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A Research on Beekeeping Sector in Semdinli

Şemdinli'de Arıcılık Sektörü Üzerine Bir Araştırma

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Abstract

Humans have benefited from animals throughout their lives by hunting before the Neolithic and then controlling them by domestication. One of the animal groups under control is the bees, which existed long before humans. Bees, which are in circulation in natural life, have been taken under control by humans and turned into an important livestock breeding used in many different fields such as food, cosmetics and medicine. These bees, which are of Asian origin, are spread all over the world except the extreme places. The world colony existence, which was around 50 million in 1960, has increased to over 100 million today. Today, the leading countries of beekeeping activities are China, Turkey and India. Turkey has an important role in world beekeeping. Turkey's beekeeping potential has increased up to ten times compared to the first years of the Republic. The majority of the country's honey production is provided from the Mediterranean, Eastern Black Sea, Aegean and Middle Eastern Anatolia regions. Semdinli (Hakkari), which constitutes the study area, is also located in the Middle East Anatolia region. Semdinli is among the towns where the most honey and beeswax production is made in Turkey. In 2021, 313 tons of honey and 32 tons of beeswax were produced in the town. In the study, in addition to data portals such as FAO, TUIK and TOB, data sets were produced by interviewing beekeepers in settlements where beekeeping is most common. In the study, a phenomenological design was used to reveal the beekeepers' own experiences from their point of view.

Keywords

Beekeeping, honey, beeswax, Semdinli

Öz

İnsanlar neolitik öncesinde avlayarak sonrasında ise evcilleştirmek suretiyle kontrol altına alarak yaşamları boyunca hayvanlardan faydalanmıştır. Kontrol altına alınan hayvan gruplarından birini de insandan çok daha önce var olan arılar oluşturmaktadır. Doğal yaşamda dolaşım halinde olan arılar, insanlar tarafından kontrol altına alınarak günümüzde gıda, kozmetik, ilaç gibi çok farklı alanlarda kullanılan önemli bir hayvancılık haline getirilmiştir. Asya kökenli olan bu arılar, dünyanın ekstrem yerleri dışında her yere yayılmış durumdadır. 1960'ta 50 milyon dolaylarında olan dünya koloni varlığı günümüzde 100 milyonun üzerine çıkmıştır. Günümüzde arıcılık faaliyetinin öncü ülkelerini Çin, Türkiye ve Hindistan oluşturmaktadır. Türkiye, dünya arıcılığında önemli bir role sahiptir. Türkiye'nin arıcılık potansiyeli Cumhuriyet'in ilk yıllarına göre on kata kadar artış göstermiştir. Türkiye bal üretiminin büyük çoğunluğu Akdeniz, Doğu Karadeniz, Ege ve Ortadoğu Anadolu bölgelerinden sağlanmaktadır. Çalışma alanını oluşturan Şemdinli (Hakkâri) ilçesi de Ortadoğu Anadolu bölgesinde yer almaktadır. Şemdinli ilçesi Türkiye'de en çok bal ve balmumu üretiminin yapıldığı ilçeler arasında yer almaktadır. İlçede 2021 yılında 313-ton bal ve 32 ton balmumu üretimi gerçekleşmiştir. Çalışmada FAO, TÜİK ve TOB gibi veri portallarına ek olarak arıcılığın en fazla yapıldığı yerleşim birimlerindeki arıcılarla görüşmeler yapılarak veri setleri üretilmiştir. Çalışmada arıcıların kendi deneyimlerini bakış açılarından ortaya koymak için olgu bilim deseni kullanılmıştır.

Anahtar kelimeler

Arıcılık, bal, balmumu, Şemdinli

Introduction

Beekeeping is known to have been started in Ancient Egypt; Mesopotamia, Anatolia and Europe have important place in the development process of beekeeping. In the 17th century, it was moved to the New World countries with immigrants, and today it is made in all settlement areas except the poles (Fıratlı et al., 2000, p. 813). It is thought that the first historical findings of beekeeping, which goes back tens of thousands of years, are based on the excavations made in Valencia, Spain in 7000 BC, and according to the pictures and fossils obtained from these excavations, people benefited from bees in the natural life. However, it is stated that the first place where the bee was taken into culture was Egypt and wandering beekeeping was carried out along the Nile River in 3000 BC. According to Crane (1999b, p. 174), a pictorial representation of the earliest known hive beekeeping dates from 2400 BC and is also located in Egypt. Contrary to popular belief, honey, which is obtained from the essences of flowers and is not a natural secretion of bees, has been considered not only a nutrient but also used in medicine and religious rituals in the historical process. The use of honey as medicine by the Sumerians in 3000 BC, the presentation of honey to the spirits of the dead and the gods in Ancient Greece, and the mention of honey in Indian religious texts, Babylonian inscriptions and ancient Egyptian writings are the clearest indications of this importance (Langstroth, 1853, p. 76,89,342; Ahmad et al., 2007, p. 5; Korkmaz, 2010, p. 1). Honeybees, which are older than Homo sapiens (Kırpık & Gülen, 2014, p. 42), served humans by producing honey in tree cavities and rock crevices in the Neolithic (Crane, 1984, p. 1). However, their service to humans is not limited to producing honey. As a matter of fact, as Agarwal (2014, p. 133) states, there are both micro and macro benefits of beekeeping, and as for Michener (2000, p. 4) the most important of all benefits of bees is the pollination of natural vegetation. As a result, this activity, which will be expressed as honey hunting for primitive times and beekeeping for modern times, has been evaluated as an important food item in modern societies as well as in primitive societies.

Beekeeping is one of the most common agricultural activities in the world (Kurtoğlu & Uzundumlu, 2022, p. 180). The advantages of this activity such as requiring relatively less labor and less capital compared to other livestock activities, and the absence of land presence, have resulted in an increase in the interest in this activity and the number of people engaged in this activity in rural areas (Çevrimli & Sakarya, 2018, p. 58).

Beekeeping is a common activity in almost every country in the world, except in places such as polar areas where the climate is not suitable and less vegetation. However, agriculture and animal husbandry activities in every country are not done in the same way, and the purpose, method and yield may also differ. In Vural's words (2008), while beekeeping is mostly done as a traditional occupation in Europe, in countries such as Spain, Poland, Hungary, Turkey and Greece, it is done to increase the income of farmers dealing with beekeeping. In addition, while beekeeping is a significant source of foreign income in the Far East, Africa, Central and South America countries, it is mostly carried out as an activity that contributes to vegetative pollination in developed countries such as the USA, Canada, and Japan. In addition, in India, this activity is important for honey to take place in rituals and medicine (Vural, 2008. As cited in Engindeniz et al., 2014, p. 113; Crane, 1999a). The beekeeping potential in the world generally tends to increase. According to FAO, the number of colonies around the world, which was around 50 million in 1961, has increased to over 100 million today. And honey production, which was around 679 thousand tons in 1961, increased to approximately 1.8 million tons in 2021, and beeswax, with 32 thousand tons of production, increased to over 65 thousand tons.

Turkey has a special importance in the world beekeeping, forming one of the bee gene centers (Korkmaz, 2010), owes this to the cultural heritage together with the floristic richness arising from the geographical structure. According to Ureten (2011), when the historical heritage left by the Anatolian peoples is evaluated chronologically, it is seen that honey occupies an important place. The importance of honey in Anatolia has continued from the first civilizations to the present day. According to FAO and TUIK data, the Republic of Turkey took over an average of less than 1 million colonies from the Ottoman Empire. Agricultural reforms made in the first years of the Republic enabled the development of beekeeping gradually, and this development process was clearly felt until the 1970s. According to FAO and TUIK data, while the number of colonies in Turkey was around 1.5 million in 1961, it reached 1.8 million in 1970 and 2.2 million in 1980. The number of colonies increased by 21% and 24% from 1960 to 1970 and 1980, and honey production increased by 86% and 69%. There was a net increase in the number of colonies and beeswax production from 1990 to 2000, but honey production increased with fluctuation. In this period, 30% of the number of colonies and 64% of beeswax were produced; and this rate was 19% in honey. According to TUIK's data for 2021, in the number of enterprises engaged in approximately 90 thousand beekeeping activities, approximately 8.8 million honey is produced from the hives. Therefore, Turkey's hive presence constitutes 9% of the world's hive presence. In honey and beeswax production, Turkey accounts 6% of the world's total production. The majority of these hives in Turkey are in the Eastern Black Sea and Central Anatolia Regions, especially in the Aegean and Mediterranean. Therefore, 60% of honey production is provided from these regions (TUIK, 2023).

