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MedBEESinessHubs

WP3: The bee waggle dance - collecting information for business clusters on the honeybee products

O3.1 Existing situation analysis (study reports) on the economic potential of honeybee handcrafting

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A3.1.2 Regional study on the economic value of networking around the honeybee products: Case of West Bank/Palestine

Objective of this document

This study comes within the framework of the work of the Palestinian Businesswomen Association - Asala, and in cooperation with a group of institutions within the framework of a project to be implemented during the years 2022/2023 under the title “Stimulating Mediterranean Cooperation in the Bee sector to Reach a Prosperous and Sustainable Economy in Marginalized Rural Areas” (MedBEESinessHub). The cross-border cooperation program in the Mediterranean, implemented mainly by the Cyprus Chamber of Commerce and Industry in partnership with “Villagrotiki Consulting” (Cyprus), the Federation of Egyptian-European Business Associations (Egypt), the Italian Arab Cooperative Chamber (Italy), the Chamber of Commerce, Industry and Agriculture of Zahle and Bekaa (Lebanon).

This study aims mainly to draw features about the beekeeping sector in the West Bank, taking into consideration the characteristics related to the beekeeping sector in West Bank and its relationship to biodiversity, the beekeepers’ -males and females- sector in terms of numbers and productivity of this sector; and the productive derivatives that can be focused on to develop it. The study also focuses on the risks threatening the beekeeping sector in the West Bank, with marketing opportunities for products, and methods to link the beekeeping sector with the tourism sector there. In addition, presenting the most prominent recommendations related to the beekeeping sector in West Bank at the production level considering the environmentally friendly biodiversity.

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Keywords

Bee: the economic social insect that beekeepers raise in order to collect products they collect from flowers "nectar and pollens", (Propolis), produce royal and wax, and pollinates flowers.

Colony: a group of bees of different ages, living together by one queen and residing in a separate hive.

Hive: the container specially prepared for housing the colony of bees independently

Swarm: a group of bee members, led by queen, leaves original hive as a natural way for bees to reproduce to preserve their species and search for a new hive.

Comb honey: natural honey contained in wax frames without any foreign material.

Extracted honey: honey that has been separated/extracted from wax frames.

Apiary: The place prepared for receiving, concentrating and collecting beehives; temporarily or permanently.

Queen: unique mature female bee in the colony, plays the role of control all other members activities through pheromones, laying eggs (mother of the colony).

Packed bees: a swarm of bees prepared for import or export within a travel box prepared for this with set specifications.

Wax: the liquid substance secreted by bees' workers from their abdominal glands, which hardens upon contact with air for use by bees to build frames.

Base wax plates: a specific sheet of pure beeswax designed according to the Palestinian specifications in this regard, engraved on both sides with the bases and the beginning of the hexagonal eyes' walls of the wax honeycomb that is fixed on frames and put in the bee colony to complete its expansion.

Bee tools: all tools and equipment that is required for beekeepers to work with bees (housing, protecting, detecting, examining, extracting, and preserving their products).

Beekeeper: a person who owns or works in beekeeping for economic reasons.

Epidemiological status: the colony's exposure to an epidemiological cause or a condition referred to in the International Animal Health Code.

Pest: Any parasitic or predatory living creature such as insects, ticks, birds, or reptiles that poses a threat to the life of the colony or one of its members.

Epidemic: Every living organism that causes economic damage to beehives.

International Animal Health Code: the constitution concerned with the safety and health of animals and their products, in accordance with the standards and recommendations issued by the World Organization for Animal Health in a manner that serves international trade.

Specialized Physician: The official physician assigned by the Ministry to implement this system.

Introduction

The beekeeping sector is one of the main agricultural productive sectors in West Bank, due to the large number of products that is produced by this sector. However, in many countries, it is still under development even though the sector is ancient in terms of productivity, and it still needs stages of governance, budget allocation and taking into account the importance of this sector on the production and environmental effects.

From a development perspective, the United Nations believes that the beekeeping sector intersects in many fields that lead to achieving the 2030 Sustainable Development Goals.[1] This is because beekeeping and the work of bees as pollinators, enhances biodiversity (Goal 15), as bees pollinate more than 170,000 species of plants, and, in turn, fights hunger (objective 2). In addition, the sector provides decent jobs (Goal 8) in agriculture and other sectors and works to promote eradicating poverty (Goal 1).[2]

Declining bee numbers around the world is considered a major threat to global food security, as they supply an important ecosystem service to ensure pollination and thus the reproduction of many cultivated and wild plants. This is critical to food production, human livelihoods, and biodiversity. Bees and other pollinators such as birds and flies affect 35% of the world's crop production, increasing the yield of 87 of the world's leading food crops, as well as many medicinal plants-derived medicines.[3] The latest FAO report on the State of the World's Biodiversity for Food and Agriculture stresses that many species associated with biodiversity, including bees, are under severe threat, and calls on governments and the international community to do more to address the underlying drivers of biodiversity loss.[4]

Data indicated that in the year 2020, there were about 94 million beehives recorded in the world, up from about 80 million beehives in 2010, and the global production of honey reached its peak in 2017 at about 1.88 million metric tons, then has decreased to about 1.77 million metric tons, and the global honey market was valued at just over eight billion US dollars in 2020.[5]

India is the country with the largest number of beehives. Containing about 12.2 million hives, followed by China and Turkey. By comparison, the United States only has about 2.7 million beehives. Despite the huge number of beehives in India, China has overtaken India in terms of production volume, producing around 458,000 metric tons of honey in the same year (2020). Turkey, the next major producer, produced only about a quarter of that volume.[6]

[1]- United nations foundation. “SUSTAINABLE DEVELOPMENT GOALS”. Check the following link: https://bit.ly/3wCr92v
[2]- UNDP. “Buzzing with life”. Check the following link: https://bees.undp.org/
[3]- FAO. “Declining bee populations pose threat to global food security and nutrition”, 20 May 2019. Check the following link: https://bit.ly/3a5bjVi
[4]- Ibid
[5]- Statista website. “Honey market worldwide and in the U.S. - statistics & facts”. Published by M. Shahbandeh, Apr 20, 2022. Check the following link: https://bit.ly/3Nt6R1c
[6]- Ibid

Although China is the leading producer, New Zealand also has the highest natural honey export value of around US$330 million, consisting of 14.4% of the total export value.[7] The United States is the largest importer of honey globally, purchasing about $441 million of honey from other countries in 2020.[8]

In the Palestinian context, the beekeeping sector in the West Bank and Gaza Strip is a new and promising sector. Despite its old existence, it was not within the framework of a clearly defined sector. Previously, the main products were honey and bees. Later, beekeepers started exploring other products that they can benefit from, so they started working on artificial swarming, multiplying bees under certain conditions. In addition, talking about achieving sustainable development goals at the Palestinian level is exceedingly difficult under occupation, in terms of demolishing and controlling resources, and in terms of the Palestinian Authority's inability to manage the basic issues related to achieving the sustainable development goals that it adopts in its national plans, which we will explain in this study. However, this does not mean that there will be no focus on the beekeeping sector and an increase in investment in it due to its importance, and in view of the near future, in which the current political situation may change.

Methodology

Palestinian Businesswomen Association - Asala implemented this study through its researchers, relying on the descriptive explanatory approach, where the researchers describe the reality of the beekeeping sector in West Bank and its encouraging environment, by collecting data using the qualitative methods adopted by the researchers from field interviews and a literature review about Beekeeping and its derivatives in West Bank. Eight in-depth individual interviews were conducted, including with representatives of responsibility centers from: Ministry of Agriculture, Ministry of Tourism, Environmental Quality Authority, and Palestinian Standards Institution "PSI". In-depth individual interviews were also conducted with representatives of the beekeeping sector actors such as the Palestinian Bee Council and beekeepers' cooperatives as follows: Jenin Beekeepers' cooperative, Jericho and Jordan Valley cooperative, Battir cooperative, Dair El -Sudan Women's Association, and the Ramallah Cooperative for Beekeeping.

The researchers also collected data at individual farmer level through a developed questionnaire, which has been distributed randomly through departments of agriculture at districts levels. 114 questionnaires were filled randomly in 11 districts.

The researchers reviewed secondary sources in the study, which are the data of the Ministry of Agriculture, Ministry of Tourism, and Palestinian Central Bureau of Statistics, in addition to the general budgets for the years (2018-2022). This contributes to explaining the reality and context of the beekeeping sector in West Bank, specifically within the context in which the Palestinians live under occupation.

Geographically, the study covers all governorates of West Bank for the year 2022, which were distributed according to the extension departments in the Ministry of Agriculture for the beekeeping sector in West Bank in the Jenin, Ramallah, Jerusalem, Hebron (three districts), Qalqilya, Bethlehem, Tulkarm, Tubas, and Nablus Governorates. (Check map No. 1)

[7]- Ibid
[8]- Ibid

Map 1: Palestinian Authority Governorates – Applied Research Institute (ARIJ) 2022*

The two researchers carried out a process of monitoring and mapping of the beekeeping sector in West Bank, dealing with the numbers of beekeepers -men and women, in addition to an estimate of the quantities of production and consumption, and the bodies that partner or intersect with the beekeeping sector in West Bank.

* Please check the following link: https://www.arij.org/maps-of-palestine/

Purpose of the study

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This study aims mainly to draw features about the beekeeping sector in the West Bank, taking into consideration the characteristics related to the beekeeping sector in West Bank and its relationship to biodiversity, the beekeepers' -males and females- sector in terms of numbers and productivity of this sector; and the productive derivatives that can be focused on to develop it. The study also focuses on the risks threatening the beekeeping sector in the West Bank, with marketing opportunities for products, and methods to link the beekeeping sector with the tourism sector there. In addition, presenting the most prominent recommendations related to the beekeeping sector in West Bank at the production level considering the environmentally friendly biodiversity.

The Situation in the West Bank and Gaza Strip (General Indicators)

Palestinian Central Bureau of Statistics revealed that the number of Palestinians in the West Bank and Gaza Strip reached about 5.3 million, with the population of the West Bank reaching about 3.2 million,[9] while the population of the Gaza Strip is 2.1 million. The ratio of males to females in West Bank and Gaza Strip is 51%, compared to 49% in favor of males.[10]

The Palestinian society is characterized as a young society, as the percentage of individuals in the age group (0-14 years) in the year 2020 was estimated to be about 38% of the total population in West Bank and Gaza Strip.[11] As for young people in the age group (15-29), the percentage reached about 21.9% of the total population.[12] This means that despite the high burdens on Palestinians in achieving security, safety and various basic needs for their children, there is still human capital that needs to be focused on to invest in, for production in various sectors, including agriculture and food production.

The poverty line for the reference family* in Palestine in 2017 is about 2,470 Israeli shekels (671 US dollars), while the extreme poverty line for the same reference family was about 1,974 Israeli shekels (536 US dollars). The poverty rate among individuals in Palestine during the year 2017 was 29% (14% in West Bank and 53%

[9]- Palestinian Central Bureau of Statistics. "PCBS reviews the situation of the Palestinians at the end of 2021". December 30, 2022, check the following link: https://bit.ly/3qHnFbM

[10]- Palestinian Central Bureau of Statistics. Dr. Awad reviews the situation of Palestinian women on the eve of International Women's Day, 08/03/2021. March 07, 2022. Check the following link: https://bit.ly/3iIwSw4

[11]- Palestinian Central Bureau of Statistics. "PCBS reviews the situation of the Palestinians at the end of 2021". December 30, 2022, check the following link: https://bit.ly/3qHnFbM

[12]- Palestinian Central Bureau of Statistics. "General Indicators: Population Levels". Check the following link: https://bit.ly/3wELzsh

* The reference family according to the Palestinian Central Bureau of Statistics is made up of five members, two adults and three children

in Gaza Strip). In addition, about 17% of individuals in Palestine suffered from extreme poverty , (6% in West Bank and 34% in Gaza Strip).[13]

The average monthly expenditure of a Palestinian individual is about 800 shekels (240 US dollars), 1000 shekels in West Bank (310 US dollars), compared to 430 shekels in the Gaza Strip (about 128 US dollars), with an average household monthly expenditure of 4000 shekels ($1,319),[14] and about 31% of this expenditure is for food.[15]

World Food Program indicates that, 32.7% of Palestinians in West Bank and Gaza Strip suffer from food insecurity, about 1.7 million people and these numbers were set before the Corona pandemic.[16] Which caused high unemployment rates, low household incomes and high living cost.

Land in the West Bank and Gaza Strip after Oslo Agreement

The total area of West Bank and Gaza Strip is about 6,220 square kilometers. Following the Oslo Agreement,* the Israeli occupation exploited the classification of lands according to it (A, B and C) to tighten control over West Bank lands and Gaza Strip, especially in areas classified (C).* Area (C) is completely under Israeli control (security planning and construction). The Israeli occupation directly exploits 76% of the total area classified (C), and the regional councils of the settlements control 63% of them. while, the area of influence with the Israeli settlements in West Bank has reached about 542 km2 (Including the closed areas designated for the expansion of these settlements) at the end of 2021. This previously mentioned area represents about 10% of West Bank, while the areas confiscated for the purposes of military bases and military training sites represent about 18% of West Bank. In addition to that, there is the apartheid and expansion wall, which isolates more than 10% of the area of West Bank, and damaged more than 219 Palestinian communities as a result of construction.

In addition, since 1967, the Israeli occupation authorities have confiscated about 353,000 dunums of Palestinian lands classified as nature reserves in preparation for their confiscation (Check map No. 2).[17]

[13]- Palestinian Central Bureau of Statistics. "The Palestinian Central Bureau of Statistics reviews the conditions of the population in Palestine on the occasion of the International Population Day". July 11, 2020, check the following link: https://bit.ly/39aRFTb

[14]- Palestinian Central Bureau of Statistics. "Living Standards in Palestine 2017". Published on 15 April 2018. Check the following link: https://bit.ly/2PHQXUK

[15]- Ibid

[16]- World Food Program. "WFP Palestine Country Brief". November 2021. Check the link: https://bit.ly/3iEIYq3

* In 1993, “Israel” and the Palestine Liberation Organization signed the Declaration of Principles, which aimed to peacefully solution for Israeli-Palestinian conflict. However, it was supposed to be a significant step towards peace, but never ended to what it aimed.

* Areas (C) are located in the West Bank, where the West Bank is classified into areas (A), (B) and (C). Area C constitutes about 60-61% of the West Bank. The Palestinian Authority is responsible for providing medical and educational services to the Palestinians in Area C, but the occupation government has security and administrative control, which makes the lives of Palestinians and their dignified life more difficult than other areas.

[17]- Palestinian Central Bureau of Statistics. “Dr. Awad reviews the 46th anniversary of land Day in numbers and statistics”. Published on March 20, 2022. Check the following link: https://bit.ly/39m5Au6

Map 2: Area (A), (B) and (C) based on Oslo Agreement – OCHA Website*

* Check the following link: https://bit.ly/3aZtEn9

The number of Israeli settlements and military bases by the end of the year 2020 in West Bank reached 471 sites, distributed through 151 settlements and 26 inhabited outposts that were considered as neighborhoods belonging to existing settlements. 150 colonial outposts, and 144 other classified sites include industrial, tourist and service areas and camps for the occupation army. The number of settlers in West Bank reached 712,815 at the end of 2020.[18] Palestinian Central Bureau of Statistics indicates that about 47% of the settlers live in the Jerusalem governorate, where their number reached 332,294, including 246,909 settlers in Jerusalem J1.* The ratio of settlers to Palestinians in West Bank is 23 settlers for every 100 Palestinians, while the highest in Jerusalem governorate reached about 71 settlers for every 100 Palestinians. In the West Bank, the Israeli occupation authorities approved the construction of more than 12,000 colonial apartments in

[18]- Ibid

* It includes that part of Jerusalem governorate that was annexed by the Israeli occupation forcibly after its occupation of the West Bank in 1967

2021, 9,000 of which are colonial apartments on Qalandia Airport land in the Jerusalem governorate and approved to build thousands of colonial apartments all over the West Bank, including Jerusalem.[19]

After the unilateral withdrawal from Gaza Strip, Israeli occupation established a border strip with a width of more than 1,500 meters along the eastern border of the Strip, and thus "Israel" controls 24% of Gaza Strip area , which is 365 km2.[20]

Agriculture, water, and agricultural lands in West Bank

The total area of agricultural land is about 1.2 million dunums (90% in West Bank and 10% in Gaza Strip). Most of the land is located in Area C, which is under full Israeli control and represents 61% of Palestinian agricultural lands; approximately two-thirds of West Bank. Accordingly, permanent Palestinian investment and agricultural intensification are not allowed in Area C.[21] A study by the World Bank estimates an additional annual production of US$2.2 billion if the Palestinians are able to invest in Area C in terms of value added.[22] The Palestinian agricultural sector consists of plant and animal production activities in terms of production. Animal production sector, including raising farm animals and their products, consists of the following sub sectors:[23]

- Small ruminants and large ruminants.
- Poultry.
- Fish.
- Bees.
- Work animals.
- Domestic animals such as rabbits, pigeons, and pets.
  The average daily consumption of water per capita is 81.9 liters of water for Palestinians, 85.6 liters per day in West Bank, and 77 liters in Gaza Strip*, with a decline of about 6 liters compared with the last year, because of population increase.

