



The role of apiculture in rural development in Turkey¹

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Abstract

In this study, the role of apiculture in rural development is examined with the help of rural development projects, implemented in Turkey. Accordingly, since 2000, rural development projects implemented by public and private sectors were evaluated. Document analysis method as a main methodology was used in the present study to analyze rural development projects. In addition, the findings were presented with the current literature results. The preliminary results showed that apiculture was not sufficiently emphasized in rural development projects in Turkey. However, there has been recently a significant increase in the number of projects about beekeeping in Turkey. These projects are mainly supported by the Ministry of Food, Agriculture and Livestock, TUBITAK and Ministry of forestry and water affairs.

Keywords: Apiculture, Rural development, Projects, Turkey

1. Introduction

Rural development aims at improving the living standards of the rural population. People who live in the rural area have disadvantages when compared with those who live in the urban area. Rural depopulation occurs due to the failure of solving rural problems and this causes serious problems to arise in urban areas. Thus, rural development is a political option which aims at uplifting the rural population and solving the migration and employment problems at the zone and has a strategical significance in resolving inter-regional imbalances. It also includes integrating the local people in decisions concerning development, improving the modern hard infrastructure, increasing the opportunities to access public services such as education and health, enabling a better use of rural environment and natural resources and promoting a sustainable administration (Ministry of Agriculture and Rural Affairs, 2004; Emekli et al., 2007). In order for rural development to succeed; policies and practices that will invigorate non-agricultural economy, that involve every category of the society, that will accelerate institutional developments, that will minimize social differences have become approaches that each international organization has adopted rather than those one-directional practices and policies that only aim at economic and agricultural integrity (Gulcubuk et al., 2010). When these facts are considered, regional development should be tackled together with sustainable development.

The issue of rural development in Turkey's national development plans has been examined under titles as community development, village and villager problems, regions privileged in development, regional development and village development. For years, rural development in Turkey was perceived as practices for improving spatial infrastructure such as improving agriculture

and stockbreeding, building village and forest roads, providing potable water (Celik, 2005). Diversifying economic practices and improving social infrastructure were not taken into consideration sufficiently. However, during the EU negation process, the understanding of rural development in Turkey started supporting the producer rather than the product and issues on increasing rural employment, decreasing migration and increasing rural enterprises came to the agenda. Small-scale rural development projects are implemented within recent regional large-scale development plans and programs (GAP, DAKAP, DOKAP etc.) in Turkey. The shared goals of these projects are to increase agricultural productivity, develop new sectors, increase employment, support entrepreneurship, decrease socio-economic gaps and to promote sustainability of the natural environment etc.

Rural development projects in Turkey have failed to achieve the desired achievement despite these alternative new practices. One of the main reasons for this is that the social dimension of development has not entered in the agenda sufficiently (State Planning Organization, 2006). One other factor is that rural settlements have a scattered structure and the settlement areas are too large in number (Arie et al., 2005; Inal Cekic and Okten, 2009). Rural regions in Turkey are primarily dependent on agriculture; however, the shattered and small-scale soil structure along with high production expenses reduced the sector's power of competition. That the rural population is undeveloped in issues concerning professional training, organization and collaboration also supports these drawbacks. Planning carried out by the central bodies with a traditional understanding have unfortunately failed to resolve the problems of provincial and rural areas. Whether or not rural development projects, practiced in order to improve rural agriculture, are the best solutions for decreasing rural poverty should be discussed (Ozturk, 2009). When the fact that rural areas in Turkey have different geographical characteristics is

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considered, diversifying rural economy become necessary (Ministry of Agriculture and Rural Affairs, 2011). Apiculture plays a key role in diversifying rural economy.

