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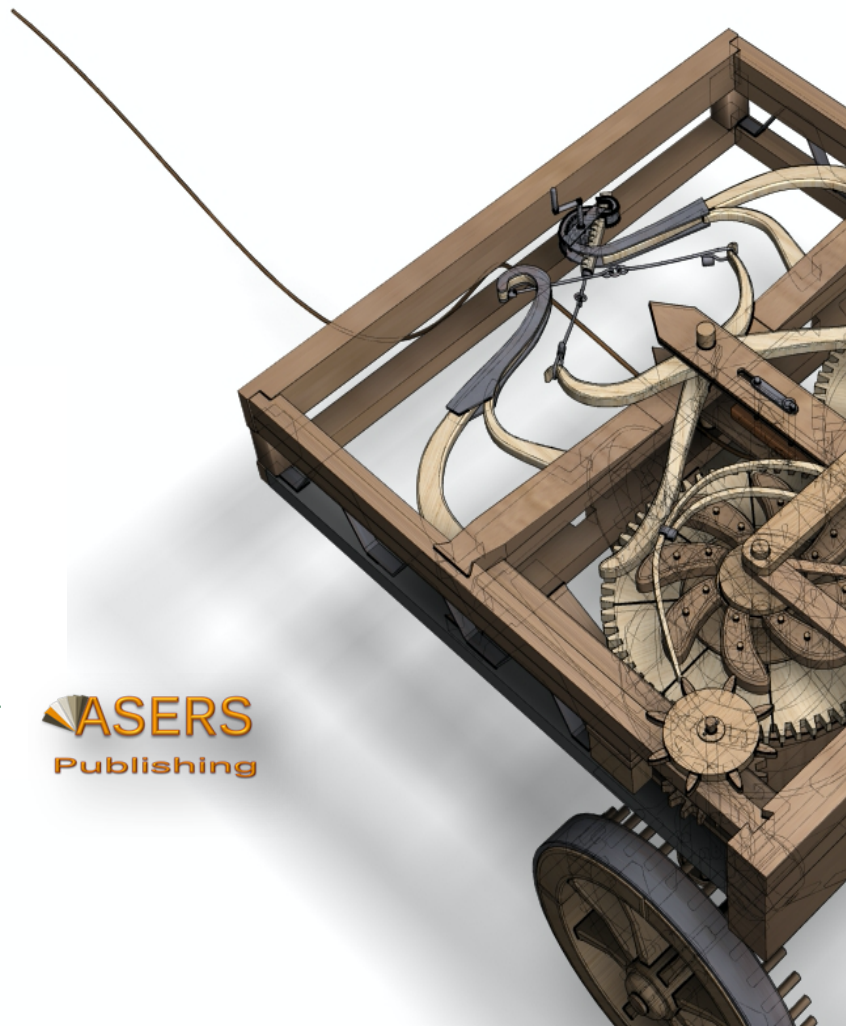
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Call for Papers Fall Issues 2023 Journal of Environmental Management and Tourism

Journal of Environmental Management and Tourism is an interdisciplinary research journal, aimed to publish articles and original research papers that should contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences.

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Sustainable Strategies for Risk Management Process of Coca-Cola Company with Regard to Promote Climate Resilience Efforts and Agricultural Sustainability. Chosen Contexts

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Abstract:

The paper regards the sustainable strategies for risk management process of Coca-Cola Company with regard to promote climate resilience efforts and agricultural sustainability. The fundamental aim of the paper is the analysis of the Coca-Cola Company in terms of agricultural sustainability. The company's beverage production and packaging processes rely heavily on agricultural components. Enterprise's efforts to promote climate resilience, water security, human rights, sustainable packaging, and economic development rely heavily on the use of sustainably produced foods. Adaptation strategies throughout its supply chain and in the communities that produce the company's agricultural components will be greatly aided by the adoption of more sustainable agriculture methods as climate change causes more severe weather and higher water stress. The PSA was first implemented in 2021 to enhance the company's prior Sustainable Agriculture Guiding Principles (SAGP) and accelerate its movement toward the ethical and environmentally responsible procurement of agricultural components. The paper is using of statistical, comparative, dynamics, and documentation analysis. The time scope of the study is 2020-2021, but in some aspects, it was broadened.

