1st International Conference - Global Ethics - Key of Sustainability (GEKoS) | May 15th, 2020 | Bucharest, Romania

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<https://doi.org/10.18662/lumproc/gekos2020/12>

How to cite: Panta, N.D. (2020). Applying Value Chain Analysis through the Lens of Sustainability to Enterprises in the Beekeeping Sector. In A. Grigorescu & V. Radu (vol. ed.), *Lumen Proceedings: Vol. 11. 1st International Conference Global Ethics - Key of Sustainability (GEKoS)* (pp. 107-116). Iasi, Romania: LUMEN Publishing House.

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Applying Value Chain Analysis through the Lens of Sustainability to Enterprises in the Beekeeping Sector

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Abstract

Undoubtedly, organizations operate nowadays in a world characterized by complexity and uncertainty. Under these circumstances, an organization must ponder upon everything that is relevant to its strategic objectives, be it operational capabilities, key drivers exerting positive, respectively negative consequences, or other factors. Therefore, it must assess both its external and internal environment. Analysing and managing trends that might affect organizations' performance will enable managers to make decisions and develop appropriate strategies. For the present paper, the internal environment of companies will serve as the general centre of interest of the conducted analysis, paying particular attention to Porter's Value Chain Analysis. Nevertheless, in a business context in which sustainability is becoming increasingly important, more and more executives consider sustainability strategies necessary for maintaining their companies competitive, a fact which stands for beekeeping enterprises as well. Given the valuable contribution of the beekeeping sector to the ecosystem through pollination services, we may already consider beekeeping enterprises sustainable by default to a certain extent. However, there are still a number of shortcomings remaining that need clarification. The managerial challenges posed by what integrating sustainability in business means have led to an increasing attention given to its understanding and not only. Consequently, the aim of this paper is to bridge sustainability and beekeeping enterprises through the value chain analysis and provide an assessment from a strategic point of view. The results provide implications for the strategists, bringing them one step closer to formulating a strategy tailored to their firms that enhances the likelihood of gaining competitive advantage.

Keywords: *Business Sustainability; Value Chain Analysis; Beekeeping Sector.*

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1. Introduction

Recent decades have witnessed an increase in international concerns about finding ways to convey sustainability in practice through businesses and not only. However, operationalising the concept of sustainability has proved challenging since its dimensions are constantly interacting. The three dimensions of sustainability, namely the environmental, social and economic pillars are highlighted both in agriculture in general, and in beekeeping, in particular. Beekeeping, as a branch of agriculture, is increasingly recognized for its contribution to sustainable development, [25] but the beekeeping sector is experiencing a decline in the number of bee colonies globally [16]. More, even though the food sector has a considerable ecological and social impact, literature has been deficient in assessing the impact of certain products or their value chains. Consequently, it is necessary to identify the areas where sustainability management can play a role, as a result of the value chain analysis and therefore, the objective of this analysis is to identify the value-creating activities in beekeeping enterprises seen from the perspective of sustainability.

2. Sustainability in Agribusiness

Business sustainability can be understood as satisfying the direct and indirect needs of stakeholders without affecting the firm's ability to satisfy their needs in the future [4]. In the business environment, managers began following sustainability principles by developing green products, reducing energy consumption or by motivating and retaining employees [2] and not only. However, literature states that these principles need to be implemented in a holistic and integrated way in order to achieve sustainable development [22].

Considering sustainability in business involves a broader perspective than the traditional one, and includes not only the shareholders, but all stakeholders through the lens of the triple bottom line by addressing economic, social and environmental aspects altogether [5].

Sustainability has become indefinitely a popular concept generally, but also particularly, in the agribusiness sector, building on the "people, planet, profit" triad [13]. Agriculture plays a key role in achieving sustainable development since it ensures human nourishment, contributes to the global economy and liaises nature and society [14]. Managing an agribusiness involves a continuous and dynamic process in which a modern manager must embrace challenges and rapidly integrate knowledge in its practice [1].

Parent et al. [18] state that in order to contribute to sustainable agriculture, agribusinesses should be socially viable (contributing to the wellbeing of farmers, their families and communities), economically viable (obtaining revenues on the long run), environmentally oriented (in matters of resources utilization) and transmissible (to future generations).