Taking into consideration high pollution rate for water in Gaza Strip, and the available quantities of water suitable for human use, the total amount of fresh water reaches only 22.4 liters per day, per capita in Gaza strip.[24]

The opportunities for individuals to access water in the Bedouin communities are very difficult. This reflects the discrimination policies of the occupation towards the Palestinians. The daily quota of the individual in the Bedouin communities does not exceed 17 liters, and the water price for Bedouins per cubic meter is considered the highest the world -reaches 25 shekels (about 8 US dollars).[25]

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[19]- Palestinian Central Bureau of Statistics. Dr. Awad reviews the 46th anniversary of National land Day in numbers and statistics. Published on March 20, 2022. Check the following link: https://bit.ly/39m5Au6

[20]- Palestinian Central Bureau of Statistics. "Dr. Awad, reviews the 44th anniversary of Earth Day with numbers and statistics." Published on March 29, 2020. Check the following link: https://bit.ly/2JOdD5T

[21]- Palestinian Ministry of Agriculture. Sectorial strategy for agriculture 2021-2023. Palestine: Ramallah, p. 21, check the following link: https://bit.ly/3l93kc6

[22]- Ibid, page 22

[23]- Ibid, page 19

* There are studies that indicate a high percentage of water in the Gaza Strip is not suitable for drinking.

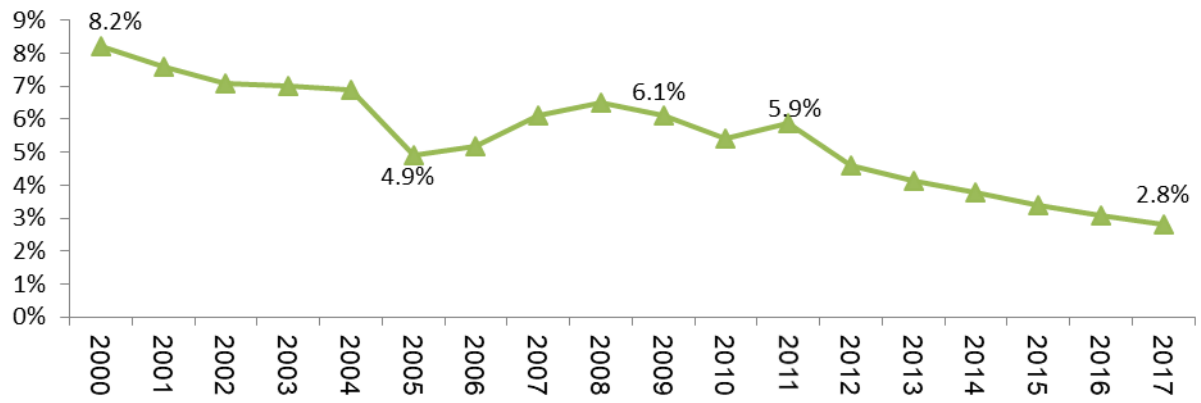
[24]- Ibid

[25]- Al-Salehi, Abdalaziz. "Women's Access to Natural Resources: Water as an Essential Resource". A study conducted for the Union of Agricultural Work Committees. Not published yet.

On the other hand, settlers consume between 100 and 230 liters per day/capita, which was indicated by the "Mekorot"* company in its reports, that settler's consumption of water reaches almost three times the Palestinians daily consumption/per capita.[26]

In the Palestinian Authority, the contribution of the agricultural sector to the GDP declined, from 36% in the seventies of the last century, to about 25% in the eighties, and in the early nineties, the contribution reached 13%. This percentage continued declining, reaching about 8.2% in the year 2000, and to about 6.1 % in 2009, and has reached about 3% in 2017.[27] (see Figure No. 1)

Figure No. 1: The contribution of the agriculture, forestry, and fishing sector to the Palestinian GDP for the years 2000-2018



Workers in the agricultural sector in West Bank and Gaza Strip

The unemployment rate of the total participants in the labor force reached 26.4% during 2021, 22.4% among males compared to 42.9% among females.[28]

The number of workers in West Bank and Gaza Strip reached about 1.034 million; 630 thousand in West Bank, 259 thousand in Gaza Strip. 145 thousand workers work inside the occupied territories and settlements. The occupied interior and 20 thousand working only in the Israeli settlements inside West Bank and around Gaza Strip.[29]

The average real daily wage for waged employees in the private sector in 2021 (based on the base year 2018) was about 97 shekels ($29.39); 42 shekels ($12.72) in Gaza Strip and 119 shekels ($36) in West Bank (does

* Mekorot is the Israeli company of water

[26]- B'TSELEM - The Israeli Information Center for Human Rights in the Occupied Territories. "Undeniable discrimination in the amount of water assigned to Israelis and Palestinians". February 2014. Check the link: https://bit.ly/34DJ2TH

[27]- Palestinian Central Bureau of Statistics. "The main national accounts indicators in Palestine for the years 2015-2016". Check the following link: https://bit.ly/2xpSS7q

[28]- Palestinian Central Bureau of Statistics, 2022. "Palestine Labor Force Survey: Annual Report: 2021." Ramallah - Palestine, p. 32. Check the following link: https://bit.ly/3kOpUGZ

[29]- Palestinian Central Bureau of Statistics. "The President of the Palestinian Central Bureau of Statistics reviews the labor situation in Palestine for the year 2021 on the occasion of International Workers' Day (May 1)." Published on April 28, 2022. Check the following link: https://bit.ly/3Pa3opG

not include workers inside the occupied territories and settlements).[30] The agricultural workers recorded the lowest real daily wage rate at 85 shekels ($25.76) in West Bank and 21 shekels ($6.36) in Gaza Strip.[31] The average weekly working hours for wage employees reach to about 41 working hours, 39 working hours for wage employees in the public sector and 42 working hours in the private sector.[32]

The percentage of female workers in agriculture sectors reached 7.7%, and 6.5% male workers, i.e., an average of 7.1% of workers in West Bank and Gaza Strip.[33]

The informal work without contracts work, constitute about 57% of the total workers in West Bank and Gaza Strip; 80% of workers in the agricultural sector are informal.[34]

Budget of the Ministry of Agriculture

The budget allocated to the agricultural sector in West Bank and Gaza Strip, reflects the level of government investment and interest in this sector. 1% of the total public budget over the years. According to the approved budget in 2018, the budget of the Ministry of Agriculture was 178,032 million shekels out of the total general budget, which was 16,559 billion shekels.[35] "1.07%".

There was no significant change in the budget allocated to the agricultural sector in the years 2019 to 2021, and regarding the years 2019 and 2020.

Referring to the Ministry of Finance's expenditure statements for the years 2019 to 2021, the government spending allocated to the Ministry of Agriculture was as follows:

Table No. (1): Share of the Ministry of Agriculture in total spending over the years 2019 to 2021[36]

Year	Ministry of Agriculture expenditure	The total expenditure of the general budget	%
2019	158,420 million NIS	16,423 billion NIS	0.96%
2020	139,014 million NIS	15,944 billion NIS	0.87%
2021*	142,575 million NIS	16,120 billion NIS	0.88%

The table above, shows that the percentage of expenditures in the agricultural sector is very low, which hinders investment at the agricultural level and implementation and development of the relevant policies of this sector. It is also important to clarify that the expenditure items in the various departments within the ministry do not appear in the statements of expenditure dimensions at the department's level; they are

[30]- Ibid
[31]- Ibid
[32]- Ibid
[33]- Palestinian Central Bureau of Statistics, 2022. "Palestine Labor Force Survey: Annual Report: 2021." Ramallah - Palestine, p. 30. Check the following link: https://bit.ly/3kOpUGZ
[34]- International Labor Organization. "The Impact of the COVID-19 Epidemic on the Labor Market in the Occupied Palestinian Territory". September 2020, p. 18. check the following link: https://bit.ly/3tcYDTA
[35]- Palestinian Ministry of Finance and Planning. "General Budget Law for the Year 2018". Palestine: Ramallah - General Administration of the General Budget. p. 30
[36]- Annual reports on government spending for the years 2019, 2020, 2021 published on the Ministry of Finance website.
* Until November of the year 2021

classified according to administrative level (salaries and wages, social contributions, goods and services, transfer expenses, capital expenditures, development expenditures).

Chapter 1: The beekeeping unique characteristics in the region – an overview

West Bank is generally divided into four agricultural regions, the semi-coastal region, the central mountainous region, the eastern foothills region, and Jordan valley region.[37] Each region was distinguished from the others in terms of biodiversity and area.

The semi-coastal area* consists of plain land with an estimated area of 400,000 dunums, some of which was suitable for agriculture. These lands were used for the cultivation of citrus fruits, fruit trees, irrigated and rain fed vegetables, winter and summer cereals. Many citrus trees, almonds and some natural summer herbs could be found there, so many beehives are concentrated in this particular area.[38] The areas can be divided as the follows:

- Central mountainous region:* most of it is mountainous land, which is the largest region of the West Bank, with a cultivated area of about one million dunums. Most of it was planted with fruit trees (olives, grapes, almonds and deciduous fruit trees). These areas were used for beekeeping during flowering periods of fruit trees and natural herbs. Tens of years ago, traditional beekeeping hives were widespread in this area in large numbers; bees produce a distinguished kind of high-quality honey from this area.[39]

- Eastern foothills:* most of them can be described as natural pasture areas, about 1.5 million dunums. It is a dry / semi-arid area. As mentioned earlier, it is considered a natural pasture area in addition to some limited areas, which are planted with winter cereals.[40]

- **Jordan Valley region**:* has a semi-tropical climate. Its area is estimated to be about 400,000 dunums. Its climate conditions and availability of water for irrigation enables cultivation of different varieties of plants

[37]- Sawalha, Firas and Bahaa El Din Abu Bakr. Beekeeping in the West Bank and Gaza Strip. An-Najah National University - Nablus: Center for Rural Studies. Group of Specialized Studies No. (15). October 1988, p. 10

* The semi-coastal region - the northwest region of the West Bank, which includes the governorates of Jenin, Tulkarm and Qalqilya, and this region receives the largest share of the annual rainfall

[38]- Sawalha, Firas and Bahaa El Din Abu Bakr. Beekeeping in the West Bank and Gaza Strip. An-Najah National University - Nablus: Center for Rural Studies. Group of Specialized Studies No. (15). October 1988, p. 10

* It extends from Jenin in the north to Dhahiriya in the south, and forms the largest part of the West Bank, its length is 120 km, and its maximum width is 50 km. It consists of the mountains of Nablus, Jerusalem and Hebron, and most of its rocks are limestone.,. This area is characterized by the presence of the fertile red trerosa soil, and the coherent silty soil, which is less fertile than the previous one.

[39]- Sawalha, Firas and Bahaa El Din Abu Bakr. Beekeeping in the West Bank and Gaza Strip. An-Najah National University - Nablus: Center for Rural Studies. Group of Specialized Studies No. (15). October 1988, p. 11

* It extends from the east of Jenin to the west of the Dead Sea, and its width ranges between 10-20 km. Its steep slope characterizes this area, and it is also exposed to overgrazing; This caused severe damage to the vegetation cover.

[40]- Sawalha, Firas and Bahaa El Din Abu Bakr. Beekeeping in the West Bank and Gaza Strip. An-Najah National University - Nablus: Center for Rural Studies. Group of Specialized Studies No. (15). October 1988, p. 12

* It extends along the Jordan River to the Dead Sea, and its depression ranges between 200-300 m below sea level

during special seasons (off-season cultivation). This region is considered the backbone of intensive agriculture in West Bank, such as vegetables (open field ad greenhouse), banana, citrus, date palm, and field crops.[41]

There is an annual variation between the governorates and regions of West Bank in the number and distribution of honeybee hives depending on the nature of the region and according to the agricultural pattern and some technical and health care aspects. The number of beehives (modern hives) in the West Bank ranged between 12,204 hives in 1980 and 13,874 in 1983. The number decreased to 11,591 hives in 1984 due to the Varroa mite parasite and other environmental factors: especially the rainfall and its impact on the flowering period for plants. The number then increased significantly in the year 1986 to about 17,139 hives due to increased demand on beekeeping, as it is one of the productive projects with high profitability, in addition to existence of means and tools to control the Varroa pest.[42]

Until 2013, the head of the bee department in the Ministry of Agriculture supervised the beekeeping sector. As part of extension department, with bee extension agents at governorates.

By the end of 2013, the specialized bee keeping department was established for the beekeeping sector in the General Administration of Extension and Rural Development unit. The General Administration of Extension and Rural Development Unit has a general manager with group of departments such as: the ruminants department, the fodder department, the poultry department, the vegetables department, the olive department, the gardening department and the planning extension program department, the information department, the rural development department, the bee keeping department, etc.[43]

By establishing the bee-keeping department, the sector has received more official attention, with the provision of a specialized team in the field of honeybees.[44] Strategic thinking of the bee-keeping sector started during the years 2010-2013, because the expansion in this sector, large group of individuals working in the sector, directly and indirectly, and other group benefit from the sector products were noted.

The work of Ministry of Agriculture's interacts with NGOs work. Nongovernmental organizations focus on the agricultural sector from a development perspective that deals with the various sectors under the agricultural sector by empowering families and creating new projects for individuals in rural and marginalized areas. This prompted the Ministry of Agriculture to pay more attention for regulating this sector.[45]

Despite the occupation's control over West Bank and its nature and distortion, approximately 75-85% of the crops are used for humans and animal feed and need bee pollination. Since 85% of crops need bee pollination, as production increases with bee pollination, up to 150%, which is considered a national wealth equivalent to honey production in terms of agricultural production.[46] Additionally, the quality of products produced by bee pollination is higher than products produced by hormonal and chemical pollination.

[41]- Sawalha, Firas and Bahaa El Din Abu Bakr. Beekeeping in the West Bank and Gaza Strip. An-Najah National University - Nablus: Center for Rural Studies. Group of Specialized Studies No. (15). October 1988, p. 12
[42]- Ibid, Page 1
[43]- From an interview with Walid al-Lahlouh, mentioned before.
[44]- Ibid.
[45]- Ibid.
[46]- Ibid

Another factor threatening biodiversity and the beekeeping sector in West Bank is desertification,* which has several factors and forms. In Jericho, high salinity is a type of desertification, while in the eastern slopes, it is embodied in the disappearing of vegetation cover due to lack of rain and drought.[47]

There is also desertification in some fertile agricultural areas due to intensive use of agricultural pesticides and chemical fertilizers, which has led to a decrease in production. In addition, the urbanization of fertile agriculture areas, for example, the "Marj Ibin Amer" case. These areas become unproductive areas.[48]

Environmental Quality Authority indicates that, at least 30% of West Bank areas are degraded. In Some areas, degradation could be slowed down if there is an opportunity to intervene and restore the systems in these areas to become productive and re-convert them from an area affected by desertification area to a productive area.[49]

Characteristics and features of honeybee sector in West Bank

The quality of honey in West Bank and Gaza Strip is one of the highest in the world. Palestinians joined the Mediterranean Bee Federation Union because of Palestinians' distinction in this sector. Palestinians also proved their international competitive participation in honey production, i.e., in 2014, Palestinian honey ranked first in the Italian Forino, which increased the focus on West Bank and Gaza Strip as honey producers and members of the beekeeping sector.[50] Despite the progress of the profession of beekeeping in historical Palestine, the institutionalization of the sector is new and promising.

