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## BEEKEEPING SECTOR OF THE REPUBLIC OF MOLDOVA – SUSTAINABLE DEVELOPMENT CHALLENGES

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**Abstract:** Beekeeping plays not only an important role in supporting biodiversity, but also has a significant contribution to the development of economic activities in rural areas and increase of the well-being of population. In recent years, honey production in Moldova has been increasing, with small fluctuations, but it is still strongly dependent on climate conditions, that can significantly affect the volumes of production. At the same time, the amount of production can also be affected by the limited capabilities of beekeepers in managing the business, the production process itself, lack of association, etc. The paper aims to present an overview of the beekeeping sector of the Republic of Moldova, by carrying out a general analysis on the evolution of the number of bee families, production, export capacities and degree of competitiveness at the international level. It concludes that although, in recent years, progress has been observed in increased volumes of production and the process of association of beekeepers, etc., still additional efforts are needed for its sustainable development like specialized courses, trainings, demonstrations in the field, access to more efficient infrastructure, assistance in disease diagnosis, with an emphasis on development and integration of sustainable honey production in the complete value chain. **Keywords:** agriculture, beekeeping, Republic of Moldova, sustainability **JEL classification:** Q01, Q18

**INTRODUCTION** 

Beekeeping represents one of the most important sectors of agriculture, due to not only its contribution to the agricultural output, insurance the population with honey, but also by playing a significant role in supporting biodiversity. Pollination of agricultural crops by bees can help increase yields of fruit trees, vegetables, canola, sunflower significantly (Rollin & Garibaldi, 2019). The sector's continuous development depends on several factors of both endogenous and exogenous nature. The production of honey, as well as other products of beekeeping origin, is strongly linked to traditional values from a certain community, investments in new processing tools, research and development activities in the field (Vapa-Tankosic et al, 2020), etc. At the same time, it is also affected by weather conditions, which can significantly affect the amount of production, as well as its quality (Garabedian, 2021). Moreover, the sustainable development of the beekeeping sector can be affected by the limited capabilities of beekeepers in managing the business, poor processing machinery and skills, the production process itself, use of excessive chemical substances in multiannual plantations during the blossom period, hive loss, pests and diseases (González Pacheco, Barragán Ocaña, 2023), etc.

In the Republic of Moldova, at the moment, the tendency to increase honey production by applying modern inputs specific to the beekeeping sector is observed. The improvement of the product is achieved by encouraging honey producers to use modern hives, as well as by providing training on how to care for bees in the cold period in particular. Organic beekeeping, which is quite new for the Republic of Moldova, represents a future direction for the sustainable development of the sector, but it faces from the beginning several important challenges, among which can be mentioned: insufficient knowledge in carrying out an organic beekeeping business and complicated process related to certification of organic honey (Pocol et al, 2021).

Nevertheless, in recent years, progress has been observed in the process of association of beekeepers, which has many advantages such as: permanent contacts with other beekeepers, including more experienced ones, the possibility to participate in courses, trainings, demonstrations in the field, access to more efficient processing and other types of infrastructure, assistance in disease diagnosis, possibility for development of organic production, etc., but additional efforts are still needed in this direction, with an emphasis on development and integration in the complete value chain.

The honey value chain consists of the following components: inputs, production, logistics elements for processing, processing, sale/distribution and consumption. Along the honey value chain, the producer is the main figure who can be involved in all stages and processes, once his position is improved and he has all the necessary levers and tools. In the Republic of Moldova, as a rule, small honey producers sell their products on the local market, and with the increase in quantities, the difficulty in their distribution appears, as a result of the larger production volumes. As a result, the position of producers in the value chain is characterized by a reduced ability to negotiate the price and define the quality of the product obtained.

Taking into account that the development of the beekeeping sector in the Republic of Moldova has not been approached form the perspective of sustainability, the paper aims to present an overview of the beekeeping sector of the Republic of Moldova, by carrying out a general analysis on the evolution of the number of bee families, production, export capacities and degree of competitiveness at the international level, with an emphasis on the sustainable development challenges.

### MATERIALS AND METHODS

The methodological basis for research is made of scientific methods of investigation, the methods of analysis, comparison, other qualitative and quantitative methods.

The assessment of competitiveness at the international level with respect to other countries was performed with the use of Revealed Comparative Advantage (RCA) coefficient.

SWOT analysis has been performed in order to identify strengths, weaknesses, opportunities and threats for the beekeeping sector from the Republic of Moldova.

The statistical data used during the analysis of the sector was retrieved from the National Bureau of Statistics of the Republic of Moldova (data on number of bee families), FAO Stat (honey production), UNComtrade (data on natural export and import volumes, export prices) and WITS (monetary values for export and import).

#### **RESULTS AND DISSCUSION**

In the Republic of Moldova, in the recent years, there is noted an increase in the number of bee families as a result of the interest of farmers in this specific sector, as well as the public support intended for its sustainable development. According to the Ministry of Agriculture and Food Industry, the number of authorized beekeepers in 2024 reached 9421

persons, of which about 3319 have a legal form of activity. Therefore, during the period 2005 - 2024, the number of bee families increased from 87 thousand to 207.1 thousand. When analysing the sector according to the type of ownership, most of the bee families belong to rural households, with a share of 98.5% in 2024, meaning that agricultural enterprises hold only about 1.5%.