More, beginning with January 2016, United Nations made a universal call to action with the aim of improving the lives of future generations through 17 Sustainable Developing Goals (SDGs) [24]. The most relevant to the agribusiness sector are Goal 2 and Goal 12. Goal 2 tackles food security and sustainable agriculture and builds on the necessity of innovative and more productive systems in agriculture, that involve reduced levels of negative externalities and not only. Goal 12 follows to ensure a sustainable production and consumption of food.

The European Union (EU) recognizes the role and importance of sustainability and it engaged in monitoring the evolution of the SDGs at Community level. Also, the Common Agricultural Policy, designed to ensure the level of food production needed at Community level and to support rural development, is aligned with the SDGs [8]. Furthermore, through its largest research and innovation programme called "Horizon 2020", the EU made a priority from researching and innovating food security and sustainable agriculture [7]. Recently, the EU presented a new set of initiatives under the European Green Deal, which plans to transform the EU-27 into a climate neutral block by 2050 [10]. The Farm to Fork strategy is encompassed within the European Green Deal and includes a set of ambitions such as reducing the environmental impact of the agricultural sector or promoting sustainable food consumption by providing better information to consumers.

For a while now, EU recognizes the role of beekeepers to sustainable development and provides support for the beekeeping sector through national programmes that aim to improve the general conditions of producing apiary products. The National Apiculture Programmes take place under EU regulation and organisation, and provide financial support to beekeepers. The programmes run over a period of three years and for the 2020-2022 period €240 million will be allotted, following an increase of 11% as compared to the previous period [6].

3. Sustainability in Value Chain Analysis

Value chain analysis is an instrument that describes a firm through a set of value creating activities that aim to transform inputs into outputs [23].

Although the value chain concept has been discussed by multiple authors, the analysis model of the value chain has been proposed by Michael Porter.[20] The model provides a detailed evaluation of how economic value creation is achieved in a firm. More, it provides an image of the customers' perceived value and the costs involved in it. The instrument is applicable to all enterprises, no matter the industry and is considered a means of identifying the competitive advantage that leans on the internal activities [19].

Value chain activities are divided into two categories: (1) primary activities, that add value directly as raw materials turn into finished goods and (2) support activities, that add value indirectly and support the primary activities [20]. Primary activities include inbound logistics, operations, outbound logistics, marketing and sales, and services. On the other hand, support activities cover firm's infrastructure, human resources management, technology development and procurement.

In order to be relevant in today's business environment, the value chain analysis needs to encompass sustainable and holistic perspectives [21]. Such perspectives refer to external factors that can extend firm's value creation to a shared value [15] and in this respect, literature [12] has proposed a set of dimensions that can be used to ensure value chain's contribution to sustainable value creation. The three dimensions for creating sustainable value creation refer to: (i) the limits of the analysis, (ii) value's purpose and (iii) governance.

The limits of the analysis refer to extending the intra-firm view to an inter-firm one and regard the firm as part of a system of value chains, where resources and abilities need to be harnessed along the entire supply chain [12]. The approach ultimately encourages collaboration.

The second dimension relates to the amplitude of beneficiaries of the value that is created and considers extending the traditional approach that creates value for the customers to one that creates value for the entire community. The value can come from product consumption but also from the social and ecological attributes [12].

Lastly, the governance dimension addresses the network which determines how resources are allocated through the value chain. Although value chain analysis investigates the relationships among a firm's activities, it can also cultivate partnerships, which can lead to greater competitiveness [3].

According to FAO, [17] governance is key in obtaining a sustainable food value chain, which in its view encompasses the three pillars of sustainability, being simultaneously: (1) profitable, (2) beneficial for society and (3) having a positive or neutral impact upon the environment.

