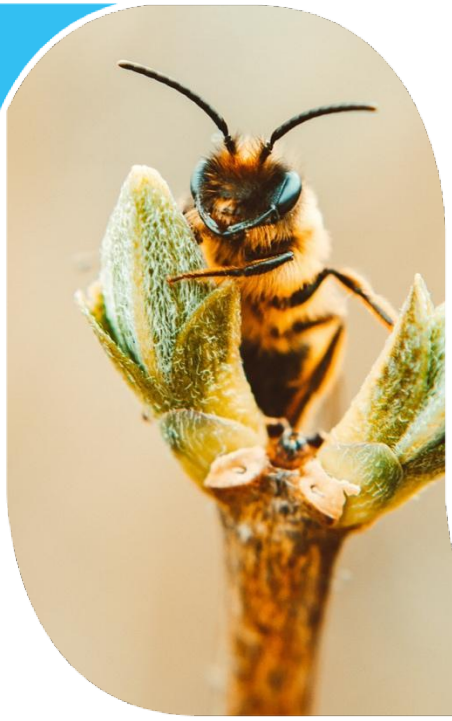
NYU STERN

Center for
Sustainable Business

Hero



The Business Case for Sustainable Farming to Improve Biodiversity

Elyse Douglas, Senior Scholar
Maggie Paruta, Associate Research Scholar

December 2022

Introduction

Hero Group is a mid-sized food company, selling baby foods, jams, and snacks globally. The company's stated mission is to "delight consumers by conserving the goodness of nature," and their sustainability commitment is at the center of this mission. For nearly a decade the company has been sharing knowledge around biodiversity and promoting practices to improve pollination through academic collaborations. The company published its first Global Reporting Initiative (GRI) sustainability report for 2021 and has begun focusing on exposures within their supply chain. In addition to establishing a baseline of Scope 3 emissions the company is also developing actions to meet their sustainability commitment for reducing emissions to meet net zero targets.

Hero's Sustainability Programs

The company agreed to participate in the HSBC-funded Food & Agriculture project to use NYU Stern CSB's Return on Sustainability Investment (ROSI™) methodology to measure the benefits of their current initiatives and the opportunity to expand upon the work done to date. The company's existing Bee Careful initiative includes:

- **Wee4Bee (formerly the Honeybee Online Studies - HOBOS)** -Led by Professor Jürgen Tautz, Wee4Bee is an interdisciplinary platform fo sharing insights found from his bee research station at the company's factory site in Bad Schwartau, Germany. The initiative also publishes research, works with educational institutions to spread awareness, and provides support to select German beekeepers.

- **Bee Supporter Jam** - A promotional product line shares engaging bee facts and imagery on its packaging and supports a tree planting project run in partnership with Schleswig-Holstein's Nature Conservancy Union (NABU)

As part of its investment in sustainability, the company's German subsidiary, Schwartauer Werke (SW) surveyed its German cherry and current growers on their use of "Bee-Friendly Farming" (BFF), to identify areas for engagement. The survey covered such topics as the use of: bee hotels, harmful pesticides to bees, and organic fertilizer, as well as questions to assess farmer interest in adding pollinator habitat (i.e. planting bee buffers and wildflowers alongside farmlands and protecting nesting areas).

NYU Stern CSB worked with SW to understand the benefits of BFF practices to growers and how engaging with growers to support a "sustainably-sourced" product line" could lead to revenue growth, cost savings and competitive advantages.

The Business Case for Sustainable Natural Spreads

SW's investment in sustainability comes at a crucial time, given the loss of biodiversity and a decline in bees and other pollinating insects that are essential for fruit production. According to

the European Commission, about a third of bee and butterfly populations are declining and 10% are endangered. There are several causes of such declines including the loss and degradation of natural habitats due to urbanization, intensive agriculture leading to a lack of diverse and resilient flora, food and nesting sources, and pesticides and other pollutants that are harmful to pollinators.[1] In response to this environmental issue, in June 2022, the European Commission adopted a proposal for a Nature Restoration Law, which includes reversing the decline of pollinator populations by 2030. This presents a business risk for SW given their natural spreads business depends on a plentiful supply of rich fruits. Added costs for growers will lead to increasing prices and if farmers perceive the added costs outweigh price increases, there will be a scarcity of fruit supply.

