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The Sweet Revolution: Sustainable Development of Honey Sector in Rajasthan, India- a Value Chain Based Approach

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Abstract

The primary objective to undertake this current study is to examine the Honey sector, specifically in the Rajasthan region of India. In particular, a value chain based approach is utilized to understand the existing challenges and prospects of the sector. In addition, the study aims to provide recommendations to strengthen the production, distribution, and sustainable development of Honey sector. India, being an agro economy, agriculture and allied activities constitute a substantial chunk of India's GDP. Rajasthan, the largest state in terms of area in India, is well-known because of its abundant biodiversity and is acknowledged as the top crop producer, accounting for an estimated 50% of the country's supply of seed spices. Drawing from the body of existing literature, this study demonstrates how the Indian honey industry has not been able to live up to its potential and instead has fallen short of expectations. These factors include a lack of technological adoption, access to markets, and value chain development. A lack of governmental support, a lack of systematic marketing and distribution strategies, a lack of knowledge about beekeeping, limited access to sophisticated tools and technology integration, and a lack of chemicals required for efficient beekeeping and honey processing operations are the main obstacles impeding the rapid development of the honey's consumption industry. The primary approaches envisioned for the long-term growth of the honey industry should include effective methods of delivering components, knowledge-based methods of processing honey from bees, integration of processes that add value, and creation of market connections for local farmers, beekeepers, and honey producers. As a result, honey producers make more money while supporting the industry's participants' performance, profitability, and sustainable way of life. The findings of this study provide policymakers and government agencies with ideas on how to create programs for the long-term growth of Rajasthan's honey sector.

Keywords: Honey; Value chain; Sustainable development; Rajasthan; India

1. Introduction

As one of the world's leading agro-economies, India heavily depends on the agricultural sector. Recent data from the Ministry of Statistics & Programme Implementation (MoSPI) indicates that 18.30 percent of India's GDP comes from the agricultural sector. More significantly, around 55% of Indians make their living through agriculture (Ministry of Agriculture & Farmers Welfare, 2023). With an estimated 50% or more of the nation's seed spice production being produced in Rajasthan, the largest state in terms of land in India and renowned for its abundant flora and fauna, Rajasthan continues to be the nation's top crop producer (IBEF, 2023). The agricultural sector and associated sectors are responsible for about 26% of Rajasthan's state GDP (Directorate of Agriculture, Government of Rajasthan). Aside from the land

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cultivated for crop production, agriculture also refers to related activities like raising cattle, poultry, beekeeping, sericulture, etc. Apiculture, or beekeeping, is one such endeavor.

The primary goal of the beekeeping sector is the production of honey. Honey has been utilized for ages in the making of confections as well as as a substitute for sugar. It is used extensively in the pharmaceutical industry and is regarded by Ayurveda as a medicine. It is a common home remedy for coughs, which is why cough syrups employ it as a primary ingredient. The black dwarf honey bee, *Apis andreniformis*, the Himalayan Cliff bee, *Apis laboriosa*, the European or Italian bee, *Apis mellifera*, the Asian hive bee, and the Indian honey bee, *Apis cerana*, are the only six species of honey-bees that are known in India. From a financial and quantitative perspective, honey is the main product. Humanity has utilized honey for food, medicine, and cultural events for a very long time (Arya et al., 2021). India's diverse range of flora and fauna presents an excellent prospect for beekeepers. India is currently the seventh-largest honey-producing nation in the world, with over 12,699 beekeepers and approximately 19.34 lakhs honey bee colonies registered with the National Bee Board. India is expected to produce about 1,33,200 Metric tons of honey in 2021–2022. The primary types of natural honey produced in India are as follows: The following honeys are available: rapeseed/mustard, eucalyptus, lychee, sunflower, Karanj / Pongamea, Himalayan multi-flora, acacia, wild floral, and multi- and mono-floral. (APEDA, 2023). Some of the most popular types of honey exported in India are mustard sauce, eucalyptus, lychee, sunflower, pongamia, multi-flora Himalayan, acacia, and wild flora honey (Press Information Bureau, GoI, 2022).