In territorial profile, during 2007 - 2024, the number of bee families increased in all regions of the country. Therefore, the largest number of bee families is located in the Central region of the country, with an almost twofold increase in the number of bee families from 37.3 thousand to 72.8 thousand, followed by the Northern region – with the same trend of increase from 31.9 thousand to 67, 2 thousand, and the South area – from 27.0 thousand to 51.7 thousand.



# Figure 1. Dynamics of the number of bee families in territorial profile, thousands of pieces

Source: developed by author based on (National Bureau of Statistics, 2024)

As a result of the increasing number of bee families, the honey production in the Republic of Moldova has experienced an important increase from 2655 tons produced in 2011 to 5500 tons in 2023. The increase in production is related to a series of factors, among which can be mentioned increased capacities and knowledge of beekeepers in diversification of production, increase of productivity and better business management, a better coordination among agricultural producers from the vegetable sector with beekeepers, diminish of the risks related to poisoning of bees with phytosanitary products, etc.

Besides honey, honey by-products like beeswax, pollen, honeycombs, etc. can also represent an important direction for the sustainable development of the sector and they can bring an additional value to the bee-related production. Statistical data is not available for assessing quantities or monetary values of these types of products.



The external trade with bee honey has a positive trade balance during 2015 - 2023. The export values have fluctuated over the time, with some periods of ascent (particularly years of 2017 and 2021), as well as periods marked with a decline in export values (2016, 2020 and 2023). In 2023 the export of natural honey decreased by approximately 2 times compared to the previous year, from 12845.1 thousand USD in to 6014.1 thousand USD. Not every Moldovan beekeeper has the physical capacities for exporting natural honey. Taking into account that 98,5% of bee families are registered in rural households, there is a need for a better coordination of actions among beekeepers for creating associations capable of providing necessary amounts of products for export as a result of common processing of honey.



Figure 3. Foreign trade with natural honey, 2015 – 2023, thous. USD Source: developed by author based on (World Bank, 2024)

The geography of domestic honey exports is quite vast, with 51 distinguished economic partners registered during 2015-2023. The main importers of natural honey from the Republic of Moldova are represented by EU countries. On average for the period 2020 - 2023, Italy held 25% of the value of honey exports, followed by Romania with 16.3%, Slovakia - 10.9%, Serbia - 8.8%, France – 7.2%, Czech Republic – 6.5%, Poland – 5.7%, Germany – 4.5%, etc.



" Italy " Romania " Slovakia " Serbia " France " Czech Republic " Poland " Germany " Other countries

## **Figure 4. Export of natural honey by countries, average values for 2020 – 2023, %** Source: developed by author based on (World Bank, 2024)

The quantities of honey exported between 2015 and 2023 fluctuated, from 2.8 thousand tons to 1.7 thousand tons, with a maximum export value of 5 thousand tons in 2017 and a minimum of 1.7 thousand tons in 2023. Honey imports during the same period were insignificant. In 2023, only 14 tons of honey were imported.



Figure 5. Foreign trade with natural honey, 2015 – 2023, natural values and prices Source: developed by author based on (UN Comtrade, 2024)

The price for one kg of exported natural honey varied from 3.7 USD in 2022 to 2.6 USD/kg in 2020. The price for 1 kg of natural honey in 2023 reached 3.5 USD/kg.

For assessing the Moldovan natural honey competitiveness on international markets, the RCA indicator was calculated and all the obtained values are considerable higher than 1, thus pointing on the existing of a competitive advantage in this area. The values fluctuate between 42,5 in 2017 to 15,9 in 2023. Although experiencing a sharp decrease in the last two years, the values are still net positive and point on the existing competitiveness of the product at the international level.



Figure 6. RCA values for natural honey with respect to world countries, 2015 – 2023 Source: developed by author based on (World Bank, 2024)

The increasing success of the beekeeping sector is also due to the public support intended for it, that relies on several directions:

- Reimbursement of investments:

a. Reimbursement of investments in livestock farms, in this case, for at least 30 queen bees/swarms of queen bees. The amount of subsidy accounts for 50% of the investment costs for queen bees no more than 12 months old, but no more than 150.0 thous. MDL per beneficiary and 50% of the investment costs for swarms of bees with queens no more than 12 months old, but no more than 300.0 thousand lei per beneficiary.

b. Reimbursement of investments for construction or modernization of bee honey storage units; construction or modernization of units for primary/finished processing, packaging, refrigeration, freezing or storage of bee honey; modernizing the processes of performing test analyses for honey and bee products. The size of the subsidy accounts for 50% of the value of the eligible project, but no more than 5.0 mil. MDL per beneficiary (Guvernul Republicii Moldova, 2023a).

