

## **LIVESTOCK AND BEEKEEPING SUSTAINABILITY IN THE BALKANS: CURRENT STATE AND FUTURE PROSPECTS**

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### **Abstract**

**Aim:** This study aims to evaluate the state and sustainability of livestock production and beekeeping in the Balkans, with a specific focus on North Macedonia.

**Methods:** Data from FAOSTAT and MakStat were utilized for a comprehensive analysis of key issues, emerging trends, and potential solutions in livestock production and beekeeping.

**Results:** The findings underscore the importance of adopting sustainable practices, strengthening regulatory frameworks, and fostering innovation to ensure the long-term viability of these sectors in the Balkans, particularly in North Macedonia.

**Conclusions:** By contributing to agricultural sustainability and resilience, this research seeks to address the challenges confronting livestock farming and beekeeping in the region, ultimately aiming to enhance food security, support rural economies, and maintain ecological balance.

*Keywords:* Livestock, Beekeeping, Sustainability, Balkans, Environmental Impact.

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### **Introduction**

Livestock production and beekeeping stand as fundamental pillars within the global agricultural framework, serving as indispensable sources of food, income, and ecological services. Across Europe, these sectors have historically played significant roles in shaping regional economies and preserving cultural heritage, contributing to the continent's rich agricultural tapestry (Frazier et al., 2015; Eurostat, 2020; Ferretti et al., 2017). Livestock farming, encompassing activities such as cattle rearing, poultry farming, and sheep husbandry, has not only provided essential protein sources but has also sustained rural livelihoods and upheld traditional practices rooted in local communities (Lipper et al., 2018; Koutsouris et al., 2019). Similarly, beekeeping has been vital for pollination services, biodiversity conservation, and honey production, serving as a livelihood for many rural households (Gallai et al., 2009; Breeze et al., 2014).

However, despite their historical importance and multifaceted contributions, both livestock production and beekeeping have encountered numerous challenges in recent decades. The onset of the 21st century has witnessed accelerated environmental degradation, driven by factors such as deforestation, soil erosion, and water pollution, posing significant threats to the sustainability of agricultural systems (FAO, 2019; IPBES, 2019). Additionally, economic globalization has reshaped market dynamics, leading to intensified competition, price fluctuations, and market volatility, affecting the profitability and viability of livestock farming and beekeeping operations (World Bank, 2018; Swinnen et al., 2018). Concurrently, changing consumer preferences towards sustainable, ethically sourced products have necessitated adjustments in production practices and marketing strategies within these sectors (Verbeke et al., 2013; Menozzi et al., 2017).

In the Balkans region, characterized by its diverse landscapes, climates, and agricultural practices, livestock production and beekeeping have played integral roles in sustaining rural economies and preserving cultural traditions for centuries (Tucić et al., 2019; Djordjevic et al., 2020). Small-scale family farms have been the backbone of agricultural production, with livestock farming and beekeeping serving as vital sources of income and food security for local communities (Milošević et al., 2017; Zdravković et al., 2018).

However, the transition from centrally planned to market-oriented economies in the Balkans, following the dissolution of socialist regimes in the late 20th century, has brought about significant changes in agricultural practices and land ownership structures (Swinnen et al., 2018). Privatization and land fragmentation have altered the agricultural landscape, leading to shifts in production methods and land use patterns (Rizov et al., 2019). Additionally, integration into the global market economy has exposed local farmers to new challenges, such as increased competition, price volatility, and stringent quality standards (Gjokaj et al., 2020).

Environmental pressures, including deforestation, soil erosion, and water scarcity, further exacerbate the challenges faced by livestock producers and beekeepers in the Balkans (Kovacevic et al., 2021). Climate change impacts, such as extreme weather events and changing precipitation patterns, pose additional risks to agricultural productivity and food security in the region (World Bank, 2020).

Despite these challenges, the Balkans region retains its unique agricultural identity, characterized by a mosaic of farming systems, traditional knowledge, and biodiversity hotspots (FAO, 2021). Efforts to promote sustainable agriculture, conserve natural resources, and support rural development are underway, with initiatives aimed at improving access to markets, enhancing productivity, and preserving cultural heritage (European Commission, 2019; UNDP, 2020).

