MT in 2011. During this period, the average sales price of honey rose from 9.59 USD in 2007 to 12.85 USD /kg in 2011. In 2011, 82 % of Lebanese honey exports by value were to Middle Eastern markets, 11 % went to the American, Canadian, and Australian markets, 5 % went to African markets, and 2.4 % went to European markets (specifically to Sweden and Switzerland, which are not members of the EU). In 2011, Saudi Arabia accounted for the largest share of Lebanese honey exports at 51 % of total value of exports, with UAE accounting for an additional 24 %*.

During 2012, LIVCD project began interventions in the honey VC to increase the quantity of honey exported by beekeepers.

LIVCD partnered with the two largest honey producers and exporters on rebranding and marketing activities to promote Lebanese honey in the local

and export market and to displace imports. The project invested with Jabal el Sheikh Honey on establishing sustainable market access to beekeepers through joint product promotions in UAE. LIVCD worked with Kaddoum Honey that rebranded and upgraded its image to increase its share in export markets. This change was accompanied by an increased exposure aboard especially in UAE and Qatar.

Impact of LIVCD intervention was reflected in honey Export at national level, where in 2016, 86 % of Lebanese honey exports by value were to GCC countries. UAE accounted for the largest share of Lebanese export at 43 % of value of exports, Saudi Arabia accounting for 31 % and Qatar for 11%. While 6 % of exports were to USA and Canada, another 6 % went to the Levantine, and North African Countries and 1% to other countries. **Figure1.**

Importing Countries	Volume of Honey Exports (MT)	Value of Honey Export/Country Thousand USD	% of Export per Country
Canada	4	6	1%
Congo	2	7	1%
Gabon	0	2	0%
Germany	0	3	0%
Guinea	1	3	0%
Hong Kong	0	4	1%
Jordan	1	21	3%
Kuwait	0	7	1%
Nigeria	0	4	1%
Qatar	6	78	11%
Saudi Arabia	13	214	31%
United Arab Emirates	24	294	43%
United States	2	31	5%
Zambia	1	2	0%
Total	57	680	100%

FIGURE 1- VOLUME, VALUE AND % OF LEBANESE HONEY EXPORTS

Source: www.customs.gov.lb

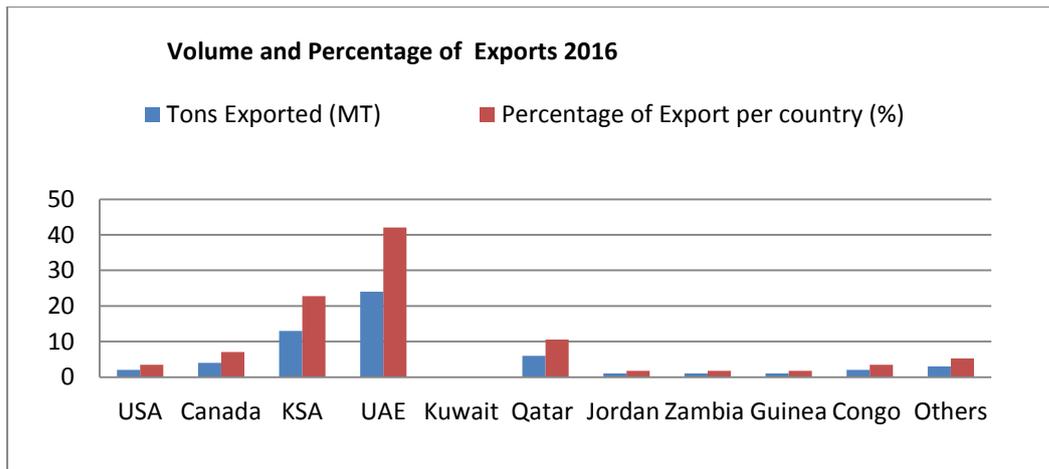


FIGURE 2-VISUAL REPRESENTATION OF LEBANESE HONEY EXPORTS BY COUNTRY

Honey Export highlights

In 2013, honey export support was initiated after the assessment phase, with the technical and financial support of LIVCD. A promotional and a co-investment plan were developed to increase honey exports to UAE and Jordan with the partnership of Jibal Loubnan, a leading honey exporter that sources honey from more than 75 beekeepers.

The Marketing plan was developed jointly to promote the Jabal Sheikh brand of Lebanese honey in the UAE at Carrefour as a new trade channel. The result of these exports to UAE on November 2013, and the promotion at the Carrefour chain impacted the total honey Lebanese exports, and is noted in the Lebanese customs data (www.customs.gov.lb) as per figure 2.

Trend of Exports since 2011

- Honey exports were facing issues since 2011
- In 2013 Honey exports were in a declining trend until November 2013, where the export growth occurred, led by Jibal Loubnan exports to UAE
- As soon as the Technical and financial support was provided to Jibal Loubnan , the total Lebanese Honey exports was positively impacted, and reflected in the Lebanese customs export numbers as of November 2013 date of the first shipment made by Jibal Loubnan to UAE , resulting with a 84% growth vs. 2012. The growth trend is still sustained in 2014, 2015 and 2016, where honey exports grew 110 % between years 2012 and 2016 as per figure 3.

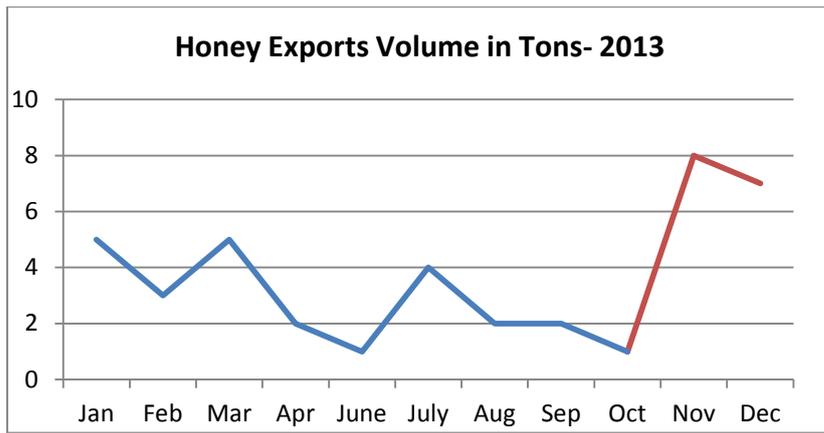


FIGURE 3- HONEY EXPORTS TREND IN 2013 BY MONTH

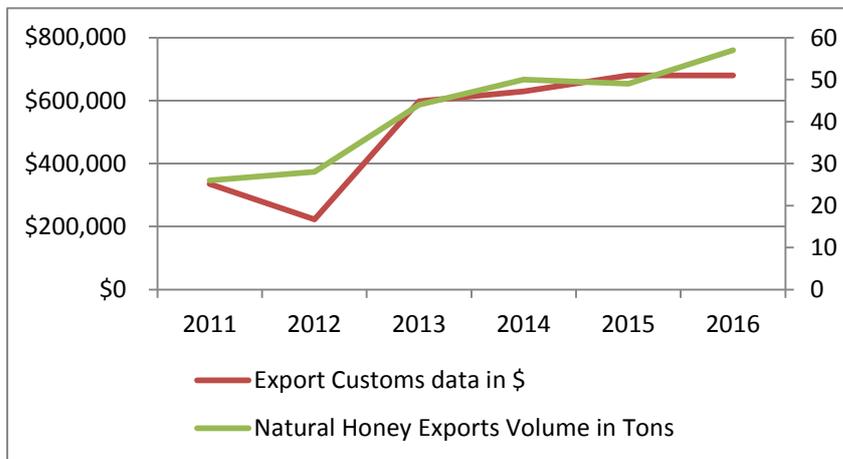


FIGURE 4-LEBANESE HONEY EXPORT MARKET TREND

Honey Export	2011	2012	2013	2014	2015	2016
Volume in (Tons)	26	28	44	50	49	57
Value in (USD)	\$335,000	\$323,000	\$598,000	\$629,000	\$680,000	\$680,000

DOMESTIC HONEY MARKET ANALYSIS

Lebanon produced around 1,800 MT of honey in 2011, and imported in 2010, 2011 between 203 to 229 MT respectively. However, in year 2016 Lebanon's honey production capabilities has increased over the years to an average of 3,500 MT, and imported around 343 MT of honey in year 2016. The increase in imports is justified by the increase in consumer demand on honey. This increase was reflected on all levels of the value chain, as all input suppliers, and beekeepers noticed a heightened increase in beekeeping as a profession, and as honey. However, the percentage of imports in relation to local production decreased from 12.7 % of imports in 2011 to 9% of imports in 2016.

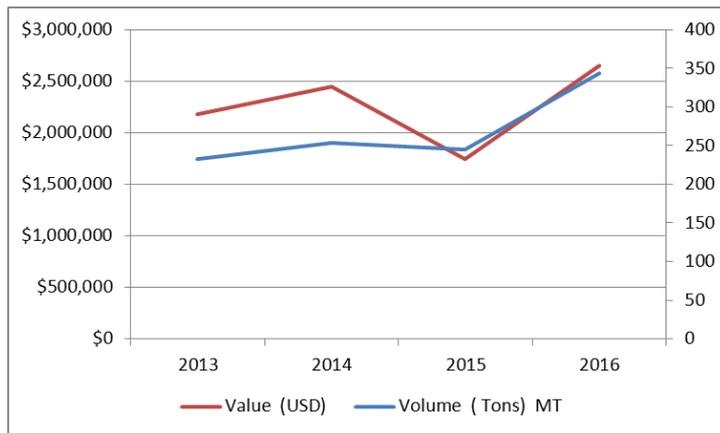


FIGURE 5- HONEY IMPORTS TREND BY VALUE

Honey Imports	2013	2014	2015	2016
Volume (Tons) MT	232	254	245	343
Value (USD)	\$2,183,000	\$2,451,000	\$1,744,000	\$2,649,000

Domestic consumers prefer to buy honey directly from beekeepers and will pay a significant market premium for unbranded honey purchased from beekeepers. Around 67% of the total honey production is sold directly by beekeepers to consumers at around USD25/kg. Meanwhile, branded bottled honey from retail markets, which in many countries would be more expensive, is sold at a 25 % lower price.

The domestic honey market in Lebanon has a high volume of very inexpensive “fake honey produced from sugar syrup sold in restaurants and juice snacks.” However, recently this has decreased due to the enforcement of the new regulation to have stricter standards in honey.

Detection of adulterated honey will be possible, as LIVCD has introduced high-tech spectroscopy capabilities to test the quality and botanical origin of honey for quality and purity by equipping ESIAM lab with the first of its kind FT-NIR spectrophotometer which detects honey adulteration and botanical origin. This service will be launched in May 2017 and will support the value chain in detecting fraud and honey adulteration in addition to the existing laboratories.

In 2016, the volume of honey in Lebanon was 3,786 MT, (3,500 MT Lebanese production and 286 MT in imports).

The increase in production and in import is insufficient to meet the national consumption and the export demand as if we consider that consumption is 0.7 kg per capita in Lebanon, and there is a total population of 5 million Lebanese and a minimum of half million Palestinian and Syrian refugees willing to buy honey, annual consumption of honey will be equivalent to a minimum of 4000 MT of honey annually. **FIGURE 6**

In fact honey export volume is much greater than what is reported by Lebanese customs. The increase in demand of honey in export and local market has led companies to source higher quantities of honey from local beekeepers, thus the interest in expanding and creating new apiaries have become a must to meet market demand.

Honey in Local market in MT	2011	2016
Lebanese Honey production	2000	3500
Trade Balance in MT	195	286
Total Honey in the Lebanese Market	2195	3786
Consumption in Lebanon (700g.per capita)	3500	4000
Difference between supply and consumption	-1305	-214

FIGURE 6-HONEY CONSUMPTION IN DOMESTIC MARKET

Description of Honey Harvesting and Seasonality

Honey production in Lebanon is predominantly mountainous, oak, poly-floral, and orange blossom honey. Mountainous honey is produced at high altitudes where bees forage on a diversity of flora, and obtains a high market price due to its purity and flavor. Small and large scale beekeepers produce mountain honey. Orange blossom honey is produced in citrus groves, usually at lower altitudes along the coast in the winter and spring when orange trees blossom.