The biodiversity in historical Palestine, including the West Bank, gives it a distinctive character in the beekeeping sector and the possibility of investment in the future. This diversity has created an abundance in the number of harvestings of hives throughout the year, as there are at least one to two harvests per year, and a maximum of 7 harvests, and 9 harvests in occupied Palestine. The cycle begins as follows:[51]

Table No. (2): Harvesting cycle during the year in occupied Palestine

Period of the year(season}	Area	Main source of honey	Photo
First 10 days of April	J.V	Citrus, spring plants	

* Desertification does not mean that the area has become a desert, but it is practically a reflection of the decline in the production process and the absence of vegetation cover. When there is a productive area and its production decreases, we call it a type of desertification.

[47]- From the interview of Issa Adwan, mentioned before.

[48]- Ibid.

[49]- Ibid.

[50]- From an interview with Tahseen Odeh | President of the Cooperative Society for Beekeepers in Ramallah and Al-Bireh Governorate and Chairman of the Palestinian Bee Council - conducted on February 15, 2022

[51]- From an interview with Walid al-Lahlouh, mentioned before.

25 April	Qalqilia &Tulkarm	citrus, avocado, mango and "fruit stars"	
May	J.V	*Cetaurea calcitrapa* *(Yellow starthistle)*	
May	Jenin (Ibn Amer Plain)	*Clover and Cetaurea calcitrapa*	
June	Jordan Valley	*Ziziphus spina*	

June -July	It grows from the north of Ramallah to the plain of Marj Ibn Amer	*Cephalaria leucantha*	
July-August	It grows from the south of Nablus and extends towards the east, villages of Ramallah. t extends on this mountainous strip between Shafa al-Ghor and the interior regions, and continues to the mountains of Jerusalem, the Bethlehem mountains and the eastern mountains of Hebron. (High quality honey)	*Thymus capitates*	
September October – November	Jordan Valley	*Ziziphus spina-christi*	

Through artificial swarming, beekeepers multiply their hives, where each swarm is sold at a rate of 200-300 NIS.[52] Occupied Palestine is one of the founding countries of the Association of Bee Venom Therapists in the world. Rateb Sammour, Palestinian agricultural engineer from Gaza, is one of the few people in the world in who are using bees' venom for treating diseases (Apitherapist).[53]

Chapter 2: The flora and the ecosystem that support the bees

The composition of the vegetation cover of historical Palestine has wide diversity, which is rare in most countries of larger areas. The coastal area, western mountains, the eastern mountain range, and Jordan Valley. Therefore, there is a diversity of cultivations and different groves. Throughout the year, one crop can grow throughout the year in different geographical areas in Palestine –with the absence of the occupation (from sea to river).[54]

For about seven thousand years, Palestinians have been keeping bees as traditional hobby or as a job. Archaeological remains show beekeeping in clay in the Canaanite period in Bab El-Wad region. Additionally, remains of beekeeping activities were discovered in Jericho "the ten-thousand-year-old city".[55]

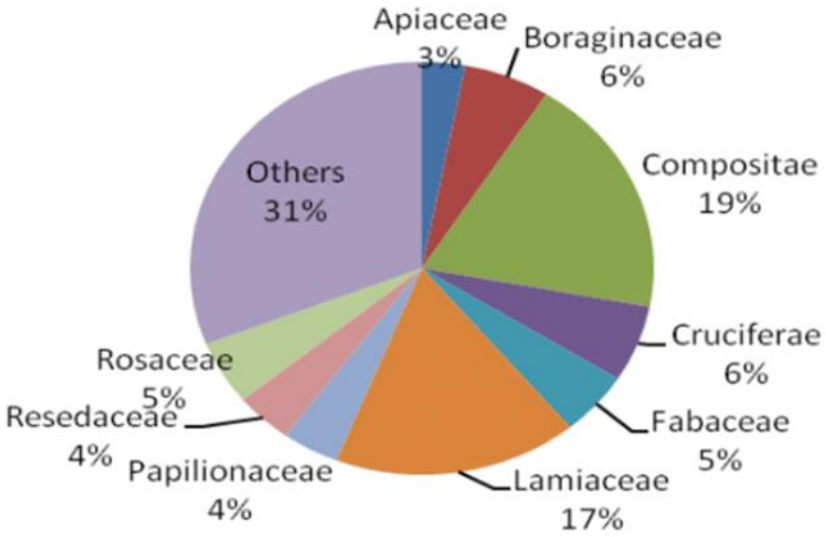
Historic Palestine is located at the crossroads of three biogeographically regions (Mediterranean, desert, and steppe). Topography, geomorphology, geology, and soil differ, giving the vegetation a different diversity and a rich variety of plant life including about 2,780 species of plants, among which more than 900 species are part of the original species of flowering plants.[56]

[52]- From an interview with Tahseen Odeh | President of the Cooperative Society for Beekeepers in Ramallah and Al-Bireh Governorate and Chairman of the Palestinian Bee Council - conducted on February 15, 2022
[53]- From an interview with Walid al-Lahlouh, mentioned before.
[54]- From an interview with Walid al-Lahlouh | Director of the Department of Bees in the Ministry of Agriculture until February 2022 - the interview was conducted on January 17, 2022.
[55]- Ibid
[56]- Albaba, Imadeddin and others. "Apiecoflora and Biodiversity: international symposium". Abstract, ROMA MMXIV 2014, page 84. Please check the following link: https://bit.ly/3IksLHY

"List of the Most Important Types of Honeybees Nectarous and Pollen Plants in the Governorates of the West Bank - Palestine", study revealed that 143 indigenous plant species have been identified as nectarous plants out of the 393 potential plant species (see Annex No. 1)

The study also shows the main nutritional values of these species and the period of their flowering in Palestine. A total of 143 species of nectar and pollen plants, belonging to 37 families (see figure 2), were identified through direct observation of bee workers in the field, and/or through surveys conducted in the same area.[57]

Figure No. (2): Plant distribution by family in percentage of nectar and pollen types

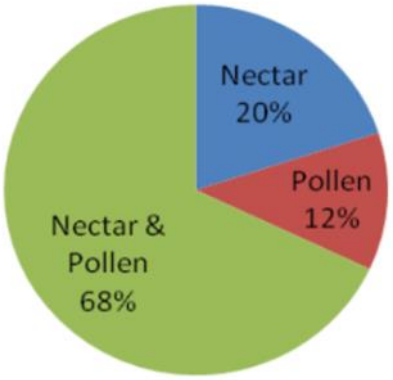


The specific plant species were classified into three groups based on their nutritional value: pollen source plants, nectar source plants and pollen and nectar source plants. The results also showed the majority of plant species visited to collect both pollen and nectar, 97 (68%), followed by 29 plant species considered as a source of nectar (17%), and 17 plant species considered as a source of pollen (12%).[58]

Figure No. (3): Nutritional value-wise distribution of the percentage of nectar and pollen species visited by honeybee workers

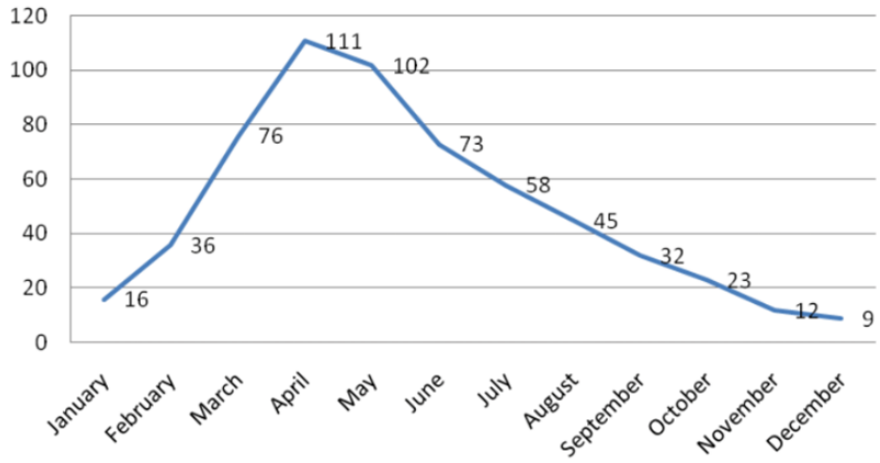
[57]- Albaba, Imadeddin. "A List of Important Honeybee Nectariferous and Polleniferous Plant Species in the West Bank Governorates, Palestine". Journal of Agricultural Science and Technology, 2015. Page 116. Check the following link: https://bit.ly/3PriVS9

[58]- Ibid, page 117



The study also showed a low number of flowering pollen plants and nectar plants during December and January. The study confirms the importance of pollen and nectar plants for honeybees in West Bank, and indicates the results of fluctuations in the availability of pollen and nectar for bees throughout the months of the year, which affects honey productivity and plant pollination (Check Figure 4).[59] These results are in harmonization with many regional and international studies.

Figure No. (4): The number of flowering species over the months



Challenges of occupation restrictions with all its practices, between the apartheid wall, bypass roads for settlements, or building in areas important for biodiversity, are imposed on Palestinians. In addition to other global challenges, such as climate change, loss of species due to population increase and expansion of buildings.[60]

Occupation poses the main threat to the reality of the natural and important reserves in the areas of biodiversity. An example is the clear live occupation practices is Wadi Qana, where a group of settlements was established on the richest areas of biodiversity, Qalqilya and Salfit areas, and the settlers trying to forbid Palestinians from entering their agricultural land by considering it a natural reserve.[61]

[59]- Ibid, same page.
[60]- From an interview with Issa Adwan | Director General of Environmental Resources at the Environmental Quality Authority - the interview was conducted on April 20, 2022
[61]- Ibid

Thus, lack of Palestinian control over their resource is a big challenge that they suffer from, which does not exist for other countries. Due to this, the Palestinian authority does not allocate a suitable budget to develop resources in the West Bank. The allocated budget of the Environmental Quality Authority, does not exceed 0.10% of the total public budget.[62]

The Environmental Quality Authority has worked on a study of the areas of biodiversity, which is still under implementation.* Currently, there are 50 natural reserve sites, but the Environmental Quality Authority is currently re-examining the natural reserves to create a national network for them, in line with international agreements and international standards such as the International Convention on Biological Diversity and the International Union for Conservation of Nature. Most areas that have been classified as natural reserves in occupied Palestine are not actually natural reserves; they have been reserved as an obstacle to forbid Palestinians from using and benefiting from them.[63]

Important areas for biodiversity have been identified through the work of the Environmental Quality Authority. Special provisions can be made for these areas, namely KBAs (KEY BI-Diversity Areas), which are important areas for biodiversity. Fourteen clusters were identified within the West Bank,* and began working through the Critical Environmental Partnership Fund, implementing projects in these areas to integrate local communities to raise awareness in these areas to protect some threatened species. For example, the Environmental Quality Authority has declared the Faqqu`a Lily as a national flower in threat, so the Environmental Quality Authority, concentrates its interest in Faqqu'a and the surrounding area.[64]

It is not easy to preserve the environment in private areas and agricultural lands, unless raising awareness of citizens about the importance of plants, animals, and birds, is put into a practical plan to protect each of the varieties that are declining from the original Palestinian wild varieties, to be replanted by farmers. This must be done to maintain the ecological balance. Therefore, focusing on preserving honeybees and developing the sector is possible good opportunity through concerted efforts between the Environment Quality Authority, the Ministry of Agriculture, and the private sector.[65]

[62]- Annual reports of government spending in the year 2021 until the month of October, which are published on the Ministry of Finance website.

* The study will be available at the end of August of this year

[63]- From the interview with Mr. Issa Adwan, mentioned before.

* The clusters were formed based on a global vision of the International Union for Conservation of Nature and the International Convention on Biological Diversity, of which the Palestinian Authority has been a member since 2015. The United Nations launched a decade to restore degraded ecosystems, and the contract began a month before the implementation of this study and will last for 4 years, to identify the fragile areas and to use various methods, including bees, to help restore these systems to the way they were.

[64]- From the interview with Mr. Issa Adwan, mentioned before.

[65]- Ibid

Chapter 3: The beekeeping sector of the region in numbers (time series data on hives, beekeepers, production, regional concentration if any etc)

since the establishment of the Palestinian Authority until 2013, there was lack of information regarding the data on hive numbers and holdings in West Bank and Gaza Strip, because – as mentioned earlier in this study- the sector was managed individually at governorate level under the name of the head of the bee department in the Ministry of Agriculture.[66]

Additionally, the gap in the data about the number of beehives and data related to the beekeeping sector over the different years came due to the fact that the Palestinian Central Bureau of Statistics carries out the agricultural census every 10 years. The last agricultural census for the agriculture sector in West Bank and Gaza Strip was conducted during 2010, the new agricultural census was supposed to be done by the end of 2020, but due COVID- 19, was delayed. Its results are expected to be published by the end of 2022. Thus, the data of the 2013 livestock survey indicate, according to the Palestinian Central Bureau of Statistics, that the

[66]- From an interview with Walid al-Lahlouh, mentioned before.

total amount of hives in the West Bank and Gaza Strip has reached 46,226, 39,211 of which are in the West Bank.[67]

The most recent data for 2021 related to the sector through field interviews and documents obtained. The Department of the Bee Sector in the Ministry of Agriculture indicates that the number of beehives in West Bank and Gaza Strip for the year 2021 reached about 86,000 hives, with an expected production for that year at a hypothetical rate of 10 kg/hive. However, the harvest was carried out in the Gaza Strip in mid-April at a rate of 10 kg/hive.[68] About 10,000 hives died in the Gaza Strip in the year 2021 because of the attack launched by the occupation on the Gaza Strip.[69]

The total amount of hives in the West Bank and Gaza Strip indicates that approximately 860 tons of honey are expected to be produced by the end of 2021. It is important to note that this number is expected to increase according to the remaining harvests. In 2020, the number of hives was almost the same as in 2021, but the production of honey was about 1,050 tons, because in 2020, the production/hive was about 12.5 kg / hive.[70] The following table shows the difference over the years 2018 to 2021:

Table No. (3): The number of beehives in West Bank and Gaza Strip and the productivity of honey over the years 2018-2021*

year	# Of hives	Honey production(ton)
2021	86,000	860
2020	86,000	1,050
2019	85,000	1,000
2018	85,000	850

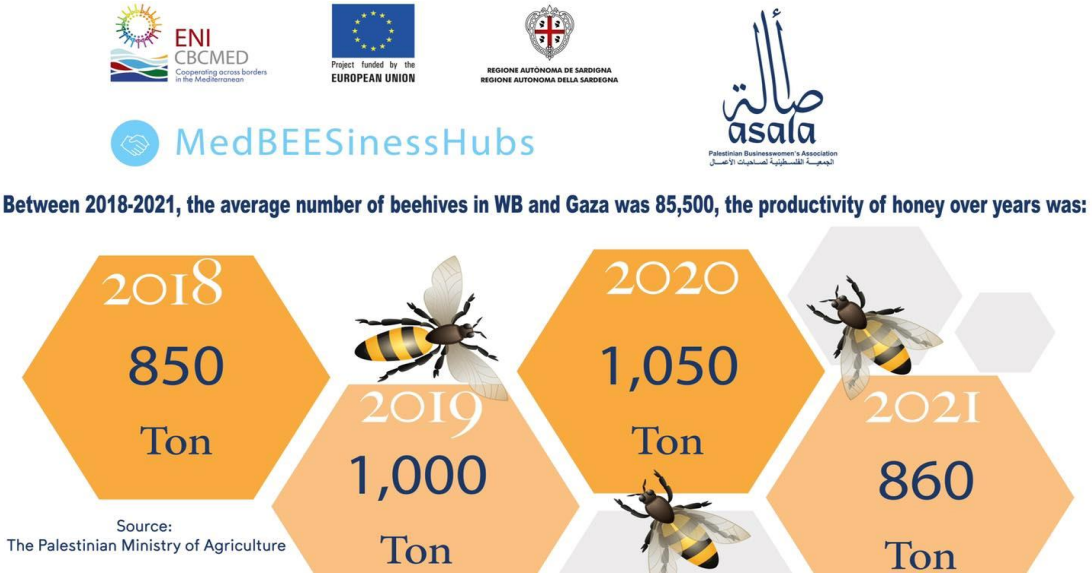
[67]- Palestinian Central Bureau of Statistics. Livestock Survey 2013 - Main Findings. Palestine RAM Allah. April 2014, p. 118. Check the following link: https://bit.ly/3wsbr8Z

[68]- From special data about the reality of the bee sector, obtained by the team through the Department of Beekeeping Sector in the Palestinian Ministry of Agriculture.