In North Macedonia, livestock production and beekeeping are deeply ingrained in the fabric of rural life, representing not only economic activities but also cultural traditions passed down through generations. Livestock farming encompasses a variety of activities, including the rearing of cattle, sheep, goats, and poultry, with many small-scale family farms contributing to the sector's diversity and resilience (Milošević et al., 2017; State Statistical Office of North Macedonia, 2020). Similarly, beekeeping has a long-standing tradition in North Macedonia, with beekeepers managing hives to produce honey, beeswax, and other bee products (Hefft et al., 2022).

Despite the rich heritage and potential of these sectors, North Macedonia faces several challenges that impact the sustainability and growth of livestock production and beekeeping. Land degradation, resulting from factors such as deforestation, soil erosion, and improper land management practices, threatens the productivity of agricultural land and the health of livestock grazing areas (World Bank, 2020). Water scarcity poses another significant challenge, particularly in arid and semi-arid regions, affecting both livestock watering needs and the availability of floral resources for bees (UNDP, 2020).

Socio-economic factors are pivotal in shaping North Macedonia's livestock and beekeeping sectors. Limited access to modern agricultural technologies, financial resources, and market opportunities can hinder productivity and profitability for small-scale farmers and beekeepers (FAO, 2019). Additionally, rural depopulation and migration to urban centres contribute to labour shortages, impacting farm management and production activities (World Bank, 2020).

Despite these challenges, opportunities for innovation and sustainable development abound. Initiatives promoting agroecological practices, value-added products, and market diversification can enhance resilience and improve environmental sustainability (European Commission, 2019; FAO, 2021). Collaborative efforts involving government agencies, NGOs, and local communities are crucial for addressing complex challenges and fostering a sustainable agricultural future.

Ultimately, the aim is to inform decision-making among policymakers, researchers, and stakeholders to develop strategies for sustainable agricultural development (Pretty & Smith, 2004). This necessitates a comprehensive understanding of the factors influencing agricultural systems and the adoption of appropriate policies and practices.

One crucial aspect is the role of social capital in biodiversity conservation and management, highlighting the importance of collaboration and trust among stakeholders (Pretty & Smith, 2004). Furthermore, matching demand and supply in the agricultural knowledge infrastructure is essential, underscoring the need for effective communication channels and innovation intermediaries (Klerkx & Leeuwis, 2008). However, agricultural research systems often shape technological regimes that may favor certain innovations while neglecting others, leading to potential lock-out effects (Vanloqueren & Baret, 2008).

Competing claims on natural resources further complicate decision-making processes, requiring careful consideration of trade-offs and compromises (Giller et al., 2008). To address these challenges, adopting a holistic approach to rural development that integrates diverse perspectives and knowledge systems is essential (Van Der Ploeg et al., 2000).

By synthesizing insights from these studies and other relevant literature, policymakers, researchers, and stakeholders can make informed decisions and develop strategies that promote sustainable agricultural development while addressing the complex and interconnected challenges facing the agricultural sector.

In the following tables, we present important insights into the trends in the livestock, poultry, and beekeeping sectors in Balkan countries. These tables offer valuable data that can inform policymakers and stakeholders in planning and supporting agricultural development initiatives. By examining the numbers and trends in livestock, poultry, and bee populations, stakeholders can gain a better understanding of the dynamics within these sectors, enabling informed decision-making for sustainable agricultural practices and sectorial growth.

**Table 1:** Total number of livestock, poultry, and bee families, in the Republic of N. Macedonia, by years (MAKSTAT, 2024)

	2018	2019	2020	2021	2022
<b>Cattle</b>	256 181	217 790	222 202	177 622	164 751
<b>Pigs</b>	195 538	135 770	164 074	186 146	182 604
<b>Sheep</b>	726 990	684 558	630 634	633 281	646 488
<b>Goats</b>	117 447	87 581	95 008	75 753	80 186
<b>Poultry</b>	1 828 287	1 562 089	1 643 462	1 484 025	1 561 933
<b>Bee families</b>	81 197	96 143	99 558	92 968	290 879

Resource: [https://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat\\_Zemjodelstvo\\_DobitocnoProizvodstvo/125\\_DobPro\\_Mk\\_DobZivPc\\_ml.px/chart/chartViewPoint/](https://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat_Zemjodelstvo_DobitocnoProizvodstvo/125_DobPro_Mk_DobZivPc_ml.px/chart/chartViewPoint/)

The data in Table 1 illustrates the trends in livestock, poultry, and bee families in the Republic of N. Macedonia from 2018 to 2022. Over this period, notable changes are observed in the livestock numbers:

The number of cattle has shown a steady decrease from 256,181 in 2018 to 164,751 in 2022. The pig population decreased in 2019 but then increased gradually in the following years. Sheep and goat numbers remained relatively stable with minor fluctuations observed. Poultry numbers also exhibited some variation but generally remained steady throughout the period. The most significant change is observed in the number of bee families, which experienced a remarkable increase from 81,197 in 2018 to 290,879 in 2022, indicating substantial growth in beekeeping activities. These trends provide valuable insights for policymakers and stakeholders in

understanding the dynamics of livestock, poultry, and beekeeping sectors in the Republic of N. Macedonia, facilitating informed decision-making for sustainable agricultural practices and sectorial growth.

Table 2 provides valuable insights into the trends in bee colonies and organic honey production over the specified years, highlighting fluctuations and changes in the sector.

**Table 2.** Number of bee colonies and organic honey production, by years (MAKSTAT, 2024)

Year	Total		In Transition		Organic	
	Bee families, number	Honey, kg	Bee families, number	Honey, kg	Bee families, number	Honey, kg
2018	8 138	-	2 257	-	5 881	-
2019	9 061	-	1 979	-	7 082	-
2020	9 829	29 705	4 277	13 570	5 552	16 135
2021	11 055	59 152	4 953	27 042	6 102	32 110
2022	9 436	44 093	5 035	23 838	4 401	20 255

Resource: [https://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat\\_Zemjodelstvo\\_OrganskoProizvodstvo/135\\_Zem\\_Mk\\_PcelSemOrgProMed\\_ml.px/](https://makstat.stat.gov.mk/PXWeb/pxweb/mk/MakStat/MakStat_Zemjodelstvo_OrganskoProizvodstvo/135_Zem_Mk_PcelSemOrgProMed_ml.px/)

In 2018 and 2019, information on the transition to organic status and honey production is not specified.

From 2020 onwards, the table categorizes bee families into those in transition to organic and those certified organic. In 2020, there were 9,829 bee families, with 4,277 in transition to organic and 5,552 certified organic. The total honey production was 29,705 kg, with 13,570 kg produced by bees in transition and 16,135 kg by certified organic colonies. In 2021, both the number of bee families and honey production increased, with 11,055 bee families and a total honey production of 59,152 kg. Of these, 27,042 kg were produced by bees in transition and 32,110 kg by certified organic colonies. However, in 2022, there was a slight decrease in both the number of bee families and honey production, with 9,436 bee families and a total honey production of 44,093 kg. Of this, 23,838 kg were produced by bees in transition and 20,255 kg by certified organic colonies. These trends provide valuable insights into the dynamics of bee colonies and organic honey production over the specified years, aiding policymakers and stakeholders in understanding and supporting sustainable practices in the beekeeping sector.

**Table 3.** Total number of livestock, poultry and bee families, in the Republic of Albania, by years (FAOSTAT, 2024)

	Animals	2018	2019	2020	2021	2022
Albania	Bees	285,455	288,329	358,365	393,635	479,096
	Cattle	467,318	415,609	362,583	336,784	297,656
	Chickens	7,272	7,090	6,774	5,249	4,999
	Goats	917,155	862,865	774,332	775,337	721,555
	Sheep	1,863,837	1,758,333	1,557,861	1,480,450	1,371,695
	Swine/pigs	184,133	183,847	158,401	159,237	137,304

Resource: <https://www.fao.org/faostat/en/#data/OCL>

Table 3 provides data on the total number of livestock, poultry, and bee families in the Republic of Albania from 2018 to 2022. Here are the key observations:

In 2018, Albania had 285,455 bee families, which increased steadily over the years to reach 479,096 bee families in 2022, indicating significant growth in beekeeping activities. The number of cattle decreased from 467,318 in 2018 to 297,656 in 2022, showing a declining trend

over the years. Similarly, the number of swine or pigs decreased from 184,133 in 2018 to 137,304 in 2022. The number of chickens decreased from 7,272 in 2018 to 4,999 in 2022. However, the numbers of goats and sheep fluctuated but remained relatively stable over the years, with slight decreases observed from 2018 to 2022.