Among the agricultural practices, apiculture is the cheapest economic practice which also generates employment the easiest way. It is also a crucial means of income for families with no or very few lands. Thus, apiculture comes to the forth as a crucial tool in rural development practices of many countries (Kumova and Korkmaz, 2001). In general, Turkey has a mountainous topographic appearance. This has led to significant climate and flora differences in short distances. Also, due to the various climate conditions, the blossoming season continues throughout almost the whole year. Anatolia, the region where apiculture has the oldest and most expanded history, embodies three quarters of the world's total honey plant species (Firatli et al., 2000). Apiculture is a traditional agricultural activity which is carried out in almost all regions throughout Turkey. Almost every region in Turkey is potentially convenient for apiculture. 20 of the 25 bee species in the world exist in Turkey (Kence, 2006). The fact that apiculture is a means of employment mainly for producers living in rural areas and who have very few lands proves that apiculture is a crucial practice in Turkey's economy. With its 6.3 million colonies and above 90 tons of honey production, Turkey has a significant position in global apiculture (FAOSTAT, 2013). The bee population in our country, which ranks second in the number of colonies, enables sustainability in the flora, increases productivity and quality in plant production and serves as a crucial source of income with the honey and other productions (Taori and Chakravarty). Forests contribute significantly in carrying out this production. The relationship between honey production fields and forests is an important factor in rural development (Okan and Cosgun, 2012). Important projects, which support apiculture in forest villages, are carried out by ORKOY (Department of Forest-Village Relations).

Although Turkey is the second in the world concerning the number of colonies, with the average of 16 kg of honey per colony, it is 20 kg. below the world average (FAOSTAT, 2013). Moreover, this value corresponds to about one third of the figure in EU countries. Production of other beekeeping products such as pollen and bee milk is also low. The main needs in this sector are; modernization and development and refurbishment of existing instruments, equipment, machinery, storage and filling facilities. The producers should develop marketing skills, market their products at higher values, and use the revenue they generate to further improve their business. (IPARD-I Programme, 2013).

Turkey is encountering serious problems such as disorganized apiarists, lack of information about modern apiculture, bee pest, bee bugs, climate problems, avoiding apiarists in agricultural contention practices, the drawbacks in queen bee breeding and failing to diversify honey products. There are also problems such as the majority of the apiculture sector being unrecorded, instable prices and producer concerns about marketing fake honey. Despite all these drawbacks, apiculture is a strategical sector which should be supported so as to; protect and convey biological

diversity to future generation to promote sustainable food security and to prevent erosion which threatens Turkey at a large scale.

2. Purpose and Methods

The purpose of this study was to put forward the role of apiculture in rural development in Turkey with regards to rural development projects. Rural development projects implemented in Turkey since the last 2000 years were examined through the document analysis method. The results were evaluated through national and international literature.

3. Results and Discussion

In Turkey's rural development projects, apiculture has always undertaken the role as a means of agricultural development. Apiculture is also one of the oldest economic activities in Anatolia. The fact that apiculture was mentioned on stone scriptures in Bogazkoy, the place where the Hittites had settled during 1300 BC in Anatolia, indicates that apiculture has a long history in Anatolia (Dincol, 1982). Apiculture, which is a crucial source of agricultural development, is considered as an alternative economic practice in mountainous and woody areas which are inconvenient for planting. Thus, apiculture has gained support by being an alternative source of employment and by decreasing rural-urban migration. The amount of female population in rural areas in Turkey suggests that female employment and female entrepreneurship in apiculture is supported. When the key role of females in rural economic practices in Turkey are considered, it is clear that rural development will not succeed in the strict sense without the participation of females (Ozmete, 2012; Soysal, 2013). From 2000 to 2013, 139,695 women were given training in various animal husbandry issues, including beekeeping, as part of the Agricultural Education Project for Female Farmers, which was implemented by the Ministry of Agriculture in 19 provinces (IPARD-I Programme, 2013).