[69]- Ibid

[70]- Ibid

* From the statistics of the Ministry of Agriculture about the bee sector in the governorates of the West Bank, which the researchers obtained.



In good years, honey production in West Bank and Gaza Strip reaches between 900 and 1,200 tons.[71] The recent number of hives according to each governorate until the end of 2021, which was obtained from governorates' departments of agriculture through the honeybee department, indicates that the greatest number of hives is in the Jenin governorate, as the number of hives reached 12,000 in 2021 (11,940 modern hives and 60 old clay hives. This is followed by Nablus Governorate, with 6,455 hives.

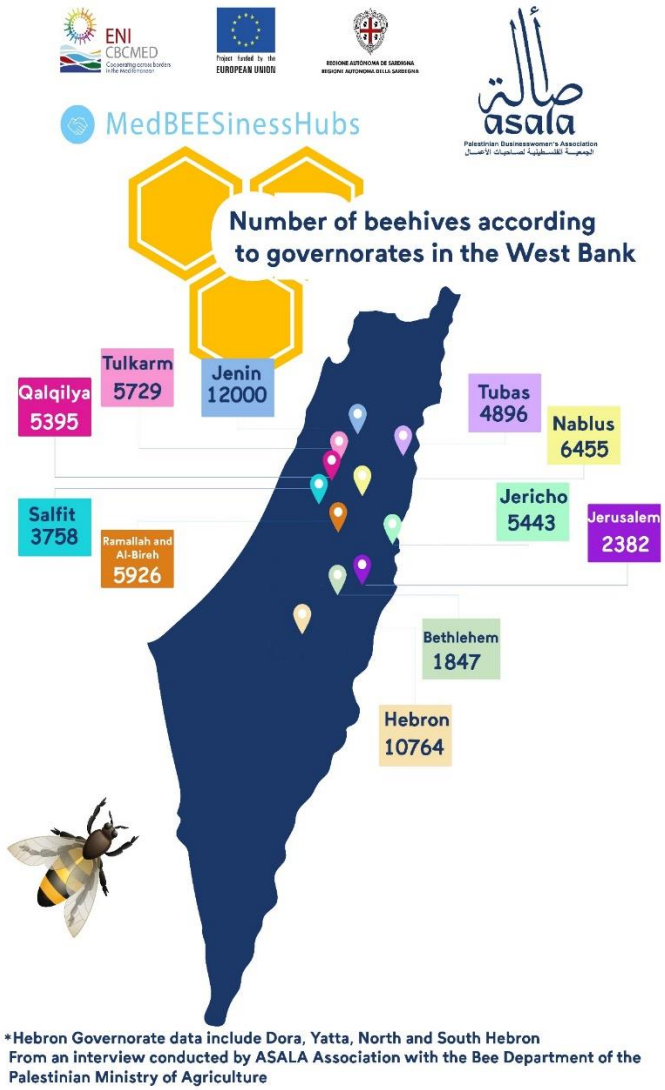
Table No. (4): Number of beehives according to governorates in West Bank*

Governorate	Number of Hives
Jenin	12,000
Nablus	6,455
Jerusalem	2,382
Ramallah	5,926
Hebron	2,714
North Hebron	2,363
Dura	4,257
Yatta	1,430

[71]- From an interview with Taghreed Sheathe - The Acting director of Department of Quality and Qualification at the Standards and Metrology Organization – conducted on March 21, 2022.

* Ibid

Salfit	3,758
Tubas	4,896
Qalqilia	5,395
Tulkarm	5,729
Bethlehem	1,847
Jericho	5,443
Total	**64,595**



In terms of ownership, beekeepers are classified as follows:

- Less than 30 hives: hobbyist.
- 30-100 hives part-time keeper (medium tenure).
- More than 100 hives: Real beekeeper; can fully be a source of income.[72]

Some beekeepers from Hebron, Tulkarm and Nablus transfer their hives during the season (starting from the end of March to the end of June) to Jenin governorate to take advantage of the season of alfalfa, Cephalaria, yellow star thistle, and other flowers.[73] Therefore, during the season, the highest density of beehives will be in Jenin Governorate.

According to the sources in the bee department in the Palestinian Ministry of Agriculture, the actual number of hives is more than indicated in records due to the following reasons: Some beekeepers are hesitant to register or update their data with the Extension Department of the Ministry of Agriculture. This is due to their fear of imposing some taxes. Therefore, they avoid giving their data, in spite of the fact that agriculture is tax-free and there are tax exemptions, but some are still suspicious.

It is worth mentioning that there are about 1,500 to 2,000 old clay hives (an old breeding system). These are estimated to produce between 1.5 to 2 kilos per hive per year, and they are added to the total hives.[74]

The number of beekeepers is estimated to be about 1500-1600 beekeepers in West Bank, and 500-600 in Gaza Strip (2,000 holdings on average).[75]

Women's Work in the Beekeeping Sector

The number of women beekeepers among total beekeepers does not exceed 10% of the total number of beekeepers in various governorates of West Bank.

This issue can be interpreted as follows:

- Registration in the departments of the Ministry of Agriculture is based on the person who registers the ownership by their name, meaning that the men who registered apiaries in their names do not necessarily work in the production process, but rather are registered on behalf of the producers at the level of the family framework.
- In beekeeping sector, the registration with departments of agriculture is based on personal owner ship; the nature of production is family production.
- There are many women's associations working in the beekeeping sector and its derivatives.

Beekeeping in west bank has a nature of family work. There are many families that started beekeeping from swarms collected from trees, and eventually acquired 350 hives. Others started with five hives and now have 60. In contrast, some families started with 10 hives, and now do not have any. This issue depends on the methodology of working and the way to manage their project.[76]

[72]- From an interview with Islam Douglas | The Beekeepers Cooperative Society in Jenin - conducted on January 12, 2022
[73]- Ibid
[74]- From an interview with Walid al-Lahlouh, mentioned before.
[75]- Ibid
[76]- Ibid

Cooperatives in the Field of Beekeeping

There are about 900 cooperatives, or a little less, in West Bank and the Gaza Strip. About 770-790 of which are in West Bank, (the number is not accurate because there are cooperatives in the process of registration). In terms of number of members, the Union of Agricultural Cooperatives is the largest. However, in terms of capital investment, the Federation of Housing Cooperatives is the biggest, because it was dealing with the construction of buildings and infrastructure, which needs high investment.[77]

There are five cooperative unions, as part of a general cooperative union. Each sector has a union, which are distributed as follows:

- The Union of the Agricultural Cooperative Sector,
- The Union of the Consumer's Cooperatives.
- The Cooperative Union for Services (or savings and credit),
- The Craft Cooperative Union,
- The Cooperative Union for Marketing Products.

Cooperatives are registered by the Ministry of Labor, while charities and grass-roots organizations (NGOs) are registered by the Ministry of Interior.

For charities, the Ministry of Interior does not have a classification based on the types of projects within these charities. Only the financial and administrative reports are monitored without classifying the nature of the activity and in which sector it directly works.

The number of associations and bodies registered with the Ministry of the Interior and affiliated with the agricultural sector is 153 association/organization. This does not mean that there are charities and organizations that are not active in the agricultural sector and are affiliated with other sectors such as the women's sector, social development, and local government.[78]

According to the Palestinian Ministry of Agriculture, the most active cooperatives specialized in beekeeping and its derivatives in the West Bank are summarized in table (6):*

Table No. (5): specialized beekeeping and its derivatives cooperatives in the West Bank

Beekeeping Cooperative	Governorate	Year of establishment	Number of members Females	Number of members (Males	Estimated total number of hives
Beekeepers Cooperative –Jenin	Jenin	2017	15	29	3000

[77]- Al-Salehi, Abdalaziz. "Conceptual Research Paper on Cooperatives in a Colonial Context". The Palestinian Center for Policy Research and Strategic Studies - Masarat. 2022, p. 22. Check the following link: https://bit.ly/3ldHrse

[78]- Al-Salehi, Abdalaziz. "Palestinians' Perceptions of Palestinian Civil Society Institutions". Campaign - The Arab Center for Social Media Development. October 2021, p. 11. Check the following link: https://bit.ly/3PjE1C2

* These associations were presented by the Palestinian Ministry of Agriculture as being the most active in the West Bank.

Beekeepers Cooperative –Ramallah	Ramallah	1994	4	39	3000
Jericho and Jordan Valley cooperative for bee keeping	Jericho	1994	5	63	
Deir Al-Sudan Women's Charitable Society	Ramallah	2014	45	0	80
Battir Agricultural Cooperative	Bethlehem	2016	14	14	120
Bazzariya Cooperative Society for Mutual Benefit.	Nablus	2005	110	0	40
Tubas and Northern Jordan Valley Beekeepers Cooperative	Bardala	2021	1	14	2500

Chapter 4: Beekeeping economic figures and employment in rural regions (macroeconomic impact)

The Palestinian trade balance shows an average annual deficit of about $5 billion over the years 2019-2021. In 2019, the cost of imports from or through the occupation government was about 6.54 billion dollars, while exports were about 1,155 billion dollars. During 2020 the value of imports was about 6,613 billion dollars,

while exports were about 1,104 billion dollars, and in 2021 the imports reached up to 6,063 billion dollars and exports about 1,055 billion dollars.[79]

This is, of course, related to the economic and political context of the Palestinian authority, which is governed by the occupation government in terms of controlling resources, crossings, and borders. In addition to that, there also is the Paris Protocol,* which undermines the Palestinian economy in favor of the Israeli occupation.

Regarding the beekeeping sector exports and imports, there is a group of tools and inputs related to the beekeeping sector that are imported, and rarely exported, due to restrictions imposed on the Palestinians with regard to the process of export and trade. (Check Table No. 6)

Table No. (6): Exports and imports related to the beekeeping sector for the years 2018, 2019, 2020 (amount in thousand dollars)[80].

	Imports			**Exports**		
	2018	**2019**	**2020**	**2018**	**2019**	**2020**
Natural Honey	533	869	1,289	99	289	279
Polysaccharides in solid form, incl. Chemically pure invert sugar and maltose, and sugar-syrup and sugar-syrup mixtures containing in the dry state 50% by weight of fructose, unflavored or colored, artificial	210	172	181	25	27	82

[79]- From the data of the Palestinian Central Bureau of Statistics - a list of exports and imports of goods for the years 2019, 2020, 2021

* The Paris Agreement is the colloquial name for the economic protocol attached to the Oslo Agreement, signed by the Palestinian Authority and "Israel" in Paris on April 29, 1994. The agreement consists of 82 clauses with the aim of regulating economic relations through the "Joint Economic Committee" between the two parties within 5 years, which is the lifespan of the transitional phase of the Oslo Accord, which ended in 1999. However, this agreement is still valid and is still in force.

[80]- From the data of the Palestinian Central Bureau of Statistics - a list of exports and imports of goods for the years 2019, 2020, 2021

honey, whether or not mixed with natural honey and caramel						
Agricultural machinery, gardening, forestry or beekeeping machinery, not included or specified elsewhere	528	241	691	-	0	9
Parts of agricultural, horticultural, forestry or beekeeping machinery, not included or specified elsewhere	44	262	69	-	-	-
Beeswax and other insect waxes and spermaceti, whether refined or colored	-	6	26	-	-	0
Live Bees	66	250	85	-	-	-

The table reflects a huge gap in terms of import and export regarding the basic products related to Palestinian honeybee sector, mostly natural honey. While the value of imported honey during 2018 was about 533,000 dollars, exports were $ 99,000 only. In the year 2019, the imports reached 869,000 dollars, compared to 289,000 dollars in exports, and for the year 2020, the value of imports of honey reached about 1,289 million dollars, compared to 279,000 dollars in exports.

The value of importing live bees reached its peak in 2019, reaching $250,000, compared to $66,000 in 2018, and $85,000 in 2020, without any export.

Regarding beeswax, no data was mentioned on the level of import for the year 2018, while it reached 6,000 dollars in 2019 and 26,000 dollars in 2020, without any export.

Even for sugars and industrial honey, even mixed with natural honey and caramel, there is an average gap of 125,000 dollars between import and export over the years.

These figures reflect a deficit in the trade balance at the level of import and export in the bee sector and its derivatives, and even confirm the needs to revise the Paris Economic Protocol with the occupation. While taking into consideration the focus on investment on local consumption in addition to export. The proposition is made because of noting that the quantities produced in the sector indicate self-sufficiency in many of the items mentioned in the above table.

Palestinian Minister of Agriculture, Riad Al-Atari, issued a decision, in accordance with the powers conferred upon him, in July of the year 2021, prohibiting importing honey from any external source to protect the local product and maintain the profitability of the Palestinian farmer. (Check Annex No. 2)

However, there are many challenges facing beekeepers, which will be discussed in detail under the title of “Challenges Facing Beekeepers” in this study, which greatly hinder and impede the issue of marketing products of the beekeeping sector relative to policies and general culture.

Honeybee Production Inputs

Through conducted field interviews, it was found that the average selling price of a kilo of honey in West Bank is 70 shekels (22.5 US dollars), this price is the average price per kilo due to different classifications of honey, which are classified as follows:

- Extra honey: premium grade honey.
- First-class honey: close to Extra honey, but it differs in very precise values in terms of nutritional and therapeutic value.
- Second-class honey: honey that contains additional feed with sugar syrup (sold for 15-20 shekels per kilo).

In terms of production inputs, and through focus groups conducted with beekeepers, main production tools and inputs are summarized in table (7) below[81]:

Table No. (7): Production tools inputs in beekeeping sector and their prices

Input/tool	**Cost**
Rearing Wooden box (Langstroth hive)	60 NIS ($18)
wax	25 NIS ($7.5)
Smoker	40 NIS ($12) according to quality
Stainless steel hive tool	15 NIS ($4.5)
Bee Keeping Suit	140 NIS ($42)
Candy* (bee food - protein pastes)	25 NIS ($ 7.46)
Stainless Steel wire	40 NIS ($12)
Frames	2.5 NIS (less than dollar)
Stainless steel queen excluder	20 NIS ($6)
Feeder (top or side)	25 NIS ($7.5)
Anti-varroa Slices (20 slices)	35 NIS ($ 10.44)

[81]- From an interview with Walid al-Lahlouh, mentioned before.