**Table 4.** Total number of livestock, poultry, and bee families, in the Republic of Bosnia and Herzegovina, by years (FAOSTAT, 2024)

Country	Animals	2018	2019	2020	2021	2022
Bosnia and Herzegovina	Bees	402,630	423,406	446,759	262,945	298,756
	Cattle	438,006	429,653	427,461	341,898	339,169
	Chickens	16,229	16,669	16,658	8,727	9,299
	Goats	73,038	72,362	71,336	48,372	44,588
	Sheep	1,012,546	1,012,648	1,014,427	1,029,966	997,046
	Swine/pigs	541,526	543,357	546,771	555,792	471,555

Recourse: <https://www.fao.org/faostat/en/#data/OCL>

Table 4 provides data on the total number of livestock, poultry, and bee families in the Republic of Bosnia and Herzegovina from 2018 to 2022. Here are the key observations:

In 2018, Bosnia and Herzegovina had 402,630 bee families, which progressively increased until reaching a peak of 446,759 bee families in 2020, before decreasing to 298,756 bee families in 2022. This indicates fluctuations in beekeeping activities within the country during this period. The number of cattle demonstrated a relatively stable trend from 2018 to 2022, with minor fluctuations observed. Similarly, the number of chickens remained relatively consistent, showing only slight variations over the years.

Conversely, the number of goats and sheep experienced a gradual decline throughout the period, with significant decreases observed from 2018 to 2022. Additionally, the number of swine or pigs displayed a decreasing trend over the specified period.

**Table 5.** Total number of livestock, poultry, and bee families, in the Republic of Bulgaria by years (FAOSTAT, 2024)

Country	Animals	2018	2019	2020	2021	2022
Bulgaria	Bees	765,772	783,348	863,000	838,000	-
	Cattle	542,120	527,190	588,910	611,200	579,860
	Chickens	18,830	20,793	17,177	-	-
	Goats	271,740	228,490	253,400	215,000	184,020
	Sheep	1,350,030	1,280,980	1,307,770	1,199,550	1,096,400
	Swine/pigs	654,550	491,810	592,100	694,660	601,700

Recourse: <https://www.fao.org/faostat/en/#data/OCL>

Table 5 presents data on the total number of livestock, poultry, and bee families in the Republic of Bulgaria for the years 2018 to 2022, sourced from FAOSTAT (2024).

In 2018, Bulgaria had 765,772 bee families, which experienced a steady increase in the following years, peaking at 863,000 bee families in 2020 before slightly declining to 838,000 bee families in 2021. Unfortunately, data for bee families in 2022 is unavailable. Regarding livestock, the number of cattle exhibited a fluctuating trend from 2018 to 2022, showing some variability over the years. Similarly, the number of goats experienced fluctuations, with a gradual decline observed from 2018 to 2022.

The number of sheep showed variations over the specified period, with a slight decrease noted from 2018 to 2022. In contrast, the number of swine or pigs displayed fluctuations, with a slight decrease observed in 2022 compared to 2021. However, data for chickens in Bulgaria is

unavailable for 2021 and 2022, limiting the analysis of trends in the poultry sector for those years.

**Table 6.** Total number of livestock, poultry, and bee families, in the Republic of Croatia, by years (FAOSTAT, 2024)

Country	Animals	2018	2019	2020	2021	2022
Croatia	Bees	372,002	418,657	461,000	460,000	-
	Cattle	414,000	420,000	423,000	428,000	-
	Chickens	10,881	12,162	11,360	12,096	10,918
	Goats	80,000	82,000	86,000	86,000	82,000
	Sheep	636,000	658,000	662,000	654,000	643,000
	Swine/pigs	1,049,000	1,022,000	1,033,000	972,000	945,000

Recourse: <https://www.fao.org/faostat/en/#data/OCL>

Table 6 illustrates the total number of livestock, poultry, and bee families in the Republic of Croatia for the years 2018 to 2022, sourced from FAOSTAT (2024). In 2018, Croatia had 372,002 bee families, which experienced a steady increase over the following years, reaching 461,000 bee families in 2020 and maintaining stability at 460,000 bee families in 2021. Unfortunately, data for bee families in 2022 is unavailable. Regarding livestock, the number of cattle remained relatively stable from 2018 to 2022, with minor fluctuations observed. Similarly, the numbers of goats and sheep also showed stability over the specified period. The number of chickens displayed some variability, with fluctuations observed from 2018 to 2022; however, the overall trend remained relatively consistent. In contrast, the number of swine or pigs exhibited fluctuations over the years, with a gradual decrease noted from 2018 to 2022.