Professional beekeeping is based on a vertical transhumance, i.e. moving hives from high to low altitudes following temperature variations and flowers blooming. Beehives can be moved from the coast during spring to medium altitude then to a higher altitude during the summer months, alternating between orchards, natural flowers, and forests. See Annex 2 for more details on production seasonality.

Because of Lebanon's diverse terrain, honey production occurs in every region of the country. As shown in figure 7, the North and Mount Lebanon have the highest number of beehives, followed by Nabatieh, Bekaa, and the South. It is important to note that the highest number of beehives is in Donnieh, followed by Jbeil as shown in Figure 8.

Details on beehives distribution in Annex 3

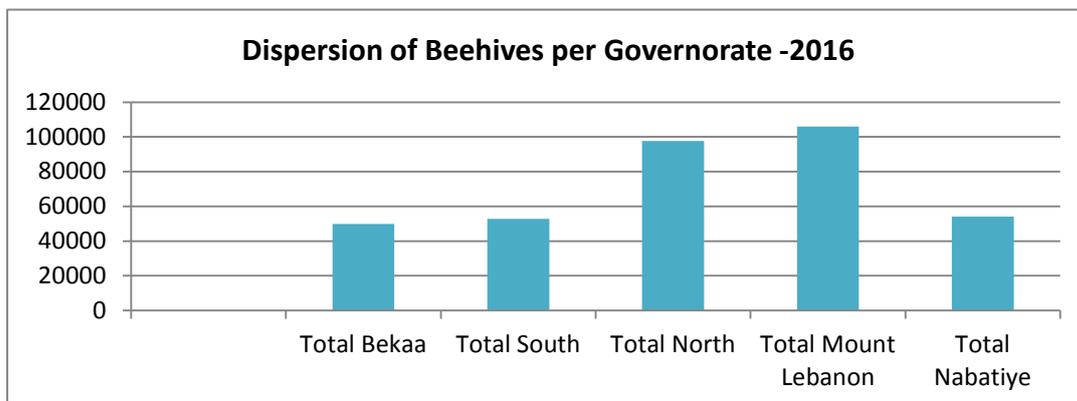


FIGURE 7- DISTRIBUTION OF BEEHIVES PER GOVERNORATE

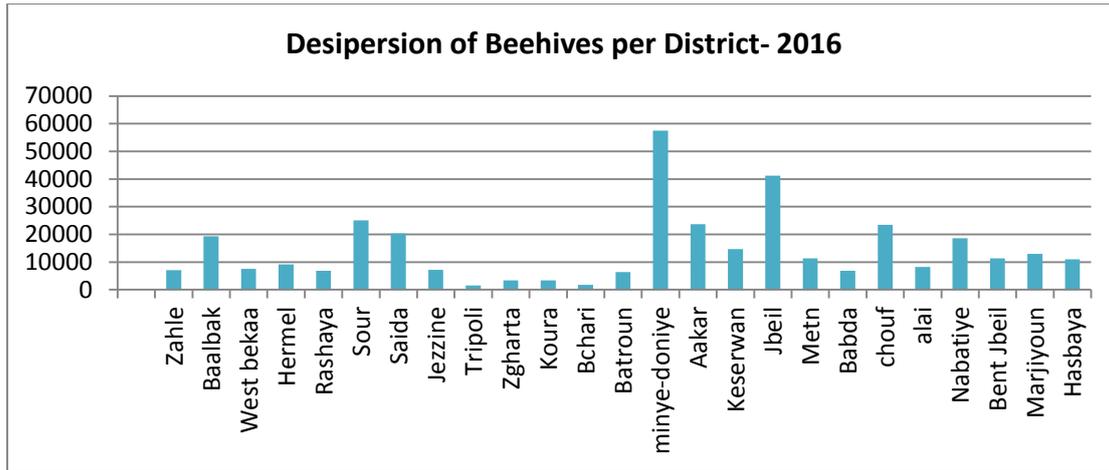


FIGURE 8-DISTRIBUTION OF BEEHIVES PER DISTRICT-2016

HONEY PRODUCTION

Based on the Ministry of Agriculture data, Lebanon has witnessed a 75% increase in honey production from year 2011 to year 2016 with a current market value of 65, Million USD. A 114 % increase in beehive numbers was observed, where in year 2011 beehive number was 168,214 and in 2016 360,179 hives (refer to Annex 3). **In the purpose of simplifying calculations we use the number 360,000.** Even though the number of hives has increased to 360,000 hives in 2016, productivity per hive decreased from 11Kg/hive to 9 kg per hive in 2015 and 2016 based on the ministry of agriculture's data. However after interviewing the largest beekeepers in Lebanon, some data were slightly different than the conservative data of the MOA; mainly the productivity /hive. The private sector mentioned that the minimum average for beekeepers in 2016 was 12 kg/hive (refer to figure 9).

Year/Honey VC Data	# of Beekeepers		# of Hives		Productivity/ hive Kg/hive		Honey Production in Tons		Market Size Value in USD Million		Avg farm Gate price USD
	MOA DATA	Private Sector	MOA DATA	Private Sector	MOA Estimation	Private Sector	MOA Estimation	Private Sector	MOA Estimation	Private Sector	
2011	5,230	5,500	168,214	168,214	11	14	1,850	2,355	\$27,755	\$35,325	\$15
2012	5,230	5,700	198,000	198,000	11	14	2,178	2,772	\$32,670	\$41,580	\$15
2013	6,100	6,100	227,000	227,000	11	14	2,497	3,178	\$37,455	\$47,670	\$15
2014	6,200	6,200	257,000	257,000	11	14	2,827	3,598	\$45,232	\$57,568	\$16
2015	6,500	6,500	328,832	300,000	8	8	2,631	2,400	\$52,613	\$48,000	\$20
2016	7,500	7,500	360,179	320,000	9	12	3,242	3,840	\$64,832	\$76,800	\$20

FIGURE 9-MINISTRY OF AGRICULTURE AND PRIVATE SECTOR DATA

PRODUCTION TREND: PRODUCTIVITY/ HIVE AND OVERALL INCREASE IN NATIONAL PRODUCTION:

In 2015 and 2016, Lebanon has witnessed adverse weather conditions which negatively affected the beekeeping sector especially the beekeepers relying on the oak season.

- In 2015, rain fell in late April, and early May which washed away the aphids that produce the secretion responsible for production of the oak honey. As a result as no oak honey was produced.
- In late August and early September 2015, a sand storm hit Lebanon which affected production of wild flower honey.

However, the decline in productivity/hive in 2015 and 2016 was compensated by an increase in number of beehives partially resulting from the LIVCD honey distribution program where almost 6,500 beehives were co-invested with beekeepers. In addition, beekeepers swarmed their beehives to produce additional beehives instead of losing the honey season. The swarmed beehives have a market value of 125 USD per hive, adding both production value and volumes to honey produced and sold.

Medium to large beekeepers who move their hives typically harvest 2 seasons mainly the orange blossom and wild flower honey, losing the high value oak honey season in 2015 which represents almost 25% to 30% of the Lebanese Honey production. Consequently, there was a reduction in productivity per hive, and national honey production. **Figure 10**

Under optimum conditions productivity per hive should be 14kg/hive

- In 2015 the total market value should have been 84 Million USD compared to the actual 54 Million USD
- In 2016 the total market value should have been 90 Million USD compared to 70 Million USD .

Actual market value of the honey sector is observed in **Figure 10**.

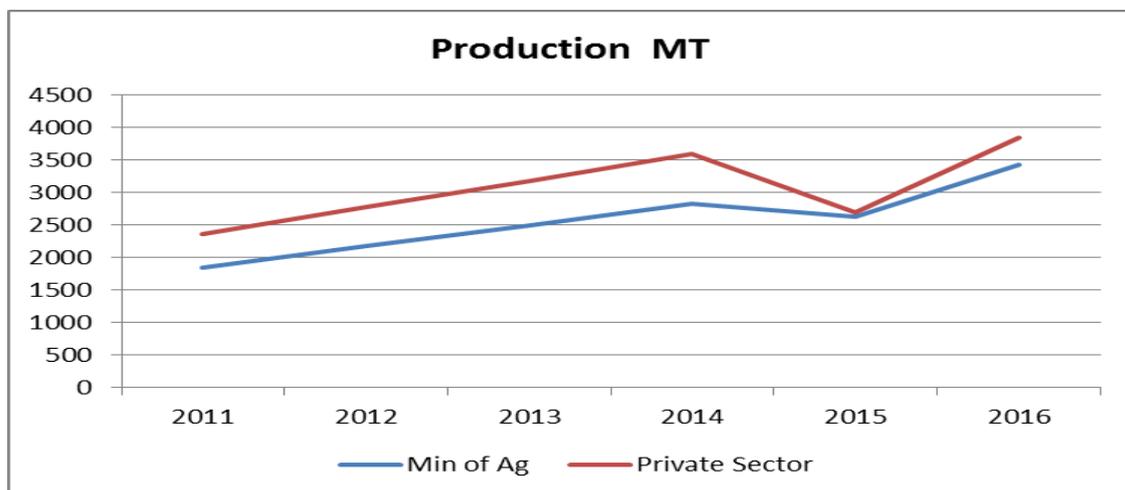


FIGURE 10-LEBANON HONEY PRODUCTION TREND IN MT

Trend in Number of Beekeepers

Number of beekeepers has increased by more than 36 % since 2011 totaling to 10,057 beekeepers registered in 2016 compared to 5,230 beekeepers in 2011 according to MoA data (Refer to Annex 4). However, LIVCD will consider the number 7,500 beekeepers when discussing 2016 data, as some newcomers in beekeeping will lose their hives in the same year. This dictates

that the number of *active* beekeepers registered at the Ministry of Agriculture for year 2016 is estimated to be 7,500.

This increase is a result of the:

- New entries of both young and mature beekeepers;
- the honey training program,
- Co-investments made by LIVCD's ,
- External factors affecting the dynamics of the value chain.

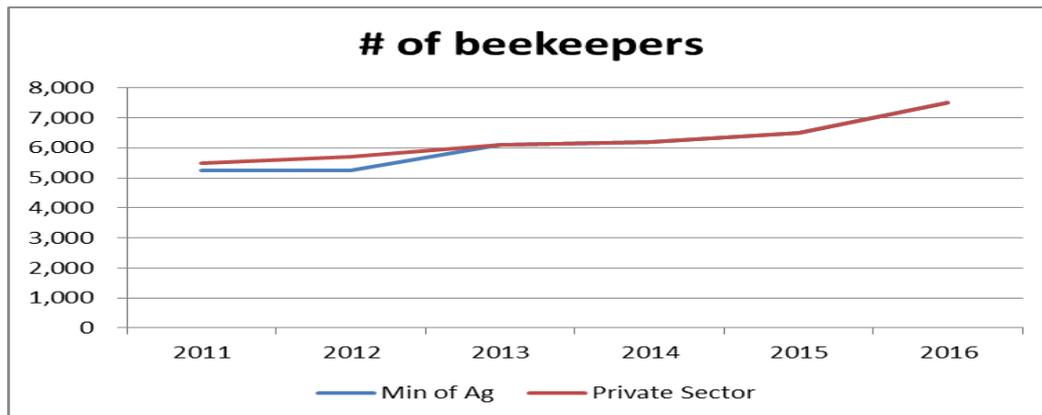


FIGURE 11-NUMBER OF BEEKEEPERS IN LEBANON

Based on all the above we will estimate that the average numbers for the year 2016 are as follows:

2016	Estimated values
Volume of Honey	3500 MT
Value of Honey	70 Million USD
Number of Beehives	320,000
Number of Beekeepers	7,500
Productivity per hive	11Kg
Farm gate Price/ Kg	\$20

COST OF PRODUCTION AND MARGINS:

Farm gate Prices

Due to larger demand than supply in the domestic market, and lower honey production due to adverse weather, the average farm gate price increased by 33 % from year 2011 to 2016.