* Some beekeepers prepare candy by themselves

Average consumption of Honey /capita in Palestine is 175 g, which is below minimum international level" 500g). Palestinians consume about 1000 tons of honey , so they imported about 200 tons and exported small quantities . Regarding Pollination, 75%-85% of crops needs pollination. Production increases with pollination, which may reach 150%. In addition to the fact that the quality of the fruits will be better, there is a huge difference between agricultural production based on chemical treatments and bee pollination. This is considered –at national level -equivalent to honey production in terms of agricultural production

Employment in rural regions

The number of beekeepers in Occupied Palestine ranges between 2000-2200 (1500-1600 in west Bank and 500-600 beekeepers in Gaza strip. It is estimated that 3000 -5000 are employed completely or temporary by this sector. More than 50 agricultural shops ad carpenters for supplying and producing bee keeping inputs

Chapter 5: SWOT analysis of the beekeeping sector in the region

Strengths:	**Weaknesses:**
- Quality of Honey - Diversified climatological areas with many flowering plants in small area enable producing honey most of the year - Product of holy land –good market potential "locally and to other Arab countries - High demand - Low starting costs projects - Potential for high production	- Weak /absence of development research of this sector - Absence of breed and queen development center - Limited areas as pastures - Drought /diverse weather conditions - Un availability of local inputs with affordable prices - High production cost – most inputs imported from Israel - Low productivity. - Weak/absence of control over resources - The absence of an organizational structure for breeders and producers that protects them. - Low experience of small-scale beekeepers - Diseases and pests - Lack of laboratories to detect diseases and check the quality of honey. - un manageable, intensive, random Use of insecticides and herbicides - Marketing.
Opportunities:	**Threats:**
- The bee sector in Palestine is considered one of the important and promising productive sectors in the agricultural production system and a	- Pests and diseases - Israeli restrictions: Violations of the occupation - Smuggled and adulterated honey

priority within the components of the national strategy for the agricultural sector for the years 2017-2022; therefore, all relevant parties should support beekeepers, to support their steadfastness on their land. - International support through many projects /programs - Regional demand on Palestinian honey	- Weak Control over the Palestinian markets - unfair competition

Chapter 6: The region's product portfolio on honeybee products and the honey types available

The honeybee sector is considered a promising sector and had many intersections with other sectors such as agriculture, environment, economy, and tourism. As expected, honey is the main product of this sector; there are many products that can be produced within the beekeeping sector, for instance:

1- Honey: High quality, tested honey that is packaged in various kinds of packages. (Until now, the usual packages are a 25-kilo package, 1-kilo package, half-kilo ad 0.25 kilo package. Currently, there are countless packages, starting from a 25-kilo bucket and ending with stick pack packages with 5-10 grams.

		
1kg	0.5 kg	0.25 kg

2- Beehives/swarms: Increasing the number of hives in apiaries, or selling hives. (Out of every 100 beehives, an average of 50 to 100 new hives/swarms can be produced each year).

3- Natural beeswax: There are local experts in this field, one of whom can compete with international companies, such as "L'Oréal" in processing creams that contain beeswax and Extra Virgin olive oil, to produce about 13-14 types of creams with high quality; equivalent to famous international commercial companies.[82] Production of and processing beeswax is among the industries that contribute to achieving Goal No. 8* and Goal No. 9* of the 2030 Sustainable Development Goals. On a national level, there is high level of experience in this regard, as the process of reproducing natural beeswax started in Jenin Governorate.[83]

4- Pollen, a source of protein (the male part of the plant flower), that is collected by bee-workers, with high nutritional and medicinal value.

[82]- From an interview with Walid al-Lahlouh, mentioned before.

* Goal 8 of sustainable development goals 2030:" Promote inclusive and sustainable economic growth, employment and decent work for all.

* Goal 9: of sustainable development goals 2030:" Build resilient infrastructures, stimulate sustainable industrialization and encourage innovation.

[83]- Food and Agriculture Organization of the United Nations. Innovation in the beekeeping sector in Palestine using recycled beeswax. Check the following link: https://bit.ly/3yT9bdU

5- Propolis or bee gum: Propolis (translation: the fortified castle) is an immune-enriched material, which can treat many diseases as it supports immune system. This product is sold with prices ranging from 3 shekels per gram to 5 shekels per gram ($0.90 to 1.2 USD).

6- Queens production: producing and rearing queens and selling them to other beekeepers. Previously, beekeepers were depending on natural replacements of queens when the original queen was lost either due to death or being killed, by the swarm assigning a new queen naturally. This caused deterioration of bees' quality with a certain parentage of failing in queens' mating. In addition, this process takes more than one month, in which the hive declines. Queens' production can enable beekeepers to change queens of weak performance at any time with high-quality disease-free queens, which enable hives to produce a good quality of honey and good swarms.[84]

7- Royal Jelly is produced by young bees (5 to 12) days old. These bees, at this age, are called "house bees",[85] as they carry out several activities inside the hive, which are needed to maintain the hive's wellbeing.* Each gram of Royal jelly is sold for 10 shekels ($3). It has several uses in cosmetics and health.

[84]- From an interview with Walid al-Lahlouh, mentioned before.

[85]- Ibid

* The worker bees in this stage stay inside the hive to serve the queen and run other activities inside the hive.

8- Homogenate is the juice of the larvae of male bees, its price is very close to the price of royal jelly, and it is difficult to store. It needs complete freezing so that it can be stored. It considered a purely natural alternative to sexual activators. It is also used as an immune-enriched natural material.
9- Bee venom. It is not poison; it is an antidote. It has healed properties and the stinging process is used for healing purposes.
10- Beehive air, for healing of respiratory problems, by using an inhalation device that is directly interconnected with the beehive, with a filter inside the hive so that the bees do not come out. The air of the beehive is very rich with medicinal substances. The substances that consist of many ingredients found in the beehive air that can be of apitherapeutic and medicinal nature.
11- Pollination: Many farmers think that honeybees cause serious damage for field plants, vegetables, and fruit trees. Where some believe that bees feeds on all the pollen contents of the flower and cause lack of fruits, which leads to a decrease in production. While others believe that honeybees feed on the fruits and destroy them. In fact, bees pollinate about 80% of the field crops, vegetables, and fruits. Which increases in the economic value of the land planted with crops. The increase is due to the action of the honeybee worker as a pollinator exceeds the value of combined products of honeybee. Bees and other pollinators are essential to food security and nutrition, according to the Food and Agriculture Organization of the United Nations (FAO), which celebrates World Bee Day on May 20 to highlight the importance of their conservation.

Chapter 7: Marketing & packaging

Marketing is one of the biggest problems facing beekeepers - men and women. Even though the Ministry of Agriculture issued a decision prohibiting importing honey from abroad; there still are loopholes that enable importers to import honey to the West Bank as “sweeteners”. This leads to dumping in the local market with many types of cheap sweetening liquids, [one Kilo is sold at a rate of 30 shekels (8.9 US dollars), while production cost of Palestinian honey ranges between 45 -55 shekels (about 17 US dollars)]. Beekeepers sell the Kilo of honey at the rate of at least 80 shekels (about 24 US dollars), which makes the competition very difficult for the Palestinian beekeeper.

Honey consumption culture is not well developed for Palestinian families, which makes honey marketing difficult and increases competitiveness within Palestinian honey production.

Palestinian beekeepers produce high quality honey that competes in foreign markets, but according to the interviews,

There are many operations that are out of control in the market. For example, syrups, sweeteners, or jams are imported and re-sold in the market as honey, with very low prices; this will affect the Palestinian bee market.

In addition, importing sweeteners and reselling them as honey is out of the control of PSI, the Ministry of Agriculture, Customs Police, the Ministry of Economy, and the Ministry of Agriculture.

Even though the Palestinian Standards institute does not test the imported products, follow-ups after the entry of these products to West Bank is highly needed, (how they are packaged and where).[86]

Many samples of honey were entered illegally and were destroyed, because they are not suitable for human consumption, and their toxicity is very high. In 2020, the agricultural control and the customs officer confiscated a shipment that was found unfit for human consumption.[87]

There are bee products that are smuggled from settlements or from Israel with the facilitation of the occupation government, without any tests, so it is not possible to know the nature of the honey and the materials introduced to the market (due to the absence of laboratory testing). Those are sold at a very low price. This is one of the most prominent problems, as 4 kilos of these products are sold for 100 shekels (about 30 US dollars), while, as mentioned earlier, each kg of honey produced by Palestinian beekeepers' costs NIS (50-60) and sold at 100 shekels per kilo (depending on the type). The competition will become very difficult for Palestinian beekeepers.[88]

Chapter 8: Regional tourism products and services based on the honeybee

The tourism sector in West Bank is considered a new sector. Before the Oslo agreement, there was no tourism sector, because the West Bank was under the control of the occupation's civil administration until 1996.

The first Palestinian government was formed on May 20, 1994 and continued until May 16, 1996. The Ministry of Tourism and Antiquities was one of the state ministries that had been established at that time with the phase of building the institutions of the Palestinian Authority.[89]

Budget of the Ministry of Tourism

In 2018, the allocated budget for the Ministry of Tourism was 26,058,000 million Shekels, but this did not exceed 0.16% of the total general budget.[90] The budget was not approved during the years 2019-2021 due to the reasons.* However, after reviewing the expenditure statements published by the Palestinian Ministry of Finance for the same years, a difference in the level of expenditure was seen. This does not affect much investment in this sector (Check Table No 8).

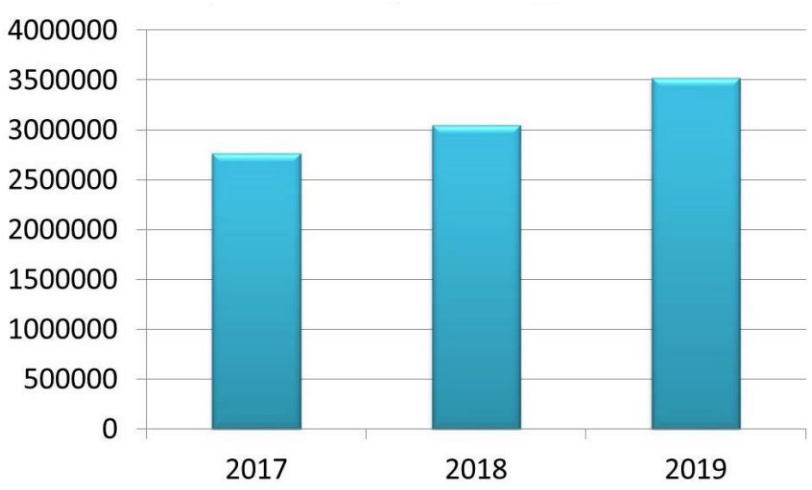
Table No. (8): The Ministry of Tourism's share of total spending over the years 2019 to 2021.[91]

[86]- From the interview of Taghreed Sheathe, mentioned before.
[87]- From an interview with Walid al-LaHood, mentioned before.
[88]- From the interview of Islam Douglas, mentioned before.
[89]- Palestinian News and Information Agency - Wafa. "Seventeen Palestinian Governments Since 1994". Published on March 11, 2019. Check the following link: https://bit.ly/3LcPvnt
[90]- Palestinian Ministry of Finance and Planning. "General Budget Law for the Year 2018". Palestine: Ramallah - General Administration of the General Budget. p. 30
* Check the title of the budget of the Ministry of Agriculture in this study.
[91]- Annual reports of government expenditure for the years 2019, 2020, 2021 published on the Ministry of Finance website.

year	Spending for the Ministry of Tourism Expenditure	Total expenditure of the general budget	%
2019	58,890 million ILS	16,423 billion ILS	0.35%
2020	32,326 million ILS	15,944billion ILS	0.20%
2021*	25,590 million ILS	16,120billion ILS	0.16%

Before the COVID-19 pandemic, indicators showed that the number of tourists who visited the West Bank during 2019 reached about 3.5 million, and in 2018, about 3.1, while in 2017, the number of tourists reached about 2.75 million.[92] (Check Figure No5.)

Figure No. (5): Number of tourists visited West Bank in 2017, 2018, 2019.



The legislative framework regulating tourism in West Bank and Gaza Strip

In 1998, Decree Law No. (1) was issued regarding implementation of temporary Jordanian Tourism Law No. 45 of 1965,[93] published in the Jordanian Official journal in 1965, as West Bank was under Jordanian rule (Jordanian state) at that time, until 1967. The law defines the tourism industries in Article (2) as tourism offices and companies, travel and tourism transport, antique stores and manufactures of the Holy Land, hotels, hostels restaurants and rest houses, guide services for tourists, and any other activity that the Council decides, and was announced in the Official Journal.[94]

Palestinians are still working according to that law. Jordanian Tourism Law, affects any improvement and development in the tourism sector in the West Bank and Gaza Strip. There is currently a draft law in the Council of Ministers where the new tourism law will be approved with new standards that address new types of tourism patterns. Great development in the tourism sector has been happening worldwide since 1965. The Community Tourism and Ecotourism proposed law is trying to focus on the revenues of the sector in

* Until November 2021

[92]- Palestinian Ministry of Tourism. Tourism statistics. Check the following link: https://bit.ly/3LexZzo

[93]- Decree-Law No. (1) of 1998 regarding the application of Tourism Law No. 45 of 1965 on all Palestinian territories. Check the following link: https://bit.ly/3wkBFLH

[94]- Jordanian Temporary Tourism Law No. 45 of 1965. Check the following link: https://bit.ly/3PrB9TM

favor of the largest sectors and local communities regarding tourism, especially rural, poor, or marginalized communities.

Responsible authorities are currently working on building a joint framework between the Palestinian Ministry of Tourism and all the associations working in tourism to support initiatives. The orientation of the Ministry of Tourism focuses on encouraging community tourism and initiatives in parallel with traditional (religious) Christian and Islamic tourism. Focus has become more on community and environmental tourism and walking paths (hiking), some of which focus on the rehabilitation of ruins and cultural heritage.[95]

Recently, the private sector and civil society showed increased interest in this sector, the Ministry would develop a common framework with all actors, which will support all initiatives that encourage local and handicraft products. Specialists in the Ministry believe that the best way is to promote products directly to local or foreign tourists.[96]

Honeybee Products with Marketing Opportunity to Tourism Sector

The Palestinian Ministry of Tourism does not market directly, but it promotes local and traditional products such as, olive wood, seashells, Hebron glass, pottery, ceramics, and Palestinian embroidery. Palestinian honey is not considered a tourist product, because, according to Laws (45) and (65) the law clarifies what oriental antiques mean. The law identifies 12 products as oriental antique products, or tourism products.[97]

According to the law, everyone who wants to sell these products must obtain a license from the Ministry of Tourism and Antiquities. Any other product that is not classified as a tourist product, but is marketed to tourists, or comes within sales in the tourism sector, can be marketed without obtaining a license from the Ministry of Tourism and Antiquities. Buying honey from the main source directly will have an impact on trust between the consumer and the beekeeper (where the tourist buys honey directly from the source).

It is recommended by the Ministry of Tourism to not list honey as a tourist product, because this will cause complications for smallholder beekeepers, and request them to obtain licenses from the Ministry of Tourism and pay license fees.[98] In addition, annual bank guarantee of about 7,500 JD (10,700 US dollars) is required. Beekeepers must also obtain licenses from other related ministries and authorities.[99]

Organizing visits of tourist groups to apiaries, restaurants, or any commercial establishment, gives a wide scope for individuals to promote local products and increase commercial activity. Therefore, it is important to invest in promotion of bee products rather than to focus on listing and licensing these products as tourist products.

It is worth mentioning that the Ministry of Tourism organized an event as part of its activities in the Ministry, by launching an activity called “Nablus Week.” When the Palestinian tourists from 1948 areas passed through a group of apiaries around Sabastia, tourists asked to stop and buy honey, this incident occurred at a time when honey sales were not within the framework of the tourism plan. This means that including such

[95]- From an interview with Majid Ishaq - Director of the Marketing Department at the Ministry of Tourism - conducted on April 14, 2022.
[96]- Interview with Majed Ishaq, Director of the Marketing Department at the Ministry of Tourism - conducted on April 14, 2022
[97]- Ibid
[98]- Ibid
[99]- Ibid

activities in domestic and foreign tourism plans might increase the volume of sales. This might apply not only to Bethlehem, but to Jericho as well. Where many tourists visit Jericho from foreign and domestic areas.[100]

Many opportunities that may serve the beekeeping sector and marketing its products were recommended in the following points:

- There are many geographically identified (GI) product initiatives of handicrafts that are specific to each region. Locality (village or city) enhances possibility to promote these products through walking (hiking) paths or organized trips, in terms of domestic tourism or even tourism that attracts tourists from abroad. Therefore, it is possible for Palestinian apiaries to become part of the stations for tourist tracks or trips, which contributes significantly to the marketing of apiaries' products directly to tourists.
- Focus on apiaries, and its products of honey, and derivatives of the beekeeping sector, as products to be highlighted within media materials that promote tourism in West Bank.
- Most hotels offer a small box of honey as part of their breakfast meal, most of which is imported. It is possible that the Ministry of Tourism can encourage using Palestinian honey in hotels and promote it through their services. This also applies to candles used in hotels, or products that contain beeswax.
- The greatest opportunity is to introduce lighting candles made with beeswax. Even then, it is not possible to replace paraffin wax completely with beeswax in the market, because paraffin wax has a lower price than beeswax.