**Table 7.** Total number of livestock, poultry and bee families, in the Republic of Greece, by years (FAOSTAT, 2024)

Country	Animals	2018	2019	2020	2021	2022
Greece	Bees	1,600,064	1,686,063	1,631,000	2,183,000	-
	Cattle	542,000	530,000	631,500	614,100	581,600
	Chickens	37,300	-	-	-	-
	Goats	3,625,000	3,580,000	3,149,000	3,135,100	2,960,900
	Sheep	8,430,000	8,427,000	7,721,800	7,690,900	7,378,400
	Swine/pigs	721,000	733,000	743,000	758,900	741,600

Recourse: <https://www.fao.org/faostat/en/#data/OCL>

Table 7 illustrates the total number of livestock, poultry, and bee families in the Republic of Greece for the years 2018 to 2022, as documented by FAOSTAT (2024). In 2018, Greece had 1,600,064 bee families, which experienced a steady increase over the following years, reaching 1,686,063 bee families in 2019. Although there was a slight decrease to 1,631,000 bee families in 2020, there was a significant spike to 2,183,000 bee families in 2021. Unfortunately, data for bee families in 2022 is unavailable. Regarding livestock, the number of cattle demonstrated some fluctuations from 2018 to 2022, with variations observed each year. Similarly, the numbers of goats and sheep displayed fluctuations over the specified period, with a gradual decrease noted from 2018 to 2022. In contrast, the number of swine or pigs exhibited some variability but remained relatively stable overall, with minor fluctuations observed from 2018 to 2022. The data for chickens in Greece is not available for the years 2018 to 2022, making it challenging to analyze trends in the poultry sector for those years.

**Table 8.** Total number of livestock, poultry and bee families, in the Republic of Serbia, by years (FAOSTAT, 2024)

Country	Animals	2018	2019	2020	2021	2022
Serbia	Bees	914,134	976,701	979,870	976,444	977,471
	Cattle	878,336	898,178	886,127	859,514	799,844
	Chickens	15,685	15,417	14,927	15,122	14,624
	Goats	195,932	191,280	202,325	195,037	191,703
	Sheep	1,711,677	1,641,827	1,684,613	1,695,408	1,720,826
	Swine/pigs	2,782,282	2,903,007	2,983,102	2,868,121	2,666,983

Recourse: <https://www.fao.org/faostat/en/#data/OCL>

Table 8 presents the total number of livestock, poultry, and bee families in the Republic of Serbia for the years 2018 to 2022, as reported by FAOSTAT (2024). In 2018, Serbia had 914,134 bee families, which increased gradually over the next few years, reaching 977,471 bee families in 2022. This indicates a relatively stable trend in beekeeping activities within the country over the specified period. Regarding livestock, the number of cattle experienced slight fluctuations from 2018 to 2022, with a gradual decrease observed over the years. Similarly, the numbers of goats and chickens also displayed minor variations but overall remained relatively stable. The number of sheep showed some variability, with fluctuations observed from 2018 to 2022. In contrast, the number of swine or pigs exhibited fluctuations, with a gradual decrease noted over the specified period.

**Table 9.** Total number of livestock, poultry and bee families, in the Republic of N. Macedonia, by years (FAOSTAT, 2024)

Country	Animals	2018	2019	2020	2021	2022
North Macedonia	Bees	81,197	253,489	309,568	312,623	290,879
	Cattle	256,181	217,790	222,202	177,622	164,751
	Chickens	1,828	1,562	1,643	1,484	1,562
	Goats	117,447	87,581	95,008	75,753	80,186
	Sheep	726,990	684,558	630,634	633,281	646,488
	Swine/pigs	195,538	135,770	164,074	186,146	182,604

Recourse: <https://www.fao.org/faostat/en/#data/OCL>

Table 9 illustrates the total number of livestock, poultry, and bee families in the Republic of North Macedonia for the years 2018 to 2022, based on data from FAOSTAT (2024). In 2018, North Macedonia had 81,197 bee families, which experienced a significant increase to 253,489 bee families in 2019. The number continued to rise, reaching 309,568 bee families in 2020. However, there was a slight decrease to 312,623 bee families in 2021, followed by a further decline to 290,879 bee families in 2022. Regarding livestock, the number of cattle declined from 256,181 in 2018 to 164,751 in 2022. Similarly, the numbers of goats and sheep also experienced a decrease over the specified period, with minor fluctuations observed. The number of chickens remained relatively stable from 2018 to 2022, with slight variations observed each year. In contrast, the number of swine or pigs exhibited fluctuations, with some variability observed from 2018 to 2022.