Year/Honey VC Data	Average farm Gate price USD per Kg

2011	\$15
2012	\$15
2013	\$15
2014	\$16
2015	\$20
2016	\$20

FIGURE 12- FARM GATE HONEY PRICES

Based on Figure 13, cost of production ranges from \$8/kg for small beekeepers having 25 hives to 4 USD /kg for large professional beekeepers having more than 350 beehives.

Honey Margins	Beekeeper Large size	Beekeeper Large size	Beekeeper Medium size	Beekeeper Small size
	A	B	D	E
Number of beehives	More than 350 hives	100	50	25
Honey cost of production \$/kg	4	5	6	8
Farm Gate Prices	18	20	22	30
Margins	14	15	16	22

FIGURE 13- DIFFERENCE IN COST OF PRODUCTION DEPENDING ON SIZE OF BEEKEEPERS

Import and export Prices:

To respond to the increasing demand in local market, imported honey prices increased by 18%. From year 2011 to 2016, prices of honey exports showed a slight decrease (6%) in prices to compete and win in export markets.

	Tons		Value Millions USD		Average (USD/kg) Price	
	2011	2016	2011	2016	2011	2016
Exported Honey	26	57	0.334	0.68	12.8	12
Imported Honey	229	343	1.5	2.6	6.5	7.7

FIGURE 14-QUANTITY AND PRICE OF IMPORTED AND EXPORTED HONEY

LIVCD - Value Chain Upgrading Strategy and Intervention

LIVCD interventions in the honey value chain were tailored to boost competitiveness of Lebanese honey in both domestic and export markets. Increased competitiveness of branded commercial honey in the high value honey segment increased the demand for honey from rural honey producers. The strategy was differentiated from previous honey support projects by emphasizing vertical linkages between private commercial brands and smaller beekeepers with under 100 hives, rather than seeking to build cooperative marketing structures that lack the financial strength and incentive to invest in brand development. LIVCD played the key role of facilitator that ensured the two ends of the chain continue to work together while building each actor's

capacities and arranging the required third party support services. A summary of LIVCD interventions is detailed below:

Axis One: Access to market

SUPPORTING LEBANESE HONEY EXPORTS

Lebanese brand owners lack the skills and financial means to back their brands in export markets. In many cases, honey exporters to GCC markets lack a professional marketing and sales department that can navigate the wholesale and retail markets. In general, in house marketing functions are under-staffed and lack computer-based communication skills. Market entry costs, especially in the GCC, can be prohibitively expensive. Without an adequate marketing and branding plan, Lebanese honey brands risk failure in GCC markets and loss of significant investments. In the US marketing difficulties are even more formidable. Breaking into the US market will usually require either identifying new ethnic market importers/distributors who are willing to place Lebanese brands on the shop shelves (and not use them as mixes for their own brands) or going through mainstream distributors of specialty product with a specifically designed marketing campaign that is developed for this market segment

LIVCD worked with exporters to increase and introduce Lebanese honey abroad. LIVCD partnered with the two largest honey producers and exporters on rebranding and marketing activities to promote Lebanese honey in the local and export market and to displace imports. The project invested with Jabal el Sheikh Honey on establishing sustainable market access to beekeepers through joint product promotions in UAE. LIVCD worked with Kaddoum Honey that rebranded and upgraded its image to increase its share in the Lebanese and export markets. This change was accompanied by an increased exposure abroad especially in Qatar and the Gulf market. Figure 1

SUPPORTING LEBANESE HONEY IN DOMESTIC MARKETS

As part of increasing market shares of Lebanese Honey in local market, LIVCD had interventions to improve equity, branding and labeling of honey brands. LIVCD supported cooperatives with no honey brands to create one and to start selling to supermarkets such as Maten el Aala Honey. LIVCD partnered with Kaddoum honey on rebranding their brand image to upgrade and develop new packaging, labels, online and social media presence, and in store marketing to be able to compete with the imported brands and to reach a wider range of customers. Following the completion of the Kaddoum rebranding, the brand successfully launched its products in the local market

LIVCD played a key role to increase purchases of Lebanese honey in the local market. Most importantly, the national honey awareness campaign from January 2017 till March 2017 has spurred national awareness on honey. This campaign was a co-investment with the Syndicate of Dieticians in Lebanon after the new regulation for honey quality was issued and made official covering Lebanese and imported honey brands. The regulation is being

implemented in stores by the Ministry of Economy. Thus, no local honey brand in stores should be below required quality.

LIVCD Facilitated Market Linkages for Beekeepers with over 25 hives and commercial honey brands such as J Grove, Jabal Sheikh, Kaddoum, Maten el Aala honey, B.Balady and Atelier du Miel. These can absorb surplus honey production that is not sold directly to households

Axis two: strengthen key actors in the domestic branded honey market segment.

HONEY EXTRACTION, AGGREGATION AND PROCESSING

The honey value chain engages a large number of rural Lebanese households. Supporting rural beekeeping practices through investments in new equipment elevates the living conditions of citizens of the area reducing the necessity of migrating to the city searching for alternate income. Increase productivity and competitiveness requires improving both the quality and the production efficiency of honey through usage of new technologies and adequate equipment in honey production.

- LIVCD focused on improving aggregation and processing facilities by co-investing with cooperatives and private companies on developing the honey processing services through advanced equipment in extraction, packaging, and wax processing, in all over Lebanon. These cooperatives, laboratories, and companies function as service centers where equipment and tests are ready to be used by beekeepers of the respective areas and at national level. (**Figure 15**)
- LIVCD Supported laboratories to develop needed testing capacity. LIVCD has equipped ESIAM laboratory with the first of its kind FT-NIR spectrophotometer that tests for the botanical origin of honey, as well as adulterations in honey. This will support traders and exporters in testing their honey at affordable prices before marketing and exporting to ensure that they meet export markets requirements.
- LIVCD with private sector established the first professional wax sterilizing and recycling center at HOSCO Agri in Mount Lebanon. This has attracted beekeepers seeking high quality wax production and recycling. A good honey production requires good quality wax sheets in beehives, and these are difficult to find in Lebanon.
- LIVCD Co-invested in breeding and queen bees' production centers, with the first Artificial insemination queen bees breeding center at the Golden Queen Center, with Jabal Amel Cooperative on protecting and proliferating the production of the selected local queen bees

Regions	Cooperatives and Private Sector	List of Services offered in collaboration with LIVCD	LIVCD Cost Share
South	Jezzine Cooperative	Increase production	Beehives
	Caritas	Increase production	Beehives
	Development Cooperative of Jezzine- B.Balady	1. Honey Extraction and Wax Services, 2. Supplies for beekeeping	Wax production Unit and Honey Extractor, candy machine , beehives
	Deir Mimesse Cooperative	Increase production	Beehives
	JAZ	1.Honey Extraction 2. Storage Services	Uncapping Stands ,Elecric Knife,Reversible Honey Extractor (6 frames),Stainless Steel Containers
	Jabal Amel Beekeeping Cooperative	1.Natural Queen Rearing and Breeding Services 2. Selective Beehive	Queen rearing kit ,Frames for queen breeding,Incubator For Queen Bees ,Nucleus Hives ,Empty Wooden Beehives boxes,Beekeepers' tools
	Kfeir Beekeeping Cooperative	1.Increase production 2.Beehive Selling	Beehives
	Kawkaba Agriculture Cooperative	Increase production	Beehives
Bekaa	Karoun Beekeeping Cooperative	1. Honey Extraction and Storage services 2. Wax processing	Honey Extractor, Stainless Steel Containers, Wax sterilizers
	Zeghrine Beekeeping Cooperative	Increase production	Beehives
	Rif el Hermel Beekeeping Cooperative	1. Honey Extraction 2. Wax Sterilizing	Honey Extractor;Wax sterilizer machine
	Hermel Beekeeping Cooperative	1. Honey Extraction 2. Wax Sterilizing	Honey Extractor;Wax sterilizer machine
	Dar Tanit Association	1.Honey Extraction 2. Storage Services	Beehives , Honey Extractor , Stainless steel containers (200 l)
	Baalbeck and Zahle Cooperative for Beekeeping	1.Honey Extraction 2. Storage Services	Beehives , Honey Extractor , Stainless steel containers
	North Bekaa Beekeeping Cooperative	Increase production	Beehives
	Cooperative Association for Marketing and Production of Beehives in Baalbeck	1.Honey Extraction 2. Storage Services	Beehives , Honey Extractor (6 frames);Stainless steel containers
	Association for Alternative Crops in Baalbeck	Increase production	Beehives
	ESIAM	Detection of Botanical Origin and Adulteration in Honey	FT-NIR Spectrophotometry

Regions	Cooperatives and Private Sector	List of Services offered in collaboration with LIVCD	LIVCD Cost Share
North	Akkar el Atika Beekeeping Cooperative	1.Honey Extraction 2. Storage Services	Beehives Wax melting and sterilizing Tank - 33 frames, Electric extractor (6 frames), Stainless steel container
	Kashlak Beekeeping and Honey Production Cooperative	Honey Extraction	Beehives, Honey Extractor
	Menjez Cooperative	Honey Extraction	Beehives, Honey Extractor
	Beekeeper cooperative association in Chadra	Honey Extraction	Beehives, Honey Extractor
	Cooperative Association in Douma	1.Honey Extraction 2. Storage Services	Beehives, Honey bee extractor, Stainless steel containers
	Cooperative Association for beekeepers in Ghouma	Honey Extraction Services	Beehives, Honey Extractor
	Aydamoun Cooperative Association	Increase production	Beehives
	Kobayat Agricultural Cooperative	1.Honey Extraction and Storage Services 2. Thyme Distillation Practices	Beehives, Distillation unit for thyme, honey extractor, stainless steel containers
	Kwayteh Beekeeping Cooperative	1. Honey Extraction and Storage Services 2. Wax Services 3. Candy Making Machine	Beehives, Wax sterilizer, wax foundation mold, candy making machine, stainless steel tank, wax rolling machine, honey heating machine
Mount Lebanon	Ehmej	Increase production	Beehives
	Ain el Abou Cooperative	1. Extraction Services 2. Wax Services	Beehives, Extractor, wax processing equipment, Candy making machine
	Almet Cooperative	1.Honey Extraction 2. Storage Services	Beehives, Honey extractor, Stainless steel containers (50 kg), Stainless steel manual uncapping stand
	Mrsity	Wax Processing	Wax sterilizer, wax sheeting and embossing machine
	APIS	1. Extraction Services 2. Honey Mixing Services 3. Honey Bottling Services	Beehives, Fully automatic uncapping and extraction line, and Honey Mixer
	Jabal Moussa	Increase production	Beehives
	HOSCO Agri	1. Professional Wax Services 2. Educational Services- Beekeeping School	Beeswax Foundation Fully Automatic Machine
	Golden Queen Center- Afif Abi Chedid Ag and Trade Company	1.AI Center 2. Fully Equipped Conference Center 3. Training Services	Beehives, Artificial Insemination apparatus, Stereoscopes, microscopes, Queen Rearing Kits
	Maten el Aala Beekeeping Cooperative	1. Extraction Services 2. Wax services 3. Honey Marketing Support 4. Conference and meeting Room 5. Training Services	Beehives, Honey Extractors, Wax foundation molds, Wax sterilizer, accounting system, marketing and promotional material, and Educational support

FIGURE 15-LIST OF ESTABLISHED OR SUPPORTED SERVICES BY LIVCD

Axis Three: Sustain and increase production of honey

The major production constraints to beekeeping included:

- The lack of understanding of modern beekeeping techniques and principals. Beekeeping requires a certain amount of technical knowledge that is difficult to attain without practical experience and some theoretical training;
- The second main obstacle to increased production came from diseases affecting honeybees. These include the American foulbrood disease, the Varoa mite, and colony collapse disorder (CCD). Most of the diseases come from lack of proper management of beehives, in addition to the entry of low quality beehives and queen bees into the country and the beekeeper's inability to manage diseases and behavioral patterns accompanied by this;
- The third major constraint is the availability of high quality queen bees; Lebanese beekeepers face a dilemma of where to get certified queen bees. Importing foreign-bred queens are expensive, and the overseas travel often results in weakened queens, a risk many are not willing to take. Despite this, beekeepers import approximately 15,000 queen bees every year.