4. Value Chain Analysis in Beekeeping

In order to maintain themselves competitive, businesses need to make constant improvements to the activities that add value to the consumer, and this also applies to beekeeping businesses. With concern to primary activities, the inbound logistics are responsible for the transport of goods to the unit, the reception of goods, and their storage and management. Beekeeping firms need relatively few inputs. The biological material (bee families, which feed on their own) is subject to the necessary raw materials, while other materials include hives, equipment (bee centrifuge, honey barrel etc.), means of transport (trailer, caravan), medicines, auxiliary materials (coveralls, smoker, pollen collector, product storage containers, promotional materials, etc.), packaging containers and packaging labels. Larger beekeeping companies use automated professional equipment (processing line, bottling line, honey extracting line, packaging machine, etc.). Materials can come from other beekeepers, manufacturing studios, manufacturers of beekeeping supplies or veterinary pharmacies. Although most of the time the transport of goods is ensured by farmers, it may also happen to be provided by the supplier. Usually, relationships with suppliers are short-lived and not complex. Even if the inbound logistics activities are necessary for a beekeeping enterprise, they are not value creating activities. However, managers may seek to enter into long-term relationships with the suppliers.

Operations involve the handling and maintenance of bee families (often occupying more than 50% of the beekeeper's time), exploitation and production. Beekeepers are responsible for selecting the areas and flora for exploitation, changing areas of exploitation in a timely manner, managing hives (health of bee families, replacing the queen), harvesting bee products, processing and bottling honey at the farm and deliver it to a distributor or deliver it to a processor after harvesting it. Among the bee products that are harvested are different types of honey, beeswax, pollen, propolis, royal jelly or apitoxin (bee venom). Through additional processing, value-added products can be created such as vitamins and supplements or honey sweets. Nevertheless, bee production generates shared value at societal level by pollinating crops and supporting biodiversity. The most harvested apiary products include honey and beeswax, and their production can be individual, at enterprise level, or collective, by belonging to a beekeeping cooperative. Individual production leads to a negligible influence in the market, while collective production minimizes farmers' weaknesses and provides easier access to distribution channels.

Production costs can often vary significantly due to unfavourable natural phenomena like cold and rainy springs or dry summers that affect the honey flora and ultimately honey production.

Outbound logistics considers the distribution of the product to customers. The customer can be either an intermediary or the final consumer. In the value chain, their requirements may vary, so the beekeeping manager must identify the inconsistencies in order to solve them. The products must be packed in clean and sterilized containers and labelled respectively, while delivery and storage, usually performed by carriers, must be done in optimal conditions regarding temperature or disinfected areas etc., following the general principles of food hygiene. To contribute to sustainable development, beekeeping enterprises can create storage buildings that use renewable energy. According to the Codex Alimentarius, [11] honey can be labelled according to extraction process (eg. centrifugal force), form (eg. liquid/crystallized), botanical source (eg. monofloral/polyfloral), geographical source, species of bees (eg. *Apis Mellifera*) or type (eg. organic). The product distribution can take place through multiple channels:

(1) from producer to customer - at farm gate, farmers' market or fairs; distribution can also happen through partners through their respective point-of-sale units, in which case the producer is obliged to bottle and store the apiary products like any other retailer; the beekeeper is the one who transports the goods in most cases;

(2) from producer to processors, who then further distribute to wholesalers and then to retailers, who connect with the final consumers;

(3) from producer to the cooperative, which ensures connection with wholesalers or retailers.

To eliminate distribution challenges, beekeeping managers can get into collaborative relationships with distribution partners. Manufacturers that ensure their own distribution can create shared value by using low-emission means of transportation.

The marketing and sales of bee products take place domestically (through wholesale, usually at half of the market price or through own packaging and direct selling) and/or externally (which requires adherence to international standards). The variety of bee products consists of honey (polyfloral, linden, manna, lavender etc.), organic honey, beeswax (which has uses in the production of wax, furniture polishes, lipsticks or pharmaceuticals), pollen, propolis, royal jelly or apitoxin, all of which have multiple uses and properties in food and nutrition, pharmaceuticals and not only.