When examining the relevant literature, it becomes evident that numerous theoretical and field-based studies have been

conducted on beekeeping. While these studies, mostly based on surveys with beekeepers, exhibit important differences, their methodological similarities and consistent results are noteworthy. Several studies are worth mentioning in this regard. Özbakır et al. (2016) conducted a study in Adiyaman, where beekeepers were surveyed and frequency distribution and Chi-Square tests were applied. The study revealed that winter losses and diseases like varroa were significant problems for beekeepers in that region. Similarly, a study by Erkan and Aşkın (2001), which employed the same methods and Chi-Square test, identified varroa disease and the inability to cover expenses as the main challenges faced by beekeepers in Başkale, Van. In another study focusing on mobile beekeepers in Hakkari, Kanakan and Erkan (2020) concluded that the issues encountered by beekeepers in this area were similar to those faced by many other beekeeping businesses. Additionally, Söğüt et al. (2019) utilized the proportional sampling method and field survey data to analyze the structural conditions of beekeeping enterprises in Bingöl. Their study presented an overview of the problems related to beekeeping activities in the region, along with possible solutions. Several other studies also contribute to this topic (Topal et al., 2020; Burucu and Gülse Bal, 2018; Kaya Sandal and Kan, 2013; Kutlu and Kılıç, 2020) and provide valuable insights in terms of methodology and results.

1. Aim and Methodology

This study aims to assess the beekeeping activities in the Semdinli town of Hakkari by examining the perspectives of local beekeepers. Despite having a lower number of beehives compared to Hakkari and Yuksekova, Semdinli contributes significantly to the province's honey production, accounting for nearly half of it. However, over time, Semdinli's beekeeping sector has encountered various challenges, necessitating the need for this study.

To conduct this research, both primary and secondary datasets were utilized. Global and Turkey-specific beekeeping data were obtained from reputable sources such as the Food and Agriculture Organization (FAO) and the Turkish Statistical Institute (TUIK). However, to acquire specific data on Semdinli villages, the researchers conducted meetings with the Ministry of Agriculture and Forestry, Agriculture and Forestry Directorate, and distributed questionnaires to local beekeepers during their field study. In this study, interview forms comprising 50 questions were administered to 27 individuals residing in villages with the highest intensity of beekeeping activities. The selection of participants took into account the number of colonies owned by each individual and their potential for honey production. Notably, most participants owned more than half of the total number of colonies in their respective villages. During the data analysis phase, the researchers employed the descriptive analysis technique (Cokluk et al., 2012), a form of qualitative data analysis. This technique facilitated the organization and interpretation of the collected data based on predetermined themes. Additionally, the researcher created maps and graphics utilizing the obtained data.

2. Beekeeping in Semdinli

The Eastern Anatolia region constitutes an area where crop production is relatively limited due to factors such as landforms and climate. Natural factors made it necessary for the economy of the region and the main occupation to be mostly animal husbandry. One of the intensive livestock activities in the region is beekeeping. Koday (2005) states that in some areas of the region such as Erzurum-Kars, Yukarı Murat Van, beekeeping activities are carried out relatively less than in other cities due to the generally low annual temperature averages, but that quality honey is produced as well. Nonetheless, apart from these high areas, beekeeping is actively practiced in almost all settlements. The most important advantage of the region is that the plateaus cover a large area. As Sıralı (2009;18-19) stated, the presence of plateaus in the region has enabled beekeeping to find a suitable environment. According to him, quality honey is produced in the region, especially in areas such as Kars, Erzurum, Erzincan, Agri, Semdinli and Bitlis. Similarly, Güler & Demir (2005) noted that one of the most suitable places for beekeeping in the region is Semdinli. Known as Samizdin (Assyrian), Navsar, Semzdinan or Semdinan with its old names, it has a very mountainous and rugged structure with a surface area of 1209 km². 45% of this area consists of forests (mostly oak forests), 41% is unsuitable for agriculture, 10% is short-term pastures and 4% is arable land. While it was a town during the First World War, it was reduced to a subdivision in 1932, and after Hakkari became a province in 1936, it became a town (URL1, 2023; Commission, 1982, p. 3318).

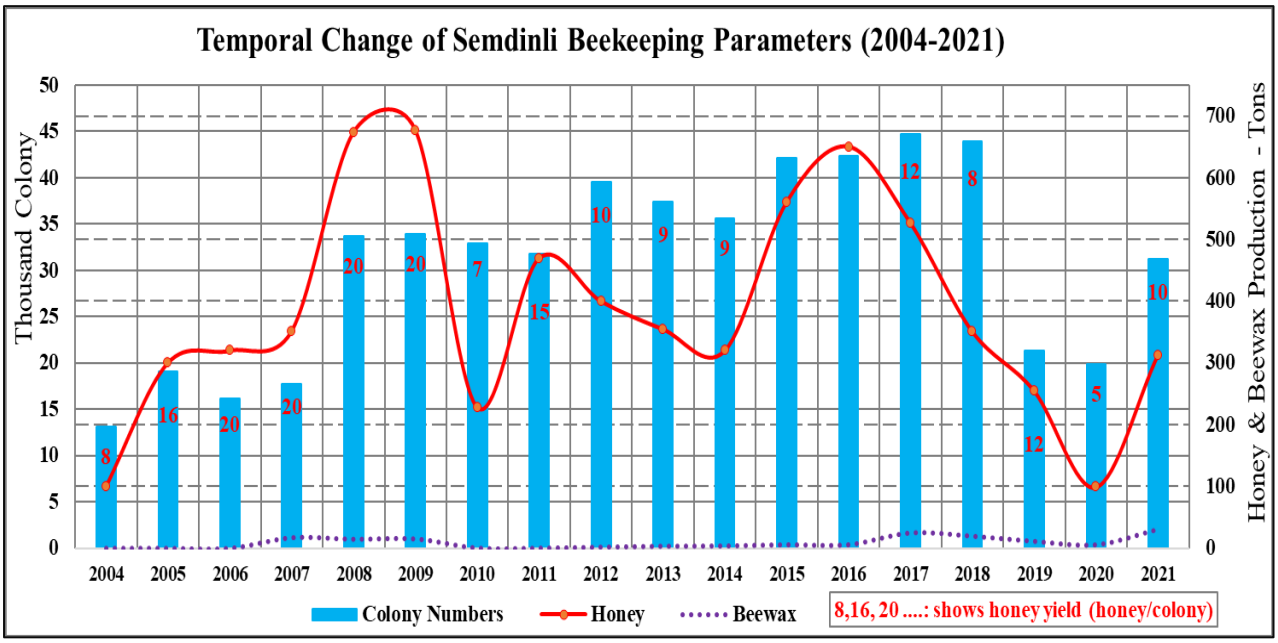
The agricultural areas in the town, which is mostly mountainous and rugged, are quite limited and the rural population is mostly engaged in vineyard, horticulture, and animal husbandry activities. Agricultural activities are highly related to cereals (alfalfa 86%). Another animal husbandry activity, which is mostly done in most parts of the town, is beekeeping. In addition to the diversity of vegetation, plant production activities, especially vineyard and gardening, have had an important share in the development of beekeeping. Semdinli has been a town known as prominent with beekeeping throughout history.

Semdinli has a different beekeeping structure compared to other town throughout the province. While town such as

Yuksekova and Hakkari center leave Semdinli and other towns behind in terms of number of business and colony presence, they lag behind Semdinli in honey and wax production. According to the official data of the TUIK, there are 1263 AFYIS and nearly 113 thousand colonies in Hakkari in 2021. 41% of these activities are in Hakkari center and 27% in Yuksekova, while 22% are located in Semdinli. Likewise, 43% of the total colonies are in Yuksekova, 28% are in Semdinli and 18% are in Hakkari. Derecik and Cukurca are the weak links in the presence of colonies and other beekeeping productions. Although Semdinli ranks third in terms of the number of enterprises and colonies, it ranks first in honey production with a rate of 45%. As of 2021, approximately 694 tons of honey was produced throughout the province and 313 tons of this was produced in Semdinli. In honey production, Semdinli is followed by Yuksekova with 35%, Hakkari with 14%, Derecik with 4% and Cukurca with 1%. Also, Semdinli produced approximately 32 tons, or 62% of the 50 tons of wax throughout Hakkari in 2021.