To increase honey production in Lebanon, LIVCD co-invested in 6,238 hives with 1,497 beekeepers, trained 3,600 beekeepers and invested in breeding centers.

LIVCD intervention to increase production:

EXPANDED THE NUMBER OF HIVES IN PRODUCTION BY SMALL AND MEDIUM BEEKEEPERS.

The co-investment in beehives was based on beekeepers attending the training for application of improved practices. 1,497 beekeepers co-invested in 6238 beehives. This promoted the entry of new beekeepers that had less than 25 hives. In total, 6,328 beehives were co-invested.

LIVCD provided 3 beehives while beekeepers purchased a minimum of one hive. A total of no less than 2,000 hives were invested by beekeepers as cost share. Through this co-investment, it is estimated that LIVCD contributed directly in increasing the number of hives in Lebanon by a minimum of 8,000 hives in 2014, 2015, and 2016.

Impact of beehive investment on production:

LIVCD's co-investment in beehives will lead to an increase in production by:

- 40,000 kg/ \$800,000 for the First Year. Based on a productivity of 5kg/hive
- 64,000 kg/ \$1.28 million for the Second Year. Based on a productivity of 8kg/hive
- 120,000 kg/ \$2.4 million for the Third Year. Based on a productivity of 15kg/hive

LIVCD's co-investment in beehives will yield approximately 4.48 Million USD.

Year 1	\$800,000
Year 2	\$1,280,000
Year 3	\$2,400,000
Total Value	\$4,480,000

2- SUSTAIN AND INCREASE PRODUCTION PER BEEHIVE THROUGH TRAINING.

LIVCD facilitated technical assistance and training to beekeepers through extension service providers and value chain actors. More than 3,600 beekeepers, 48% of total beekeepers were trained on hive management and diseases chapters. Improved awareness of beehive management was a vital step to take. The beekeeping training program established by LIVCD to cover the five topics had several positive impacts on quality and quantity of production.

LIVCD in collaboration with beekeeping experts developed a new Curriculum on Beekeeping covering 5 topics: Hive management, Diseases, Queen Breeding, New technologies in beekeeping and Increase in honey Production. The manual was accompanied by a tutorial video encompassing the five chapters.

Subsequently, NGOs, cooperatives and universities underwent the Training of Trainers (TOT) program covering these 5 topics. 70 experts were trained on proper educational methods for beekeeping training Improvement of beekeeping practices The objective of the TOT program was to create a critical mass of trainers in each region with the basic knowledge, skills and experience to provide training sessions for beekeepers from all over Lebanon, using this newly developed curriculum.

During this training, LIVCD focused on addressing the bee diseases with a strategy of regulating chemical and pesticide use to bring beekeepers into compliance with new standards promulgated by the Ministry of Agriculture. They also addressed ways of benefitting from the wax obtained from old and damaged combs therefore providing an additional source of income for beekeepers.

The impact of the USAID honey training program is marked both on production and income. In fact, the volume of honey produced has increased by a minimum of 30%, with some beekeepers reporting an increase in productivity from 8Kg/bee hive to an impressive 15kg/bee hive. Additionally, and following the training program, a representative sample of trained beekeepers have reported a 5% decrease in the costs of production following adoption of best management practices and an increase of 66% in total value of sales as a result of increasing the number of honey producing bees by swarming.

LIVCD will ensure upon its closure that beekeeping schools are identified and launched to ensure sustainability of this project.

3- LIVCD ENHANCED QUALITY OF QUEEN BEES:

With LIVCD's support, the first Artificial insemination queen bees breeding center in the Arab world at the Golden Queen Center was established to limit the import of low quality queen bees and to promote the artificial insemination of superior queen bees.

In addition LIVCD co-invested with Jabal Amel Cooperative on protecting and proliferating the production of the selected local queen bees.

In Lebanon, the most popular type of queen bee is the *apis mellifera syriaca*, a local bee which is slightly more aggressive than the *ligustica* bee, has lower productivity, yet highly adaptable to the Lebanese environment. Another less popular type of queen bee is the *apis mellifera ligustica*, an Italian bee which is gentle and has higher productivity in terms of honey production.

Only professional and knowledgeable beekeepers produce their own queen bees given the need expertise in this area. The small beekeepers rely on purchasing queen bees from the local cooperative, and professional beekeepers, or from the input suppliers that import queen bees. There are no artificial insemination queen breeding centers in Lebanon nor in the Arab world. Yearly, Lebanon imports around 15,000 queen bees for domestic sale, selling at around 25\$/queen bee. Imported queen bees are often inaccessible to Lebanese beekeepers for several reasons, namely high cost, and importation logistics.

LIVCD Finding 1: In 2016, Lebanon had a queen bee market potential of around 275, 000 queen bees. The conservative estimate for queen bee market potential in Lebanon is 100,000 queen bees annually as the market is untested and an undetermined number of beekeepers in Lebanon are stationary, leaving their hives in one location from year to year. In this case replacing the queen every two years is advisable if high honey production is the purpose of maintaining the hive.

LIVCD Finding 2: There is currently a market for at least 15,000 queen bees in Lebanon. This is determined by the fact that 15,000 queen bees are imported and sold

LIVCD Finding 3: Lebanon's unique climate and geography allows for the production of queen bees from February through August in different regions within the country. In South Lebanon queen bees can be produced from February through July. In Ouyoun El Siman queen bees can be produced from March through July. In Rashaya El Wadi queen bees can be produced from April through August.

LIVCD Finding 4: Lebanon's unique climate and geography allow beekeepers to transport their hives within the country for honey production during most months of the year (weather permitting). The high number for hive transportation events within Lebanon is five times per hive. Multiple hive transportation events support the practice of annual queen replacement, but

potentially undermine the ability to maximize queen production at a fixed location. .

Value Chain Stakeholder Analysis

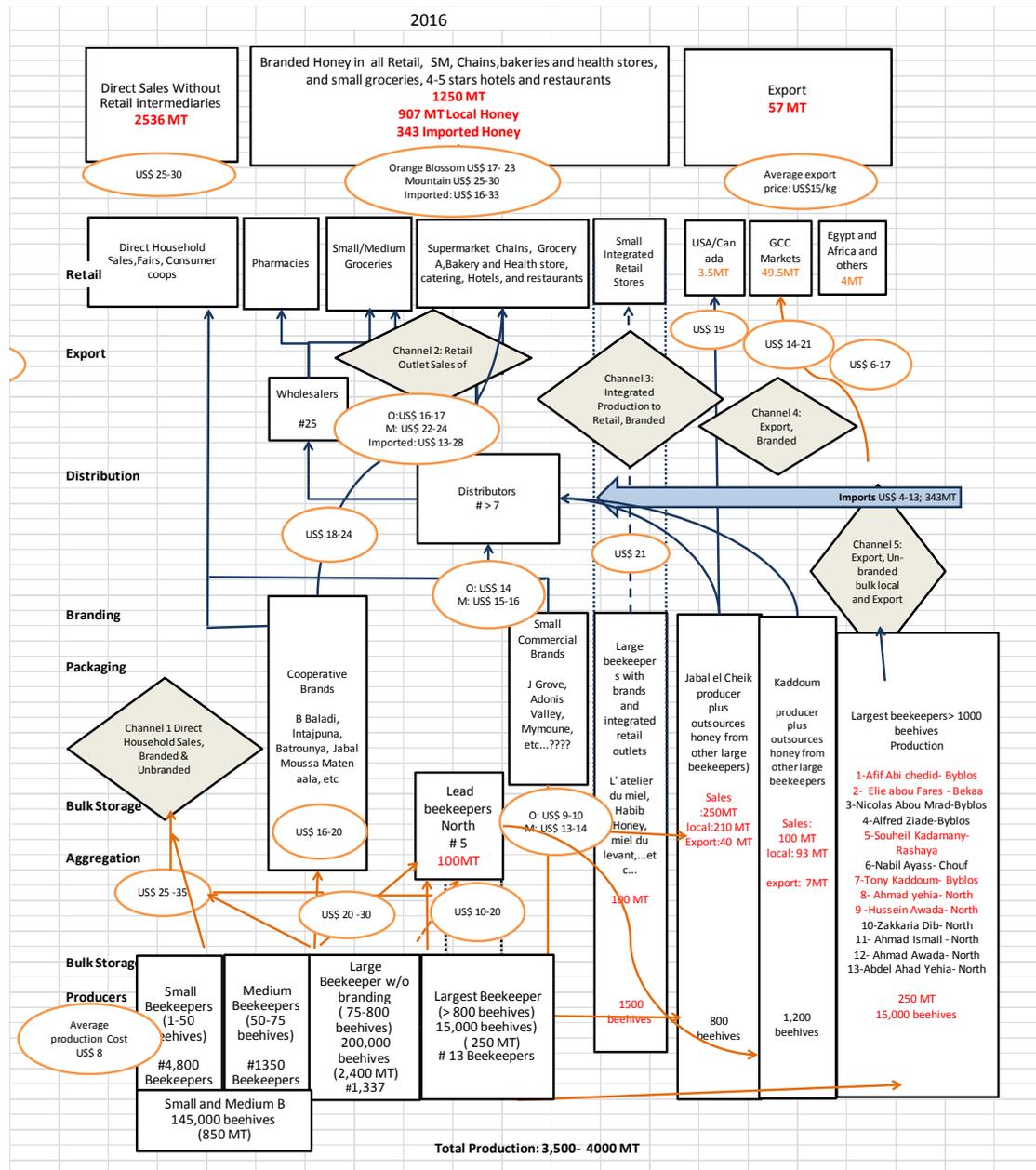


FIGURE 15-HONEY VALUE CHAIN STAKEHOLDER MAP 2016

Honey Value Chain Stakeholder Map 2016

The structure of the honey value chain map is given in Figure 16 for the year 2016. This map shows the main functions, volumes of product flow and prices per Kg at different points in the value chain. Descriptions of the main actors are given below by functional level. This function has slightly changed with numbers and actors since 2011 till 2016. Below is a description of how the value chain functions interlinked to create the current situation.

Beekeepers numbers in 2016, were given by the beekeeping department at the ministry of agriculture, and we applied the same proportion of small, medium and large as in 2011 provided by the ministry as well.

PRODUCTION

In general, among all categories of beekeepers in Figure 16, the model for beekeeping in Lebanon is for honey producers to place their hives on privately and publicly owned land. Beekeepers either place their beehives in familiar lands, or ask permission to place them in other fields. Common practice is for the beekeeper to provide some gift honey to the land owner. Formal rental payments are largely unknown. The land owner generally provides no services other than accepting that the hives be placed on his/her property. All upkeep and management of the hives (including harvesting) is the responsibility of the beekeeper.

Distribution of Beekeepers in Lebanon

As observed in the table, **Figure 17**, the major concentration of beekeepers and beehives is in North of Lebanon. This is due to the need to search for additional sources of income as a result of to the economic situation in this part of the country.

2016 numbers show an increase in the number of beehives in Mount Lebanon and South Lebanon, versus a decrease in the North, while other regions remain almost constant.

MOA	Caza	Total 2011	Total 2016	Growth 2016-2011
Bekaa	Zahle	4021	7055	75%
	Baalbak	8325	19322	132%
	West bekaa	4833	7500	55%
	Hermel	4653	9160	97%
	Rashaya	3219	6900	114%
	Total Bekaa	25051	49937	99%
	% Bekaa of Total	15%	14%	

South	Sour	8446	25123	197%
	Saida	6323	20330	222%
	Jezzine	3283	7253	121%
	Total South	18052	52706	192%
	% South	11%	15%	
North	Tripoli	790	1603	103%
	Zgharta	1454	3401	134%
	Koura	1860	3345	80%
	Bchari	721	1800	150%
	Batroun	2092	6347	203%
	minye-doniye	34522	57445	66%
	Aakar	14622	23735	62%
	Total North	56061	97676	74%
	% North of Total	33%	27%	
Mount Lebanon	Keserwan	7262	14732	103%
	Jbeil	15231	41242	171%
	Metn	4536	11377	151%
	Babda	3882	6851	76%
	Chouf	6966	23434	236%
	alai	3813	8235	116%
	Total M.L	41690	105871	154%
	% M.L of Total	25%	29%	
Nabatiye	Nabatiye	9475	18600	96%
	Bent Jbeil	7387	11336	53%
	Marjiyoun	5802	12987	124%
	Hasbaya	4538	11066	144%
	Total Nabatiye	27202	53989	98%
	% Nabatiye of Total	16%	15%	
Total Lebanon	168056	360179	114%	

FIGURE 16-DISTRIBUTION OF BEEHIVES – MINISTRY OF AGRICULTURE

LIVCD intervention MAP (figure 18) shows the area where LIVCD activities were implemented. The areas of intervention are in line with the area of increase in hives which is in Baalbek, Rashaya, Sour, South, Jbeil, Batroun, Chouf, Mount Lebanon.