Keywords: Coca-Cola company; agricultural sustainability; supply chain; climate change.

JEL Classification: D29; F64; L00; O10; Q19.

Introduction

Maintaining a sustainable agricultural system that can feed a rapidly expanding global population is essential to maintaining human life and, by extension, all human endeavors. Climate change; rapid biodiversity loss; soil erosion, compaction, salinization, and pollution; depletion and pollution of water resources; increasing production costs; a steadily declining number of farms; increasing urbanization and, consequently, a shrinking rural population are just some of the issues that threaten agriculture's ability to meet human needs now and, in the future, (Beus and Dunlap 1990). The agricultural sector is not only affected by these challenges but also contributes significantly to them due to the way it has been handled in recent decades (Goodland 1997, Koohafkan *et al.* 2012).

With the 1987 release of the Brundtland Report, which introduced the overall concept of sustainable development, attention has been focused on the notion of sustainable agriculture as a means of addressing these problems (Tait and Morris 2000). Sustainable agriculture, like the idea of sustainable development, is open to several interpretations (Culleton *et al.* 1994). This feature has made discussing and implementing the concept of sustainable agriculture particularly challenging as it has led to the formation of a vast diversity of various discourses, viewpoints, or paradigms (Tait and Morris 2000, Pierce 1993, Hildén 2012). However, this opens the

door for special interests to abuse the idea for their ends (Constance 2010). There have been several efforts to define sustainable agriculture to address this issue and provide more substance to the notion. Both Goldman and Hansen include lexical collections that define (Goldman 1995, Hansen 1996). An integrated system of plant and animal production practices that will, in the long run: satisfy human food and fiber needs; improve environmental quality; make efficient use of non-renewable resources and on-farm resources and integrate appropriate natural biological cycles and controls; sustain the economic viability of farm operations; and improve the quality of life for farmers and their communities is what is meant by the term “sustainable agriculture” (US Congress 1990).

A sustainable farm produces enough high-quality food to meet local demand, carefully guards its resources, and is financially and ecologically successful. Rather than relying on external inputs like fertilizers, a sustainable farm makes the most of the positive natural processes present on the land and the renewable resources it provides (Reganold *et al.* 1990). What the researchers mean by “sustainable agriculture” is “management practices that collaborate with natural processes to conserve all resources, minimize waste and environmental impact, prevent problems, and promote agroecosystem resilience, self-regulation, evolution, and sustained production for the nourishment and fulfillment of all” (MacRae *et al.* 1989).

The quest for a universal definition was doomed from the start: As sustainable agriculture is a fluid concept that changes depending on the circumstances, there is no such thing as a definitive definition (Pretty 1995). When new meanings, interpretations, and applications of the word arise, there is a chance that they would complement one another. This would allow for the definitions to coexist and even be mutually beneficial. On the other hand, there may be counteractive interactions between definitions, whereby the goals of one definition undermine those of the other. It is sometimes argued that two (Johnson 2006, Robinson 2009) or more (Marsden 2003, Frouws 1998, Pretty 1997) distinct and conflicting overarching schools of thought or paradigms of sustainable agriculture predominate, thus clouding the meaning of the word. In this comprehensive literature study, researchers want to further sustainable agricultural discussions by highlighting areas of complementary and concerned emerging conceptions of sustainable agriculture.

1. Research Questions

The paper regards the sustainable strategies for risk management process of Coca-Cola Company with regard to promote climate resilience efforts and agricultural sustainability. The fundamental aim of the paper is the analysis of the Coca-Cola Company in terms of agricultural sustainability.

The author presents the following research problems:

- Q1: What is the diversification of the Coca-Cola Company in terms of agricultural sustainability?
- Q2: Which of the research aspects of the Coca-Cola Company in terms of agricultural sustainability showed the most important changes?

2. Research Backgrounds and Methods

The theoretical part of the paper has depicted the company profile and agricultural sustainability. The studies are carried out within the documentation, statistical, comparative, and dynamics analysis. The results showed that the research aspects of the Coca-Cola Company in terms of the selected agricultural sustainability have different tendencies. The paper was prepared based on print, digital, and electronic sources: reports, databases, books, textbooks, academic and trade journals, and scientific papers. The inference process took place in a deductive way.