When we look at the recent history of beekeeping in the town, it is seen that both the number of colonies and honey and wax production have a highly variable structure. In 2004, only 100 tons of honey was produced from the beehive, which was around 13 thousand; and the yield from the colony this year is only 8 kg. When it comes to 2008, the number of colonies has increased more than 2 times and honey production has increased by 7 times. Honey production, which was 673 tons in 2008, decreased to 228 tons in 2010 when the yield was 7 kg. Although honey production, which tends to increase with fluctuations, reached 650 tons again in 2016, it is observed that this production decreased below 100 tons in 2020 (Chart 1).

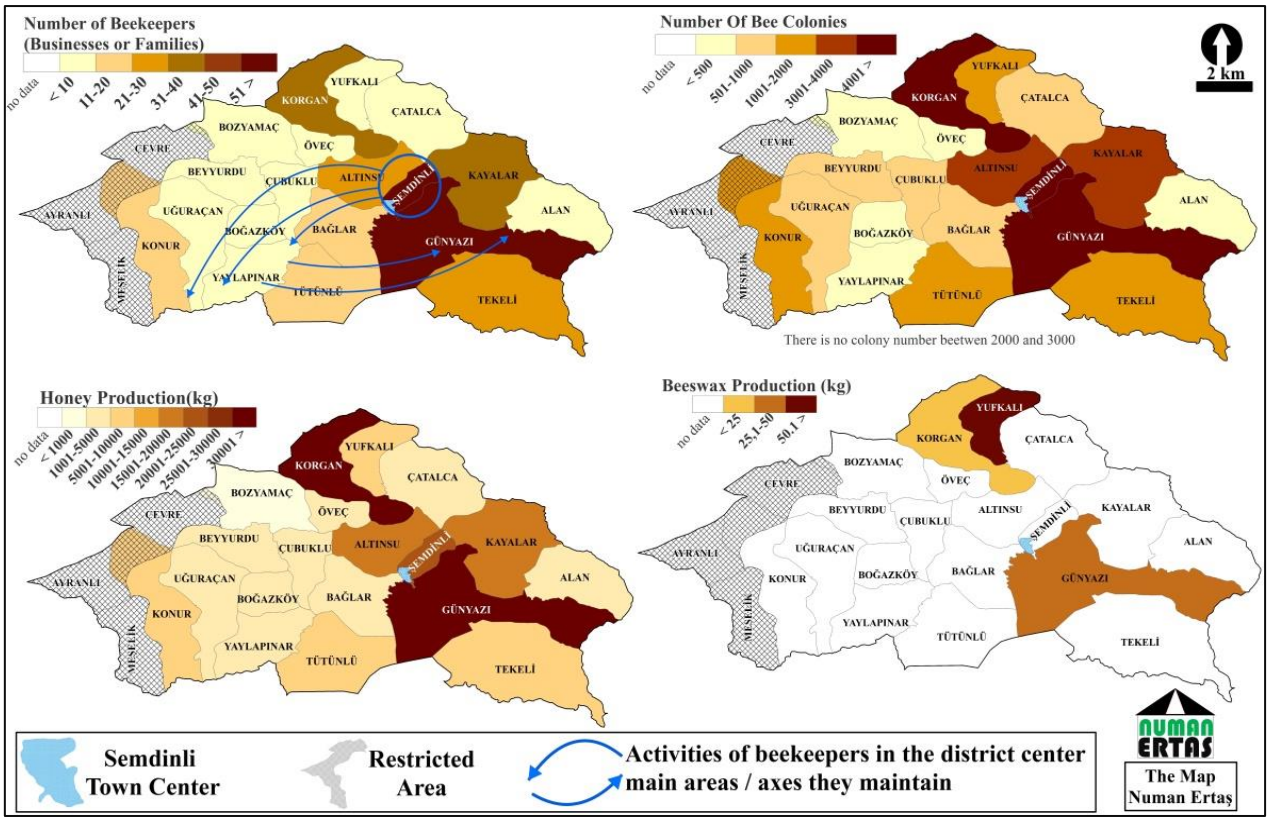
Chart 1. Temporal Change of Semdinli Beekeeping Parameters (2004-2021)



Source: TÜİK. (The data of 2015 and 2016 were obtained from Town Directorate of Agriculture)

The first parameter of beekeeping activities is enterprises. The business is followed by the existence of the colony and the related production elements. Therefore, the existence of a business does not indicate that there will be factors of production. In the Map 1, where the spatial distribution of four different beekeeping parameters by village is discussed, it is seen that there are enterprises engaged in beekeeping activities in all villages, except for the evacuated villages. Although there are businesses in all villages, the village of Günyazı, the town center, villages such as Korgan, Altinsu and Kayalar remain the most concentrated area. In addition, approximately 60% of the villages have less than 10 enterprises. This means that town beekeeping is limited to 9-10 villages. The existence of a business is possible with the existence of a colony. 20% of the colonies in the town are located in Günyazı, 15% in the town center, 14% in Korgan, 11% in Altinsu and 10% in Kayalar village. This means that 70% of the total colony existence and even honey production is in these settlements. The exception is that 75% of the beeswax production in the town is obtained only from the Yufkali village.

Map 1. Distribution of Semdinli Beekeeping by Villages (2021)



Source: Created based on the data of TÜİK

Semdinli, consists of 21 villages (TUIK, 2021) and 61 hamlets connected to these villages. Therefore, Semdinli consists of 87 settlements in total, with 5 neighborhoods constituting the town center. Among these settlements, Meselik, Ayranli and Cevre (Map 2) have been evacuated due to security and terrorist incidents and today are considered where entry is prohibited. Therefore, the prohibited villages were not included. The settlements in the town are concentrated in four valleys in general and the average elevation of these valleys is around 1500 meters. 37% of these settlements are between 1251-1500m and 33% of them are between 1501-1750m and 70% of the total is between 1251-1750m codes. 21% of the remaining parts of the settlements are at 1751 meters and above, and 10% are at 1250 meters and below. Having such a distribution of settlements has caused beekeeping activities to be concentrated in similar altitude ranges. In general terms, more than 70% of beekeeping activities and all parameters take place at a distance of 500 meters between the codes 1251-1750. The altitude level with the second-degree density is 1751 meters and above, around 20%. Therefore, the elevation level where the related activity is 10% or less is the southwestern part of the town and the parts below 1250 meters forming the Derecik town border (Map 2).