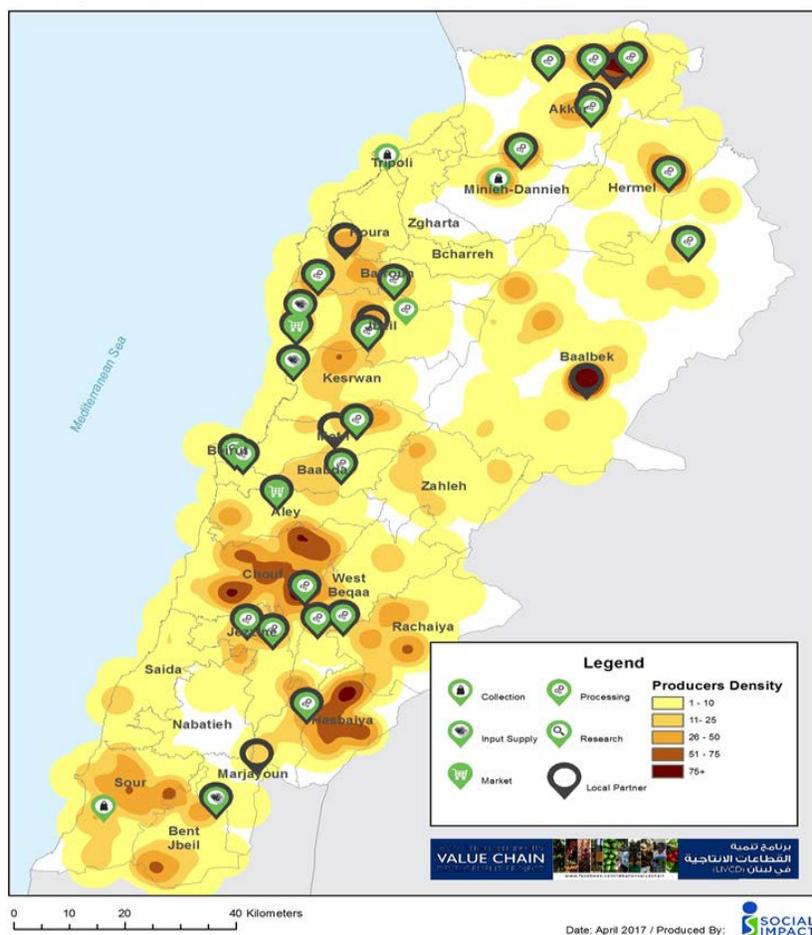


FIGURE 17-LIVCD INTERVENTION MAP

The different categories of beekeepers at the bottom of figure 16 include:

SMALL BEEKEEPERS: In general, small beekeepers have not more than 50 hives. A family with 25 hives in full production with one harvesting period a year can in general expect to harvest 200Kg of honey per year which provides 5,000 USD in revenue with standard beekeeping practices. Honey sales thus provide important supplemental family income. In year 2016, the number of small beekeepers increased to 4,800 comprising 64% of total beekeepers in Lebanon. This number increased due to the intensive hive distribution and training program which incorporated a large number of new beekeepers into the value chain.

MEDIUM BEEKEEPERS: Number of Medium-sized beekeepers who have between 50 to 75 beehives, have also increased by hives. At this level, beekeepers are mostly operating as microenterprises with an objective of profit maximization while using mainly unpaid family labor. Around 50% of beekeepers at this level collect two harvests per year. This is achieved by moving beehives between the intermediate mountain zones and the

coastal areas to take advantage of the differing harvest periods. With two harvests, a beekeeper with 50 hives can produce 900 Kg of honey per year for \$18,000 in revenue with a required fixed investment of \$10,986. At these volumes, it can be difficult for medium beekeepers to sell all of their honey solely through personal networks. They therefore need to find other sales outlets including cooperatively marketed honey and commercial buyers of honey. **MOA figures list 1,350 medium beekeepers in Lebanon.**

6,150 Small and Medium beekeepers contributes 24% of the total honey production in Lebanon, prices in the market ranging from 25\$ to 35\$ per kg, which represents around 29% of the Sector value.

- LIVCD through training and cost sharing hives with 4030 out of the 6,150 representing 65% of the Small and Medium beekeepers, impacted 16% of the total volume and 18% of the value of the sector.

LARGE BEEKEEPERS WITHOUT BRANDS: Beekeepers at this level own more than 75 hives. All large beekeepers will practice hive migration to yield at least two harvests per year and a majority of large beekeepers will migrate hives between all three production zones (High Mountain, Intermediate Mountain and coastal areas) to get three harvests per year. There are about 13 beekeepers in Lebanon with over 800 hives, only one beekeeper with more than 2000 hives in Lebanon (Afif Abi Chedid) and only two large beekeepers have more than 800 hives and have their own brands. (These are described below in the paragraphs on branded honey actors). In general, a large beekeeper with 100 hives practicing annual hive migrations with three harvests can earn 36,000 USD in annual revenue from 2,000 kg of honey. Large beekeepers need to have specific sales strategies to sell their production. In addition to using their personal contact networks as all beekeepers do, they follow three broad types of sales strategies:

- Personal relationships through family or contacts in foreign markets. Exports of this type go mainly to Lebanese diaspora communities in Africa and to Egypt and the Persian Gulf countries where much of this production is repackaged and possibly mixed for sale under another label.
- Domestic market through other beekeeper collectors who are essentially intermediaries for one of the commercial branded honey producers (see lead beekeeper section on aggregation below).
- Through the cooperative

Among the large beekeepers' segment, thirteen beekeepers own more than 800 beehives each and represent 7% of the volume and 5 % of the total value of the sector. The majority are located in North Lebanon. The largest beekeepers are: Afif Abi Chedid, Tony Kaddoum, Alfred Ziadeh, Nicholas Abou Mrad, Souheil Kadamani, Ahmed Yehia, Hussein Awada, Zakaria Dib, Ahmed Ismail, Ahmed Awada, and Abdel Ahad Yehia

There are around 1,350 large beekeepers in Lebanon, representing 76% of the volume, and 71% of the sector's value.

- LIVCD worked with 131 large beekeepers, 10% of the total number, impacting 7%-8% of the total national volume and value.

In summary LIVCD's intervention and impact on the honey sector is estimated to be 24% of the total value of the sector. Considering the sector value of 70 Million USD, LIVCD's impact would be 16.8 Million USD.

LARGE BEEKEEPERS WITH BRANDS AND INTEGRATED RETAIL SALES OUTLETS: This category of large beekeepers has invested in maintaining their own specialized retail outlets in Beirut and other urban centers, reaching consumers in urban areas in addition to using fairs and exhibitions stalls that are manned by the beekeepers' direct employees or family. The main players in this category of actor have around 300 -700 beehives each and include L'Atelier du Miel, Habib Honey, Miel du Levant, and others. LIVCD has worked with main players in this category including L'atelier du Miel.

LARGE BRANDED BEEKEEPERS/EXPORTERS: As shown in Figure16 there are two main players in this category of actors: Jabal el Sheikh Honey and Kaddoum Honey where LIVCD has co-invested with both.

The project invested with Jabal el Sheikh Honey on establishing sustainable market access to beekeepers through joint product promotions in export markets. In addition, LIVCD partnered with Kaddoum honey on rebranding their brand image to upgrade and develop new packaging, labels, online and social media presence, and in store marketing to be able to compete with the imported brands and to reach a wider range of customers.

LEAD BEEKEEPERS play an important role particularly in Jabal el Sheikh's procurement system. The LIVCD team identified five lead beekeepers in the Minieh- Donnieh region in Northern Lebanon who buy tins of honey from other medium and large beekeepers and sell mainly to Jabal el Sheikh, as well as to other small brands. Lead beekeepers buy honey from other beekeepers in 25 gallon containers and store not more than one month before sending product to Jabal el Sheikh. The Minnieh- Donnieh region has high production of honey, but because of its remote location it lacks access to markets. Thus, lead beekeepers are able to pay a considerably lower price for honey 9 USD for orange blossom honey compared to 20 USD when sold directly to consumers. This dynamic optimizes costs for commercial buyers by grouping honey shipments before transport. The relationship between lead beekeepers and their medium and large farmer's clients seems very strong as they report that 95% of their sales volume goes through these mechanisms.

These relations are governed by written contracts with set terms of volume, price and payment conditions. The lead beekeepers commonly take a mark-up of \$1 to \$2 per Kg for handling other producers' honey. Before buying, they send samples of honey to the Chamber of Commerce laboratory facility in Tripoli for testing.¹ Over 100 tons of honey per year transit through this aggregation method.

COOPERATIVE HONEY BRANDS: A number of donor projects have driven the formation of marketing cooperatives, which need to be differentiated from the beekeeper

¹ This testing is a condition required by Jabal el Sheikh in order to be sure of meeting export market specification on all the parameters requested by the US market.

cooperatives promoted by the Ministry of Agriculture that limit their interventions to facilitating input supply and beekeeper extension. The NGO supported cooperatives include B Baladi (supported by WRF/USAID), Intajouna (supported by Caritas) and Batrounyat (supported by the Italian Government). Jezzine Cooperative follows a standard cooperative model in which members contribute honey to a common marketing unit staffed by cooperative employees whose costs are paid for by the margin between an initially established beekeeper price and the eventual sales price after deduction of all marketing and processing costs. Any leftover earnings after all costs are paid are then available for rebates to members. Caritas and Batrounyat follow the same model but source their honey from beekeepers whose membership is not mandatory. To date, such marketing cooperatives have failed to capture anything but a residual share of the retail market (3 to 5 MT). This seems mainly due to their member's preference to market honey directly to consumers due to higher prices in the direct to household sales channel (up to 30 to 35 USD per Kg compared to 20 USD per Kg obtained by such cooperatives as B Baladi). New entries in 2016 include Maten el Aala honey which was supported by LIVCD, and has entered supermarkets for the first time with a brand in 2015. There are also smaller brands that belong to cooperatives that sell in the local market such as Jabal Moussa, where LIVCD partnered with Jabal Moussa to increase their production and access to market.

SMALL BRANDS: These are small brands that source honey from beekeepers, and have made a concerted effort to establish their own brand name. These actors developed brand equity as "Natural" products, and have an assortment of products. Small brands such as J Grove, Adonis Valley, Miel du Levant, etc are increasingly attracting a wider share of consumers due to their young, natural and organic approach which aligns with this new trend. Small brands lack the volumes required by major distributors and generally work through smaller distributors with retailer clients, but are continuously looking for large beekeepers to supply them with honey. LIVCD has worked with main players in this category including J. Grove, Adonis Valley, and l'Atelier du Miel.