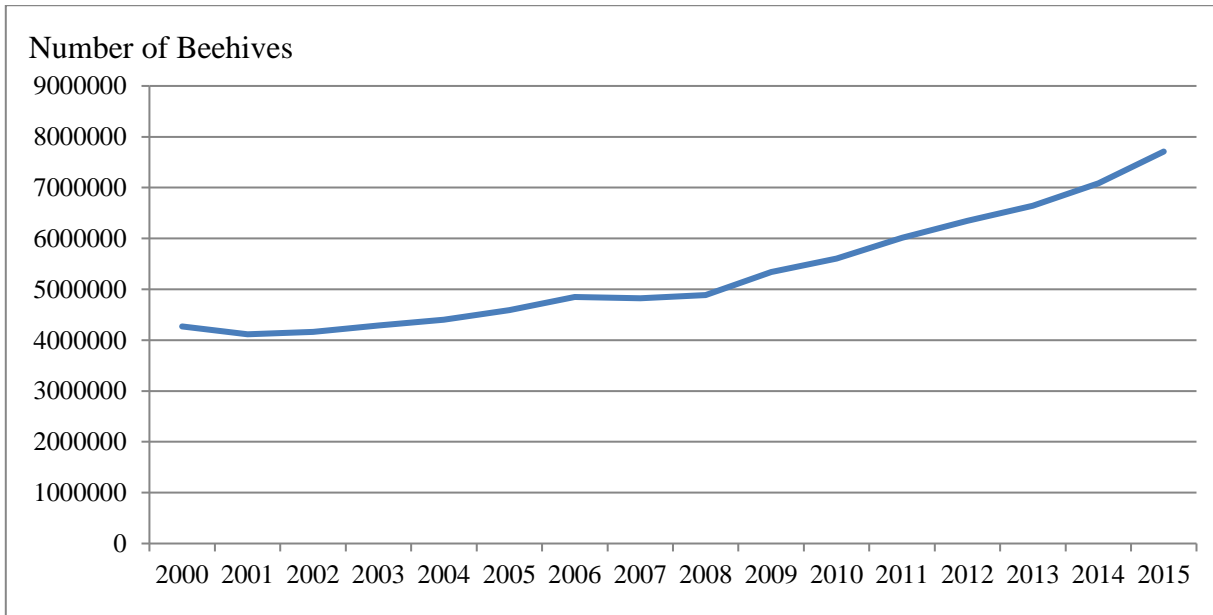
In recent projects which are implemented to develop apiculture, approaches, which aim at increasing the contribution of apiculture to the country's economy by supporting scientific studies in the field have come to the forefront rather than approaches which aim at decreasing employment anxiety. Apiculture is a profession which uses technology and information to promote sustainability and profitability, which is organized, which has ethical rules and which follows these rules and all these factors increase the importance of the profession (Gurel and Gosterit, 2011). Increasing the educational status of the rural population on apiculture through rural development projects has become a crucial issue (Adgaba et al., 2014). The issue of education has been on the agenda of rural development projects since the establishment of Village Institutes.

Year	The number of beekeeping villages	The number of beekeeping villages	The number of modern beehives	The number of transitional beehives	Total beehives	Honey production (tons)	Beeswax production (tons)
2000	22.571	-	4.067.514	199.609	4.267.123	61.091	4.527
2001	22.606	-	3.931.301	184.052	4.115.353	60.190	3.174
2002	22.423	-	3.980.660	180.232	4.160.892	74.554	3.448
2003	22.110	-	4.098.315	190.538	4.288.853	69.540	3.130
2004	22.133	-	4.237.065	162.660	4.399.725	73.929	3.471
2005	22.550	-	4.432.954	157.059	4.590.013	82.336	4.178
2006	22.305	-	4.704.733	146.950	4.851.683	83.842	3.484
2007	21.560	-	4.690.278	135.318	4.825.596	73.935	3.837
2008	21.093	-	4.750.998	137.963	4.888.961	81.364	4.539
2009	21.469	-	5.210.481	128.743	5.339.224	82.003	4.385
2010	20.845	-	5.465.669	137.000	5.602.669	81.115	4.148
2011	21.131	-	5.862.312	149.020	6.011.332	94.245	4.235
2012	21.307	-	6.191.232	156.777	6.348.009	89.162	4.222
2013*	-	79.934	6.458.083	183.265	6.641.348	94.694	4.241
2014	-	81.108	6.888.907	193.825	7.082.732	103.525	4.053
2015	-	83.467	7.486.621	223.015	7.709.636	107.665	4.750

*The number of villages profiting from apiculture since 2013 have been titled as “Number of businesses working on apiculture”. *Source: Ministry of food, agriculture and livestock (Turkey), 2015*