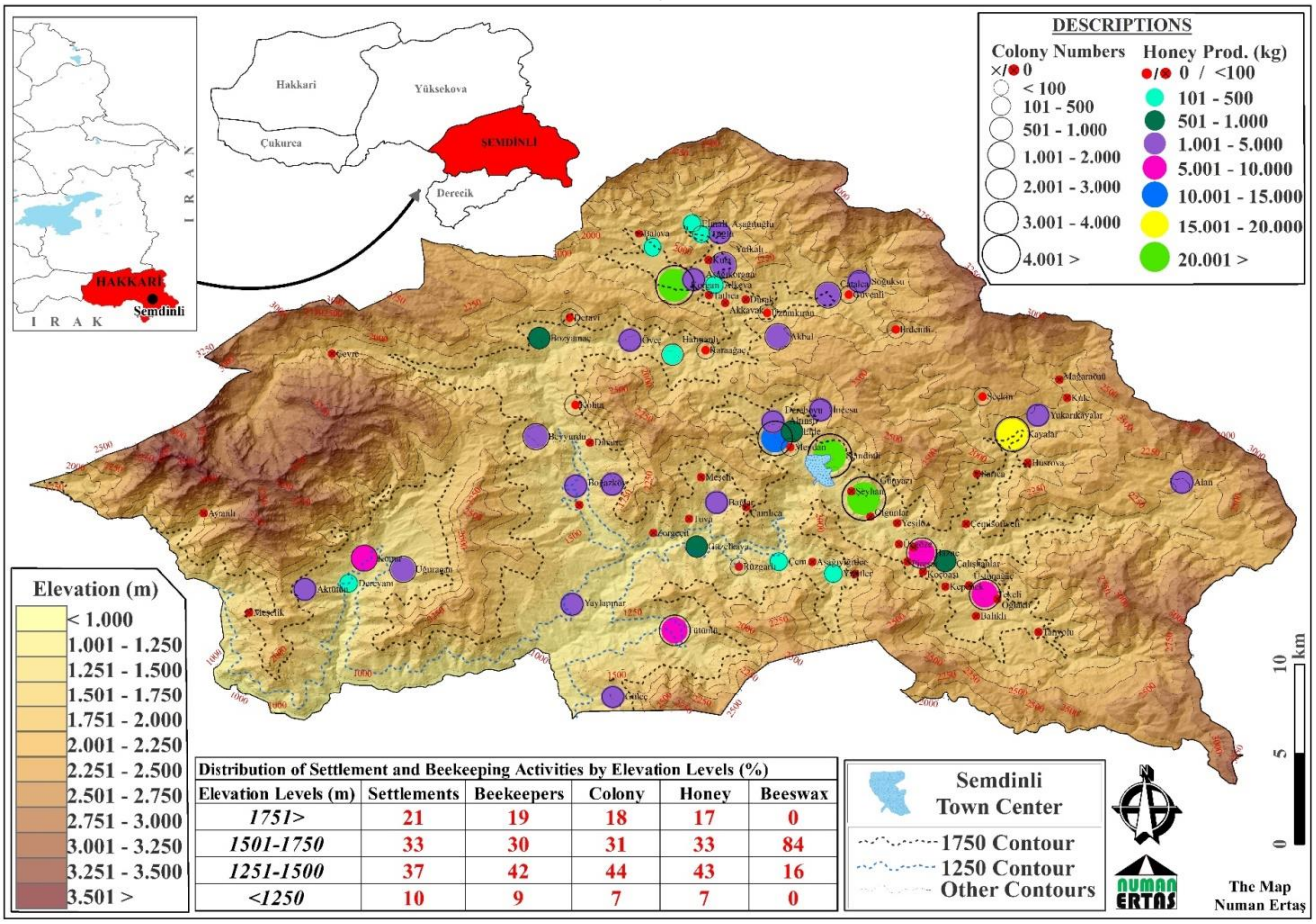
Nearly half of the beekeeping activities in the town are carried out at an altitude of 1251-1500 meters. Actually, 42% of beekeeping enterprises, 44% of colonies, 43% of honey production and 16% of beeswax are in this altitude range. In this altitude range, which includes the town center, especially Günyazı and Altinsu, Beyyurdu and Bozyamaç are the villages where beekeeping is most intense. In addition, in most settlements such as Ustunagaç, Meseli, Samanli, Uçgoze, Dinarte, Aşagiyigit, Zorgecit, Tuva and Seyhan, this activity is almost never done (Map 2). However, one should not forget the detail of the town center, which has a greater potential than most of the mentioned villages. The number of enterprises and production parameters registered in the town center is higher than the sum of many villages. But the fact that beekeeping in the town center is difficult due to natural conditions and population has caused beekeepers to carry out migratory beekeeping in different villages. Although these beekeepers carry out their activities in different villages, production and beekeeping elements are registered in the town center. That is why the villages, or the places visited were not taken into account in the spatial distribution data. The activities of the beekeepers in the town center are mostly carried out by relocating two or three times in a period. The first is the southwestern parts where the average altitude is relatively lower (<1250m) and the plant grows earlier. With the warming of the weather, beekeepers go from these valleys forming the border of Derecik to the southeastern parts of the town where the average altitude is higher, and this creates the second movement of beekeepers (Map 1 and Map 2).

The second elevation level, where beekeeping is most common, is the area between 1501-1750 meters. Although the altitude average has increased compared to the previous level, it can be said that beekeeping activities still do not lose their

intensity much. 33% of the enterprises, 30% of the colonies, 33% of the honey production and almost all the wax production (84%) are located between 1501-1750 meters, which is the second altitude range where beekeeping activities are most common in the town. There are 29 settlements in this elevation range, most of which are hamlets. Among these, especially Tekeli, Korgan and Hazne have a special importance in terms of production potential. In addition, beekeeping is rarely practiced in most settlements, but it is not practiced at all in places such as Sarica, Piresar, Kepenek, Yukariyigit, Tatlica and Kula. The upper limit of settlement in the town is 2000 meters on average, and beekeeping activities come to an end before reaching 2000 meters. 1751 meters and above, which forms 21% of the settlements in the town, constitutes the third area where beekeeping activities are carried out the most. If the Seckin hamlet (2100 m) of Kayalar village is excluded, this elevation range can be considered as 1751-2000 m. This altitude range constitutes 19% of beekeeping enterprises, 18% of colony numbers and 17% of honey production in the town. Beekeeping activities in this altitude range are mostly carried out in the settlements of Incesu, Yukarikayalar, Akbal, Kayalar and Alan. This activity is rather weak in settlements such as Magaraonu, Kule and Husrova. The area below 1250 meters, or more precisely between 1190-1250 meters, is the weakest link in all parameters of beekeeping (Map 1 and Map 2).

Map 2.

Location, Elevation Steps, and Spatial Distribution of Beekeeping in Semdinli (2021)



Source: Created by using the data of the Ministry of Agriculture and Forestry

3. Findings

The findings of this research include interviews with beekeepers in the most honey producing villages of Semdinli. As a result of the analysis of the research data, opinions and suggestions were reached in the context of the demographic structure of the beekeepers, the method of continuing the beekeeping activity, the main problems that the beekeepers experience, the income-expenditure status of the beekeeping activity and the predictions about beekeeping. The research findings obtained in the field were gathered under eight topics. In the findings presented descriptively, most of the main themes were tabulated with their sub-themes and interpreted by giving direct quotations. Most of the participants are married men (M) (93%), between is 41-60 age. 48% are primary school (PS), 22% high school graduates (HS), common (MS) and undergraduate (UG) graduates have 4% each. And literate (L) has a share of 15% and illiterate (IL) 7%.

3.1. Findings Regarding the Basic Beekeeping Parameters of the Participants

Table 1 contains information about the basic beekeeping parameters of the participants. Considering that 30% of the participants had a beekeeping background of 11-20 years and the other 30% had 21-30 years, it was concluded that more than half of them had a beekeeping background of 11-30 years. While the ratio of beekeepers with 6-10 years and 31-40 years of beekeeping background is equal (15%), it is 7% of those with more than 41 years and 4% of those with less than 5 years of experience, who can be called new beekeepers. Considering the reasons for doing beekeeping, many of the participants, such as 78%, stated that they did this activity out of necessity, with expressions such as there is no other job / source of livelihood. In fact, as mentioned above, the low plant production potential of the Semdinli countryside and the fact that the existing production is mostly animal husbandry made beekeeping a kind of necessity. The second majority of the participants (11%) state that they do beekeeping because it is their father's profession. This point of view also shows that beekeeping, which has become a cultural element, is sometimes carried out for the sake of memory. 7% of the participants stated that they did this activity because they liked it, and 4% stated that they did it to protect nature (Table 1).

Considering the assets of the participants related to the beekeeping activity, it was concluded that the enterprises were generally small family businesses, and the activity was focused on subsistence. 38% of beekeepers have 100-199 and 27% have less than 99 colonies. Therefore, beekeepers with fewer than 199 colonies have a large share (65%). These groups are followed by beekeepers with over 400 colonies and a share of 15%, which contribute 35% to honey production. Participants with colonies between 200 and 299 constitute 12%, and participants with 300-399 colonies constitute small groups with a share of 8% (Table 1).

Table 1. Information on Basic Beekeeping Parameters of the Participants

Parameters						
Duration of beekeeping (years)	**<5**	**6-10**	**11-20**	**21-30**	**31-40**	**41>**
	%4	%15	%30	%30	%15	%7
The reason for beekeeping	Because it's my father's job					%11
	Because there is no other job / livelihood					%78
	Because I love beekeeping					%7
	To protect nature					%4
Assets related to the activity	Hive (Colony) Number Groups					
	<99	**100-199**	**200-299**	**300-399**	**400>**	
	%27	*%38*	*%12*	*%8*	*%15*	
	Honey Production of Groups (kg)					
	4.368	**10.108**	**6.580**	**2.100**	**12.264**	
	%12	*%29*	*%19*	*%6*	*%35*	
Education Level Related to Beekeeping	I got an education		%37	I didn't get an education		%63
Membership Status of the Cooperative	I am a member		%63	I am not a member		%37
	I have seen the benefit		%0			
	I haven't seen the benefit		%100			

As mentioned above, beekeeping is mostly done with traditional methods and most of the participants prove this with their perspective on beekeeping education. 63% of the participants state that they did not receive any training on beekeeping, either learned from their father or imitated experienced beekeepers. In addition, giving theoretical beekeeping training does not attract the attention of beekeepers. Therefore, it is necessary for the activity to be practical for the relevant training to be useful. As a matter of fact, one of the participating beekeepers (P1; M, 38, UG, Catalca) said, "I received theoretical training, researched, read, and got expert opinions. But education is good in theory, it is insufficient for practice", and states that theoretical education does not have the expected effect. Although the participant beekeepers generally approach the cooperatives positively, they state that they do not see any benefit from the cooperative membership. In fact, 63% of the participants state that while they are members of any cooperative, all of them do not benefit from it. A participant with 45 years of beekeeping experience (P2; M, 74, MS, Catalca) stated that "Cooperative understanding consists of signboards and is empty structures that live on member fees", and another participant (P10; M, 43, PS, Altinsu) said, "It is not useful. does not support, we have become a compulsory member" supports this idea (Table 1).