Chapter 9: Honey in the local/ traditional gastronomy

In Palestinian culture honey is known mainly as healthy food that must consumed fresh without any expose to light and heat. Honey is mainly used as a sweetener of hot and cold drinks linke tea, milk, juices. Honey also is used in bakery of biscuits, as it gives the product good taste and keep it fresh.

[100]- Ibid

Honey is traditionally used for therapeutic uses such as sore throat; as soon as a person has a sore throat, some advise him to eat a spoonful of honey, as it is the best treatment that can be offered to get rid of this condition, and it contains a lot of vitamins and minerals useful to strengthen immunity. It is also used for skin care especially for wounds and burns.

Chapter 10: Needs & expectations of the local MSMEs and people in building up a bee-business

Through field interviews and focus groups conducted with groups of beekeepers (males and females), in addition to the respondents' opinions through the questionnaires that were distributed, several outputs that can be considered as challenges facing the beekeeping sector in the West Bank, in addition to a set of opportunities for future development of the sector. The challenges were categorized collectively under several titles, while opportunities were categorized under different headings, which can be considered as recommendations for future work.

The Main Challenges and Obstacles

- Obtaining data related to the beekeeping sector in the West Bank. Lack of studies dealing with this sector, in addition to the lack of data regularity from official sources such as the Palestinian Ministry of Agriculture and the Palestinian Central Bureau of Statistics.
- Intensive usage of pesticides: Honeybees, as an insect, are sensitive to pesticides used for agriculture and sanitation. Because of these pesticides, hundreds of beehives are damaged every year.
- Biodiversity and the relationship of both sectors to each other.
- High cost of production inputs.
- Pests and diseases, especially those related to honey quality charter.
- Lack of experience.
- Shortage in pastures: the areas of pastures for bees - the open spaces, which are suitable for pastures for bees, in recent years have been declining, while the need for beehives for pollination and the consumption of honey is increasing
- Occupation restrictions and violence.
- Unfair competition of smuggled Israeli honey.

- Lack, and/or absence of official supportive services to this sector (breeding and queen centers, national laboratories for pest diagnosis, and quality laboratory tests with reasonable prices).

Beekeepers' Awareness and Biodiversity

Insufficient awareness among the Palestinian policy makers and farmers about the distribution of bees in the pastures is prevalent, which is considered more important than the number of beehives, as the pasture have limited capacity, which is reflected on productivity.

The capacity of each area must be studied well, and the process of hive distribution and transferring them between areas should proceed according to the capacity of each area, not in random manners as happens. It should also be studied based on the relationships between individuals, which negatively affects apiaries, such as diseases transfer and competition between beekeepers and low productivity due to overcrowded hives. In addition to economic and social problems, hives must be checked carefully before transportation to avoid diseases transition.

There is a problem related to farmers in general regarding the low knowledge and awareness of bees' importance in nature, especially in plant flowers' pollination. This increases the production of fruits, improves agricultural production, and increases yield. In addition to cross-pollination which leads to genetic diversity which leads to genetic improvement in plants. Bees are directly responsible for pollinating 70 species of plants, and many others indirectly.[101] On the other hand, the settler farmers of the colonial settlements, realizing this, distribute the hives among their crops and pay beekeepers for putting their hives in the fields, in contrast to Palestinian farmers.

Unfair Competition of Settlements*/Smuggled /Imported Bee Products in Palestinian Markets

Mechanism of Hives Transfer

In addition to the absence of a scientific study for hives transfer and distributing hives to different pastures, transportation in car is still considered a traditional transportation mechanism. The majority of beekeepers use traditional methods, preparing the hives in a primitive way by closing the boxes with wood and screws, and placing a cloth bag on the tops for ventilation. They then transport hives, taking into account the transportation fee that varies from one region to another.

Absence of Laboratories and Tests

With the presence of laboratories accredited by Palestinian Standards Institute "PSI", such as Birzeit University's laboratory, the Scientific Center, An-Najah University laboratory, and the Ministry of Health laboratory. When the institution believes that the laboratories do not meet the demand, they send samples to the laboratories of Royal Scientific Society in Jordan.[102]

Despite the presence of this number of laboratories, there are many comments from beekeepers about the absence of laboratories, which is one of the biggest challenges facing the beekeeping sector, as the available laboratories are not sufficient to test agricultural products, and pesticides that are sprayed. The quantity of pesticides used is very high, pesticides used are highly toxic to bees, and to humans; some of them have been banned from use in their country of origin, but still are used in West Bank.[103] In addition, there is a lack, or

[101]- From the interview with Islam Douglas, mentioned before.
[102]- From the interview of Taghreed Shehadeh, mentioned before.
[103]- From the interview of Islam Douglas, mentioned before.

weakness, of awareness by farmers about these pesticides, their hazards, and the method of using them in safe way.

Adding to all of that, the testing mechanisms and procedures, and the fees of tests, are high when taking into consideration that most beekeepers are small-scale farmers.

Lack of Coordination between the Centers of Responsibility

From the interviews, it was revealed that coordination between the Ministry of Agriculture and the Environmental Quality Authority is very weak or absent regarding biodiversity, and the distribution of hives as well as in their role in preserving biodiversity. Additionally, there is an absence of clear data from the Ministry of Economy on the production related to the bee sector.

The United Nations launched a convention for the duration of 4 years to restore degraded ecosystems through identifying vulnerable ecosystem areas, using various methods, including bees, to help restore/rehabilitate these systems to their original status. The Environment Authority and the Ministry of Agriculture will be the main national representatives in this project, so, including the bee sector in interventions is particularly important. The project will start soon to look at the sites and determine the required interventions.

Problems and Challenges from Beekeepers' Perspective According to Asala's Survey

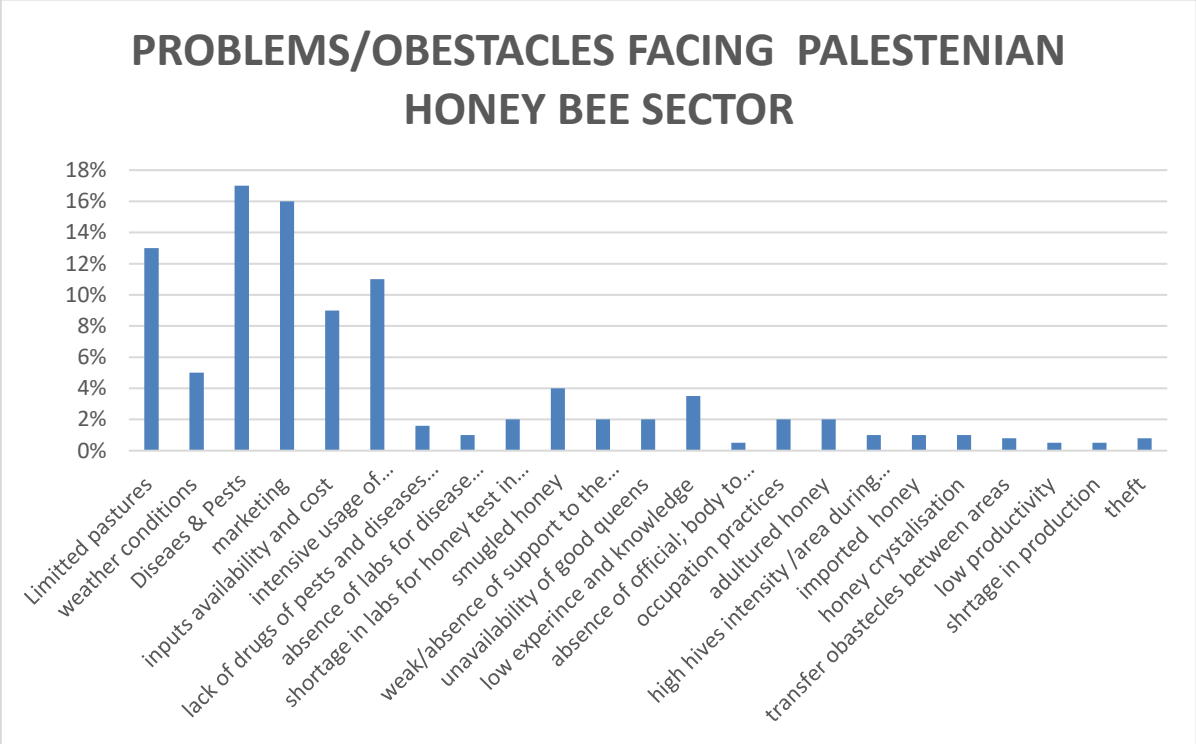
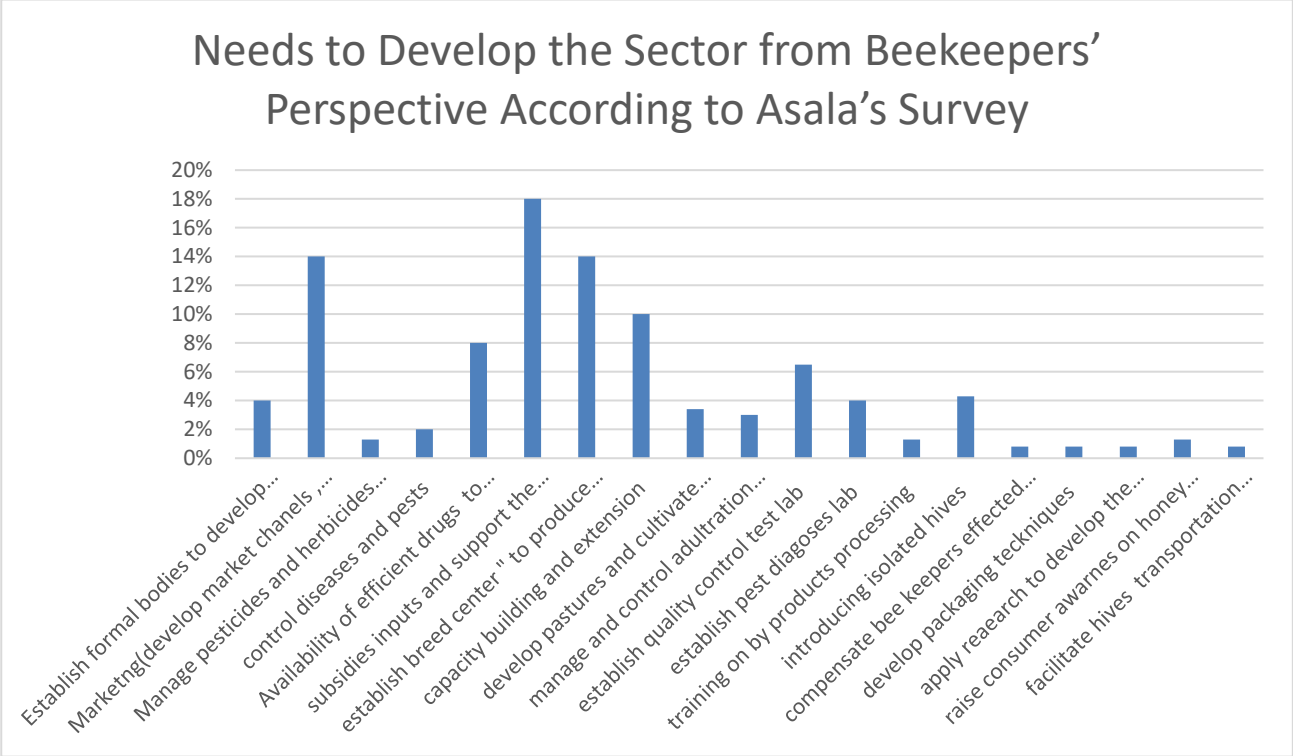


Figure No. (7): Needs to Develop the Sector from Beekeepers' Perspective According to Asala's Survey


Needs to Develop the Sector from Beekeepers' Perspective According to Asala's Survey
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
Establish formal bodies to develop...
Marketng(develop market chanels ,...
Manage pesticides and herbicides...
control diseases and pests
Availability of efficient drugs to...
subsidies inputs and support the...
establish breed center " to produce...
capacity building and extension
develop pastures and cultivate...
manage and control adultration...
establish quality control test lab
establish pest diagoses lab
training on by products processing
introducing isolated hives
compensate bee keepers effected...
develop packaging techniques
apply reaearch to develop the...
raise consumer awarnes on honey...
facilitate hives transportation...

Conclusion and recommendations

It is very clear that the beekeeping sector is promising, but it needs institutionalization that can contribute to increasing the local national production through honey as a primary product, and many other secondary products in this sector. Doing this may generate millions of dollars if they invested correctly and directed in accordance with tight policies and enforceable legislative framework.

In addition, the biodiversity in the West Bank is considered one of the best in the region, in terms of vegetation cover, pollinators, and diversity per unit area.

However, Palestinians face challenges in terms of occupation, land confiscation and misuse and destroying natural biodiversity. On the other hand, the wrong practices in bee management, involve the absence of management and coordination in hives transfer between different and diverse agricultural lands, which is necessary to increases the environmental balance and productivity.

All these obstacles can turn into opportunities, and their solutions can be a breakthrough in the establishment of a prosperous sector in the future. Decision-makers can overcome the obstacles that may face this sector in the future.

At the end of the study, a set of general recommendations for the study's main aspects:

- Increase the coordination and interactions between various bodies and ministries, to integrate the beekeeping sector within the strategic plans related to biodiversity in West Bank for better utilization of honeybees in pollination and nectar harvesting.
- Increase the allocated budget for the responsible centers (Ministry of Agriculture, Environmental Quality Authority), and allocate clear percentages within the general budget to focus on investing in the beekeeping sector, for developing it in the future.
- Institutionalization the work of the beekeeping sector to be effective in terms of the mechanisms to protect the sector; by reviewing the process of transferring hives and studying the important ecological areas and developing plans for protection and development.
- Addressing the gaps that allow importers to manipulate products as sweeteners and market them in the market as honey, which creates unfair competition with Palestinian honey.
- Activating the Palestinian Honeybee Council and passing a law that stipulates a budget allocation to the council so that it can work more effectively.
- Promotion of honeybee products in regional specialized products that are specific to each region, (GI) village or city, through hiking routes or trips organized in terms of domestic tourism or even tourism that attracts tourists from abroad. Therefore, Palestinian apiaries will become part of the stations of tourist tracks or trips, which contributes significantly to the marketing of apiaries products directly to tourists.
- Shed light on apiary products, such as honey and derivatives of the beekeeping sector as products to be highlighted within media materials that promote tourism in West Bank.
- Since The Environment Authority and the Ministry of Agriculture are main Palestinian bodies that contracted with The Unites Nations for the Ecological Restoration project, they are main bodies related to the honeybee sector, so it is important to focus on the importance of their role in this project.

- Most hotels offer a small box of honey during the breakfast period, most of which is imported. It is recommended to substitute this with Palestinian honey and promote other local bee products, like candles used in hotels, or products that contain beeswax.
- Introduce beeswax lighting candles, taking in consideration that it is not possible to replace paraffin wax candles completely, because the cost of beeswax is high, compared to paraffin wax.
- Focus on processing national natural beeswax, as there are local experts in this field, and vast quantities of wax in West Bank that can be used in other products.
- Increase farmers' and beekeepers' awareness on the importance of bees in the farming system, pollination, increasing productivity and preserving biodiversity strategically, as well as seasonally.
- It is important to organize and govern the data related to this sector, so that there are clear national reference data, as it is not possible to rely on the agricultural census alone if it is conducted every 10 years.
- Conduct more research and studies related to sector development, and give more priority in capacity building, extension and training related to production, and allocating more budgets in the sector.
- Providing and strengthening the supporting factors for the sector, such as scientific research, national breed improvement stations and queen production centers, national pest and disease diagnosis laboratories and national quality testing laboratories; with affordable costs.