- Subsidies in advance:

a. modernization of livestock farms with beekeeping specialization, with at least 30 queen bees/swarms of bees;

b. procurement of queen bees and/or swarms of bees with queens not more than 12 months old. For both directions, the total cost of the investment project should not exceed 2.0 mil. MDL for bee families or the purchase of bee queens, and the applicant's financial

contribution should account for at least 30% of the total cost of the investment project (Guvernul Republicii Moldova, 2023b).

During 2023, more that 100 mil. MDL have been allocated for the beekeeping sector as public support. Half of the applications for subsidies in advance were intended for business in beekeeping.

In order to summarize the overview of the beekeeping sector, the SWOT analysis has been developed pointing on the most vulnerable points of the sector, as well as on its advantages.

Strengths	Weaknesses
- Favourable geographical location and	- In terms of ownership, concentration of
large variety of biodiversity (flora, crops);	the sector in rural households;
- Increasing number of bee families and	- Low diversification of honey and by-
production;	products;
- High competitiveness values for natural	- Still insufficient association process;
honey at the international level;	- Low capacities in terms of processing,
- Existing public support for the sector in	packaging, etc.
the form of subsidies;	- Difficulty in homogenization of quality
- Proximity to EU market;	of natural honey;
- Sector stimulating gender equality and	- Weak and fragmented value chain;
involvement of youth;	- Weak market power;
- Association process already initiated and	- Lack of investment and operative
existence of success stories.	capital;
	- High certification costs.
Opportunities	Threats
- High demand for honey worldwide and at	- Increasing impact of climate changes on
the EU level;	the beekeeping sector;
- Development of organic honey	- High use of pesticides and lack of
production;	coordination between honey producers and crop
- Development of honey by-products;	sector producers;
- Increasing exports of natural honey and	- Increasing prices for inputs;
- Increasing exports of natural honey and by-products once improving the quality of	<ul> <li>Increasing prices for inputs;</li> <li>Instability in market prices;</li> </ul>
- Increasing exports of natural honey and by-products once improving the quality of production;	<ul> <li>Increasing prices for inputs;</li> <li>Instability in market prices;</li> <li>Invasion of markets with fake honey</li> </ul>
<ul> <li>Increasing exports of natural honey and by-products once improving the quality of production;</li> <li>Technology transfer and innovations in</li> </ul>	<ul> <li>Increasing prices for inputs;</li> <li>Instability in market prices;</li> <li>Invasion of markets with fake honey products.</li> </ul>
<ul> <li>Increasing exports of natural honey and by-products once improving the quality of production;</li> <li>Technology transfer and innovations in the sector for increased productivity;</li> </ul>	<ul> <li>Increasing prices for inputs;</li> <li>Instability in market prices;</li> <li>Invasion of markets with fake honey products.</li> </ul>
<ul> <li>Increasing exports of natural honey and by-products once improving the quality of production;</li> <li>Technology transfer and innovations in the sector for increased productivity;</li> <li>Enhancing the association process.</li> </ul>	<ul> <li>Increasing prices for inputs;</li> <li>Instability in market prices;</li> <li>Invasion of markets with fake honey products.</li> </ul>

Table 1. SWOT analysis for the beekeeping sector of the Republic of Moldova

Source: developed by author

Therefore, the existing strengths like favourable geographical location, increasing number of bee families and production, high competitiveness values for natural honey at the international level, existing public support for the sector in the form of subsidies may be overweighted by the still important weaknesses like concentration of the beekeeping sector in rural households, low diversification of honey and by-products, insufficient association process, weak and fragmented value chain, as well as weak market power. Nevertheless, there are a series of opportunities that must be taken into account when discussing about the sustainability of the beekeeping sector, mainly related to high demand for honey worldwide and at the EU level, development of organic honey production and honey by-products, technology transfer and innovations in the sector for increased productivity and enhancement of the association process.

### CONCLUSIONS

Beekeeping sector is an increasing sector both, in terms of number of bee families, and honey production, as well. The export potential for natural honey is quite significant, with significant RCA values that demonstrate the high competitiveness of Moldovan honey with respect to the other countries of the world.

In order to develop the capacities of beekeepers, it is necessary to increase the degree of awareness among beekeepers regarding the professional practice of the activity. At the same time, the development of consulting services, strengthening of the capacities of educational institutions, including the promotion of professional - dual education in the field of beekeeping will ensure increased opportunities for quality education and professional training, which will lead to progress regarding production volumes and their quality, easier integration into the value chain, increased export capabilities, etc.

Improving the position of beekeepers in the value chain through targeted investments in the sector, public support and special training programs will contribute to increasing their financial capacities, the development of storage and processing spaces, will create preconditions for the development of beekeeping by-products and the development of related industries, handicrafts, as well as the development of beekeeping clusters based on regional associations. Promoting beekeeping products as high-quality food products, as well as involving beekeepers in direct sales is another way to ensure the sustainability of beekeeping businesses.

At the same time, encouraging the consumption of honey and bee products such as pollen, propolis, beeswax, etc. may contribute significantly to the well-being of citizens with an additional positive impact on the healthcare system.

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