3.2. Findings Related to How the Participants Continue Beekeeping Activity

The way of maintaining beekeeping consists of many different activity branches such as bee treatment, bee feeding and change of place during the production phase of beekeepers. The beekeeping method varies depending on the level of education, economic opportunities, and the presence of vegetation. It can be clearly seen that the participant beekeepers carry out this activity with traditional methods. One of the best examples of this is the treatment method of beekeepers in bee

diseases. While 66% of the participants apply their own methods to bee diseases, 33% call prefer calling a veterinarian. It has been observed that beekeepers generally receive support from more experienced people in bee diseases. The statement of one of the participants who does not prefer the assistance of a veterinarian (P11; M, 65, L, Kayalar) as "We do not call veterinarians, we consult those who has knowledge, and we get their opinions" is actually quite common. One of the important elements of the beekeeping method is the bee feeding method. Considering the sugar or glucose usage status of the participant beekeepers, the majority (85%) stated that they use it for feeding during the breeding periods and winter months (Table 2).

Most of the participants (70%) are migrant beekeepers and these migrant beekeepers generally (59%) prefer Hatay (Dortyol) region. However, as mentioned above, many participating beekeepers in the town transplant beehives to Derecik, where spring comes earlier. Therefore, Derecik is the second most preferred with a share of 18% in mobile beekeeping. Other places preferred by mobile beekeepers are Van, Diyarbakir and Mugla with equal proportions. Relocation in a relatively narrow area can also be considered as mobile beekeeping. 50% of the participants change their colony locations by following the spatial distribution of flowers during the period. During the year, 17% of the participants stated that they took the colonies to the highlands 2-3 times, 17% to different places depending on the situation with flowers, and 11% to the high areas of the surrounding villages. Only 6% of the participants did not change the location of the colonies throughout the year (Table 2).

Table 2. Information on the Participants' Beekeeping Method

The Methods	%					
Treatment method in bee diseases	I call the vet		33	I treat myself		*66*
Using sugar or glucose	Yes, I give it to feed during calving and winter					*85*
	No I dont give at all					*15*
The place to continue the beekeeping activity	I'm a mobile beekeeper		70	I am a steady beekeeper		*30*
Traveling places in mobile beekeeping	Hatay	*59*	Van	*6*	Mugla	*6*
	Derecik	*18*	Diyarbakir	*6*	Others	*5*
Changing the hive location during the year	I take them to the highlands 2-3 times					*17*
	I take them to the high areas of the surrounding villages 2-3 times					*11*
	Wherever there are more flowers, I take them there					*50*
	Depends on flowering					*17*
	I never change it					6
Perspective on mobile and fixed beekeeping	It must be, because the yield is high					73
	It's not right because it spoils the quality of Semdinli honey.					9
	It's not right because it is not good for bee health					9
	It's not right because it costs too much					9

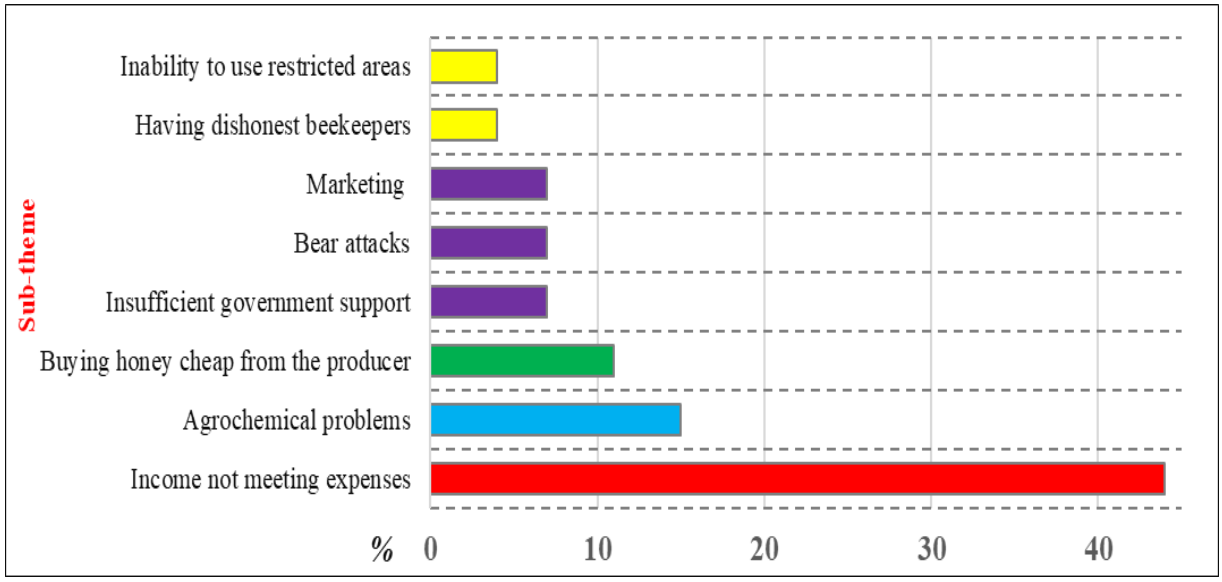
Mobile beekeeping positively affects honey yield, which confirms that mobile beekeeping provides more income than fixed beekeeping (Uzundumlu et al., 2011; Kanakan & Erkan, 2020). When Chart 2 is examined, most of the participating beekeepers expressed their opinion in this regard, and 73% of them think that mobile beekeeping should be a must, as it provides more efficiency. However, other participants do not find mobile beekeeping appropriate because it impairs the quality of Semdinli honey (9%), is not good for bee health (9%) and is expensive (9%). One of the participants (P2; M, 74, MS, Catalca) supports that mobile beekeeping will deteriorate the quality of Semdinli honey, with the statement "I partially recommend mobile beekeeping, but it is contradictory to have Semdinli honey." Similarly, other participants expressed the following: "Honey is plentiful, the bee return strongly, but there will be no pure Semdinli honey" (P5; M, 56, PS, Korgan)" or "The wandering bee gets confused" (P18; M, 35, HS, Gunyazi). In addition, those who approach mobile beekeeping negatively because of the costs say, "The yield is high, but it also costs a lot, I pay between 4-7 thousand rents, there is also a travel expense" (P3, M, 40, PS, Konur), and "Mobile beekeeping is good, but the cost is high" (P17; M, 67, PS, Balikli).

3.3. Findings Related to the Problems Experienced by the Participants in the Line of Beekeeping Activities

The determination of the problems experienced by beekeepers regarding beekeeping is very important in shedding light on the future status of the relevant activity. In order to reach the findings related to these problems, the question "What do you think is the biggest problem of a beekeeper" was asked to the participants and the answers given by the participants to this question are presented in Chart 2. As demonstrated, nearly half of the participants stated that the main problem of beekeepers is "the inability of income to cover expenses". "We have difficulty in obtaining the materials of the beekeeping activity. The biggest problem of a beekeeper is material, feed and transportation that become expensive (P20; M, 53, HS, Asagikorgan)" and "Our labor remains unpaid. Honey has become an undervalued product (P18; M, 35, HS, Gunyazi)" confirms

the idea. The biggest (15%) problem of beekeepers is the pesticides used by other farmers to spray trees. Beekeepers claim that bee deaths occur due to the pesticides. The statement of one of the participants, “The problems we experience are mostly the death and destruction of bees due to pesticides used for trees (P6; M, 35, PS, Bogazkoy)” explains this issue. It has been observed that most of the participants think that Semdinli honey is sold cheaply. In fact, although only 11% of these beekeepers answered the related question as "cheap purchase of the honey from the producer" displays a clear consensus with those who claim that the income cannot cover the expenses. The opinions of the participants such as "I find it very difficult to sell my product at the real price (P20; M, 42, PS, Asagikorgan)" and "Our problem is that the price of honey is low and we cannot afford the expenses (P21; M, 51, PS, Yufkali)" are statement confirming this consensus. Other problems of the participants about beekeeping are that the government does not provide sufficient support at a rate of seven percent, bear attacks and marketing, and dishonest beekeepers who each have a share of four percent, and the inability to use the forbidden areas.