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Field interviews and focus groups

- Interview with Islam Douglas, Director Jenin Cooperative for Beekeepers - conducted on 12.01.2020
- Interview with Walid Al-Lahlouh, former director of the bee department in the Ministry of Agriculture - conducted on January 17, 2022.
- Interview with Mona Jaber, Director of Public Relations at the Jericho, and Al-Aghwar Cooperative Society for Beekeeping - conducted on February 08, 2022
- Interview with Majed Ishaq, Director of the Marketing Department at the Ministry of Tourism - conducted on April 14, 2022
- Interview with Fida AbdelRazek, director of Deir Al-Sudan Sudan Women's Charitable Society - conducted on February 14, 2022.
- Interview with Dr. Tahsin Odeh, Chairman of the Cooperative Ramallah and Al-Bireh Beekeepers cooperative, and Chairman of the Palestinian Bee Council - conducted on February 15, 2022.
- Interview with Issa Adwan, Director General of Environmental Resources at the Environmental Quality Authority - conducted on April 20, 2022.
- Interview with Taghreed Shehadeh, Acting Director of the Quality and Qualification Department at Palestinian Standards Institution - conducted on March 21, 2022.
- The first focus group to study the reality of the beekeeping sector in the West Bank - conducted on March 22, 2022.
- The second focus group to study the reality of the beekeeping sector in the West Bank - conducted on 06 April 2022

ANNEXES

ANNEX I: List of the most important nectar-producing and pollen-producing Plants for honeybee in the West Bank

No.	Spp. scientific name	Family name	Spp. English name	Food elements	Blooming months
1	*Asphodeline lutea*	Liliaceae	Yellow Asphodel	P & N	March-May
2	*Asphodelus aestivus*	Liliaceae	Asphodel	P & N	February-May
3	*Acer obtusifolium*	Aceraceae	Syrian Maple	P & N	March-May
4	*Ammi visnaga*	Apiaceae	Toothpick	P	April-August
5	*Cuminum cyminum*	Apiaceae	Cumin	P & N	March-April
6	*Eryngium creticum*	Apiaceae	Field Eryngo	P & N	May-August
7	*Eryngium glomeratum*	Apiaceae	Sea Holly	P & N	May-September
8	*Eryngium maritimum*	Apiaceae	Sea Holly	P & N	April-August
9	*Hedera helix*	Araliaceae	Ivy	P & N	January-December
10	*Scilla hyacinthoides*	Asparagaceae	Hyacinth Sqill	P & N	February-April
11	*Alkanna strigosa*	Boraginaceae	Strigose Alkanet	N	March-June
12	*Cynoglossum creticum*	Boraginaceae	Blue Hound's Tongue	N	April-May
13	*Echiochilon fruticosum*	Boraginaceae	Bushy Bugloss	N	March-June
14	*Echium angustifolium*	Boraginaceae	Hispid Viper's-bugloss	P & N	March-August
15	*Echium glomeratum*	Boraginaceae	Tall Viper's-bugloss	P & N	March-June
16	*Echium judaeum*	Boraginaceae	Judean Viper's-bugloss	P & N	March-April
17	*Echium plantagineum*	Boraginaceae	Purple Viper's Bugloss	P & N	January-April
18	*Moltkiopsis ciliata*	Boraginaceae	Callous-leaved Gromwell	N	December-August
19	*Ceratonia siliqua*	Caesalpiniaceae	Carob tree	P & N	July
20	*Cercis siliquastrum*	Caesalpiniaceae	Cercis	N	February-May
21	*Capparis aegyptiaca*	Capparaceae	Egyptian Caper	P & N	March-August
22	*Capparis sicula*	Capparaceae	Caper	P & N	April-October
23	*Capparis spinosa*	Capparaceae	Spiny Caper	P & N	March-August
24	*Scabiosa palaestina*	Caprifoliaceae	Scabious	P & N	March-May
25	*Scabiosa prolifera*	Caprifoliaceae	Prolific Scabious	P & N	March-May
26	*Cistus incanus*	Cistaceae	Hairy Rockrose	P	March-June
27	*Helianthemum vesicarium*	Cistaceae	Pink Sun-rose	P & N	January-May
28	*Achillea falcate*	Compositae	Sulphur-colored Milfoil	P & N	April-May
29	*Achillea fragrantissima*	Compositae	Lavender Cotton	P & N	March-May
30	*Achillea santolina*	Compositae	Woolly Yarrow	P & N	March-May
31	*Carthamus glaucus*	Compositae	Glaucous Star Thistle	N & P	May-August
32	*Carthamus nitidus*	Compositae	Smooth Distaff thistle	N & P	April-August
33	*Carthamus tenuis*	Compositae	Safflower	N & P	May-September
34	*Centaurea hyalolepis*	Compositae	Centaury-thistle	N & P	March-June
35	*Centaurea iberica*	Compositae	Spanish Centaury-thistle	N & P	April-July
36	*Centaurea lanulata*	Compositae	Centaury-thistle	N & P	January-May
37	*Centaurea pallescens*	Compositae	Centaury	N & P	April-August
38	*Centaurea verutum*	Compositae	Centaury-thistle	N & P	May-July
39	*Chiliadenus iphionoides*	Compositae	Goldy Locks	P	September-November
40	*Crupina crupinastrum*	Compositae	False Saw-wort	N & P	March-May
41	*Onopordum alexandrinum*	Compositae	Thistle	N & P	March-May
42	*Onopordum blancheanum*	Compositae	Cotton Thistle	P & N	March-June
43	*Onopordum carduiforme*	Compositae	False Plumed Thistle	N & P	March-June
44	*Onopordum cynarocephalum*	Compositae	Artichoke Cotton-Thistle	N & P	May-July
45	*Senecio joppensis*	Compositae	Jaffa Groundsel	P & N	January-April
46	*Senecio vernalis*	Compositae	spring Groundsel	P & N	January-December
47	*Silybum marianum*	Compositae	Milk Thistle	N & P	March-May
48	*Cynara syriaca*	Compositae	Syrian Artichoke	N & P	June-August

No.	Spp. scientific name	Family name	Spp. English name	Food elements	Blooming months
49	*Dittrichia graveolens*	Compositae	Stinkwort	P & N	August-December
50	*Dittrichia viscosa*	Compositae	Inula	P & N	September-November
51	*Echinops gaillardotii*	Compositae	Globe Thistle	N & P	June-July
52	*Echinops philistaeus*	Compositae	Pale Globe Thistle	N & P	May-August
53	*Eupatorium cannabinum*	Compositae	Common Hemp Agrimony	P & N	June October
54	*Notobasis syriaca*	Compositae	Syrian Thistle	N & P	April-June
55	*Convolvulus althaeoides*	Convolvulaceae	Mallow Bindweed	N	March-June
56	*Convolvulus dorycnium*	Convolvulaceae	Splendid Bindweed	N	April-July
57	*Diplotaxis erucoides*	Cruciferae	White Wall-rocket	N	February-March, November-December
58	*Diplotaxis harra*	Cruciferae	Wall-rocket	N	January-May
59	*Eruca sativa*	Cruciferae	Arugula	P & N	February-May
60	*Maresia pulchella*	Cruciferae	Pretty Maresia	P & N	January-November
61	*Sinapis alba*	Cruciferae	White Mustard	P & N	January-December
62	*Sinapis arvensis*	Cruciferae	Charlock	P & N	March-May
63	*Zilla spinosa*	Cruciferae	Spiny Zilla	N	January-May
64	*Raphanus raphanistrum*	Cruciferae	Sea-Radish, White Charlock	N	January-May
65	*Ecballium elaterium*	Cucurbitaceae	Squirting Cucumber	N & P	May-October
66	*Cephalaria joppensis*	Dipsacaceae	Jaffa Scabious	P & N	May-September
67	*Arbutus andrachne*	Ericaceae	Eastern Strawberry Tree	N	March-April
68	*Lupinus pilosus*	Fabaceae	Blue Lupine	P	February-April
69	*Prosopis farcta*	Fabaceae	Prosopis	P & N	May-August
70	*Lotus collinus*	Fabaceae	Judean Bird's-foot Trefoil	P & N	March-May
71	*Lotus creticus*	Fabaceae	Silvery Bird's-foot Trefoil	P & N	March-August
72	*Lupinus palaestinus*	Fabaceae	Palestine Lupine	P	February-May
73	*Medicago sativa*	Fabaceae	Buffalo Herb	P & N	April-July
74	*Melilotus albus*	Fabaceae	Yellow Melilot	N & P	April-October
75	*Hypericum triquetrifolium*	Gluciaceae	Tumble St. John's-wort	P	May-September
76	*Moluccella laevis*	Labiatae	Molucca Balm; Shell Flower; Bells of Ireland	N	April-July
77	*Origanum syriacum*	Labiatae	The Rose of Jericho	N & P	January-September
78	*Ballota undulata*	Lamiaceae	Common Ballota	N	April-October
79	*Coridothymus capitatus*	Lamiaceae	Cone Head Thyme	P & N	May-October
80	*Lamium moschatum*	Lamiaceae	Musky Archange	N	March-April
81	*Lavandula stoechas*	Lamiaceae	French Lavender; Spanish Lavender	N	February-May
82	*Mentha* sp.	Lamiaceae	Mint	N	June-July
83	*Micromeria fruticosa*	Lamiaceae	White Leaved Savory	P & N	February-June
84	*Prasium majus*	Lamiaceae	Great Hedge-nettle	N	July-October
85	*Rosmarinus officinalis*	Lamiaceae	Rosemary	N	March-September
86	*Salvia fruticosa*	Lamiaceae	Greek Sage	N	March-June
87	*Salvia hierosolymitana*	Lamiaceae	Jerusalem Sage	P & N	March-July
88	*Salvia indica*	Lamiaceae	Wild Sage	P & N	April-May
89	*Salvia judaica*	Lamiaceae	Judean Sage	P & N	April-June
90	*Satureja thymbra*	Lamiaceae	Savory of Crete	N	March-July
91	*Sideritis perfoliata*	Lamiaceae	Mountain Tea	N	June-October
92	*Sideritis pullulans*	Lamiaceae	Branching Ironwort	N	May-October
93	*Stachys distans*	Lamiaceae	Lamb's Ear	N	May-June
94	*Teucrium creticum*	Lamiaceae	Cretan Germander	N & P	May-September

No.	Spp. scientific name	Family name	Spp. English name	Food elements	Blooming months
95	*Teucrium divaricatum*	Lamiaceae	Spreading Germander	P & N	April-June
96	*Teucrium scordium*	Lamiaceae	Water Germander	P & N	June-October
97	*Trifolium fragiferum*	Lamiaceae	Strabwerry Clover	N	April-May
98	*Trifolium palaestinum*	Lamiaceae	Palestine Clover	P & N	April-May
99	*Trifolium purpureum*	Lamiaceae	Purple Clover	P & N	April-May
100	*Trifolium repens*	Lamiaceae	Dutch Clover	N	April-May
101	*Trifolium resupinatum*	Lamiaceae	Trifolium Pink Clover	N	April-May
102	*Urginea maritima*	Liliaceae	Sea-squill	P & N	July-October
103	*Alcea dissecta*	Malvaceae	Bristly Hollyhock	P & N	April-July
104	*Alcea setosa*	Malvaceae	Hollyhock	P & N	April-June
105	*Eucalyptus* sp.	Myrtaceae	Eucalyptus	N	February-May, August-December
106	*Glaucium flavum*	Papaveraceae	Yellow-horned Poppy	P	April-August
107	*Glaucium grandiflorum*	Papaveraceae	Red-horned Poppy	P	April-May
108	*Anagyris foetida*	Papilionaceae	Mediterranean Stinkbush	P	January-April
109	*Ononis alopecuroides*	Papilionaceae	Foxtail Rest Harrow	P	April-May
110	*Ononis hirta*	Papilionaceae	Hairy Rest Harrow	P	March-May
111	*Ononis natrix*	Papilionaceae	Sticky Rest Harrow	P	April-September
112	*Ononis pubescens*	Papilionaceae	Downy Rest Harrow	P	March-July
113	*Retama raetam*	Papilionaceae	White Broom	N & P	March-April
114	*Calligonum comosum*	Polygonaceae	Calligonum Fringed	N & P	February-April
115	*Anemone coronaria*	Ranunculaceae	Crown Anemone	P	February - May
116	*Clematis cirrhosa*	Ranunculaceae	Virgin's Bower	P & N	November-February
117	*Clematis flammula*	Ranunculaceae	Sweet Virgin's Bower	P & N	April-June
118	*Reseda alba*	Resedaceae	White Upright Mignonette	P & N	February-April
119	*Reseda boissieri*	Resedaceae	Mignonette	P & N	February-May
120	*Reseda decursiva*	Resedaceae	Mignonette	P & N	February-November
121	*Reseda lutea*	Resedaceae	Yellow Mignonette	P & N	March-June
122	*Reseda muricata*	Resedaceae	Mignonette	P & N	March-April
123	*Reseda orientalis*	Resedaceae	Oriental Mignonette	P & N	December-February
124	*Rhamnus lycioides*	Rhamnaceae	Palestine Buckthorn	P & N	January-April
125	*Ziziphus spina-christi*	Rhamnaceae	Christ's Thorn Jujube	P & N	April-October
126	*Amygdalus communis*	Rosaceae	Common Bitter Almond	P & N	February-March
127	*Amygdalus korschinskii*	Rosaceae	Wild Almond	P & N	February-March
128	*Amygdalus* sp.	Rosaceae	Almond	P & N	February -March
129	*Prunus avium*	Rosaceae	Sweet Cherry	P & N	March-April
130	*Prunus domestica*	Rosaceae	Plum	P & N	March-April
131	*Prunus persica*	Rosaceae	Peach	P & N	March-April
132	*Prunus ursina*	Rosaceae	Bear's Plum	P & N	March-April
133	*Citrus* spp.	Rutaceae	Lemon	P & N	April-June
134	*Salix alba*	Salicaceae	Willow	P & N	March-June
135	*Verbascum galilaeum*	Scrophulariaceae	Common Mullein	P	April-July
136	*Verbascum sinaiticum*	Scrophulariaceae	Sinai Mullein	P	April-July
137	*Verbascum sinuatum*	Scrophulariaceae	Scallop-leaved Mullein	P	April-October
138	*Styrax officinalis*	Styracaceae	Storax Tree	N & P	March-April
139	*Tamarix aphylla*	Tamaricaceae	Athel Pine	P & N	July-November
140	*Tamarix tetragyna*	Tamaricaceae	Tamarisk	P & N	March-May
141	*Phyla nodiflora*	Verbenaceae	Sawtooth Fogfruit	N	April-September
142	*Nitraria retusa*	Zygophyllaceae	Salt Tree	P & N	April-May
143	*Zygophyllum dumosum*	Zygophyllaceae	Bushy Bean Caper Plant	P & N	February-April

P = pollen and N = nectar.

Annex II: The decision of the Palestinian Minister of Agriculture decision to forbid honey import the import.

State of Palestine
Ministry of Agriculture
Minister's Bureau

دولـة فلسطيـن
وزارة الزراعـة
ديوان الوزير

Ref :
Date:

الرقم : 2021/831
التاريخ: 2021/7/8

قـــرار

استنادا الى الصلاحيات المخولة لي قانوناً ومقتضيات المصلحة العامة ، وتمشيا مع مبدأ حماية المنتج المحلي، وتحقيقا لهدف وزارة الزراعة بالحفاظ على ربحية المزارع الفلسطيني في ظل تدفق الانتاج المحلي من العسل، فقد تقرر منع استيراد العسل من كافة المناشئ اعتباراً من تاريخه.

على جميع الجهات الرقابية متابعة تنفيذ هذا القرار اعتباراً من تاريخه .

مع الاحتـــــرام

ريـــاض العطـاري
وزيـــر الزراعـــة

دولة فلسطين
ديوان الوزير
08-07-2021
الرقم 831/2021

بـ نسخة / عطوفة الاخ وكيل الوزارة
نسخة / الأخوة الوكلاء المساعدون
نسخة / الأخوة المدراء العامون
نسخة / الأخوة مدراء عامو مديريات الزراعة
نسخة / للملف

ANNEX III: The legislative framework governing the beekeeping sector

Laws related to bees date back to 1929, during the British mandate of historical Palestine. This indicates that this sector was prosperous since the beginnings of the last century and before it as well.