In light of our findings regarding the trends in livestock, poultry, and bee families in North Macedonia, it's essential to contextualize our results within the broader literature on agricultural development and sustainability in similar regions.

Firstly, our findings align with studies conducted in other Balkan countries, which also report fluctuations in livestock and beekeeping sectors over time (Djordjevic et al., 2020; Tucić et al.,

2019). These fluctuations may be attributed to various factors such as changes in land use patterns, market dynamics, and environmental conditions, highlighting the interconnectedness of agricultural systems with socio-economic and environmental factors.

Additionally, our observation of a significant decline in cattle numbers mirrors trends observed in neighboring countries such as Serbia and Albania (FAOSTAT, 2024). This decline may reflect broader shifts in consumer preferences, land use practices, or economic pressures faced by livestock producers in the region.

Furthermore, the stability in chicken numbers observed in our study resonates with findings from other European countries, where poultry production remains a key component of agricultural economies (Eurostat, 2020). This stability may be attributed to the versatility and efficiency of poultry production systems, which can adapt to changing market demands and production conditions.

In contrast, the fluctuations in swine or pig numbers highlight the vulnerability of this sector to external shocks such as disease outbreaks or market disruptions (FAOSTAT, 2024). These fluctuations underscore the need for resilient and adaptive management practices to mitigate risks and ensure the sustainability of pig farming operations.

The observed decline in cattle numbers aligns with global trends reflecting shifts in dietary preferences and consumption patterns, with a growing emphasis on alternative protein sources and concerns about the environmental footprint of livestock production (FAOSTAT, 2024; Swinnen et al., 2018). This trend underscores the need for diversified agricultural strategies that balance nutritional needs, environmental sustainability, and economic viability.

Moreover, the significant increase in bee families from 2018 to 2019 followed by a subsequent decline highlights the dynamic nature of beekeeping activities, which may be influenced by factors such as climate variability, land use changes, and pest and disease pressures (IPBES, 2019; Kovacevic et al., 2021). Efforts to support beekeeping resilience and mitigate threats such as habitat loss and pesticide exposure are crucial for maintaining pollination services and safeguarding ecosystem health.

In light of these trends, it's essential to explore policy interventions and support mechanisms that promote sustainable agricultural practices and enhance the resilience of farming communities. Initiatives focusing on capacity building, access to market information, and adoption of climate-smart technologies can empower farmers to adapt to changing conditions and improve productivity while minimizing environmental impacts (European Commission, 2019; UNDP, 2020).

Furthermore, collaboration and knowledge exchange among stakeholders, including farmers, researchers, policymakers, and civil society organizations, are key to addressing the multifaceted challenges facing agriculture in North Macedonia and the broader Balkans region. By fostering inclusive dialogue and participatory decision-making processes, we can develop context-specific solutions that integrate local knowledge with scientific expertise and promote holistic approaches to sustainable agricultural development (Van Der Ploeg et al., 2000; Pretty & Smith, 2004).

## **Conclusions**

In conclusion, our comprehensive analysis of livestock production, poultry, and beekeeping sectors across Balkan countries sheds light on the intricate dynamics shaping agricultural activities in the region. The data presented in the tables reveal significant fluctuations and trends over the years, reflecting the diverse array of factors influencing agricultural practices, including economic conditions, policy frameworks, and environmental considerations. The observed variations in beekeeping activities underscore the need for a nuanced understanding of the complex factors shaping apiary practices across different countries. Similarly, the



fluctuations in livestock numbers highlight the necessity for adaptive strategies to address challenges such as shifting consumer demands, environmental sustainability, and economic resilience within the agricultural sector. By offering a detailed overview of the state and trends in livestock production, poultry, and beekeeping, this study contributes valuable insights to the existing body of knowledge on agricultural dynamics in the Balkans. These findings serve as a valuable resource for policymakers, researchers, and stakeholders, facilitating evidence-based decision-making and strategic planning to promote sustainable agricultural development in the region. Looking ahead, ongoing monitoring and analysis of agricultural trends will be crucial for identifying emerging challenges and opportunities, guiding the implementation of targeted interventions, and fostering resilience amidst evolving agricultural landscapes. Through collaborative efforts and informed policymaking, the Balkan countries can work towards enhancing agricultural sustainability, supporting rural livelihoods, and ensuring food security for both current and future generations.

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