India is the seventh-largest honey exporter in the world, with around 1,33,200 metric tonnes of honey harvested as per the second advance estimate for the period between 2021 according to the most recent data from the Trade Promotion Council of India report (Press Information Bureau, GoI, 2022). India is a significant global exporter of honey, having produced approximately 79,929 metric tons of the commodity in 2022-23, valued at INR 1622.77 Crores (approximately 203.07 USD) (Ministry of Commerce and Industry, GoI, 2023). In 2022, the Indian honey market had a value at INR 23.3 billion. The Indian honey industry is expected to increase at a compound annual growth rate (CAGR) of 8.4% between 2023 and 2028, reaching INR 38.8 billion, based to a recent study by IMARC Group (IMARC, 2023). According to the Press Information Bureau (2022), the National Bee Board (2021–22 2nd advance estimate) has registered about 12,699 beekeepers and 19.34 lakhs colonies of honeybees.

One of the top five states in the nation for honey production is Rajasthan. In Rajasthan, beekeeping is an essential component of the agricultural system and serves as a substantial revenue supplement in subsistence cultivation. Significantly, the National Beekeeping & Honey Mission (NBHM) was launched by the Central Government of India under the auspices of the Aatm Nirbhar Bharat initiative to promote and grow beekeeping as part of the "Sweet Revolution." Therefore, beekeeping exhibits considerable potential as a lucrative business venture and a contributor to employment creation in the area.

Honey is becoming more and more popular among consumers and healthcare organizations due to its high nutritional value and richness. However, for an assortment of reasons, such as inadequate processing, lack of scientific backing, and so forth, Rajasthan has not been able to reach its full potential in honey production. As a result, the state is unable to generate maximum profits relative to other states in the nation and is unable to satisfy the swiftly expanding domestic and regional demand.

The honey value chain structure has not yet been considered as a primary tactic to boost revenue potential, productivity, or efficiency in India. Indian honey value chains have not been emphasized enough when it comes to their growth and development. In this study, we want to conduct a value chain analysis of honey in Rajasthan, which will aid in developing practical strategies for the best possible distribution and production of honey. Value chain analysis may also identify possible drivers and bottlenecks in the honey production process, which runs from the farm to the final consumer. State-level farmers will be better able to obtain knowledge, data, and information and communication technology if they have a deeper understanding of these factors. In addition, policymakers will get knowledge to create and carry out suitable plans to optimize the Honey value chain. Consumers in India will concurrently receive honey of the highest standard that matches their preferences and flavors. With the improved value addition, retailers and exporters will incur less expenses, risks, and losses. It will also increase the farmers' income and balance the region's honey supply and demand cycle. In light of this, the primary aims of this research are as follows: (i) ascertain the potential factors that may

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facilitate or impede the expansion, progress, and competitiveness of the honey value chain in Rajasthan; and (ii) furnish policy recommendations and guidelines that guarantee the honey value chain's sustainable development in the area.

2. Literature review

India, an agrarian nation boasting an extensive variety of plant and animal life, has a long and illustrious history of honey production (Sivaram, 2012). Additional factors that contribute to this phenomenon include India's advantageous agro-ecological conditions, a plentiful supply of natural resources, and a conducive natural environment (Basu & Purkait, 2023).

State-wise honey production in the country			
Production in '000 MT			
States/UTs	**2 2019-20**	**2020-21**	**2021-22 3rd Advance Estimate**
Andhra Pradesh	85	1.89	89
Arunachal Pradesh	12	0.13	13
Assam	25	1.35	3 5
Bihar	5.50	16.00	6.00
Chhatisgarh	90	0.95	95
Gujarat	75	0.75	75
Haryana	60	4.80	80
Himachal Pradesh	80	5.85	85
Jammu & Kashmir	25	2.30	30
Jharkhand	60	1.65	65
Karnataka	25	2.30	30
Kerala	00	2.00	00
Madhya Pradesh	50	2.60	60
Maharashtra	80	1.85	85
Manipur	40	0.40	40
Meghalaya	25	0.25	25
Mizoram	25	0.25	25
Nagaland	65	0.65	65
Odisha	60	1.65	65
Punjab	620	17.00	17.00
Rajasthan	0.00	11.20	11.20
Sikkim	45	0.45	45
Tamil nadu	10	2.20	20
Telangana	80	0.85	.85
Tripura	20	0.20	20
Uttar Pradesh	1.50	22.50	22.50
Uttarakhand	65	2.70	70

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West Bengal	9.50	20.00	2 0.00
Others	28	0.29	29
Total	**20.00**	**125.01**	**125.01**