Company Profile

The Coca-Cola Corporation is a complete beverage firm, and beverage products carrying its trademarks have been marketed in the United States since 1886. Now, these products are offered in over 200 countries and territories across the world. Many beverage brands, which it owns outright or sells under license, may be categorized as falling into one of the following categories: The Coca-Cola brand, its effervescent varieties, hydration, sports, coffee, and tea drinks, nutrition, juice, dairy, and plant-based beverages, and new beverage categories are all included. Coca-Cola, Sprite, Fanta, Diet Coke, and Coca-Cola Zero Sugar are the five brands of nonalcoholic sparkling soft drinks that it owns and promotes, and they are the top six brands in the world. Through the company unified bottling and distribution operations as well as its network of independent bottling partners, distributors, wholesalers, and retailers, it can make its branded beverage products accessible to customers located all over the globe. Around 2.1 billion out of the roughly 63 billion servings of all drinks that are

consumed every day throughout the globe are beverages that contain trademarks that are either owned by the company or licensed to it (Britannica 2023).

A company's success is its capacity to interact with customers by giving them access to a diverse range of beverage alternatives that cater to their individual preferences, prerequisites, and ways of life. An additional factor that contributes to its success is the capacity of its staff to execute successfully daily. The company is founded on its strategy to drive growth in its net operating revenue and build long-term value. Enterprise aims to revitalize the world and make a difference, and it is driven by this purpose in all the company does. Enterprise's strategy for expansion is built on three interdependent pillars: beloved brands (it creates significant brands and a variety of beverages for consumers to choose from that it like and that revive it both physically and spiritually); done in a way that is sustainable (the company makes use of its position of leadership to contribute to the solution to bring about a change for the better in the world and to create a more secure future for the planet); in the interest of a better future for all of us, the enterprise makes investments to better people's lives, beginning with its workers and extending out to everyone who interacts with company's business system, including its investors and the wide communities that it considers to be its homes (World Economic Forum 2023).

Building a networked global organization that is designed to combine the power of scale with the deep knowledge that is required to win locally was the company's goal in developing its new organizational structure, which went into effect on January 1st, 2021. This was done to better equip enterprises to capitalize on growth in a market that is constantly shifting. The company established new operational units with a concentration on regional and local execution, and these units are now up and running. The operational units are strongly integrated, with greater uniformity in their structure, and an emphasis on avoiding duplication of resources and scaling new products more rapidly. These operating units fall under four regional operating segments. To swiftly scale ideas while maintaining a direct connection to the customer, the operational units collaborate closely with the five global marketing category leadership teams. Innovation, as well as marketing efficiency and effectiveness, are at the forefront of the concerns of the global marketing category leadership teams' attention. The company's organizational structure also consists of a center and an organization that provides platform services (Forbes 2023).

The original Coca-Cola Company was formed in Georgia in 1892, but in September 1919 it was reincorporated as The Coca-Cola Company under the laws of Delaware. Company internal accounting is based on the way the business is organized. The following are the main divisions within the enterprise's organization: Europe; the Middle East; Africa; South America; North America; and Asia and the Pacific. As to the investments in bottling plants and international businesses, it should be mentioned that the company's operating structure also includes corporate, which consists of two components: a center focusing on strategic initiatives, policy, governance, and scaling global initiatives; and a platform services organization supporting the operating units, global marketing category leadership teams and the center by providing efficient and scaled global services and capabilities including, but not limited to, transactional work, data management, consumer analytics, digital commerce and social/digital hubs (Rural marketing 2023).

Agricultural Sustainability

Food and drink production and distribution would not be possible without agricultural components. It is crucial to the company's efforts in climate resilience, water security, human rights, sustainable packaging, and economic empowerment that the company knows these components are supplied responsibly. Adaptation strategies throughout the company's supply chain and in the communities that produce its agricultural components will be greatly aided by the adoption of more sustainable agriculture methods as climate change causes more severe weather and higher water stress. In terms of expanding towards an eco-friendlier supply chain, it should be said that the safety and viability of the company's supply chain are essential to ensuring the quality and consistency of its goods. This network must include agricultural communities that are prosperous and flourishing. Enterprise's Principles for Sustainable Agriculture (PSA) promote and standardize its most important principles at the farm level, from small-scale farmer cooperatives to large-scale commercial enterprises, therefore assisting in the maintenance of livelihoods and contributing to the protection of food supply (The Chartered Institute of Procurement & Supply 2023).