Wholesaling/Distribution/Importing

As for aggregation, the wholesale trade segment of the honey value chain is relatively small. It is limited mainly to the branded segment of the domestic market. Key actors include:

Distributors/Importers:

These actors comprise two broader types. The largest distributors (Transmed, Fattal, Obagi, and Massoud) have well developed networks of retail clients to whom they supply large varieties of domestic and imported products. These larger distributors have significant leverage with major supermarkets and retail chains. They also act as importers of honey with Bocti importing the Lagnese brand (German) and Fattal importing the al-Shifa brand (repackaged in Saudi Arabia) which are the largest brand volume sellers in the market before the main local brands (Kaddoum and Jabal el Sheikh which are distributed by Massoud and Transmed). Large distributors which are

able to place product on retail shelves all throughout Lebanon require minimum product values of 1 Million USD per year, and are thus only accessible by the largest Lebanese producers such as Kaddoum and Jabal el Sheikh. Below this category, there are smaller distributors with more limited client networks. All the Lebanese producers of branded honey (with the exception of the three large producers who have their own retailed outlets) are required to sell through distributors if they want to access large numbers of retailers. AL Wadi el Akhdar, a Lebanese brand with Germany honey, has entered the market and is competing at a competitive level.

Wholesalers:

Wholesalers of honey are second level players who maintain exclusive agreements with individual distributors to store and deliver product to retail outlets in zones that distributors cannot reach directly from their own warehouses. They procure honey only through distributors and cannot be accessed directly by honey producers. Pharmacies are served by a separate category of pharmaceutical product wholesalers.

RETAILING

As shown in the value chain map, retail outlets selling branded honey from imports and domestic production include a variety of retail outlets. These are: small medium neighborhood groceries, pharmacies (who sell honey as a “health” product), and group of larger clients consisting of hotels, restaurants and caterers (HoReCa), supermarkets and the largest category of grocery stores .

LIVCD facilitated market linkages between beekeepers with over 25 hives and commercial honey brands that can absorb surplus honey production that is not sold directly to households. LIVCD also linked with brands that are well established in local markets, but do not have any honey products in their product portfolios to add new honey products. As these commercial brands grow increasingly sophisticated and profitable, beekeepers will see higher demand and opportunities for diversification. In addition, joint product promotion in local and export market was supported to increase market share of Lebanese honey in supermarkets, due to high cost of marketing.

Business Development Service Providers

The honey value chain includes a number of key service providers as follows.

BEEKEEPING EQUIPMENT AND HIVE SELLERS:

There are numerous stores in different regions of Lebanon that stock the most common equipment required by beekeepers. **Figure 19**

INPUT SUPPLIERS
<input type="checkbox"/> Api Shop Jawad - Ghaziyeh, Saida
<input type="checkbox"/> Ellek- Nabatiyeh
<input type="checkbox"/> Abi Sleyman – Jbeil
<input type="checkbox"/> Eefel – Naeemeh, Chouf
<input type="checkbox"/> Tarhineh – Toul, Nabatiyeh
<input type="checkbox"/> Mamlaket Al-Nahel – Baakleen
<input type="checkbox"/> Al Hayek – Ghaziyeh, Saida
<input type="checkbox"/> Milor – Mansouriyeh, Maten
<input type="checkbox"/> Mamlaket Al-Nahel – Kfar Akka, Kourah
<input type="checkbox"/> Societe Saade
<input type="checkbox"/> Hussein Awada - North
<input type="checkbox"/> Yehia Hamad- North
<input type="checkbox"/> Liban Sol
<input type="checkbox"/> Nehme est. Batroun
<input type="checkbox"/> HOSCO Agri- OKAYBE
<input type="checkbox"/> GOLDEN QUEEN CENTER- HOSRAYEL

FIGURE 18-KEY SERVICE PROVIDERS-INPUT SUPPLIERS

This includes suits, hives, feeders, stainless steel storage tanks, extractors and beeswax. Since the failure of the only two Lebanese bee selection centers (Safadi foundation in the Akkar and the Chakara center) there were no certified sources for queen bees from domestic selection centers. Most farmers, therefore either source queen bees from their neighbors or use imported queens mainly from Argentina or Egypt. For this reason, LIVCD has worked with two entities on producing high quality queen bees and has introduced the first Artificial Insemination of Queen bees in the Middle East. The latter is being tested and has begun its work in mid-2016 and has sold 14 artificially inseminated queen bees. The other input whose local supply is somewhat problematic are antibiotics and Varoa pesticide treatments. Training on proper management of bee hive

diseases, made the beekeepers more aware on the proper usage of treatments when needed.

Low quality beeswax, which contained paraffin and is harmful to both bees, and humans was also a major problem for the value chain. As a result of the above, LIVCD has co-invested with HOSCO Agri to set up the most advanced wax production unit in Lebanon. To reduce transportation cost, and based on the demand of beekeepers in rural areas, equipment was co-invested to facilitate the job of the beekeeper. Equipment such as extractors, wax melter and sterilizers, foundation molds, candy making machine, queen breeding equipment, storage tanks, labeling machines, bench uncapping machines and much more were co-invested with cooperatives and companies. Equipment was purchased from local suppliers who have either sourced them from local manufacturers or imported them from abroad.

New input suppliers in beekeeping equipment have entered the market due to the increase in demand of such equipment during the past two years.

Honey testing laboratories:

In 2011, there were three labs to test honey in Lebanon: IRI, LARI and at the Chamber of Commerce of Tripoli (QCC). Currently, there are six main laboratories testing honey namely IRI, LARI, CCIAT, Multilab, ATL, and Kfarshima. To complement the missing gap, ESAM was supported by LIVCD to invest in a FT-NIR spectrophotometer which tests in a very short period of time the botanical origin of honey, and all the other variables from sugar adulterations to acidity. By the end of 2017, the machine will be fully calibrated with local honey samples to provide exact results. There is a need to focus on laboratories as LIBNOR has issued the new honey regulation that protects the Lebanese honey against low quality imported honey. This new regulation issued in March 2016 has regulated the influx of low quality honey preserving the rights of

Lebanese beekeepers. Fortunately, LARI a governmental entity officially introduced beekeeping as one of its activities in March 2017. It has lab facilities which test honey to be exported, however, they are not all certified. In the recommendations section, certification of these labs is an important factor to consider for further development of the sector.

Beekeeping cooperatives:

Over the last several years, the Ministry of Agriculture has encouraged the formation of farmer cooperatives to help with honey production issues. Cooperatives have been formed mainly to help organize input supply and provide local level farmer based extension services. There are 62 honey cooperatives in Lebanon, distributed throughout Mount Lebanon (17), Bekaa (9), North Lebanon (20), and South and Nabatieh (16). The active cooperatives have membership numbers that vary between 100 and 300. Most of these cooperatives offer fee-based honey extraction services with centrifuges and, in theory more so than practice, cooperative marketing services for their members' honey. However, volumes of cooperatively marketed honey are quite small and are mainly the fruit of the three cooperatives mentioned above under "cooperative honey brands." Thus the main function of beekeeping cooperatives in Lebanon is not as marketers or sellers of honey, but the provision of production and related services to their member beekeepers. Common services provided include: input ordering, honey extraction, bottling, honey humidity reduction, wax recycling, distributing anti-Varoa treatments from the MoA, and extension. Few cooperatives are financially sustainable, and membership fees often do not cover the cost of operations, which include rent, machinery maintenance, and other expenses.

Note that majority of the large beekeepers are members of cooperatives.

During the four year duration of the project LIVCD has directly worked with 32 cooperatives, to support the Honey VC. The main intervention with cooperatives was focused on increasing the productivity of beekeepers given the increasing demand of Lebanese consumers and export market on honey. This was done through provision of equipment that aimed at improving productivity, decreasing costs, and accelerating production. Out of the 32 cooperatives worked with, many were professional in their course of work and benefited the beekeepers around them. An example of a leading cooperative is Maten el Aala cooperative that collaborated positively with their members to become a successful model of beekeeping cooperative. They have trained more than 20 colleges and schools on beekeeping, were also a leader in the honey training program as they took initiatives to train independent of LIVCD's support. The provided equipment are being used by beekeepers under the technical supervision from the Coop.

Figure 15 provides information on a few representative cooperatives from different production regions. The chart includes all the different cooperatives LIVCD has worked with. All these cooperatives could be reference locations for beekeepers in their regions.

Value Chain Channels and Governance

The honey value chain comprises five specific sub-segments that are indicated in the Value Chain Map. The main characteristics of each are presented below.

Channel 1: Direct Household Sales

In this channel, honey producers sell directly to households. This is by far the largest value chain segment in terms of overall volume (estimated at around 67% of total domestic market sales). In this way, consumers ensure quality of honey purchased. The vast majority of flows in this segment are from individual producers to consumers, most of which are small, medium and large farmers. But even commercial honey producers will sell small volumes direct to consumers who visit their processing units (although these volumes are insignificant in terms of total sales). Purchase decisions are governed mainly by personal relationships and contacts between the buyer and seller and the perceived “authenticity” of farm-produced product. Most sales are un-branded except for the small volumes from commercial producers. Prices in this segment are very high: at 25 to 30 USD per kg, reflecting the fact that this is essentially a “direct to retail” segment. Given the importance of personal relationship in this segment, each farmer has a sales capacity that is basically limited by the absorptive capacity of his relationship network. Most farmers are able to sell around the output from around 20 beehives through such personal networks. When their productive capacity increases to above 20 beehives, farmers need alternative sales outlets besides selling into Channel 1. This channel has limited potential for value added interventions outside of basic production, due to the high prices already being received by farmers. Simply put, other than increasing production and encouraging new entry from small farmers, it is difficult to improve sales conditions or terms in this channel since they are already extremely attractive. Thus, the main focus of LIVCD was to work with and support branded honey companies to increase their sales.

Channel 2: Sales of Branded Honey Through Retail Stores

Approximately 33% of total domestic market sales are through this channel. This market channel is dominated by the commercial sellers of branded honey, but includes many other key actors including distributors and retailers. Prices to the consumer are roughly equivalent to Channel 1, but are much lower at the lower levels of value chain, reflecting the number of actors involved. This highlights a key difference with Channel 1: farm-level prices are much lower for producers who sell into this channel as opposed to Channel 1. Thus, in practice producers (small, medium and large beekeepers) will usually sell the output from their first 20 hives into Channel 1 and output from any subsequent hives to the Cooperative and Commercial buyers that dominate Channel 2. This simple fact explains the low level of Cooperative sales in Channel 2, since cooperatives have tended to focus mainly on small farmers who have superior market alternatives available to them by simply selling on their own into Channel 1. Thus honey going into Channel 2 flows mainly from medium and large producers and from commercial processors own in-house beehives who have “excess production” that

cannot be sold through personal networks. Transactions at the bottom of the value chain map in Channel 2 tend thus to be at lower prices (10 to 13 USD per kg) and higher volumes than in Channel 1.

Governance systems in Channel 2 have become more visible and established since 2011. Two commercial honey producers, Jabal el Cheikh, and Kaddoum are leading the commercial honey production. Other smaller brands aim to strengthen their presence in the market through joint product promotions and social media presence. The role of retail distributors is quite important in this channel, since they control access to retail outlets for branded honey sellers. The imposition of annual minimum turnover thresholds of One million USD is quite important in this regard, since specialized sellers of branded honey who are under this threshold face difficulties gaining access to large numbers of retailers that they need to get an important market share. This channel presents numerous opportunities for intervention to increase volumes of production and improve quality and standards and cooperation among commercial processors to help them develop product strategies and distribution plans.

CHANNEL 3: INTEGRATED PRODUCER-RETAIL SALES

This is a quite small channel with sales amounting to 3% of total domestic market honey sales. This main actor in this Channel is Atelier du Miel, Habib Honey and Miel du Levant although other commercial honey processors have plans to expand into their own retail outlets. The business model in this chain reflects the desire of commercial branded honey producers to develop their own retail outlets, without having to go through distributors. In this way they can internalize the chain from production to retail without having to engage in market transactions. Actors in this channel are good potential candidates for collaborating on interventions to raise quality and increase production, but they would have to adopt their supply strategy to include outsourcing of honey from medium and large farmers as a precondition.

CHANNEL 4: EXPORT SALES OF BRANDED HONEY

This channel is largely an extension of channel 2 with an export sales branch. Supply comes mainly from the two largest branded honey producers—Jabal el Cheikh and Kaddoum. Their contribution to export has caused the overall export indicator to increase by 103% compared to 2011 figures. Each of these actors has developed a network of importers mainly through personal marketing efforts to export markets in the GCC and Africa where they have contacts in the Lebanese diaspora, in addition to the marketing support provided by LIVCD for Jabal el Sheikh and Kaddoum honey. This Channel has significant expansion potential due to the general lack of experience of Lebanese honey exporters, and the potential appeal of a product in both ethnic and specialty markets.