Table 1: Estimated honey production in states of India during 2019-20, 2020-21& 2021-22- 3rd Advance Estimate

Source: Horticulture Statistic Division, Department of Agriculture & Farmers Welfare,Ministry of Agriculture & Farmers Welfare, Govt. of India

Honeybees are unequivocally acknowledged in the agricultural literature as essential pollinators for a wide range of crops such as honey. Moreover, pharmaceuticals, culinary services, and processed food firms also employ apiculture products as key ingredients. A study conducted by Figueiredo Junior et al. (2016) demonstrates that production and job creation are influenced positively by technical, managerial, and financial assistance. Specifically, the research indicates that as the coverage of these supporting services increases, so does the performance in terms of beekeeper growth and production. Organic certification and additional local processing, have been recognized as the primary determinants of value addition (Jangam & Rath, 2021). Furthermore, market-based vertical linkages have been discovered between the value chain actors and their external clients. Additionally, it was discovered that integrated network strategies that strengthened client relationships were crucial in fostering stronger connections among Honey value chain actors.

Interestingly, the extant scholarship suggests that numerous initiatives are launched on a global scale in an attempt to address the aforementioned challenges; nevertheless, the majority of those endeavors fall short of their intended objectives. A few important reasons include lack of linkage between designed interventions and expected outcomes, failure to account for local environmental factors, and insufficient timeframes to precisely assess the actual outcomes of initiatives are frequent causes of failure (Brusky & Monteiro 2008; Fernandez-Stark & Bamber 2012). Moreover, methodological constraints, including a lack of causal investigations, inadequate scientific reporting and documentation, frequent modifications in government policies and legislation, and an unstructured monitoring system, further erode the efficacy of interventions in shaping the sector's prosperity and competitiveness. Furthermore, it is worth noting that various government and non-government organizations have taken an active role in value chain-based research pertaining to honey production in specific regions across the globe (e.g., Ethiopia, Rwanda, Tanzania, the United States, and others).

2.1. Value chain

Given the vast expanse of Rajasthan, it is valuable to record that the cultivation and distribution of a wide range of commodities are extremely dispersed. Therefore, the development of sustainable approaches to increase honey production is critical. An example of an effective mechanism for identifying obstacles in the honey manufacturing process is value chain analysis. A value chain can be conceptualized as an interconnected series of activities that operate in concert to augment the value of the end product (Altenburg, 2007; Jonathan, Jodie, & Christopher, 2009). It connects commodity producers with processors and markets while incorporating actors and activities that enhance a product (Kumar, 2018). The value chain comprises all the operations necessary to transport a product from its input-supply stage to its ultimate market destination, including its disposal subsequent to use (Dossou et al., 2022, p. 41). Value chains function most effectively when their participants collaborate to generate greater income for all chain participants and produce higher-quality goods, as opposed to the most basic types of value chains in which consumers and sellers exchange only price information. In the agriculture sector, a value chain approach is commonly utilized to identify constraints within the chain, thereby facilitating the creation of additional value for the process (Kaplinsky & Morris, 2002). Such weaknesses include, but are not limited to, inadequate financial resources, markets and communication barriers, a dearth of scientific instruments and equipment, substandard seed quality, and suboptimal product harvest. In order to satisfy the needs of customers, the essence of value chain is to establish and manage a strategic network among numerous business organizations. Consequently, value chain analysis (VCA) develops strategies for mitigating threats and maximizing benefits, as well as a commercial orientation for future support activities of the relevant stakeholders in the agricultural sector, with the primary mission of achieving particular market objectives.

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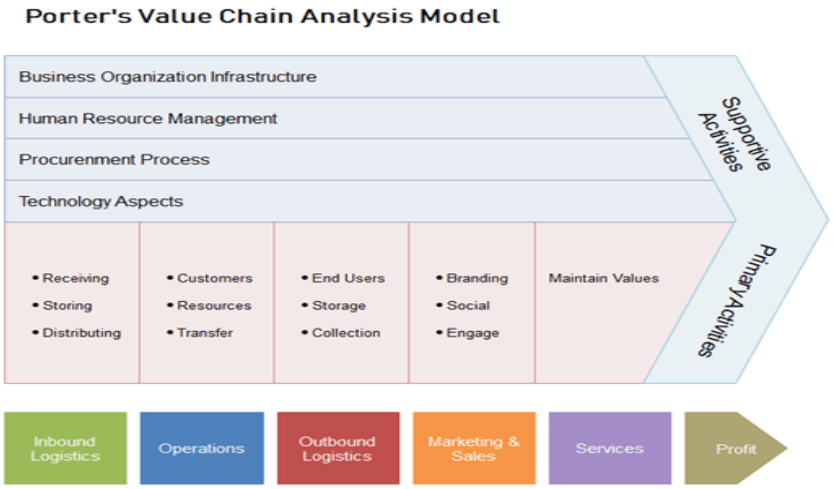