Quality is a very important aspect for bee products, as fraudulent practices can easily take place. According to Codex Alimentarius, [11] no food additives or ingredients should be added to honey. The certification of honey requires compliance with certain rules and procedures before it is authorized for sale. It generally includes inspection, analysis and verification of aspects related to good processing practices. The marketing activity is a creative one, and beekeepers can resort to offering promotions, creating premium brands (based on taste or nutritional value), or they can improve the packaging (design, capacity/size, product information/sustainable production, benefits after use). However, it can be frequent for the manufacturer to have poor marketing skills. With regard to sales, managers can enter into collaborative relationships with partners such as pharmacies, supermarkets or health food stores to enable the selling in multiple locations.

After-sales services such as maintenance services are not applicable to bee products. However, merchants may provide product return guarantees.

Within the support activities, infrastructure includes the development, planning and management of the firm. Beekeeping enterprises can grow also due to financial support programmes from the national and EU budget. The development possibilities of a beekeeping enterprise also include: the exploitation of a wider range of bee products than those already harvested (eg organic products), the development of the farm into an agrotouristic one, providing assistance to novice beekeepers, implementing innovation through technology, concentrating activities through vertical integration (eg. becoming a processor) etc. In small beekeeping enterprises, the manager often matches the farmer.

In matters of technological development, beekeeping enterprises can provide technology transfer to farmers, purchase high-tech equipment for extracting and processing products, apply special treatments against pests or implement digital devices in the beekeeping activity. Even though the beekeeping activity is based on traditional knowledge and practices, in recent years there have been more and more efforts to integrate technology in the sector. These efforts include developing innovative devices (eg. device with sensors that tracks the movements inside the hive and determines their location via GPS in case of theft or natural disaster, device for practicing beekeeping in urban areas) or integrating the Internet of Things and Big Data into beekeeping by creating new hives that regulate temperature, humidity and acoustics through sensors [9]. The implementation of electronic devices assures reduced costs, reduced bee stress and higher efficiency through monitoring.

However, some beekeepers believe that bees should interfere as little as possible with digital devices as they are themselves a perfect "natural thermometer", and manage to control their temperature and humidity on their own. Also, in practice, cooperatives may be seen to provide temporary technological transfer to beekeepers.

This is especially encountered in the case of individual businesses, which are managed by beekeepers themselves.

The procurement activity is responsible with purchasing raw materials and materials used in the production process, and it is often carried out by the farmer. The farmer may create long-term relationships with suppliers.

Last but not least, human resources management deals with the recruitment, training and development of human resources. Beekeeping can help provide jobs in their communities. The jobs must ensure good general working conditions, provide opportunities for women in a male-dominated sector, training for farmers, but also career guidance for young people.

5. Conclusions

A sustainable value chain must be efficient and add value at the lowest cost and at the lowest ecological impact, and it must be also effective, by maximizing value creation opportunities. To do this, the value chain must understand what is valuable to the consumer, develop collaborative relationships along the value chain, innovate continuously, and gain competitive advantage through ecologically, socially and commercially sustainable means.

The activity of beekeeping enterprises supports biodiversity and is beneficial to the environment. Value chain participants in the beekeeping sector include suppliers, beekeepers, processors, shippers, wholesalers, retailers and consumers. The chain is relatively integrated, as some manufacturers are also processors. However, the bargaining power of wholesale customers is weak if producers belong to a beekeeping cooperative.

Among the challenges of the value chain are the low managerial skills of producers (which may raise barriers in implementing strategies for sustainability), the reduced capacity of limiting risks such as unfavourable weather or theft of hives, or the reduced capacity of integrating technology.

The activities with the greatest potential for value creation, including shared value, are: (1) operations, through quality, variety or efficient means of extraction, (2) marketing and sales, especially if organic products are

made, if environmentally friendly packaging is used and if the chain is integrated and the producer is also a processor, (3) technological development, through high-tech devices, (4) human resources management, through providing jobs for the rural community and ensuring wellbeing at work for the farmers, and (5) infrastructure, through management to ensure the implementation of technology and sustainability strategies and access to financial programs.