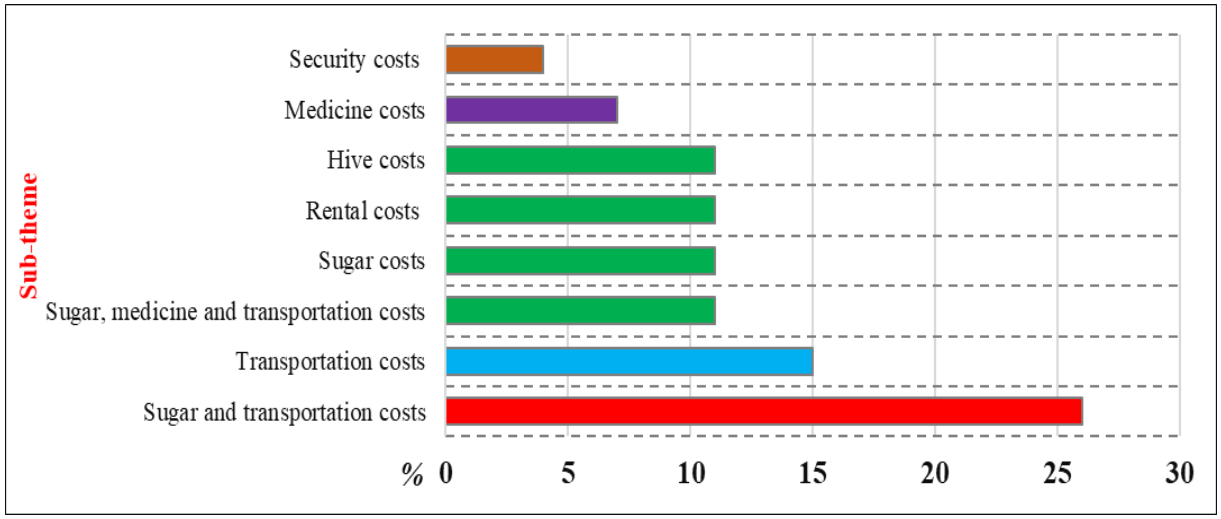
Chart 2. Beekeepers’ View on the Problems They Experience



3.4. Findings Regarding the Basic Expenses of Beekeepers' Beekeeping Activities

The biggest reason why livestock activities are sometimes interrupted is that they are away from providing economic input. Therefore, the economic depression seen in a country causes an increase in the expense fees in livestock activities and a decline in animal husbandry. This general situation can be clearly seen in Semdinli beekeeping. As mentioned above, the biggest problem of the participants is that the income from beekeeping cannot provide a living. In Chart 3, the expenses of the participants are presented. In obtaining these findings, the participants were asked, “What is your most important expense in beekeeping activity?”. According to the data obtained in line with the answers given by the participants to this question, the biggest expenses of them are bee feeding, transportation of colonies, especially in mobile beekeeping, rental expenses of the area where beekeeping is carried out, and fight against bee diseases. 26% of the participants state that their main expense is sugar and transportation, and the second main expense is transportation with a rate of 15%. The fact that the town beekeepers mostly prefer Hatay province to obtain more honey yield confirms how important the transportation costs are. As a matter of fact, the distance between Semdinli and Hatay (Dortyol) is more than a thousand kilometers. 11% of the participants state that basic expenses are collected in three items: sugar, medicine, and transportation. Apart from these, it is stated that items such as only sugar, only rent and only beehives constitute basic expenses with equal proportions (11%). Finally, medicine (7%) and safety (4%) expenses are the other items (Chart 3).

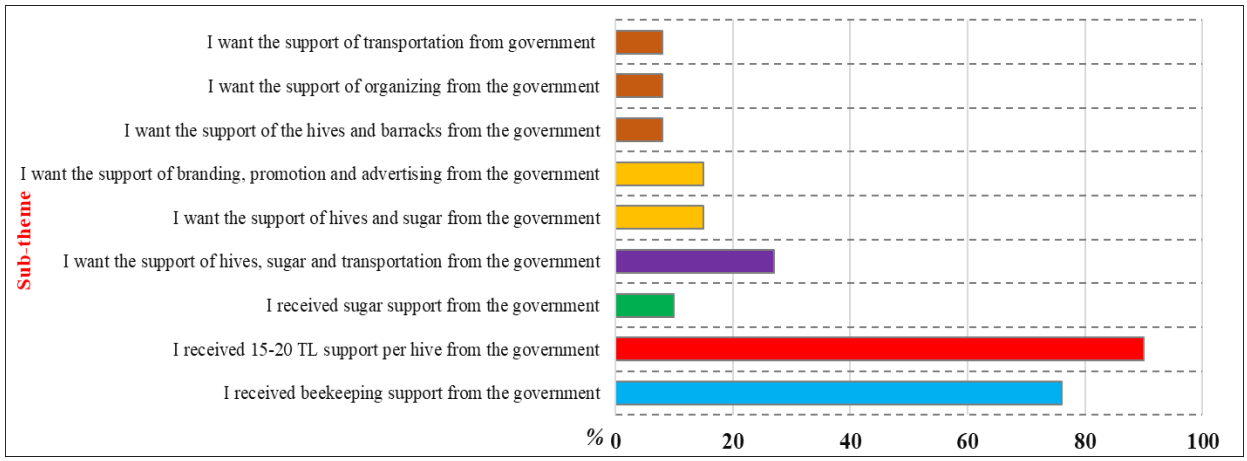
Chart 3. Beekeepers' Views on Basic Expenses of Beekeeping Activities



3.5. Findings Regarding the Supports Given by the State to the Beekeepers and the Support Requested by the Beekeepers from the State

To obtain the opinions of the beekeepers about the state support, the participants were asked, "Does the state give you any support since you are a beekeeper?" and "What kind of support do you want the state to give to beekeepers?". Although most of the participants (76%) stated that they received support from the state, they stated that support was quite insufficient and almost did not cover even one of the expense items. As seen in Chart 4, 90% of the participants stated that the support they received from the state was 15-20 liras per colony, and the remaining 10% stated that they received some sugar. In addition, it is noteworthy to mention that there are quite different options/requests in the type of support requested from the state. However, it is seen that most of the requested supports are in parallel with the expense items. 27% of the participants emphasized that the state support should be hives, sugar and transportation. The statement of one of the participants, "We do not want cash from the government, we want bee materials, the money given to us is already low and we cannot buy the material, but the state can buy and distribute it itself (P7; M, 58, L, Tekeli)" explains the importance of the expenses and possible support of the beekeepers. Mostly, the support that fixed beekeepers request from the state is hive and sugar-oriented, excluding transportation. 15% of the participants expressed that the support should be hives and sugar. Another support request is that the state takes the responsibility of all production and marketing processes of Semdinli honey rather than providing financial support. 15% of the participants mentioned that state support should be "branding, promotion and advertising". One of the participants' statements "We want inspection, follow-up and purchase guarantee from the state (P5; M, 56, PS, Korgan)" confirms such demand. In addition, the support request of 8% of the participants is in the form of "organizing" and this is actually a factor related to state control. Other supports requested from the government are in the form of interest-free loans, grants, land rents and other supports to encourage beekeeping at a rate of four percent, primarily beehives and barracks (8%) and transportation (8%) (Chart 4).