Figure 1. Generic value chain representation
Source: Kelwig (2022)

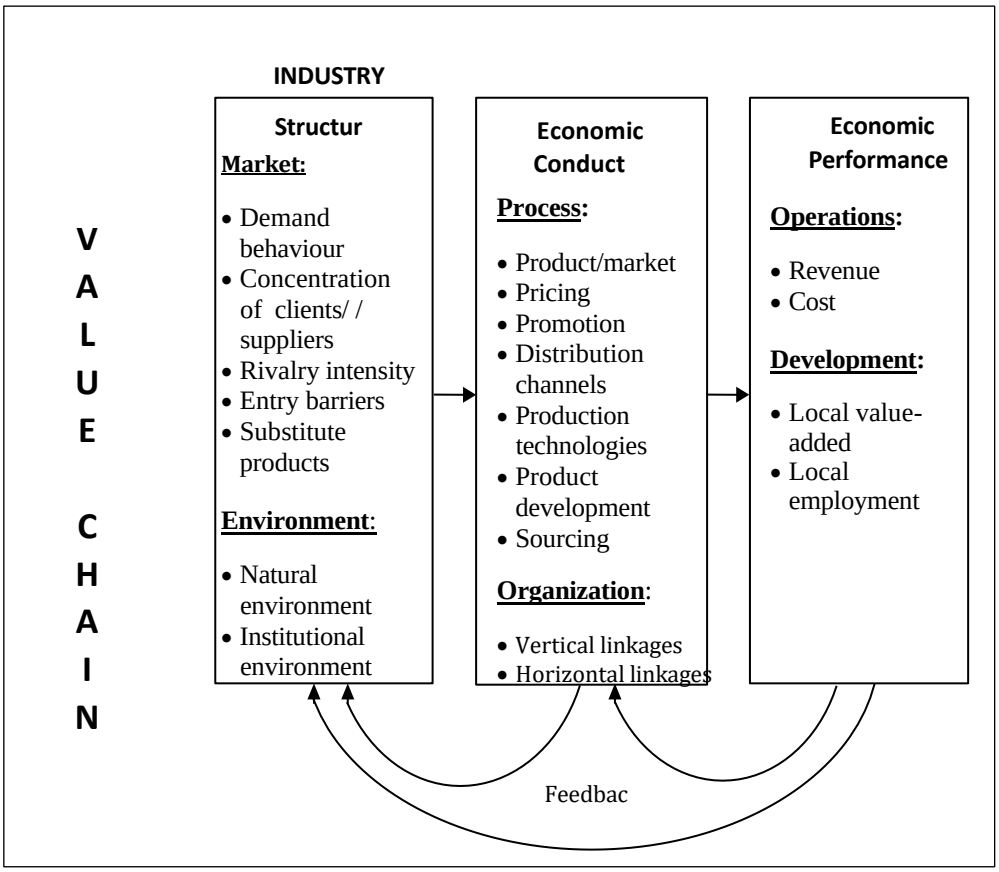

Figure 2. Value chain framework
*Source***.** Adapted from Figueiredo Junior et al. (2014)

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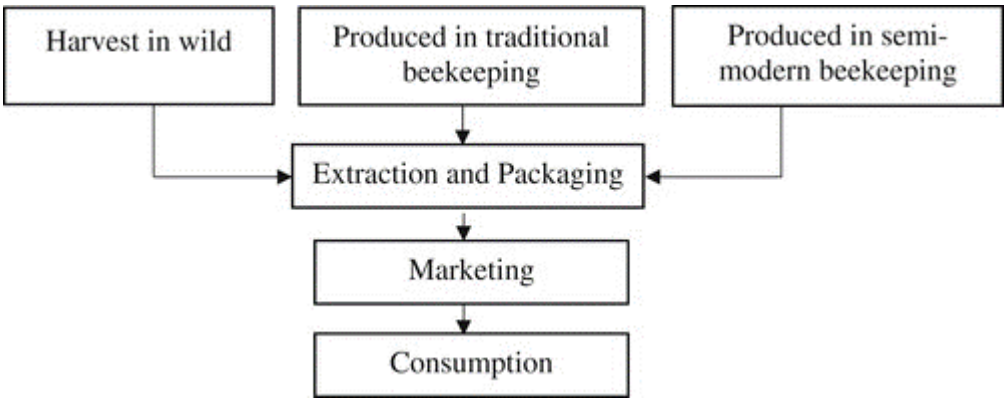