Additionally, the majority of the company's carbon footprint lies in their supply chain. Promoting and tracking the adoption of practices is an opportunity for the company to reduce their Scope 3 carbon emissions and to achieve any future carbon reduction goals.

Consumers are also placing a greater value on sustainably sourced products as shown by NYU Stern CSB research (Sustainable Market Share Index) where sustainability-marketed products exhibit higher growth in sales and premium pricing. Therefore, offering a "Bee Friendly Farming" sourced product presents an opportunity for the company to differentiate itself within the natural spreads category, apart from traditional value drivers such as taste and nutrition.

ROSI Benefits

NYU Stern CSB's Food & Agriculture Return on Sustainability Investment Framework was used to identify benefits for growers and Hero/SW. The benefits of promoting the adoption of BFF practices are improved pollination and crop yields leading to the following:

1. More stable supply leading to reduced price volatility
2. A reduction in carbon emissions from switching to organic fertilizer and planting trees, flowering strips, and meadows
3. Establishing a BFF sustainably sourced product line can improve sales and marketing through increased customer loyalty and increased penetration into consumer segments and/or channels with greater growth and price potential
4. Increasing investments in sustainability initiatives to improve biodiversity can lead to higher employee engagement due to greater alignment of values
5. More stable supply leading to lower costs by securing local high quality, locally produced product
6. More stable supply can lead administrative cost savings related to long-term contracting with growers
7. Messaging on sustainable products and company investment in improving biodiversity can lead to unpaid media exposures
8. Less erosion and the ability to better withstand extreme weather (floods and droughts) leading to improved water efficiency (use and quality)
9. An improved sustainability profile can lead to lower cost of borrowing

[1] "What's behind the decline in bees and other pollinators?" *European Parliament*. September 2021. Source: https://bit.ly/3MsfGcj

Due to the limited scope of the project, only the top 4 benefits were monetized.

For the benefits of sustainable sourcing to be realized, the company would need to engage directly with growers to adopt BFF practices, track results and monitor compliance, establish requirements for sustainability-sourced and develop marketing strategy for new sustainably sourced products.

Methodology: Applying ROSI

Hero/SW provided NYU Stern CSB with information and data on sourcing activities, experience with sustainable products (i.e., “Bee Supporter” jam and organics), and insights on costs including marketing programs. NYU Stern CSB reviewed relevant research and designed approaches to monetize the benefits. Additional details on the benefits assessed are highlighted below.

Benefit 1: Price Risk

More stable supply leading to reduced price volatility

Fruit prices have been increasing due to volatile weather conditions and a reduction in the number of growers reducing overall supply. The German Federal Statistics Office reports that the acreage of strawberry cultivation in Germany has been decreasing since 2017.
Research by Bartomeus (2014) and Albrecht (2020) confirm the adoption of BFF practices leads to increased pollination and higher yields and more stable supply of locally grown fruit.

While more data and analysis would be needed to isolate the specific impact of improved yields on fruit prices, its assumed that an improvement in yield will likely lead to a moderation of price increases. A metric was therefore developed to capture a modest decline in the trajectory of rising prices.

Also, more information would be needed to calculate the improvement on input and processing costs related to German sourced fruit versus imported and processed fruit.

Methodology

For this metric, historical fruit prices from the European Commission were used for SW’s main natural spreads flavors (strawberry, cherry, and apricot). Price stability benefits were captured by comparing future prices based on historical average growth rates to an estimate of prices based on a modest reduction in the growth rate. While more analysis is needed to assess the magnitude of the impact of supply stability on prices, the metric provides a reasonable and conservative estimate of value.