The PSA, which was implemented in 2021 to enhance its previous sustainable agriculture framework, helped the company to make greater strides toward sustainable sourcing of agricultural ingredients by adopting a more long-term perspective that is in line with its growing product line, more complex supply chains, and cutting-edge scientific knowledge. This set of principles was developed to make farms more productive, resilient, open, and lawful. The company intends to make lasting, systemic changes in its supply chains, so it is working with its

vendors to improve on-farm operations. Better crop yields, more efficient management, lower input costs, and more resistance to weather fluctuations all contribute to increased farm revenues, as do improve product quality and supply reliability. The PSA is intended to catalyze the ongoing development of best agricultural practices. The PSA recognized the diversity of supply chains, farm structures, and risk contexts, and as a result, it developed a new framework for evaluating the compliance and performance of its supply farm base. This new framework was designed to reflect the on-the-ground realities of sustainable farming practices. It can categorize its ingredient supply into three performance categories with the help of the “Leader/Mover/Improver” framework developed by the PSA. This allows a company to prioritize its actions by the highest sustainability priorities of the company, which include climate change, water resources, ecosystems and biodiversity, human rights, and animal health and welfare. These classifications are as follows (Capital Monitor 2023):

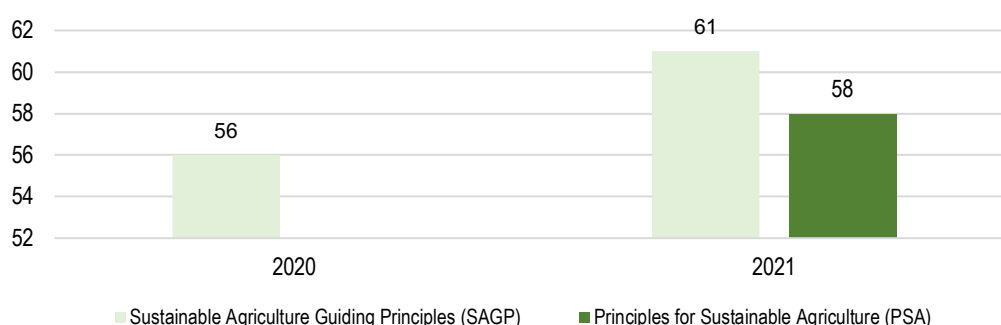
- *Leader level:* The number of supplies is validated by a third party by the PSA, and this validation has been accepted by the TCCC;
- *Mover level:* Supply volume is derived from farms that use various agricultural farming standards, which successfully identify and solve significant sustainability challenges while also improving sustainable practices;
- *Improver level:* This is reached when a significant portion of the supply comes from smallholder/small-scale farmers who are engaged in a support program and making steady progress toward addressing their primary sustainability challenges.

Enterprise is working on mapping the volume of the 12 global priority ingredients that it acquires by this framework. By its Leader-Mover-Improver architecture, this mapping will serve as the foundation for how the company connects with its suppliers to achieve continuous development. Enterprise long-term goals are split into two categories (Planet-tracker 2023):

- The Coca-Cola Corporation will classify all of its agricultural suppliers as either “Leaders, Movers, or Improvers” based on their track record of constant innovation;
- With time, every one of its worldwide priority ingredient suppliers and their agricultural supply base will reach the “Leader” rank.

As regards making headway towards the company’s objective, it monitors its progress toward its goal of sourcing 12 global priority ingredients (cane sugar, mango, grape, orange, apple, corn, lemon, beet sugar, tea, pulp & paper, coffee, and soybeans) in a manner that is consistent with its commitment to sustainable agriculture. These ingredients account for approximately 80% of its total annual agricultural ingredient purchases. After the introduction of the company’s PSA in 2021, it performed a benchmarking analysis on more than 500 suppliers located in more than 115 countries and territories. With the help of third-party validation programs authorized by the company’s PSA, effective 2021, it has made progress toward achieving total sustainable sourcing of all 12 global priority ingredients. Figure 1 compares the enterprise’s progress in 2021 versus its previous SAGP, which was in place from 2013-2020.