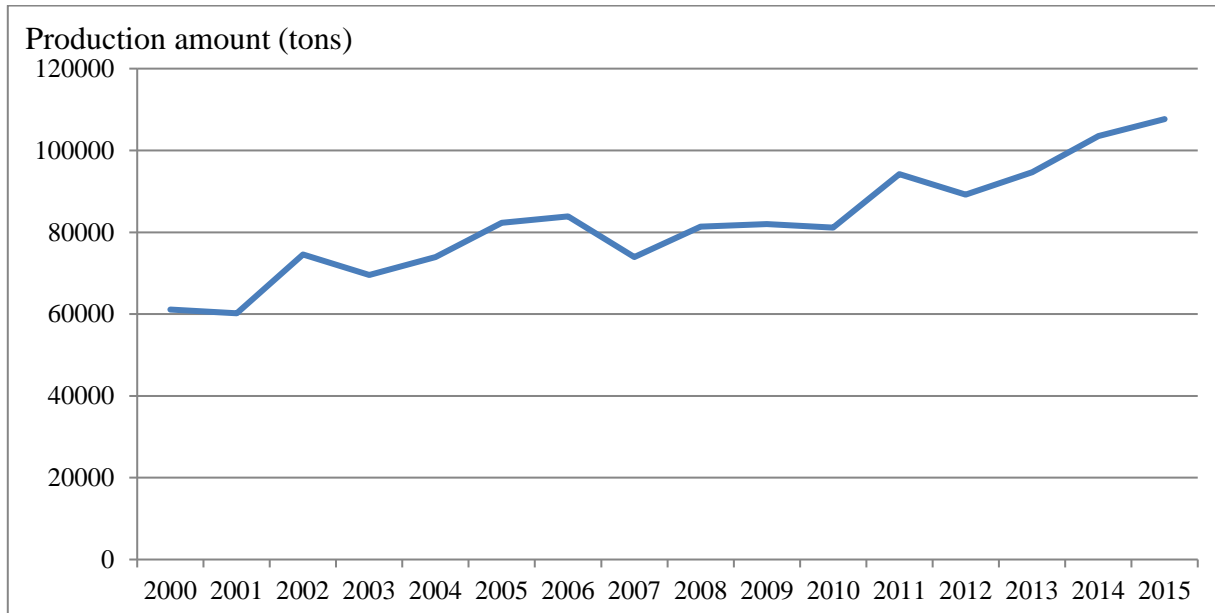
The number of beehives and amount of honey production in Turkey has increased significantly in recent years. However, the increase rate in the number of beehives is higher than the increase rate in the amount of honey production (Table 1, Figure 1 and

Figure 2). Also, there is a decrease in the number of old beehives. The number of new beehives has increased rapidly in recent years. Recently, there is a tendency of an increase in the amount of honey production.