Benefit 2: Reduction in carbon emissions

Ability to cost effectively reduce Scope 3 emissions

Grower adoption of several BFF practices within the supply chain leads to reduced carbon emissions. By promoting adoption and monitoring grower compliance, reductions in carbon can be used to achieve the company's Scope 3 carbon goals. This benefit captures the amount of carbon sequestered from tree planting (Kay et. al. 2019) and reduced synthetic fertilizer (Smith et. al. 2005) identified in academic research to calculate expected carbon reduction values.

This metric can help evaluate how BFF practices can contribute to the carbon emissions reduction commitments and targets the company is currently developing as part of the Science Based Targets Initiative (SBTI), which will be public in 2023.

Methodology

Measuring carbon efficiency is more of an intangible given the company is not being paid outright for reduced emissions. If companies charge internal carbon prices when making investment decisions the internal carbon price can be used. In this case, there is no internal carbon pricing mechanism, therefore a conservative assumption that investing in carbon reduction strategies today will avoid the need to buy offsets in the future was used. The differential between today's prices and the expected future prices will be avoided, in effect the benefits are viewed as a hedge against rising carbon offset costs.

The benefit was determined by comparing the value of carbon sequestered at today's price to the value assuming these costs increase overtime (3% growth assumed).

Reduced Fertilizer Use

A forecast of the number of growers expected to convert to organic fertilizer was assumed and an estimate of the number of acres impacted was calculated. The acres were multiplied by the unit value of reduced carbon emissions. The value of reduced emissions was calculated using the incremental carbon cost described above.

Planting Trees

The number of trees to be planted was determined by estimating the expected program size (target number of farms and number of trees per farm) and time period to reach full adoption. Then the amount of carbon captured given the total annual number of trees planted and its associated carbon offset value was calculated. The costs of trees were estimated using data from the company's experience with the NABU program. These costs were then subtracted to arrive at the value of reduced carbon risk associated with the program.

Benefit 3: Sales impacts of offering sustainably sourced product

Increased penetration of consumer segments & retail channels

SW working directly with growers to adopt BFF practices can lead to the development of a "sustainably sourced" product, based on an internally defined sourcing standard. This can eventually lead to a fully certified product in partnership with BEE FRIENDLY, Bee Better, or another independent certifying body which audits BFF practices on farms. Marketing a sustainably sourced product improves customer loyalty and brand image leading to increased sales and profits by reaching new demographic segments, retail channels, and/or growing existing market share. The sales and marketing benefits reflect impact on volumes, price premium potential, and the ability to grow market share. The NYU Stern CSB Sustainable Market Share Index research confirms the ability for SW to achieve higher sales growth and pricing with a well-defined, and messaged, sustainability-sourced product.

More market research would be needed to isolate the specific driver of improved sales and marketing such as increased customer lifetime value, growth in specific demographics (e.g., Millennials, Gen Z), and access to new retail channels (e.g., health food stores). However, a benefit was estimated using conservative assumptions around potential growth and price based on the company's experience with their promotional "Bee Supporter" and organic product lines.

Methodology

Increased Volumes

Incremental volumes and associated new revenue related to converting the "Bee Supporter" promotional line into a full sustainably sourced product line were forecasted, including assumptions on potential cannibalization. Costs on new revenues were calculated using historical costs as a percent of revenues ratios and subtracted from revenues to measure incremental profits.

Price Premium

The NYU Stern CSB Sustainable Market Share Index research results show sustainably-marketed products sold at price premiums ranging from 5% to over 150% - an average premium of 30%. However, more analysis would be required to identify the specific impacts on natural spreads only. For the purposes of our analysis, a conservative approach was taken. The increase in average selling price was calculated by estimating the price premium potential (used a 1% premium (€0.03) that is not realized until year 2). Benefit is calculated by multiplying price premium by the new revenue volumes.