Law No. 9 of 1928 was enacted by the High Commissioner under the name "Bee Diseases Law", which enforces securing bees of diseases. The articles of the law deal with issues such as the mechanism of appointing inspectors, destroying and treating infected bees with foul brood, restricting bees importing, violations, penalties and other issues.[104]

Regarding the current legislative system regulating the beekeeping sector, there are several regulating legislations related to this framework. The origin of the law and legislation goes back to the Palestinian Agriculture Law of 2003, which clarifies the responsibility centers and tasks assigned to them by various ministries and local authorities.

The body of the law stated that, after reviewing a set of laws -including Bee Law No. (26) of 1926, in addition to Article 56 of the law under the chapter on organization and development of livestock, that "the Ministry prepares a system for monitoring the health of animals issued by the Council of Ministers, provided that includes: Monitoring the health of animals, poultry, wild birds, fish and bees; and examining, isolating, vaccinating or disinfecting them".[105]

In Article (60) of the same law, the Ministry must prepare a special system for organizing beekeeping work, to be issued by the Council of Ministers, to include the following:[106]:

1) Exceptional measures necessary to protect beehives when epidemiological and disease risks threaten them.
2) Conditions for registering beehives, setting conditions and veterinary controls for importing or exporting beehives or queen bees, and fees due for these activities.
3) Determine all means to protect the health of the apiary, including diseases diagnosis and conditions for using the treatments and medicines related.
4) Establishing veterinary controls for importing bees and queens.
5) Measures to protect the vegetation cover and bee pastures, including regulating the use of pesticides to control agricultural pests that have negative effect on beehives.
6) Conditions for importing, exporting, and marketing bee honey or its products.

In 2008, Council of Ministers Resolution No. (13) was issued regarding the regulation of honeybee breeding work, which indicated in article number (2) that the beekeepers will be registered officially in the Ministry's records if they meet the following conditions:[107]

1) The beekeeper must own three hives or more
2) The beekeeper must fill out the form prepared for this regard by the Ministry.
3) The commitment of beekeepers to mark and number the hives with the number given by the bee department.

[104]- Bee Diseases Law No. 9 of 1928. Check the following link: https://bit.ly/37SvnJM
[105]- Palestinian Agriculture Law of 2003. Check the following link: https://bit.ly/3PqDcha
[106]- Ibid
[107]- Council of Ministers Resolution No. (13) for the year 2008 AD Regulating Honeybee Breeding Business. Check the following link: https://bit.ly/3sCTPpK

4) Beekeepers' commitment to the instructions issued by the Ministry.
5) The location of the bees should be in a place that meets the special conditions and specifications mentioned in Article (4) of this regulation.
6) Cooperate with specialized employees of the Ministry in implementing the instructions and facilitating their tasks based with the provisions of this system.
7) Update the Ministry with locations of the beehives, their numbers, their sale and purchase, their health status and any new developments.
8) Record keeping according to the forms prepared by the Ministry.

The law also raised the issue of transferring apiaries and the conditions resulting in Article (3)[108], as it is based on the epidemiological situation of the place in which they are located, in addition to an official veterinary certificate issued by the official veterinary doctor. Seasonal instructions must issue to fruit and vegetable growers not to spray pesticides during the flowering season with substances toxic to bees.
Article No. (4) made a set of conditions that must be met at the site of bees, including:[109]

1) The apiary should be at least 50m away from the roads on which cars are traveling, so that there is calmness for bee colonies to carry out their usual activities
2) It is allowed to practice the profession of beekeeping within the boundaries of municipalities or village councils, provided that the bees are of a quiet type and in proportion to the number of hives and the area of the land, with approval of the concerned authority in the Ministry.

In addition, article (5) lists veterinary conditions and standards for import and export of beehives and queens, considering the applicable veterinary quarantine system. Article (6) outlined conditions for the import or manufacture of base wax, which requires the beekeeper to have a prior permit from the ministry. It added that base wax must be manufactured from natural sterilized beeswax, and the substance must be free from any foreign chemical additives and manufactured according to the standard hexagonal size of bees. Shipment must be accompanied by a certificate of origin, and the wax must be 100% natural and does not contain any foreign substances.[110] In addition, a set of technical laws that govern mechanisms related to work in the beekeeping sector and its derivatives was published.
In instruction No. (4) of 2012[111] regarding the marketing mechanism for honeybees, Article (2) indicated that the beekeeper must register his apiary with the Department of Agriculture in his governorate, according to the approved form attached to these instructions. Article (3), specifically concerned with hive transfer from one location to another indicates that the beekeeper is obligated to obtain the following documents from the Department of Agriculture when transferring honey beehives from one location to another:

- A disease-free certificate from the responsible extension agent.

- Internal transport permit (according to the presidential decree).

Article (4), from the same instructions, states that the beekeeper must report the harvest of honey two days before the date of harvesting to estimate production. In Article (5), it is stated that the locations of the

[108]- Ibid
[109]- Ibid
[110]- Ibid
[111]- Ministry of Agriculture Instructions No. (4) of 2012 regarding the marketing mechanism of honeybee. Check the following link: https://bit.ly/3G1RDxx

beehives are specified and their movement monitored as follows: honeybee extension agent takes honey sample for testing from the beekeeper's store. After testing, a report is submitted as follows:[112]

a. The quantities of honey present in the apiary
b. Honey production history.
c. The source of honey (the name of the beekeeper and the location of the apiary).
d. Theoretical evaluation of honey.

Since article (6) of the instructions is concerned with examining the honey sample, it states that the beekeeper sends the honey sample for testing, closed and sealed by the Department of Agriculture, to an accredited laboratory. The farmer will pay the costs of the tests. Article (7) is concerned with product display in the market; it says that before displaying products in the market, the beekeeper must do the listed tests.[113]

Table No. (8): Tests for beekeepers before displaying honey in the market

Number	The test
1	% Of ash
2	Converted sugar
3	Formol number
4	Glucose
5	Humidity
6	Acidity
7	HMF Furfural
8	Sucrose

Article (8) of the decision states that the beekeeper is obligated to bring the test results in a closed, sealed envelope from the accredited laboratory.[114] With the obligation to place the identification label on each product in accordance with Article (10) of the decision [115].

[112]- Ibid
[113]- Ibid
[114]- Ibid
[115]- Ibid

Importing honey in any way from any external sources is prohibited according to the Minister of Agriculture, Riyadh al-Atari. This was enforced in a decision issued in July 2021, in order to protect the local product of honey from competition and increase the profitability of the Palestinian farmer. (Check Annex No. 2).

Amendments to the Agriculture Law No. (11) of 2005, state that the formation of agricultural councils, and the councils themselves, will refer to the Minister of Agriculture, and have full capacity to achieve their objectives under public monitoring. The objectives of forming the councils are[116]:

- Participating with the Ministry and other concerned parties in setting laws, policies, strategies, plans, general procedures and programs for development of the targeted sector.
- Contributing to the development, encouragement, building of sectors, and increasing profitability for developing all related processes.
- Encouraging scientific research, developing information and regulating work conditions.
- Arranging work conditions according to market mechanisms to ensure balanced prices for all stakeholders, and to organize, protect and defend sectors.

The structure of the agricultural councils was organized in four main sectors:[117]

1- Specialized councils' sector.

2- Agricultural service institutions sector,

3- Non-governmental institutions services sector,

4- The Ministry services sector.

Within the specialized councils' sector, ten councils were related to the main animals and produced crops, namely:[118]

- Olive council
- Grape and fruits council
- Palm dates council
- Vegetable council
- Grain council
- Milk and cow council
- Poultry council
- Horse council
- Sheep council
- Honeybee council.

[116]- Palestinian News and Information Agency - Wafa. Agricultural councils. Check the following link: https://bit.ly/3lAPqj8
[117]- Ibid
[118]- Ibid

Palestinian Honeybee Council

Despite the amendment that took place in 2005, for the formation of specialized councils, mentioned earlier, they are still pending until issuing a presidential decision to identify a clear budget for the councils, including the Palestinian Bee Council. Some informal information said that the law of councils has passed first and second readings, but not the third reading.[119]

In 2016, The Mediterranean Beekeepers' Forum was held in the West Bank, and hosted in the Red Crescent Society building in Al-Bireh, the Forum highlighted the importance of activating the Palestinian Honeybee Council.[120]

Due to the absence of law, no budget was allocated to The Honeybee Council, thus the council is unable to be able to operate actively and to open a bank account. This council represents most beekeepers, males and females, in the West Bank.[121]

The Minister of Agriculture (at that time was Shawki Al-Eissa*), gave the council good support. Mr. Tahseen Odeh was elected at that time to be the first chairperson of the Honeybee Council, in 2016, but without any authority, no budget and no legitimacy.

Thus, the work of the Honeybee Council depends on the individuals who are running the council. Official stamp and papers were issued.[122] They conduct regular meetings through members' relationships with the existing institutions, who donate halls to the Council to conduct meetings. The council launched a series of annual exhibitions of bee products, the last was the fifth annual bee exhibition conducted in 2021.[123]

One of the main objectives of the Palestinian Honeybee Council is to promote the culture of honey consumption in Palestinian society. This objective is based on a study by the World Health Organization, which estimates that the individual body needs 500 grams of honey per year. The Palestinian individual consumption of honey does not exceed 175 grams per year.[124] Thus, the Palestinian Honeybee Council adopted an idea of organizing honey consumption campaigns in Palestinian schools. The Honeybee Council has worked on these campaigns for a period of four years. Financial coverage of campaign expenses came from members' own contributions.[125] In terms of membership, each Palestinian beekeeper who owns at least 10 hives is a member of the general assembly of the council, but this has not been applied until now.[126]

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[119]- From an interview with Tahseen Odeh, mentioned before.

[120]- Ibid

[121]- Ibid

* A former minister, he held the portfolios of the Ministry of Social Affairs and the Ministry of Agriculture during Rami Ramallah's third government. He continued his position as Minister of Agriculture until the first Council of Ministers reshuffle in July 2015, while retaining his position as Minister of Social Affairs until his resignation in October 2015.

[122]- From an interview with Tahseen Odeh, mentioned before.

[123]- Ibid

[124]- Ibid

[125]- Ibid

[126]- Ibid

Quality Charter of Palestinian honey

Within the framework of the Palestinian Standards Institution,* a set of tasks was assigned to the institution in terms of preparing mandatory technical instructions, in cooperation with various regulatory authorities. The Compulsory Technical Instructions Committee prepared Palestinian standards through permanent technical committees, consisting of representatives from all sectors of commerce and industry, scientific institutions, consumer and environmental protection associations, governmental bodies, in addition to the Palestinian quality mark, supervision mark, conformity certificates, and halal certificates in accordance with the certification systems approved by the institution.[127]

Palestinian Standard Institute (PSI) is the official body issuing certificates of safe products, quality management certificates and individual service providers, in addition to a set of quality charters that are a reference guide for the food production process, such as the Quality Charter for olive oil and the Quality Charter for honey.

The beekeeping sector is completely and fundamentally subject to follow-up by the Palestinian Ministry of Agriculture, but PSI is a legislative body, which provide services to the sector. PSI has prepared the technical specifications for honey.[128] In addition, it participates in providing mandatory technical characters for honey. Systems have been established for honey in two forms: Quality Charter Certificate, or/and Honey Quality Certificate.*

The difference between them is that for the Honey Quality Certificate, the beekeeper must apply administrative systems based on administrative specification No. 15 with the Palestinian specification for honey.[129] While in the Quality Charter Certificate, more strict conditions are required by the Palestinian specification. The charter means a “premium” quality, not only first class, but also higher than that.[130]

Those who want to obtain the Quality Charter Certificate must show some cooperation with the Ministry of Agriculture. MOA & PSI representatives will visit the pastures and hives and the environment that surrounds the apiary. If any pests or diseases are identified, the mechanism of the treatment used must be clarified. Visiting the place of honey extraction, and taking samples of honey for testing as a final product are implemented.[131]

The plan is to establish a honey-tasting team that meets requirements to obtain the Charter Certificate. The final draft of the Quality Charter of Honey has been approved since 25 November 2018 by the committee of representatives of several bodies, which are the Palestinian Standards Institution, the Ministry of National Economy, the Ministry of Health, the Ministry of Agriculture, the Palestinian Honey Council and the Federation of Food Industries.

* Palestinian Standards Institution (PSI) :was established in 1994 by a decision of President Yasser Arafat, and began its work in 1997 according to the Standards Law No. 6/2000, with financial and administrative independence, as it is considered the national body for standards in Palestine and the point of contact with the global infrastructure for quality, the role of the institution is to Seeking to insure high competitive ability for the Palestinian product, facilitating trade, contributing to protect the health and safety of the consumer and the environment, and representing Palestine in the international system of standards through preparing internationally harmonized Palestinian specifications and providing inspection and measurement services (metrology) and the granting of certificates and conformity marks and labels.

[127]- Palestinian Standards institution (PSI). About the institution. Check the following link: https://bit.ly/3PssJvn

[128]- From Taghreed Shehadeh's interview, mentioned before.

* The technical specification for honey is older than the charter, and its number is 216

[129]- From Taghreed Shehadeh's interview, mentioned before.

[130]- Ibid

[131]- Ibid

Quality Charter goals are producing Palestinian honey of high quality, which increases the production capacity of beekeepers, and increases the competitiveness of Palestinian honey in the local and foreign markets.[132] The Honey Quality Charter sets the conditions for the registration and general instructions about beekeeping and honey production, such as conditions for apiaries, hives, importing bees, queens and wax, as well as procedures for protecting apiaries and pastures, and methods for managing diseases and pests.[133] The Charter also describes honey as the product of the nectar of flowers of wild or field plants, or tree flowers.

Article (4) of the Charter, sets general requirements, while Article (5) sets conditions of breeding stages, extraction, production, packaging, transportation, storage and marketing. Beekeepers geographically (region, village, governorate) determine the amount of hives. The Honey Quality Charter sets out a set of instructions that must be considered. The Charter also sets conditions for apiaries, and importing bees, queens and wax.[134] In addition to everything mentioned, the Honey Quality Charter deals with a set of measures to protect beehives and pastures, methods of controlling diseases and pests, in addition to beekeeping management, identifying diseases, pests and enemies of bees, and the mechanism of honey extraction[135].

Two years ago, PSI decided to issue quality certificates for a period of two years, except for agricultural products because they need intensive monitoring.

For honey in particular, the certificate is given on harvest bases and institution test samples of each harvest. Test fees cost approximately about 700 shekels (about $220) for each harvest, and the annual cost of the certificate about 1,300 shekels (about $338) annually.[136]

As mentioned earlier, the Charter is strict and needs more requirements, because it not only testing the production sample, but also tests the quality of the entire environment and the entire production chain. In addition, some tests are not required for the honey certificate.

For example, “Distaze enzyme test”, which indicates whether, the honey is fresh or not, is required by the Honey Quality Charter, and the percentage of "hydroxymethyl fural”, which must not exceed 15, is also required. These tests have an effect on the safety and quality of honey.[137]

The Honey Quality Charter is three years old; currently, it is in process of revision for updating and adding some missed points, such as honey moisture, where humidity must not exceed 18 %. While mandatory technical characters for honey allow humidity up to 22%.

The Charter is unique at a worldwide level.[138] The Charter as a document that is renewed whenever there is a need or trend setting more strict conditions. The standard of the Palestinian Charter is stricter than others around the world. Which gives Palestinian honey that was made through applying the charter specifications a high competition potential in international markets.[139]

Palestinian Standards institute (PSI) was also able to adopt some international standards for beeswax specifications that beekeepers can benefit from. It has been translated from French into Arabic, and the Institution is in the process of adopting it through a specialized committee as a Palestinian standard.[140]

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[132]- Palestinian Standards Institution. "Honeybee Quality Charter". Palestine, Ramallah, first edition; 2018, Page 1. Check the following link: https://bit.ly/3jLZUez

[133]- Ibid, Page 7

[134]- Ibid Page 7-8

[135]- Ibid, page 9

[136]- From Taghreed Shehadeh's interview, mentioned before.

[137]- Ibid

[138]- Ibid

[139]- Ibid

[140]- Ibid

Many producers used beeswax and re-cycled it into candles for lighting or other uses. As there is a recommendation for wax processing to have a center specialized in collecting wax and recycling it, an example that implemented this was the Jenin cooperative, which has an assembly line for wax refining, which needs to be expanded.