References

- [1] Beierlein JG, Schneeberger KC, Osburn DD. Principles of agribusiness management. Fifth edition. Long Grove, Illinois: Waveland Press, Inc; 2014, 378 p.
- [2] Bonini S, Gorner S. The business of sustainability. McKinsey & Company; 2011.
- [3] Bonney L, Clark R, Collins R, Fearn A. From serendipity to sustainable competitive advantage: insights from Houston's Farm and their journey of co-innovation. Supply Chain Management: An International Journal; 2007.
- [4] Dyllick T, Hockerts K. Beyond the business case for corporate sustainability. Business strategy and the environment. 2002; 11(2): 130–141.
- [5] Dyllick T, Muff K. Clarifying the meaning of sustainable business: Introducing a typology from business-as-usual to true business sustainability. Organization & Environment. 2016; 29(2): 156–174.
- [6] European Commission. Detailed information on honey production, national apiculture programmes, budget and legal bases. Brussels: EC; 2020. Honey. Available from: https://ec.europa.eu/info/food-farming-fisheries/animals-and-animal-products/animal-products/honey_en
- [7] European Commission. Horizon 2020 - The Framework Programme for Research and Innovation. Brussels: EC; 2011, p. 14. Available from: https://ec.europa.eu/research/horizon2020/pdf/proposals/communication_from_the_commission_-_horizon_2020_-_the_framework_programme_for_research_and_innovation.pdf
- [8] European Commission. Implementing the Sustainable Development Goals through the next Multi-Annual Financial Framework of the EU [Internet]. EC; 2018, p. 17. Available from: https://ec.europa.eu/info/sites/info/files/adopted-position-paper-on-the-mff_en.pdf
- [9] European Commission. Smart beekeeping systems, investEU – EC; 2017. Available from: https://europa.eu/investeu/projects/smart-beekeeping-systems_en
- [10] European Commission. The European Green Deal/ Brussels: EC; 2019, p. 24. Available from: https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf

- [11] FAO. Value-added products from beekeeping. Codex standard for honey. Available from: <http://www.fao.org/3/w0076e/w0076e30.htm>
- [12] Fearne A, Martinez MG, Dent B. Dimensions of sustainable value chains: implications for value chain analysis. *Supply Chain Management: An International Journal*; 2012.
- [13] Friedrich N, Heyder M, Theuvsen L. Sustainability management in agribusiness: Challenges, concepts, responsibilities and performance; 2012.
- [14] Kanter DR, Musumba M, Wood SLR, Palm C, Antle J, Balvanera P, et al. Evaluating agricultural trade-offs in the age of sustainable development. *Agricultural Systems*. 2018; 163: 73–88.
- [15] Kramer MR, Porter M. Creating shared value. FSG; 2011.
- [16] Neumann P, Carreck NL. Honey bee colony losses. *Journal of Apicultural Research*. 2010; 49 (1): 1–6.
- [17] Neven D. Developing sustainable food value chains: guiding principles. Rome: FAO; 2014, 75 p.
- [18] Parent D, Bélanger V, Vanasse A, Allard G, Pellerin D. Method for the evaluation of farm sustainability in Quebec, Canada: The social aspect. In: *Methods and Procedures for Building Sustainable Farming Systems*. Springer; 2013: 239–250.
- [19] Pearce JA, Robinson RB. Strategic management: formulation, implementation, and control. 10th ed. Boston: McGraw-Hill/Irwin; 2007.
- [20] Porter ME, Advantage C. Creating and sustaining superior performance. *Competitive advantage*. 1985; 167:1 67–206.
- [21] Porter ME. On competition. Harvard Business Press; 2008.
- [22] Rocha M, Searcy C, Karapetrovic S. Integrating sustainable development into existing management systems. *Total quality management & business excellence*. 2007; 18 (1–2): 83–92.
- [23] Rothaermel FT. Strategic management. Second edition. New York, NY: McGraw-Hill Education; 2015, 468 p.
- [24] Sustainable Development Goals Knowledge Platform. New York: UN; c2016-2020. Sustainable Development Goals. Available from: <https://sustainabledevelopment.un.org/sdgs>
- [25] Ubeh EO, Ekwughu EU, Nwagbaraocha N, Opara IU. Sustainability of beekeeping as a means of economic empowerment, biodiversity and food security. *International Journal of Agriculture and Rural Development*. 2011; 14(2): 666–670.