CHANNEL 5: EXPORT SALES OF UNBRANDED HONEY

A small amount of export sales to regional markets consists of unbranded honey sent directly by larger farmers to personal contacts in the Arab Gulf. This Channel is essentially an extension of Channel 1. In the past, exports in this channel were largely supplied informally by travelers carrying tins of honey on buses. Recently security

concerns about transport through Syria have resulted in more formal shipments, often to GCC importers who may repackage honey using their own brands. As with Channel 1, this relatively informal channel has little upgrading potential—both because of the generally high prices and because of the importance of personal connections in providing an overall governance structure.

Business Enabling Environment

Historically, honey production has not been a major focus of Lebanon's agricultural policy. In contrast, various donor and NGO projects have proliferated in the beekeeping sector. This is changing now, partly in response to the high visibility problems that were related to the contaminated exports to the EU that resulted in a three-year ban on animal product exports from Lebanon. It is also changing as a result of the growing recognition of the potential of honey production as a supplementary and important source of income to poorer rural households. Most importantly it is changing, as the concentrated amount of effort and leveraged investment in this sector has drastically shifted the value chain to a higher level attracting investors, and new comers into the sector.

Product Traceability and Health Regulations

In March 2016, LIBNOR, Lebanese Standards Institution issued the new regulation which imposed a threshold for honey quality, in addition to the requirement for all honey in Lebanon to have product traceability to the farm/beekeeper level. This is in large part due to an effort to register cooperatives that accompanied the MOA's campaign to fight diseases with the Ministry's provision of medicine, and the combined interest of Lebanese beekeepers to fight the import of low quality honey that is ruining the reputation of Lebanese honey, and that is unfairly competing with the commercial honey on shelves. Beekeepers and cooperatives had to be registered in order to receive support, so that now cooperative and beekeeper registration is nearly 100%. Additionally, because the Lebanese honey market is structured such that large volumes of honey flow directly from the farmer to the consumer, traceability for the majority of honey is very straightforward. As consumers pay a premium for honey bought directly from the farmer or cooperative farmers are incentivized to put simple labels on their honey that include their names, region, and type of honey. Still, compliance with the measure is largely voluntary, since no effective control mechanism has been put into place. On another note, the national honey awareness campaign also signed agreements with the honey brands to ensure quality of honey marketed.

Prior to 2013, honey sold in Lebanon was solely required to meet LIBNOR norms—which regulated purity and freshness through eight different simple chemical tests.

LIBNOR honey standards have been challenged since they apply a lower threshold for the allowable limit on hydroxymethylfurfural (HMF) than is permitted in the FAO's Codex Alimentarius, which sets commonly accepted international standards. As of 2016, a revised honey standard was made official by LIBNOR after all beekeepers have signed

on the standards and agreed on all parameters. The new regulations with lower HMF and moisture levels are mentioned in LIBNOR standards. Relevant pesticides and antibiotics decree is mentioned in ANNEX 1.

Parameters of Honey Quality	Modifications made in 2016
<p>HMF Regulations(The higher the HMF value, the lower the quality of the honey is considered to be. Consumer protection is obligatory; the presence of potentially toxic compounds in food has been attracting more attention (Spano et al., 2009). While HMF might be metabolized by humans to potentially carcinogenic compound (Capuano and Fogliano, 2011), the concentration in natural honey is found to be several magnitudes lower than many thermally processed foods. Food industry has taken the levels of HMF in honey as a quality measure. Elevated concentrations of HMF in honey (HMF is almost absent in fresh extracted honey) provide an indication of overheating, stored in poor conditions, higher age of the honey or possible adulteration with sugars and syrup.)</p>	<p>Recommendation was made for LIBNOR in 2012 mainly by importing company to increase HMF to 40 mg/kg – 80mg/kg to meet codex standards, LIVCD invested in studies and lab tests and in collaboration with private sectors, HMF levels were kept to 20 mg/kg – 40mg/kg in the new regulation.</p>
<p>Humidity Regulations</p>	<p>In addition imported honey were fighting to get humidity levels increased to 20 to meet codex, while in the new regulation it was kept it to max 19 in favor of Lebanese honey</p>
<p>Sucrose Regulations</p>	<p>Level of Sucrose in the old regulation included higher levels up to 15g/100g that will only benefit imported honey, while in the new regulation it was made to 5g/100g, and it deleted all the varieties from other countries origin , this was made in favor of Lebanese Honey.</p>
<p>Regulations of Antibiotics in Honey (Generally antibiotics are widely used in Food Animals as growth promoters, to prevent or to treat infections. However in apiculture they are used essentially for treatment of bacterial diseases. Residues of antibiotics originate mostly from the environment and improper beekeeping practices.) Oxytetracycline is commonly used to treat European foulbrood disease and American foulbrood diseases caused by Paenibacillus (Bacillus) larvae and Streptococcus pluton bacteria, respectively.</p>	<p>The level of maximum residue levels (MRL) of three antibiotics (Oxytetracyclines, tetracyclines, and streptomycin) was increased from 5µg/kg to 50 µg/kg. Ministry of Agriculture have been distributing Tetracyclines for years and Lebanese beekeepers were using it and this is why we can find traces of tetracycline in the Lebanese Honey only, while Imported honey contains higher levels of Sulfamides, Sulfamides levels were kept to 0.5 µg/kg</p>
<p>Regulations of pesticides residues in honey</p>	<p>Pesticides are worldwide used in control of bee diseases and pests and in most instant their administration is uncontrolled and applied without approved protocols. In the new decree Amitraz levels were kept to 200 µg/kg.</p>

Export Market Quality Requirements

Testing is required of all export shipments of honey. This is done by the three main laboratories with capacities for honey testing (LARI, IRI, and the QCC Laboratory in Tripoli). Exports to the region and to the US follow each country's limits on pesticide residues—which they are able to comply with by contracting one or the other of the various Lebanese laboratories. ESIAM's new FT-NIR machine will begin testing officially for botanical origin, and honey adulteration in end of 2017.

Extension Services and NGO Support Programs

Extension services to the honey value chain have come overwhelmingly from the donor and NGO community, and have focused on technical aspects of production. Since 2000, there have been over 17 different programs providing support to the honey value chain—mainly to groups of beekeepers in cooperatives. Geographic focus of these programs has been skewed to the South, as 11 of these programs have focused on the South, 4 have had national coverage, and only 2 have focused on servicing the North. The UNDP and the allocated fund by the European Commission Humanitarian Aid Department (ECHO) launched after the war in 2006 an initiative called “Restoration and Preservation of Lives and Livelihoods” with the objective to fund interventions, among which beekeeping and honey production, and support in restoring and preserving livelihoods in Lebanon. The objective of the beekeeping activity was to support the production a high quality of honey by using new techniques such as humidity control of the extracted honey and refined pre-filtering line which will reduce the production fees.

Previous work:

- **2006:** The beekeeping project provided support to around 1,200 beekeepers from different villages in the South enrolled at the cooperative, by providing access to a modernized center for honey extraction and pre-filtering and processing, then packaging and labeling the final product. The project supported the cooperative through provision of a whole production liner of equipment used for honey extraction, honey dryer and pressure filtering, pre-filtering, honey filtering and processing, honey filling, honey packaging and labeling. With around 50,000 beehives in both South Lebanon and Nabatieh Governorates, the average output of each bee hive is from 10 - 15kg per year, with a yearly net profit of 4,166USD.
- **2009-2010:** Through the “Sharing and exchanging information about key aspects of beekeeping”, the UNDP-ART GOLD Lebanon Supported in 2009-2010 Lebanon's Beekeepers, for which more than 3000 beekeepers of North Lebanon, South Lebanon and the Bekaa region are benefiting from an initiative spearheaded by UNDP-ART GOLD Lebanon in support of the honey value chain in Lebanon.
- **2011:** Food and Agriculture Organization of the United Nations (FAO) in 2011 supported a honey production project in the Kesserwan district. The project includes building honey production centers in the villages of Baskinta and Ain el-Abou through providing honey extraction equipment and few hives to

cooperatives. It is also intended to support agricultural coops in the region through providing local beekeepers with a range of beekeeping equipment. The project aimed to contribute to raising local incomes and improving food security

Current Work:

Lately UNDP had minor activities such as Training and distributing some tools and reached Palestinian people in Tyr.

AVSI Foundation, an international NGO, is present in Lebanon since 1996, and has implemented more than 50 projects divided between agriculture and water, educational, humanitarian and emergencies.

- **2016:** AVSI has distributed in 2016 two beehives to all agriculture schools in Lebanon and has collaborated with experts in beekeeping to provide trainings in these schools. In addition to training to the youth local community through a 6 days courses.

- **2016:** In 2016, the Capacity-building project, implemented by UNIFIL's Civil Affairs Office in collaboration with the Bint Jbeil Union of Municipalities targeted 200 beekeepers in the districts of Bint Jbeil and Marjayoun. In order to support the local community, UNIFIL also donated apiary equipment to the At Tiri Agriculture Services Centre, which implemented this project on the ground, for training and developing the beekeeping field. The project started in April and completed in October 2016. (For more details check this link <https://unifil.unmissions.org/hive-activity-unifil-beekeeping-workshop>)

Ministry of Agriculture (MOA): The beekeeping unit at the ministry of agriculture is very active, holding workshops, training, keeping records and data related to the beekeeping sector, managing the distribution of the Varoa disease treatment, in addition to developing and implementing a strategic plan for pest management.

- **2016:** In 2016, The Arab Organization for Agricultural Development (AOAD) distributed 350 beehives to 70 women, each receiving 5 beehives, wax blocks, containers, and beekeeping suits,. However, no training was provided along with the hives distribution.

Dynamic Trends

The recent increase in the value of honey, increased activity from commercial honey stakeholders in Lebanon, and greater government support has generated two dynamic trends.

INCREASING SALES OF BRANDED HONEY FOR THE DOMESTIC MARKET

Before 2006, the only honey available in mainstream Lebanese retail outlets was imported- predominantly from Saudi Arabia and the EU. Since 2006 however, when domestic commercial producers first accessed retail markets, these channels (channels two and three in the VC Map) have expanded dramatically to capture 23 % of the domestic

honey market. As of 2008, large brands such as Jabal Sheikh and Kaddoum had penetrated the major distribution networks, and are now established in mainstream retail circuits. This last fact is highly important, it means that there is a certain volume threshold that is needed for honey producers to “crack” the domestic market and integrate themselves as a product that major distributors want to carry.

In 2016, these large honey producers continue to increase their market shares as a result of joint product promotions, rebranding, and investment in social media. The increased focus on honey has invited smaller brands to open sales outlets to identify themselves as niche and natural products. This has attracted consumers who identify with preferences for high quality honey.

Long term trends for expansion in the supermarket segment coupled with the new domestic market regulations on pesticide residues both argue for continued expansion of this segment of the Lebanese honey market. Given the weaknesses in cooperatives, it is likely that this segment will continue to be driven by private commercial brands. Future trends may also include new product development building on the fact that a few types of honey are associated with medicinal properties and can be found in pharmacies. Expansion of product offerings to include flavored honeys such honey with walnuts and fruit flavored honey also reflect increasing competition and diversification in domestic markets.

EXPANSION OF SALES IN GULF MARKET

Entering Carrefour was a critical point to the Lebanese honey value chain in Lebanon. LIVCD supported Jabal el Sheikh Honey to enter this chain in UAE, in December 2013, due to a stiff competition with lower cost honey brands such as al Shifa and Lagnese. Additional marketing activities were required to boost sales in the UAE, and to ensure more exposure and visibility of the Lebanese honey on Carrefour shelves, without this extra marketing support the Jabal Sheikh honey brand risk to be delisted and will be out of Carrefour. As a result, a contract was signed during the trade show between Jabal Sheikh and his importer. The success model in UAE, motivated the company to replicate the success and to invest in marketing plans in new markets such as KSA.