Figure 3. Main stages of activities along the honey value chain
Source: Dossou et al. (2022)

National Bee Board (NBB)	
Department of Agriculture and Farmers Welfare (DA&FW)	
Ministry of Agriculture and Farmers Welfare	
Government of India	
Year-wise honey production for last 5 years	
Year	**Production in Metric Tonns (MTs)**
2016-17	**94,500**
2017-18	**1,05,000**
2018-19	**1,20,000**
2019-20	**1,25,000**
2020-21	**1,25,000**
2021-22	**1,33,200**

Table 1. Production trends of Honey in India
Source: NCBI (2022)

2.2. Agents and their functions in the Honey value chain

The intermediaries, producers, processors, exporters, transporters, wholesalers, retailers, and consumers comprise the majority of the agents or actors in honey value chains (Dossou et al., 2022; Suman et al., 2020). The subsequent information provides specifics regarding the agents' respective roles within the value chains.

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Input suppliers

Suppliers of honeypots and honey-house equipment, craftsmen and vendors of small equipment, contributors of cans and recycling bottles, and beekeeping tools are examples of input suppliers who supply beekeeping tools and other inputs required along the honey value chain.

Beekeepers

Agents involved in the production related activities in the honey value chain are beekeepers or honey producers. There are several possible manifestations of value chains for honey, including those of honey hunters (those who harvest honey in the field), traditional beekeepers (producing honey through traditional beekeeping), and semi-modern beekeepers (producing honey through semi-modern beekeeping).

The principal activity of honey hunters is the acquisition of honey from colonies of wild bees. This is a more conventional method of honey production in which combs are obtained and pollinators are repelled in order to extract raw honey. Certain individuals depend on hunting as their primary source of income, whereas others participate in it only infrequently as a supplementary source.

Furthermore, traditional beekeeping relies on the maintenance of bees in conventional hives, which are generally fewer in number. Conventional beekeepers were primarily agriculturalists who also maintained beekeeping operations.

Middlemen

Traders serve as intermediaries in the value chain between honey collected in the wild and produced through conventional beekeeping. The honey houses, which are frequently subcontracted, are an integral part of the semi-modern beekeeping value chain, alongside merchants. By conducting regular apiary inspections and providing training, they ensure the cultivation of honey of superior quality. After harvesting, gathering, and transporting the commodity to the bee hives. Honey is weighed after extraction in order to determine the beekeepers' compensation.

Beekeepers engage in trade operations such as purchasing, packaging, and preserving honey for retail and wholesale distribution. Remote regions of the country, in addition to beekeeping areas in northern and central Benin, are replete with wholesalers. Beekeepers who supplied honey houses, honey collectors, conventional beekeepers, and semi-modern beekeepers. Contrary to honey homes, which are integral components of the semi-modern beekeeping value chain, they do not contribute to the improvement of honey quality or the simplification of beekeeping operations. They acquired the products during the harvest season due to their comprehensive knowledge of the market. The quality of honey is evaluated using standard methods. Receipt of currency is extended to suppliers. The stakeholders can repackage honey before delivering it to their customers. The latter group is honey merchants.

Transporters

Retailers are supplied with honey houses, transporters, or honey producers. Retailers are located in metropolitan areas and include supermarkets, pharmacies, different business owners, and vendors in local markets. Retailers employed traditional control methods to ensure the product's quality or consulted certification bodies for quality control structures. In the process of marketing, the product is typically repackaged.

Consumers

People of almost all sections of society act as honey consumers. There are two basic categories into which honey consumption can be classified: ultimate consumption and intermediate consumption. The latter refers to the commercial application of honey, predominantly derived from semi-modern beekeeping, in manufacturing and distributing diverse products, including detergents, ointments, traditional remedies, and baked goods. Honey is highly regarded for its nutritional and dietary attributes, in addition to its medical applications in preventative and therapeutic pharmaceutical preparations. Regarding dietetics, consumers rather use honey instead of sugar as an all-natural sweetening agent.