Figure 1. All critical ingredients sourced from sustainable locations



Source: The Coca-Cola Company 2023.

This allowed the company to begin mapping the quantities of its global priority ingredients to the new framework and build a baseline. 58% of its key ingredient quantities were supplied sustainably from suppliers utilizing third-party validation methods that were previously certified under the PSA, and this became effective in 2021 (Figure 1). This indicates that they have reached the “Leader” level of its PSA structure. Along with its vendors, it has made tremendous headway in validating or verifying the farms at which its products are cultivated. But the company is aware that sustainable agriculture is not a predetermined endpoint but rather a protracted

process that calls for continuous participation on the part of both its company and the supply networks that it relies on (CSR Europe 2023).

In the matter of participation and verification of the suppliers, it is important for the company's ultimate goal which is to work together with suppliers to include farmers in their supply chains to increase the efficiency and effectiveness of both parties. Coca-Cola gets its ingredients from companies that in turn get them from farmers or middlemen, so this is a reality for the company. Company's PSA is communicated to all of the farms where its ingredients and packaging are farmed, and sourcing contracts and other interactions with its suppliers outline clear expectations for making quantifiable progress toward satisfying its PSA. With the help of the company's Principles for Sustainable Agriculture (PSA)-Supplier Guide, the enterprise can help ensure that the PSA is effectively implemented by its vendors. Along with its distribution partners, the company fund sustainable agricultural projects like providing training and extension services to farmers so they may adopt environmentally friendly farming methods that boost quality, output, and revenue; methods of self-evaluation for monitoring development and enhancing existing best practices. Suppliers of global priority ingredients are also obligated to certify annually in writing the proportion of ingredients supplied to the company that complies with its PSA. These letters should include information on the country of origin, as well as any applicable verifications and criteria that have been satisfied (World benchmarking alliance, 2023).

As regards the relationship between water and agriculture, it should be said that 73% of the company's overall water footprint and 92% of its freshwater footprint comes from cultivating the ingredients required for its drinks, according to its full enterprise water footprint evaluation. Hence, the company has unified its water and sustainable agriculture policies to include ingredient sourcing in its overall goal of water security. Much like the enterprise did with operational water consumption in its production facilities, it is taking a two-pronged approach to addressing water use throughout its agricultural supply chain (Washington post 2023):

- What the company is doing to encourage the use of cutting-edge water management techniques in the parts of the world where the company gets the majority of its high-priority components;
- The measures the company takes to enhance watershed health in places where its top-tier, world-sourced components are cultivated.

In 2021, the company started working on a water-agriculture handbook that would include a prioritizing structure for the most water-dependent and water-risky agricultural components on a worldwide scale, as well as their corresponding watersheds of origin and relevant suppliers. A system-wide strategy that is consistent with the PSA and its water security objective will be provided by the manual.

In respect of fostering self-renewing farms, it should be added that the regenerative agriculture strategies may protect and rehabilitate lands, boost biodiversity and production, create resilience to climate change, and improve the water cycle. These benefits are achieved via the practices' ability to restore and rebuild damaged soils. Many of the company's programs that replenish water supplies encourage farmers to engage in practices that are beneficial to the environment, such as no-till, reduced-till, or conservation tillage; precision agriculture; practices at the field's edge; crop rotations; the use of cover crops; and the effective utilization of fertilizers and compost. For instance, in Turkey, the enterprise has been collaborating with the General Directorate of Agricultural Reform of the Ministry of Agriculture and Forestry and the Nature Conservation Centre to implement regenerative farming methods in the province of Konya. The initiative first began in 2013 on 125 hectares of land, and it has in 2021 extended to include more than 3,500 hectares of agricultural land. It is projected that the use of regenerative agriculture methods has led to an increase in soil organic matter of at least 30%, an increase in soil moisture content of 10 percent, and a decrease in the amount of irrigation that is needed during the growing season by 10% (Reuters 2023).