Source: <http://faostat3.fao.org/download/Q/OP/E>, 07.03.2016

Figure 1. The Change in the Number of Beehives in Turkey during Years 1961-2015

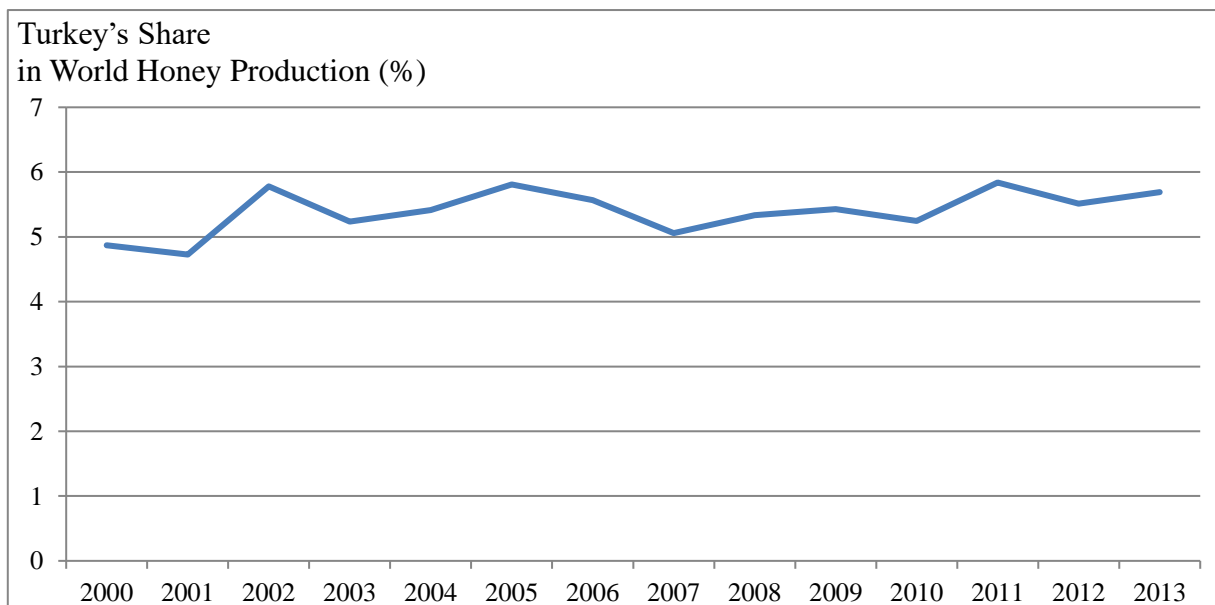


Source: <http://faostat3.fao.org/download/Q/OP/E>, 07.03.2016

Figure 2. Honey Production in Turkey during Years 1961-2015 (tons)

Since the year 2000, Turkey's share in world honey production has remained stable due to the difficult competition conditions (Figure 3). World honey production is 1.663.798 tons in 2013. Turkey has 94.245 tons of honey production, and as a second country after China, it has a say in the beekeeping sector. There are approximately 89 million hives worldwide in India and China with more than 20% of their existence. Turkey is ranked

3rd in the world with 6.641.348 hives. The average honey production per hive around the world is about 20 kg and this production value is about 14.3 kg in our country. 64,777 tons of beeswax were produced worldwide. With 4,235 tons of production per year, Turkey ranks fourth in the world (FAOSTAT, 2013).



Source: <http://faostat3.fao.org/download/Q/OP/E>, 07.03.2016

Figure 3. Turkey's Share in World Honey Production during Years 1961-2013 (%)

Due to the difficult competition conditions of recent years, apiculture has received significant support from rural development projects with the aim of increasing public or private enterprises competitiveness and solving current problems. The

main operation of apiculture projects is to increase product diversity and productivity. The reasons for this are stated as the high cost productions of present enterprises due to insufficient use of apiculture technology and from only producing honey

(products such as propolis, royal jelly, pollen, bee wax, bee venom and apilarnil are not well-known) (Ministry of Food, Agriculture and Livestock, 2015).

Rural development projects in Turkey are mainly carried out by official institutions under the auspices of international organizations (EU, World Bank, International Fund Agricultural Development etc). Within these, the IPARD (Instrument for Pre-Accession Assistance Rural Development Program), which is supported by the European Union and implemented by the Agriculture and Rural Development Support Institution, has earned a investment of a total of 6.1 Billion Liras including 3.5 Billion Lira grant (IPARD Programme, 2015). Beekeeping has been supported under the diversification and development of rural economic activities. Appropriate investments on this subject are construction of shelter and annex for the storage and processing of hives, honey and other beekeeping products, purchasing of equipment necessary for the management, maintenance and production of hives, purchasing or renewing technological bands for processing and packaging of honey on the farm, installation and equipment of rearing station for licensed breeders to produce queen bees, procurement of construction works and machinery equipment for renewable energy production for the enterprise's own consumption. During the IPARD-I (2007-2013) implementation period, the amount of support for a project was between 5,000 and 250,000 euros, at 50% of the total eligible investment. Under IPARD-I, 1,691 projects have been contracted in beekeeping sector. The total amount of support paid by the institution to the 1383 beekeeping projects that have been closed has reached TL 55.8 million. When the 1,691 apiculture project is examined; 99,9 % of the applications made are made by real persons and only 0.01% is made by legal entities, 91% of beneficiaries were male, 9% were female, 67% of beneficiaries are over 40 years old and 33% of them are under 40 years old and 66% of the projects are modernized enterprises and 34% are new ones (IPARD-I Programme, 2013). In the implementation period of IPARD-II (2014-2020), the support rate increased to 65 percent. In addition, the total upper limit of investments has been raised to 500,000 euros (IPARD-II Programme, 2015).