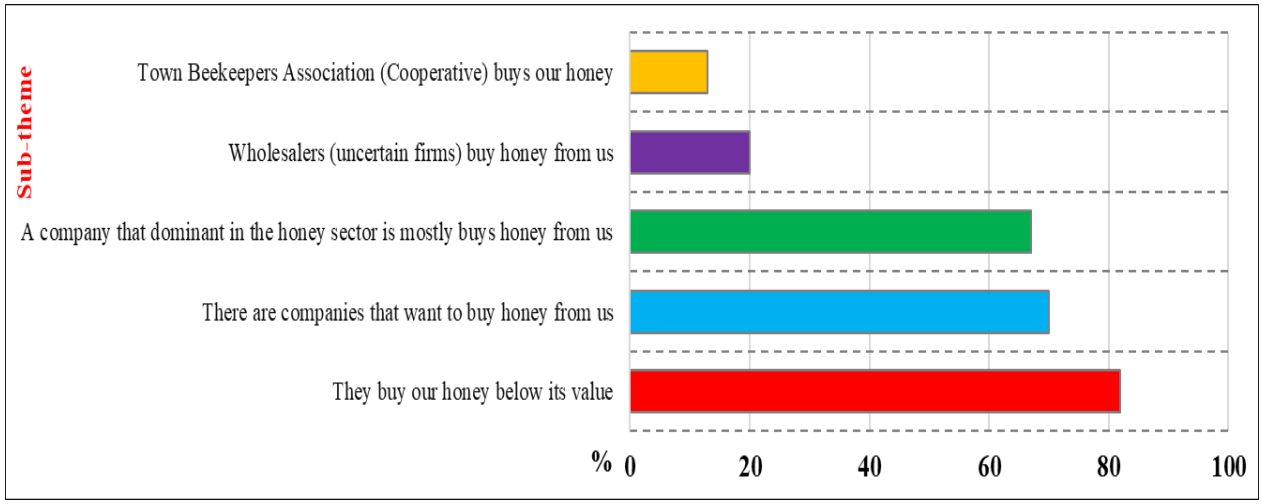
Chart 4. Beekeepers' Opinions on State Support for Beekeeping



3.6. Findings Related to Firms and Companies Desiring to Purchase Honey from Participating Beekeepers

Marketing is one of the important problems of beekeepers in Semdinli. According to the observations made in the field, it has been found that Semdinli honey does not have a regular market. Regarding the institution and organization dimension of the marketing activities of Semdinli honey, the participants were asked "Are there any company/companies that want to buy honey from you?" and “Do the companies/companies that want to buy honey from you buy your honey cheaply or at a price similar to the market?”. As seen in Chart 5, in the findings obtained from the analysis, 70% of the companies concluded that wanted to purchase honey, and one of them is the one which had made a name in the honey sector (67%). It has been concluded that there are institutions and organizations such as Wholesalers (uncertain companies) (20%) and Beekeepers' Association (Cooperative) (13%) apart from the company mentioned above that wants to purchase honey from the participating beekeepers. While 18% of the participants stated that companies buy Semdinli honey at prices like in the market, 82% stated that companies or institutions try to buy their honey far below its value (Chart 5). However, it has been observed that the role of the company, which has made a name in honey production, is quite high in these formations. The opinions of the participants below were concluded that the mentioned company caused a decrease in the income sources of beekeepers. For example, “It is undervalued compared to the market, most of the time the expenses do not cover the income, but we have to pay (P6; M, 50, PS, Gunyazi)” and “They try to buy it cheaply and then two-sided fraud is triggered (P5; M, 56, PS, Korgan)”. It was concluded that the companies left no other choice to some participating beekeepers but to be a part of the purchase. On the other hand, some participants stated that in this unfair exchange, the companies had a negative impact on the reputation of Semdinli honey by mixing Semdinli honey with other honeys. For example, the statements such as "they say it is cheap but not enough. They go and buy poor quality honey from other regions, mix it with our honey. They lower the value and put it on the market (P1; M, 38, UG, Catalca)" and "They buy it cheaply and exploit it and mix it with other honeys and put it in front of the consumer with the label of Semdinli honey” (P2; M, 74, MS, Catalca), are supporting arguments.

Chart 5. Beekeepers’ Views on Companies which Want to Purchase Honey from Them



3.7. Findings Related to the Earnings Dimension of the Participants' Beekeeping Activities

As in every economic activity, the prerequisite in animal husbandry activities is to provide a sufficient income. However, in the activities such as animal husbandry, the frequency of being affected by natural and social conditions can sometimes be higher. The effect of natural conditions in Semdinli has caused these activities to be limited in terms of both distribution and species. In this part of the findings, the earning dimension of the participating beekeepers was examined. Chart 6 shows the findings which consist of many sub-themes. When the income sources of the participants are examined, it is concluded that it is mostly limited to beekeeping, that is, there is no income other than beekeeping (65%). 78% of the participants who have income other than beekeeping stated their income is provided by agriculture and animal husbandry, and 22% are dependent on pension. As stated in previous findings, high beekeeping expenses and purchasing products such as honey below their value caused the income from beekeeping to be insufficient for subsistence. Therefore, 80% of the participants agreed that the income from beekeeping is not enough for their household expenses. In addition to the insufficient beekeeping income, 65% of the participants expressed that this situation is worse than ten years ago, and for the 31% the situation remains the same. The earnings size of Semdinli beekeeping is related to honey production as it is in Turkey. Therefore, the hive and other

production elements are mostly in the background. The biggest gain of the participants in this activity is honey with a rate of 88%. Honey is followed by other production parameters such as beeswax and propolis. Marketing, which is an important problem for beekeepers, has caused beekeepers to not be able to bring their products mostly to the province or abroad, and it has resulted in 56% of the producers doing this trade in the town center and 28% outside the town center and the province. This caused the rate of participants who exported Semdinli honey out of the province to remain at 16% (Table 3).

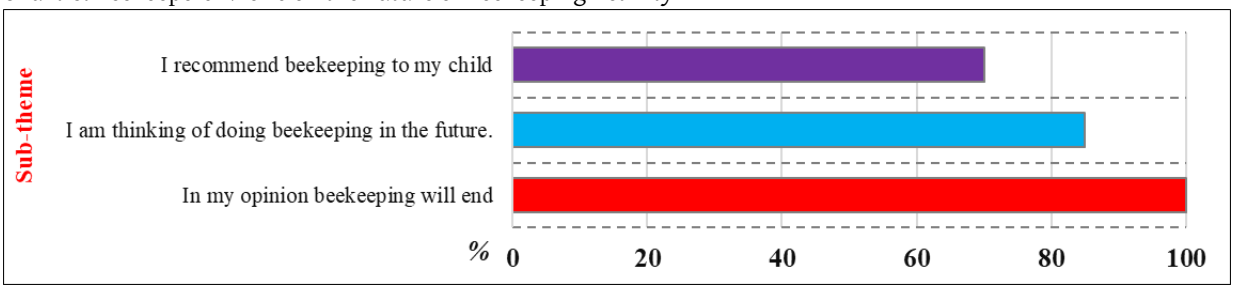
Table 3. Beekeepers' Views on the Evaluation of Earning Dimension of Beekeeping Activity

Sub-theme		**%**
Do you have any income other than beekeeping?	Yes	*35*
	No	*65*
Incomes other than beekeeping	Agriculture and Livestock	*78*
	Retirement	*22*
The ability of the earnings from beekeeping to support the house	Yes	*20*
	No	*80*
Comparison of beekeeping incomes with ten years ago	Worse	*65*
	Same	*31*
	Better	*4*
The biggest source of income in beekeeping	Hive	*4*
	Honey	*88*
	Other	*8*
Honey selling place	In the town center	*56*
	Out of the province	*16*
	Both	*28*

3.8. Findings on the thoughts of Beekeepers about the Future of Beekeeping

The fact that the main reference in farmer predictions is experience, it makes these predictions valuable especially in animal husbandry. Beekeeping, which plays a very important role in Semdinli animal husbandry, has a negative course according to the participants. None of the participants, who have been actively working in beekeeping activities for many years, expressed a positive opinion about the future of beekeeping (Chart 6). Numerous findings justify these predictions, such as the inadequacy of beekeeping incomes to cover living expenses, in addition to the answers to questions about the future of beekeeping directed to the participants; if it continues like this, there will be no such thing as beekeeping (25%), because of fraudsters (20%), because of lack of ownership (15%) and because of expenses (10%). The marketing of fake honey as Semdinli honey is one of the significant threats to beekeeping in the town. Two participants from the same village said that the orientation towards beekeeping will continue increasingly. But as long as there is lack of principles, worthless poor-quality products will multiply in parallel with fraud and lack of control. They emphasized their hope that it will reach its brand value with the product obtained under state control and periodic inspection or analysis. "Otherwise, it looks like we will continue to deceive each other" (P1; M, 38, UG, Catalca)". And the statement as, "Dishonest traders, including some cooperatives, should be prevented from mixing Iranian honey with Semdinli honey, and severe penalties should be given, otherwise this business will be over. (P2; M, 74, L, Catalca)" reveals the seriousness of honey fraud. Similarly, other participants' statement such as, "Honey market will continue like this as long as there is fraud (P13; M, 39, HS, Erdemli)", "It will be worse because fraud is rampant, there is fake honey (P12; M, 55, L, Korgan)", and "Beekeeping is not going well, I do not see the end of this job well, fraud is out of control (P11; M, 65, L, Kayalar)" displays the hopelessness in this activity. As mentioned above, a significant part of the participants thought that this activity would come to an end due to beekeeping expenses. Some of the participants think that it is getting harder to keep bees due to the costs (P22; M, 39, HS, Aşagituglu), "The conditions have become more difficult with the recent hikes, the number of people who quit beekeeping will increase (P9; M, 62, PS, Baglar)", and "Sugar reaches a billion. Fuel is expensive, we can't buy materials, it is very difficult to do beekeeping in this situation (P25; M, 53, HS, Moda)", identify the gravity of the problem. Other participants believe, "Beekeeping here will end for three reasons. First, because there is no marketing, beekeeping will disappear in these conditions. Secondly, bees are harmed because of wrong pesticide application. Third, there is a great decrease in the number of bees due to global warming (P10; M, 43, PS, Altinsu)", "Vague process, poor quality but a lot of honey (P3; M, 40, PS, Konur)" expressed why beekeeping in Semdinli has come to an end.