The enterprise is working pre-competitively with industry peers and suppliers to promote and implement regenerative agricultural practices, by supporting the development of tools and guidance documents to build farmer capacity, as a founding member of the SAI Platform's Regenerative Agricultural Programme, which aims to set an industry benchmark for measuring outcomes at the farm level. In addition, the enterprise has kept up its involvement with the SAI Platform's work on Farm Sustainability Assessment (FSA), which promotes a shared knowledge of sustainable agriculture and drives meaningful, measurable improvements in environmental, social, and economic performance on farms (Sai platform 2023).

Concerning China, makes use of circular water for sugar cane. Over 60% of China's sugar originates from the drought- and flood-prone Guangxi Zhuang Autonomous Area (Guangxi). The Coca-Cola Foundation, the United Nations Development Programme, and the China International Centre for Economic and Technological Exchanges have all been working with the company over the last decade to improve sugar cane output while decreasing water usage to assist with this problem. Promoting drip irrigation systems and reusing wastewater

from sugar mills in the area have contributed to this goal. During 2011-2013, the initiative was piloted on a small scale (200 ha) with direct assistance from project partners. When the Chinese provincial government saw the positive results of this new sustainable agricultural method, they backed its replication and growth to another 6,500 hectares in 2013, which eventually led to a full-scale implementation of the whole sugar cane industry in Guangxi. As of January 2021, the program's trial agriculture methods have benefitted a total of 350,000 hectares in Guangxi and adjacent regions (Relief Web 2023).

As to the Fruto Resilience in Brazil, it should be underlined that trying to get a third party to confirm their produce, smallholder farmers often confront several significant hurdles. Therefore, in 2019, the company initiated the "Fruto Resilience" project with the intention of enhancing the farming practices of 480 smallholder orange growers in the Brazilian citrus belt by the end of 2023, with the expectation that at least fifty percent of these growers will reach the point that is equivalent to the bronze level of the SAI FSA standard. Moreover, the company set this target date with the expectation that it would be able to accomplish this goal. The Coca-Cola Corporation, The Coca-Cola Foundation, Solidaridad, Cutrale (its biggest orange juice supplier in Brazil), and Eckes Granini are the organizations that are working together on this initiative as part of a collaborative relationship (a leading supplier of fruit juices and beverages). The transmission of knowledge via the use of digital means such as messaging apps, videos, and live broadcasts, as well as a website where farmers can obtain training manuals, pamphlets, and other materials, enabled the initiative to reach 800 orange producers as of the end of the year 2021. A collaboration agreement was also inked with the Sylvio Moreira Citriculture Center (CCSM) of the Campinas Agronomic Institute as part of the project. Agriculture extension workers, who give advising services to farms and customized action plans, made more than 300 visits as part of the project (IAC). The project will make use of the demonstration farm that is maintained by CCSM/IAC to highlight and demonstrate to farmers sustainable farming methods. At least 200 orange farmers' agricultural methods are targeted for improvement as part of this initiative (Solidaridad network 2023).

Regard to the health of Indiana's soil may be improved by the use of cover crops. Cover crops were planted on 2,660 acres of farmland in the Big Pine Creek watershed in Indiana by The Nature Conservancy (TNC) and The Coca-Cola Corporation in partnership with local farmers between the years 2016 and 2017. Outside of the growing season of the primary crops of maize and soybeans, which are grown in rotation, farmers sowed cereal rye as a cover crop. Cover crops are crops that are grown over many years to enhance the general health of soils, increase their ability to store water, absorb carbon, and prevent soil erosion and runoff. After receiving this first investment and help, a significant number of farmers have gone on to grow cover crops every year using their cash. Cover crops were sown on a total of 1,264 acres in 2021, out of the initial 2,660 acres that were supported. It is projected that planting these cover crops would result in a reduction in the runoff by a total of 484 million liters annually. It is projected that there has been a reduction of 2,001 metric tons per year in sediment erosion (Indiana Environmental Reporter 2023).