In addition, Ministry of Food, Agriculture and Livestock supports per-queen bee producers who have received queen bees from businesses that have been permitted queen bee production, per hive producers that have been permitted with a minimum of 30 and a maximum of 1000 bee hives, per colony to producers who use *Bombus* bees for pollination in 2016. This support is 10 TL per beehive, 60 TL per colony for producers using *Bombus* bees (Ministry of Food, Agriculture and Livestock, 2015).

The support of the beekeeping sector by the government agencies in Turkey started after 2000 years. Initially, in 2003, the union member beekeepers who buys queen bee was paid incentive premium of 6 TL and 4 TL for the other beekeepers for per queen bee. This support has been raised to TL 10 for 2004 and TL 15 for 2005 and 2006 for union members. For the other beekeepers, incentive payment of 7.5 TL was made. In 2003-2007, support was provided for queen bee and extracted honey, and since 2008, support has been introduced per beehive. In addition, the beekeeping registration system (AKS) was introduced in 2008. In 2008, 5 TL support payment per hive was realized. This support was paid as 10 TL in 2015. With the *Bombus* Bees Regulations issued in 2011, some principles have been set to prevent *bombus* bees, one of our native gene resources, being picked from nature and to be abducted abroad, encouraged to grow on supervised conditions, and promoted to use in greenhouses. (Ozturk and Gurpinar, 2012). Greenhouse owners using *bombus* bees have

been supported since 2005 and a payment of 60 TL per colony was made in 2015 (General Directorate of Livestock, 2016).. In addition, since 2011 organic beekeeping has been supported and 50% of the price paid as hive support to the honey producers that provide the necessary conditions in production is paid. (Ministry of Food, Agriculture and Livestock, 2016).

The Ordu-Giresun Rural Development Project (1995-2006) and the Erzincan-Sivas Development Project (2005-2012), both of which are supported by IFAD, are among the regional rural development projects in Turkey. The total budget of Ordu-Giresun Rural Development Project is 41.5 million Euros, while the total budget of Erzincan-Sivas Development Project (2005-2012) is 24 million Euros. These projects aim to support small family businesses, improve social and agricultural infrastructure and raise rural living standards in less developed regions in order to increase agricultural productivity and income level.

2013-2017 General Directorate of Forestry Honey Forest Action Plan consists of; regulations concerning protecting and improving vegetation convenient for apiculture, preparing apiculture-oriented functional plans and settling of migratory bees along with codes of practice for protecting forest ecosystems and biological diversity; on issues about the projects and implementations about forestation, erosion management, pasture improvement, production and maintenance. 1620 ha forest areas and honey forests per year will be allocated with the 2013-2017 Honey Forest Action Plan. Almost 2.106.000- 3.069.900 TL and 405.000-583.200 TL per year has been planned as the amounts for maintenance costs for honey forests and facilities respectively (General Directorate of Forestry, 2016). The first honey forest was established in Ağızkara, Afyonkarahisar in 2010. It consists of forestry such as black locus, willow, sugar maple and almond trees along with herbaceous plants and bushes that are highly productive in honey such as esparsette, musk thistle and gorse plants. In addition, increasing honeydew honey production in Turkey, which makes up for the majority of the world's honeydew honey production, is one of the goals of this action plan.

There has been recently a significant increase in the number of R&D projects in Turkey. These projects are mainly supported by the Ministry of Agriculture and TUBİTAK (Scientific and Technological Research Council of Turkey). Issues which are dwelled upon are; identifying, protecting and improving the local bee species in Anatolia, developing new methods for fighting against bee pests, producing queen bees for breeding and detecting fake honey and adulteration.