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Figure. 4. Major actors in Honey value chain

3. Methodology

Literature review method serves as the foundational source of the cited literature in the present study. Literature sources were gathered using *EBSCO*'s agriculture and food science databases, *Google Scholar*, *Scopus*, and other well-known databases. A literature review on the honey value chain is the focus of the current article. Conducting a comprehensive review of the existing scholarly literature on value chain analysis and honey production, including both conceptual and empirical studies. Journal articles, book chapters, government reports, practitioner surveys, conference proceedings, dissertations, and white papers were incorporated in this context. Identifying frequently cited articles involved a scan of the reference listings of recent articles.

Similarly, scholarly articles that examine agricultural value chains pertaining to commodities apart from honey were also analyzed. The following terms were incorporated into the search criteria: "value chain," "honey," "India," "value chain analysis," "honey processing," "honey production," "apiculture value chain," and "honey value chain." Only English-language articles that specifically addressed the value chain were taken into account.

4. Findings

The honey value chain remains largely unstructured, with micro and small enterprises comprising the majority of participants at both the production and distribution levels. Nevertheless, the value chain exhibits a considerable degree of integration, as several producers operate as their own processors, supplying both retailers and final consumers. Importantly, the honey distributed through this channel is of substandard quality. Honey producers continue to employ rudimentary, traditional methods, resulting in suboptimal yields. Likewise, processors are operating below their maximum capacity as a result of insufficient quantities supplied by the producers.

4.1. Challenges in Honey value chain

Drawing from the existing body of scholarship (Arya et al., 2021; Dossou et al., 2022; Figueiredo Junior et al., 2016; Suman et al., 2020; Tadesse et al., 2021) the following factors have been identified, which influence the production and productivity of honey in the value chain (see Table 1 and Table 2)

S. No.	Agents	Major challenges
1	Pro**ducers**	• Limited availability of inputs • Insufficiency of packaging supplies • Inadequate expertise in constructing locally produced transitional hives • Poisoning of crops caused by pesticides and herbicides • Financial constraints • Inaccessibility to markets • Farmers' weak negotiating position • Absence of packing and storage facilities
2	Cooperatives	• Inadequate governmental support • Limited financial access
3	Wholesalers	• Poor infrastructure

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4	Processors	• Lack of access to modern technological • Poor quality of raw materials (honey) • Poor expertise in honey processing • Adulteration problem
5	Retailers	• Suboptimal quality • Inadequate access to credits / loans / financial support • Lack of quality packaging materials • Technological problem
6	Consumers	• Price fluctuations • Poor quality

Table 1. Summary of challenges corresponding to different value chain actors
Source: Created by authors from literature review

S. No.	Category	Major challenges
1	Labour-force challenges	• Limited skilled labor • Lack of Apiculture specialists • Limited access to practical-based training for beekeepers
2	Production challenges	• Migration of bee boxes from one location to another • Weather variability and theft of hives • Inability to perform quality assurance • Limited access to modern technology • Absconding • Low quality of input materials • Pesticide and herbicide poisoning, bee diseases, and predates threats • High transportation costs • Poor pre and post harvesting management • High cost of standardized beekeeping equipment
3	Market-level challenges	• Poor market linkages among actors such as beekeepers, producers, processors, wholesalers, retailers, and exporters • Low pricing transparency • Lack of market information and access • Poor Infrastructure • Poor of branding and legal policy • Lack of storage facilities • High transaction costs • Weak bargaining power of farmers • Inefficient cooperative and institutional linkage • Unorganized and unregulated markets
4	Financing challenges	• Inadequate access to funds, loams, and credit • Inadequate access to appropriate financial products

Table3. Summary of challenges under broad categories
Source: Created by authors from literature review

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5. Discussion and conclusions

The present investigation aligns unequivocally with the ambitious goals established by the National Beekeeping & Honey Mission (NBHM), a pioneering scheme of the Government of India known as AatmNirbhar Bharat. The study's results significantly contribute to the enhancement of the honey sector's sustainable development in the region.