Other competing Lebanese brands are also increasing their connections with the Gulf market and will seal agreements in the year 2017 as new markets opportunities have been raised.

Value Chain Opportunities- Next STEPS

OPPORTUNITY #1: CAPITALIZE ON LINKAGES BETWEEN MEDIUM AND LARGE PRODUCERS TO SUSTAIN AND EXPAND PRODUCTION.

Once producers reach the 25 hive threshold, they will need to be assisted with market linkages to buyers. This model with Jabal el Sheikh should be replicated with producers with smaller brands. These deals are made via agreements between beekeepers and the trader to access the high volume market channels either in the domestic branded segment or in the export market. As demand for honey is increasing, companies are

expanding in honey production and are further opening retail shops to market their honey such as l'Atelier du Miel. Extensive linkages between medium beekeepers and booming honey companies must be made to ensure sustainability of brands and jobs of beekeepers.

OPPORTUNITY #2: LIMIT THE ENTRY OF LOW QUALITY QUEEN BEES AND BEEHIVES

The entry of low quality queen bees and beehives to Lebanon has negatively impacted the situation of beekeeping in Lebanon and has caused a visible change in the performance of bees and their productivity. The import of queen bees without proper regulations has introduced new diseases that were previously irrelevant to the Lebanese ecosystem. Enforcing a rule to protect and regulate the entry of queen bees and beehives to Lebanon is a crucial step to protect the future biodiversity of beekeeping and the environment in Lebanon. Studies, and demo plots with LARI, universities and the private sector for a period of five years should be carried out to observe the differences between the local queen bees and the imported queen bees. The reports and conclusions will be shared with the MOA as a prerequisite to any regulation. Protecting the bee population from low quality imported bees (Egyptians) that are corrupting and decreasing the quantity and quality of the species in Lebanon through regulating and validating the quality of queen bees produced and imported through a collaboration between universities, laboratories, private sector and governmental bodies.

OPPORTUNITY # 3 PROFESSIONAL BEEKEEPING SCHOOLS- SUPPORT ESTABLISHED PROFESSIONAL SCHOOLS

Establishing and strengthening already developed beekeeping training service centers was a priority for LIVCD as it is continuity for the four year training program that has trained 3,500 beekeepers around Lebanon. As a result, a beekeeping manual was developed and printed in addition to tutorial DVDs that were filmed to serve as educational tools for beekeepers. Few cooperatives and companies proved their success in co-managing the honey training program. The established system of the honey training needs to be continued due to the need and high demand for professional and ongoing training programs. Consequently, investing with professional beekeeping schools in every governorate while providing all the material printed and created by LIVCD will be a breakthrough in the beekeeping value chain in Lebanon. HOSCO Agri, Maten el Aala Cooperative, Afir Beekeeping Schools, and LARI extension centers are the main identified players who will be leading this opportunity.

OPPORTUNITY #4 CERTIFY LABS THAT WORK WITH HONEY IN ADDITION TO ESIAM LAB

Export requires country specific information to deem successful. Every country has its own regulations when importing honey. Lebanese exporters suffer from a lack of accredited and certified labs that could test for honey and issue a full report on honey physiochemical and nutritional qualities. With ESIAM laboratory, beekeepers now have a quick and cheap method to test for the botanical origin of honey, in addition to the regular honey tests such as acidity, pH, sugars, HMF, moisture and etc. Additional

certification of existing laboratories is needed for export. For this reason, LARI labs should work with other donor projects on certifying labs to facilitate export for traders.

OPPORTUNITY #5 INCREASING PASTURE LAND THROUGH MAINTAINING CURRENT LANDS, AND CULTIVATION OF ARID AREAS

A major constraint to beekeeping in developed countries is lack of wild arid lands that support the ecosystem and biodiversity. Countries are working on replanting large areas with wildflowers to bring back the bees as they complement the environment. With a balance in the ecosystem, pollination increases, plant diversity increases, and beekeeping remains a healthy and productive practice. In Lebanon, due to the increase in deforestation, the municipalities and the governments should work on replanting pollinating trees rather than ornamental trees as this will support beekeeping in areas closer to cities. In addition, increasing pasture will increase yield of honey for beekeepers.

OPPORTUNITY # 6 RESEARCHING THE BEST TYPES OF PLANTS FOR CULTIVATION TO INCREASE HONEY PRODUCTION, AND POLLINATION AND SHARE WITH MUNICIPALITIES

Partnering with universities is essential to publish studies on most suitable plants for pollination in Lebanon. Past studies regarding pollinating plants, and wild flowers and trees are already documented. However, practical studies with results and publications regarding beekeeping and plants are missing and should be further developed to support the sector and change the direction of plantation.

OPPORTUNITY # 7 INCREASE LOCAL MARKET SHARE FOR LOCAL BRANDED HONEY VERSUS IMPORTED HONEY

Strengthening and implementation of the new honey regulation issued by LIBNOR at the import level is a step forward to limiting the entry of the low quality honey competing with the Lebanese honey. The entry of mixed honey marketed as “honey”, and selling at lower prices is displacing sales for the benefit of the imported and mixed honey. Through strict implementation of the regulations, Lebanese honey will gain market share, thus increasing sourcing of honey from local beekeepers.

Honey Value Chain Annexes

ANNEX 1: MINISTRY OF AGRICULTURE – HONEY DECREE

جمهورية اللبنانية
وزارة الزراعة
الغدير

مديرية الثروة الحيوانية
رقم: ١٠٠٠/١٠٠٠
تاريخه: ١٠٠٠/١٠٠٠
قرار رقم ١/١٠٠

متطلبات تداول بمنتهج العسل

إن وزير الزراعة،
بناء على المرسوم ١١٢١٧ تاريخ ٢٠١٤/٢/١٥ (تشكيل الحكومة)،
بناء على المرسوم الاشتراعي رقم ٣١ تاريخ ١٩٥٥/١/١٨ وتعديلاته (تحديد مهام وزارة الزراعة)،
بناء على المرسوم الاشتراعي رقم ٩٧ تاريخ ١٩٨٣/٩/١٦ وتعديلاته (دمج مؤسسات عامة بوزارة الزراعة وإعادة تنظيم الوزارة)،
بناء على المرسوم رقم ٥٢٤٦ تاريخ ١٩٩٤/٦/٢٠ وتعديلاته (تنظيم وزارة الزراعة)،
وحرصاً على حماية المزارع وتحقيقاً لمصلحة الاقتصاد الوطني وسلامة العلاقات التجارية الدولية،

يقرر ما يأتي :

المادة الأولى: يخضع جميع أنواع العسل المستورد أو المنتج محلياً للفحوصات المخبرية الخاصة بتحليل ترسبات المضادات الحيوية والمبيدات الواردة في الجدول رقم ١ المرفق بهذا القرار.

المادة الثانية: يخضع العسل المصدر لجميع الفحوصات المخبرية التي تتناسب مع المواصفات الإلزامية المفروضة في البلد المصدر اليه.

المادة الثالثة: يخضع العسل المصدر الى أوروبا لفحوصات مخبرية تتعلق بتحليل الترسبات الكيميائية المنصوص عليها في الجدول رقم ٢ المرفق بهذا القرار والتي تتناسب مع المواصفة الأوروبية الإلزامية.

تجرى التحاليل المخبرية المنصوص عليها في الجدول رقم ٢ في مختبرات معتمدة ومعترف بها رسمياً.

المادة الرابعة: يستثنى عسل النحل من ذكر تاريخ الصلاحية على البطاقة البيانية على أن يذكر تاريخ الانتاج بالشهر والسنة شرط أن لا يتعدى الخمس سنوات.

المادة الخامسة: تلغى جميع النصوص السابقة التي تتعارض مع هذا القرار.

المادة السادسة: ينشر هذا القرار ويبلغ من يلزم ويعمل به بعد ستة اشهر من تاريخ نشره في الجريدة الرسمية.

تبلغ نسخة الى:
رئاسة مجلس الوزراء
التفتيش المركزي
وزارة الاقتصاد والتجارة
المجلس الاعلى للجمارك
المديرية العامة للجمارك
مؤسسة المقاييس والمواصفات اللبنانية
اللجنة الوطنية لمتابعة مواضيع سلامة الغذاء
اللجنة العليا لقطاع النحل
اتحاد غرف التجارة والصناعة والزراعة في لبنان
نقابات وجمعيات مربي النحل
جمعية الصنا عين اللبنانيين
نقابة اصحاب الصناعات الغذائية
الجريدة الرسمية (للتفضل بالنشر)
المديريات المركزية - المصالح الاقليمية
المحفوظات

١٠/١٤

بيروت، في ١٠ - ٢ - ٢٠١٦

مديرية الثروة الحيوانية
وزارة الزراعة
شهاب شهاب

المدير على المصالح المركزية
مدير الثروة الحيوانية بالتكليف
د. الياس الجور
٢ شباط ٢٠١٦

- ١ -

ANNEX 2: SEASONALITY

FIGURE 19: HONEY TYPES IN LEBANON

Honey types	Region of production	Period of Harvesting	Characteristics
1 Citrus blossom Honey	Coastal area especially in Saida and Tyre region	April	<ul style="list-style-type: none"> - The production quantity is highly depending on the climate condition. - in the citrus orchards the beehives suffer from pesticides spraying - sometime this honey contain pesticides residues - Crystallize early (after 5 months)
2 Multiple-flowers honey	Central region, elevation from 400 till 850 m.	July - August	From different kind of plants and trees followers. The quality and the characteristics change from region to other.
3 Honeydew honey	Central region: at elevation from 400 till 850 m. especially in Pine and oak forests area	June	This honey has dark color and rich in minerals
4 Mountain Honey (Jerdi)	The high mountain in Lebanon at elevation 850 m and above	September	The demand for this honey is high for it is quality, and sold at higher price.

Annex 3 Beehives distribution

MOA	Caza	Total 2011	Total 2016
Bekaa	Zahle	4021	7055
	Baalbak	8325	19322
	West bekaa	4833	7500
	Hermel	4653	9160
	Rashaya	3219	6900
	Total Bekaa	25051	49937
	% Bekaa of Total	15%	14%
South	Sour	8446	25123
	Saida	6323	20330
	Jezzine	3283	7253
	Total South	18052	52706
	% South	11%	15%
North	Tripoli	790	1603
	Zgharta	1454	3401
	Koura	1860	3345

	Bchari	721	1800
	Batroun	2092	6347
	miny- Donnieh	34522	57445
	Aakar	14622	23735
	Total North	56061	97676
	% North of Total	33%	27%
Mount Lebanon	Keserwan	7262	14732
	Jbeil	15231	41242
	Metn	4536	11377
	Babda	3882	6851
	chouf	6966	23434
	alai	3813	8235
	Total M.L	41690	105871
% M.L of Total	25%	29%	
Nabatiye	Nabatiye	9475	18600
	Bent Jbeil	7387	11336
	Marjiyoun	5802	12987
	Hasbaya	4538	11066
	Total Nabatiye	27202	53989
	% Nabatiye of Total	16%	15%
Total Lebanon		168056	360179

Annex 4 Beekeepers distribution

MOA	Caza	Total 2011	Total 2016
Bekaa	Zahle	106	203
	Baalbak	358	745
	West bekaa	187	282
	Hermel	134	318
	Total Bekaa	785	1548
	% Bekaa	14%	15%
South	Sour	342	878
	Saida	251	564
	Jezzine	124	263
	Total South	717	1705
	% South	13%	17%
North	Tripoli	14	44

	Zgharta	43	45
	Koura	48	116
	Bchari	28	30
	Batroun	54	146
	Minye-Doniye	610	677
	Akkar	659	894
	Total North	1456	1952
	% North	26%	19%
Mount Lebanon	Keserwan	168	301
	Jbeil	296	700
	Metn	93	255
	Babda	158	262
	chouf	235	661
	alai	169	297
	Total M.L	1119	2476
	% M.L	20%	25%
Nabatiye	Nabatiye	450	770
	Bent Jbeil	369	481
	Marjiyoun	503	772
	Hasbaya	146	353
	Total Nabatiye	1468	2376
	% Nabatiye	26%	24%
Total Lebanon	5545	10057	