There has also recently been an increase in organic apiculture improvement practices. Organic breeding in stockbreeding in Turkey began with apiculture (Saner et al., 2004). Organic apiculture has been observed to fail developing at desired levels. There are many reasons for this. One reason is the state of weather conditions. Apiarists encounter serious damages when the weather conditions are inconvenient. The number of bees decreases because bees are sensitive species and because the traditional products for protection are not convenient for organic apiculture.

Issues which have been discussed in rural development projects in Turkey are listed below:

- Using new beehives rather than old type beehives in production,
- Increasing the number of queen bees, making production with teenage and healthy queen bees,

- Using the bee species convenient with the region's environment,
- Making production according to the botanic origin and increasing the production of plants that are crucial for apiculture,
- Breeding the bee species used in apiculture,
- Fighting against bee pests,
- Increasing product diversity in apiculture,
- Supporting organic apiculture,
- Increasing the educational status of producers, supporting bee breeding graduate programs and giving technical support to apiculture organizations through bee breeders,
- Taking legal precautions against fake honey production,
- Increasing the number of honey analysis laboratories,
- Observing sufficiently the bee marketing chains,
- Organizing the apiarists,
- Improving internal marketing opportunities and facilitating external exporting,
- Transferring government incentives and supports to people and producers who have required knowledge and experience and who carry out convenient scale production oriented to the market,
- Including the apiculture sector to government-supported insurances,
- Detecting pasturelands (staging area) which will encourage seasonal migration in apiculture and organizing the staging areas according to beehives' and apiarists' needs,
- Encouraging branding in honey production,
- Updating the honey codexes.

4. Conclusion

One of the most important problems in the beekeeping sector is that the migratory bees, which constitute 75% of the sector, are the problem of "accommodation". A major problem with migratory beekeepers is the "shipping" problem, which accounts for almost 40% of the costs.. Lowering the definition of young farmers to under 30 is important for the future of the beekeeping sector (Agriculture and Rural Development Support Institution, 2016). R&D and production activities required to increase the production of by-products such as bee milk, bee poison, beeswax, pollen, propolis need to be replicated. Given the falling consumer confidence index, awareness-raising and advertising campaigns on the basis of safer production should be supported and supported by the industry.

When the contributions of apiculture on employment and its importance on environmental sustainability through pollination are considered, it can be regarded as a crucial agricultural practice that should be supported (Yilmaz and Akbas, 2010). Thus, sufficient amount of fertile queen bees should be bred, researches on identifying genotypes convenient for the region and on product standards should be carried out and technically qualified personnel who are also interested in research should be trained.

In this study, among the bee products, the recognition of honey was detected as 99.4%, pollen as 61.6%, royal jelly as 52.8%, bee wax as 46.4%, bee pest as 16.3% and propolis as

8.9%. In the same study, it was observed that the participants bought honey every two to six months but avoided buying the other apicultural products ((Boluktepe and Yilmaz, 2008). Although Turkey has a crucial position in global honey production, it was observed that the recognition of the other apicultural products were at a low level. Thus, increasing product diversity in apiculture became a crucial issue in rural development projects in Turkey.

The significant economic problems have still showed up such as losses related to Varroosis, expenses for struggling, decrease the number of bees and in production due to unhealthy beehives in Turkey. Fighting against bee pest is among the serious problems of apiculture. Increasing R&D practices for improving the role of apiculture in rural development along with increasing the number of honey analysis laboratories is also an important issue.

Instability in the prices is one of the major problems of apiculture in Turkey. Because wholesalers are usually the unit which determine prices and because there are no clear markets, establishing cooperations or producer associations in which producers can participate in determining prices and commercialize their products with lower risk levels is crucial. In addition, projects on marketing are observed to be very few within rural development projects. Recent apicultural potentials can be exploited if policies and strategies, which integrate the production and marketing dimensions of apiculture, are established and implemented effectively. Practices in creating a brand value in national and international market are of crucial importance. Examining multi-dimensional utilization opportunities from a single area of land and planning agriculture-forests-livestock together on the same land have become important issues in Turkey. In other words, agricultural forestry is crucial for both rural development and sustainable development.

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