Increased Market Share

This is a broader measure of potential volume increases and can be used by commercial entities within the company that do not have an existing promotional line. It was applied to SW assuming that other products may benefit from the company's improved sustainability profile (for instance they may see incremental growth in their organic lines).

The total market size was calculated by dividing SW sales by the company's estimated market share. A small share gain was estimated and multiplied by total market size to derive

incremental revenues (amounts calculated in the Increased Volume section above were deducted to arrive at net incremental revenues to avoid double counting). Then the incremental production and marketing costs were calculated and subtracted from revenues to calculate incremental profits.

Benefit 4: Higher employee engagement

Higher employee retention and productivity due to greater alignment of values

Improvement in the company's sustainability profile provides greater alignment of values with employees resulting in improved employee retention and productivity. Improvements in turnover and productivity for companies with high sustainability profiles are identified in research from Vitaliano (2010), Bode et al. (2015), and Delmas, Pevokic (2012). Both metrics apply an attribution factor to the potential benefits based on the estimated impact of the specific initiative being considered. For example, converting natural spread products to "certified" sustainably sourced would have a greater impact than merely adding or extending an existing organic line. Additionally, BFF practices will likely have the most impact on employees within the natural spreads business, rather than other business units that have their own specific sustainability strategies.

Methodology

Reduced Turnover

The current turnover rate was used to calculate the number of employees replaced each year. This number was multiplied by a research-based cost of replacing employees to estimate the annual cost of turnover. Potential improvement in turnover rates was estimated using the expected improvement identified in research (achieved by companies with high sustainability performance) multiplied by an attribution rate (factor assigned to reflect the expected impact of the initiative on the results - for instance a strategy of converting all products to fully "certified" sustainably sourced would have a greater impact than merely adding a product line that is not "certified). Using this adjusted improvement rate, calculate the lower number of employees to be replaced and multiply by cost per person and compare the result to current turnover cost to identify net benefit.

Improved Productivity

A measure for employee productivity was calculated by dividing the operating income by the number of employees. Potential improvement in productivity (income/employee) was estimated using the expected improvement identified in research (achieved by companies with high sustainability performance) and then multiplied by an attribution rate. The adjusted potential improvement in productivity per employee was then multiplied by the number of employees impacted to arrive at a value of increased productivity.

The company decided only to consider reduced turnover as a potential benefit.

Conclusion

Biodiversity loss is a material issue for SW. By promoting BFF practices, it not only preserves (pardon the pun) supply of fruit but leads to incremental financial benefits for the company. Sales and marketing represent the largest benefits, *in part due to the conservative assumptions used for other metrics.* Nonetheless, investing in sustainable farming leads to reduced price volatility, reduced carbon emissions (Scope 3), and can increase employee engagement. **A 10-year NPV of €3,572,988 (before costs) was estimated with an average annual operating income impact of €650,206.**

The cost of a program to engage with growers and provide the necessary infrastructure to monitor and validate results were also considered. A very rough estimate was assumed given the uncertainties around program scope and design but net results include an estimated **return on investment of 33% and a payback period of 5.6 years.**

The ROSI™ model was used in this case study to calculate the opportunity for Hero's German subsidiary, SW but it can be used by other commercial entities within the natural spreads business to assess the directional benefits of introducing a new or expanded "sustainably-sourced" product line. In addition, the tool provides a platform to foster more detailed discussions around sustainability investments across functional areas within the organization (sustainability, sales and marketing, procurement, HR, finance) and helps to identify data needs to improve investment decision making.

Restoring and maintaining agricultural biodiversity is essential for soil formation, biological nitrogen fixation, biological pest control, and plant pollination, and can improve the carbon storage capacity of soil. This project illustrates how using ROSI can provide insights to the value of addressing biodiversity concerns within the supply chain. It can lead to establishing a sustainable sourcing strategy, product offering and product messaging around improved biodiversity can meet the company's sustainability as well as commercial goals. And by acting early the company will be better positioned to deal with potential regulatory changes, increased supply costs, and possibly provide first mover positioning in the market driving a competitive advantage.