Chart 6. Beekeepers' Views on the Future of Beekeeping Activity



Animal husbandry, like other agricultural activities, is an activity that is closely related to cultural patterns. Therefore, cultural elements sometimes require maintaining livestock activities despite low profits. Regardless of the insufficient income from beekeeping, the participants want to continue this activity, and also wish that the future generations will continue. 85% of the participants stated that they would like to be beekeepers in the future and 70% of them would recommend their children to be beekeepers (Chart 6). It was concluded that a considering number of the participants (44%) did not recommend beekeeping to their children, since beekeeping did not bring profit compared to the past and the loss that was caused. Although the expressions of the other participants who did not recommend this activity are different, it is believed that the reasons are close to each other. As a matter of fact, 22% of them justified as "because there is no *bread* (earning) in this business", 22% as "because the business has gotten out of hand, fraudulent honey sellers have increased" and 11% as "there is a marketing problem" (Chart 6).

Conclusions and Recommendations

Animal husbandry is one of the most indispensable occupations of human life. It is an important source of service in meeting many basic needs of people such as nutrition, shelter, and clothing. In this study, beekeeping activities, which constitute one of the important branches of animal husbandry, are discussed in the context of Semdinli.

Semdinli, ranks 55th with 31,866 colonies, 70th with 313 tons of honey production, and 16th with 31 tons of beeswax production among all towns in terms of colony presence. Semdinli, constitutes 0.4% of Turkey's colony wealth, 0.3% of honey production and 1% of beeswax production. As can be seen, the town does not have a significant share in beekeeping in Turkey. However, it is much more important than the percentage share, as it is the main occupation and an important source of livelihood of the rural and farmers of the town. Although beekeeping is carried out in all villages, it is carried out in four main villages such as Günyazı, Korgan, Altinsu and Kayalar, apart from the town center. Town center and Günyazı in terms of the number of beekeeping businesses, and the above-mentioned villages in terms of colony presence and honey production represent Semdinli beekeeping. Most of the beeswax in the town is produced mainly in Yufkali, Günyazı and Korgan villages. Beekeeping in the town is mostly carried out between 1251 and 1750m isohips. Places lower than 1250m and higher than 1751m are the areas where beekeeping is done relatively less. 75% of beehives, 76% of honey production and all of beeswax production in the town are in the altitude range.

The findings obtained in the study area are presented with eight themes consisting of several sub-themes. 78% of the participants do beekeeping on the grounds that they do not possess another job and then because it is their father's profession. It has been determined that the beekeeping profession will decrease considerably if any alternative income source is obtained. That is why it is important to take state-based steps for the continuation of the beekeeping profession. The steps should be in the nature of some incentive support rather than cash aid. It has been determined that most of the participants have small family businesses rather than professional beekeeping. Participants did not approach beekeeping education positively and 63% of them stated that they practiced beekeeping with traditional methods. The participants were also negatively affected by cooperatives. While 63% of the beekeepers are not members of any cooperative, all the members claimed that they did not benefit from these institutions. At this point, it is necessary to control the cooperatives by the relevant units and discuss the issues in a platform where beekeepers are also present.

In the findings about the way of beekeeping of the participants, it was concluded that 66% of the beekeepers did not call a veterinarian in bee diseases and traditional methods were applied in such cases, including the use of medicines. In addition, the statement of the participant who called a veterinarian in bee diseases as *"The biggest enemy of beekeeping in the town is Varroa disease, and this disease cannot be controlled without a veterinarian"* is noteworthy. In fact, according to Crane (1999b), one of the most important reasons for the disappearance of traditional beekeeping and the emergence of the need for modernization is the spread of Varroa. Therefore, it should not be forgotten that trying to solve veterinary problems with traditional methods

may cause undesirable results.

70% of the participants are mobile beekeepers and Hatay (Dörtyol) is mostly preferred region in this regard. There is also small-scale mobile beekeeping in the town, and beehive location changes are made two or three times a year. 73% of the participants stated that mobile beekeeping is and should be more qualified in honey yield. In mobile beekeeping, it has been scientifically proven that the yield obtained is higher due to the feeding of the bee from more than one vegetation area. However, the transportation of the hives and the rents of the area prevent the beekeepers in the town from being fully mobile beekeepers. Due to these expense items, less production was accepted by having to do fixed beekeeping. Therefore, by introducing a production obligation, the state should provide some facilities such as fuel discounts for mobile beekeepers.

The biggest problem of the participants is that the income does not cover the expenses with a rate of 44%. Purchasing honey below its real value prevents the beekeepers from providing sufficient input to their economy. This basic problem is followed by the death of bees due to the use of pesticides, bear attacks, marketing problems and the emergence of fraudulent beekeepers. The most fundamental factor in the emergence of beekeeping problems is the unparallel increase rate of expenses and the rate of incomes. Depending on the market conditions, the increase in expenses faster than income puts the beekeeper in a difficult situation. When the expense items of beekeepers are examined, it is concluded that items such as sugar, transportation, medicine, hive, and security require a significant budget. In this case, state support is not the only solution. However, it is essential to reconsider the state subsidies in line with the beekeepers' opinion. Although 76% of the participants receive state support, 90% of this support is limited to 15-20 TL per hive. Therefore, this support, which does not have an important place in beekeeper expenses, should be made more qualified. As seen in the findings, the support requests of beekeepers are not cash, but beekeeping materials. Therefore, it is possible for the sector to revive and reach a significant commercial volume by determining the net production potential of beekeepers and providing support for transport and bee feeding elements.

Marketing constitutes an important problem of Semdinli beekeeping. The majority of the participants sell their products in the town center and cannot market them outside the province. It can be clearly seen that the cooperatives are insufficient in terms of gathering all beekeepers under one roof and eliminating the problems experienced. Therefore, an organization should be established by the state at all stages of beekeeping, not only in marketing. Trying to purchase the honey of the beekeepers cheaply by companies that are dominant in the honey sector is a problem that needs an urgent solution. It should not be forgotten that the biggest income source of the beekeepers is only honey. Therefore, this unfair shopping reveals the dimensions of the marketing problem. In addition, Semdinli honey, which is bought cheaply by the companies, is mixed with other low-quality honeys, and put on the market, causing a negative impression about Semdinli honey. Based on the reasons mentioned above, for Semdinli beekeeping to continue in the future, it is necessary to organize the marketing in a way that will be done through a single channel.

The fact that 65% of the participating beekeepers have no income other than beekeeping shows how important the activity is or should be given importance. As a matter of fact, beekeeping is one of the most important livelihoods of the Semdinli countryside. However, beekeeping is now under threat due to the reasons mentioned above. According to 65% of the participants, beekeeping in Semdinli today is in a worse condition than it was ten years ago. As in the comparison with the past, the predictions about the future of beekeeping are also negative. All the participants think that beekeeping will come to an end. In addition, it was concluded that 85% of the participants will continue this profession and 70% of them recommend beekeeping to their children and future generations. However, young generations do not prefer this profession due to reasons such as the fact that beekeeping is seen as an elderly profession and the income in the profession is insufficient.

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I declare that I pay attention to all ethical principles and rules in the collection, analysis and reporting of data.

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The article was written by a single author.

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