In connection with raising the stakes on climate change, it is worth accent that the company's efforts to combat climate change have increased in intensity over the last several years to match the magnitude and severity of the problem. Enterprise boosted its climate ambition even as it met its 2020 "drink in your hand" the aim of cutting relative carbon emissions by 25% from a 2010 baseline. With a focus on research, it has set a goal of reducing absolute emissions by 25% by 2030 from a 2015 baseline, and it wants to reach net zero carbon by 2050. The enterprise is excited that some of its bottling partners have announced their science-based objectives and net zero commitments, which will help propel even more positive climate action throughout the Coca-Cola system. To achieve its objective of net zero by 2050, the company has begun the basic modeling required to do it. Suppliers, who account for over 80% of expenditure across most main procurement categories, are asked to fill out the CDP Supply Chain Climate Change questionnaire on the company's behalf. More than three times as many vendors responded in 2021 as they had in 2020. Making steady progress toward the enterprise's objectives, as well as providing assistance to important stakeholders as they increase their aspirations, is essential to achieving significant climate progress (The Spin-Off 2023).

Concerning administration regarding climate change, the Board of Directors has delegated ultimate responsibility for climate-related matters to the ESG and Public Policy Committee. Environmental, social, legal, regulatory, and public policy problems, including its progress toward its science-based aim, are among the many areas that the committee helps the Board monitor. Regularly, the committee updates the whole Board on its progress, including any progress made on climate-related concerns (Climate Action 100+ 2023).

As regards incorporating climate change responses into the company's strategy in 2021, the company conducted an extensive new study across its organization and agricultural supply chain, expanding on its first climate risk scenario analysis from 2019, which focused on three scenarios: Business as Usual (warming above

5°C), Middle of the Road (warming limited to 2.7°C), and Low Carbon (warming kept below 2°C). By this method, the company was able to pinpoint a more nuanced collection of climate-related hazards and opportunities across many future scenarios, including physical and transitional consequences. This is going to be an essential resource for making long-term plans and developing contingency strategies (Harvard Business School 2023).

In connection with handling climate risk, the company has set up a Risk Steering Committee and Enterprise Risk Management process to monitor system-wide risk assessments regularly, and it is working to include climate risk planning into this strategy. Changes in global weather patterns and an increase in the frequency and intensity of natural disasters are two examples of the physical dangers associated with climate change that might reduce supply or drive up the price of essential agricultural commodities. The availability of water for the Coca-Cola system's bottling operations may be hampered by climate change's potential to worsen water shortages and induce further degradation of water quality in impacted locations. An increase in climate change-related legislation and regulation is possible. As to altering to a carbon-low economy, to reach the company's scientifically-based goal, it must evaluate every link in the value chain, from raw materials to final packaging. System partners within its scope 1 and 2 boundaries are included in the company's goal to decrease absolute GHG emissions across all of scopes 1 through 3 by 25% by 2030. Some specific ways in which the enterprise is working to include its climate efforts across the enterprise's value chain and in concert with system partners are detailed below (Risk and Insurance 2023).

Packaging advancements and improved collection rates. Over a third of its total carbon footprint may be attributed to packing, therefore every action it takes toward its World without Waste campaign will also help the company to reach its evidence-based goal. Plant-based packaging reduces demand for virgin plastic made from petroleum, and so does lightweight, reusing packaging (both conventional refillable and fountain and Coca-Cola Freestyle dispensed solutions), and recycling. Reports on Emissions and Reduction Strategies from Suppliers Twenty-five to thirty percent of its overall value chain emissions come from its agricultural suppliers, and each year many of them reports on their performance and progress in lowering emissions and on plans to achieve further reductions. All of the practices outlined in the company's Principles for Sustainable Agriculture (PSA) such as maximizing energy efficiency and using renewable energy, employing responsible forest management practices that protect biodiversity and restore degraded ecosystems, and maintaining or improving soils by preventing degradation plays an important role in reducing negative climate impacts (Packaging-Gateway 2023).

Industrialists' bets on renewable energy from 10% to 15% of their country's emissions originate from industrial processes. In 2021, renewable energy accounted for 12% of the system's total power use. The enterprise's commitment to helping operations and bottling partners increase their usage of renewable energy sources in 2022 was not wavering. To further the company's efforts to increase its usage of renewable energy, the company re-joined the Clean Energy Buyers Association in 2021 (formerly the Renewable Energy Buyers Alliance) (Food navigator-Asia 2023).