The utilization of the value chain framework enables honey sector professionals to conduct a comprehensive evaluation of the value chain: structure, conduct, and performance. Thus, the value chain strategies are unambiguously identified, and the primary connections between strategies and outcomes within a specific business environment are highlighted. It is advisable for governmental and private entities to develop and execute critical corrective actions at the local, regional, and national levels in light of the aforementioned difficulties in the honey value chain. Active participation and coordination among all relevant stakeholders in the honey value chain—including the apiculture fraternity, government, non-government organizations, and private sector companies—are crucial to the success of these initiatives. In summary, the implementation of the subsequent strategies is necessary: enhancing the availability of contemporary beehives; augmenting the expertise and capabilities of beekeepers, farmers, and honey producers via training and development initiatives; fostering the formation of honey marketing cooperatives; and forging connections between critical stakeholders. These initiatives possess the capacity to enhance honey production, optimize marketing and distribution processes, and ultimately contribute to the honey value chain's sustainable development.

In order to provide technical assistance, innovative approaches such as establishing processing units, a technology development center, a bulk processing and packaging unit, and an apiculture nodal center integrated with local R&D capabilities were implemented. The alignment of these strategies shows potential in the field of supply chain scholarship (Chopra and Meindl 2013), and the same applies in the case of Honey value chain.

6. Limitations and future scope

The major limitation of this work lies in the usage of secondary data and literature survey, henceforth, the future studies must collect primary data with India, and specifically Rajasthan region in India. Further, it is recommended to design long-term and short-term interventions for Honey sector in order to strengthen its sustainable development. The present research has, infact illustrated the key challenges and constraints faced by multiple actors involved in Honey Value Chain in India. Therefore, this study offers key insights to the policy makers in the union and state governments in India to draft amendments in the existing Honey related initiatives including National Honey Mission. Likewise, another possible line of future investigation is to pursue SWOT analysis of Indian Honey sector, which will furnish crucial information regarding the present state of the sector and its future promise vis-à-vis the constraints and threats in the market. Lastly, future researchers and research institution should pursue action research targeting region specific constrains and promises in different parts of the country.

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References

1. Altenburg, T. (2007). Donor approaches to supporting pro-poor value chains. Report prepared for the Donor Committee for Enterprise Development: Working Group of Linkages and Value Chains, German Development Institute. Retrieved from https://www.die- gdi.de/uploads/media/DonorApproachestoPro-PoorValueChains.pdf

2. APEDA Ministry of Commerce and Industry, GoI (2023). Agricultural and Processed Food products Export Development Authority (APEDA) https://apeda.gov.in/apedawebsite/SubHead_Products/Natural_Honey.htm

3. NCBI (2022) https://efaidnbmnnnibpcajpcglclefindmkaj/https://nbb.gov.in/pdf/honey%20production%20for%20last%205%20years.pdf

4. Arya, S., Kumar, A., Kumar, K., & Kumar, D. (2021). Major constraints faced by the beekeepers in production and marketing of honey in the Nainital district of Uttarakhand. *The pharma innovation journal*, *10*(8), 276-27.

5. Basu, A., & Purkait, S. (2023). Evaluating Apiculture as a Sustainable Livelihood Option in the Wake of Climate Change: West Bengal, India. In *Climate Change, Agriculture and Society: Approaches Toward Sustainability* (pp. 37-63). Cham: Springer International Publishing

6. Brusky, B., and J. Monteiro. 2008. Assessing the impact of the Micro and Small Enterprise Trade-led Growth Project of USAID/Brazil. Final Report, prepared for USAID. http://microlinks.kdid.org/sites/microlinks/files/resource/files/ML5861_brazil_final_impact_assessment_final_report.pdf [accessed Decemebr 6, 2023].

7. Chopra, S., and P. Meindl. 2013. *Supply Chain Management: Strategy, Planning and Operation* (5th ed.). Upper Saddle River, NJ: Pearson.

8. Directorate of Agriculture, Governemnt of Rajasthan (2022). Agriculture Prosperity and Opportunity. https://farmer.gov.in/imagedefault/handbooks/BooKLet/RAJASTHAN/20150120164649_Rajasthan%20Agriculture%20Prosperity_and_Opportunity.pdf/

9. Dossou, S. A., Adanguidi, J., Aoudji, A. K., & Gbedomon, R. C. (2022). Promotion of beekeeping: insights from an empirical analysis of three honey value chains in Benin. In *Natural Resources Forum* (Vol. 46, No. 1, pp. 39-59). Oxford, UK: Blackwell Publishing Ltd.