Conclusions

Human rights, water security, climate resilience, GHG emissions reduction, and women's empowerment are just a few of the interconnected problems that the firm thinks sustainable agriculture can solve. Along with the company's suppliers and a variety of partners, it is trying to implement systemic change throughout its agricultural supply chain. Several new methods and techniques are being developed to address the growing concern for agricultural sustainability by offering new forms of integrated and comprehensive evaluation. Yet, a cohesive understanding of sustainable development that includes the standardization of agricultural sustainability assessment has to be reached. Several of the new concepts advocate case-specific methods that analyze the relationship between resource use and agricultural sustainability. Methods are often used together rather than alone, making it difficult to draw clear lines between them.

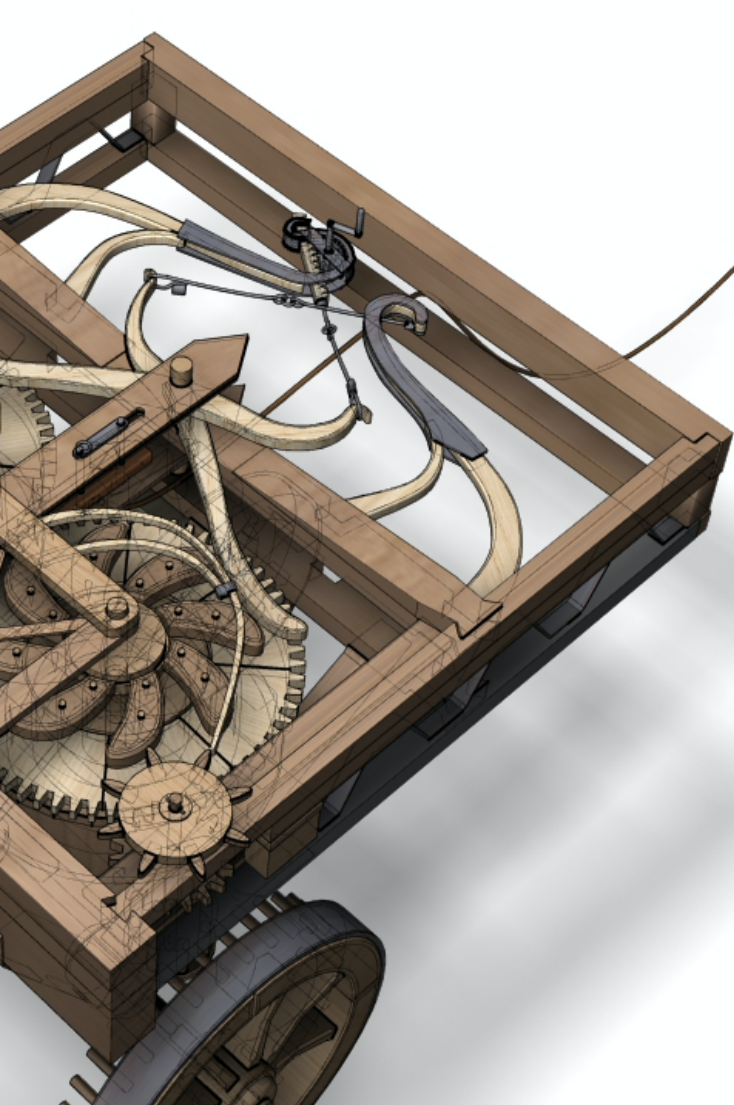
This research offered a methodology for conducting a comprehensive literature assessment of agricultural sustainability studies, which will help to fill a current gap in the indexing of accessible approaches. The structure unifies the many criteria for reviewing the literature and presents a two-tiered analysis to aid in systematization, data mining, and the extraction of techniques. Throughout the last decade, the approach has been used to systematically analyze the literature on farm-level sustainability assessments of crop agriculture. As there are now no guidelines or criteria for the evaluation of agricultural techniques' sustainability, research into the methodology employed is of utmost relevance.

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