10. Fernandez-Stark, K., and P. Bamber. 2012. Assessment of Five High-Value Agriculture Inclusive Business Projects Sponsored by the Inter-American Development Bank in Latin America. Center on Globalization, Governance & Competitiveness, Duke University. http://www.cggc.duke.edu/db_research.php?cat=gvc [accessed December 15, 2023].

11. Figueiredo Junior, H. S. D., Meuwissen, M. P., & Oude Lansink, A. G. (2016). Evaluating strategies for honey value chains in Brazil using a value chain structure-conduct-performance (SCP) framework. *International Food and Agribusiness Management Review*, *19*(1030-2016-83129), 225-250.

12. Figueiredo Junior, H. S. de, M. P. M. Meuwissen, and A. G. J. M. Oude Lansink. 2014. Integrating Structure, Conduct and Performance into Value Chain Analysis. *Journal on Chain and Network Science* 14(1): 19-28.

13. Humphrey, J., and H. Schmitz. 2002. How Does Insertion in Global Value Chains Affect Upgrading in Industrial Clusters? Regional Studies 36(9): 1017–1027.

14. IBEF (2023). Agriculture in India: Information About Indian Agriculture & Its Importance. https://www.ibef.org/industry/agriculture-india

15. IMARC (2023). ndian Honey Market Report by Flavor (Multiflora Honey, Eucalyptus Honey, Ajwain Honey, Sidr Honey, and Others), Seasonality (Autumn and Spring Season, Winter Season, Summer and Monsoon Season), Distribution Channel (Business to Consumer, Business to Business), and Region 2023-2028. https://www.imarcgroup.com/indian-honey-market

16. Indiastatmedia (2021) https://www.indiastatmedia.com/data-infographics/Agriculture/States-with-Highest-Honey-Production-in-India/4/169

17. Jangam, B. P., & Rath, B. N. (2021). Does global value chain participation enhance domestic value-added in exports? Evidence from emerging market economies. *International Journal of Finance & Economics*, *26*(2), 1681-1694.

18. Jonathan, M., Jodie, K., & Christopher, C. (2009). Trading up: How a value chain approach can benefit the rural poor. London: COPLA Global: Overseas Development Institute. Retrieved

from https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/5656.pdf

19. Kaplinsky, R., & Morris, M. (2002). *A handbook for value chain research*. Ottawa, Canada: IDRC Retrieved from http://www.acdivoca.org/acdivoca/Amapbds.nsf/WebLU/31E9A4331F7F316785256E5900701DBA?opendocument

20. Kelwig, D. (2022). Value chain analysis: Definition, examples, and strategies. https://www.zendesk.com/in/blog/value-chain-analysis/#georedirect

21. Kumar, S. (2018). Training programme On "Value chain for agricultural commodities" , Centre for International Programmes, Centre for ICT & e-NAM Centre for Agribusiness Management & Education, CCS National Institute of Agricultural Marketing

22. Ministry of Agriculture & Farmers Welfare (2023). Contribution of Agricultural Sector in GDP. https://www.pib.gov.in/PressReleasePage.aspx?PRID=1909213

23. Press Information Bureau, GoI, 2022). https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=1855541#:~:text=At%20present%2C%20about%2012%2C699%20Beekeepers,MT%20of%20Honey%20worth%20Rs.

24. Sivaram, V. (2012). Status, prospects and strategies for development of organic beekeeping in the South Asian Countries. Division of Apiculture and Biodiversity, Department of Botany, Bangalore University.

25. Suman, B., Pandey, S. R., Bhattarai, S. K., Rupak, K., Suraj, G., Arun, C., ... & Dutta, J. P. (2020). Value chain analysis of honey bee (Apis mellifera) products in Chitwan, Nepal. *Azarian Journal of Agriculture*, *7*(1), 26-35.

26. Sivaram, V. (2012). Status, prospects and strategies for development of organic beekeeping in the South Asian Countries. Division of Apiculture and Biodiversity, Department of Botany, Bangalore University.

27. Tadesse, B., Tilahun, Y., Woyamo, W., Bayu, M., & Adimasu, Z. (2021). Factors influencing organic honey production level and marketing: evidence from southwest Ethiopia. *Heliyon*, *7*(9). 1-9.