



# Unleashing Sustainable Value in Food & Agriculture

**Executive summary**

**March 2024**

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# Foreword



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Organizations across the food and agriculture sector are grappling with the impacts of a changing climate and evolving consumer needs. Compared to other sectors, food and agriculture is already seeing the impacts of climate change on its business and is uniquely positioned to drive change through its connection to sustaining climate, nature, and humanity. In the United States, climate change has already imposed devastating impacts on food production, causing shortages across domestic commodities including corn, poultry, and wheat,<sup>1</sup> and models show climate change will lower yields for major domestic staple crops even if CO<sub>2</sub>e emissions peak in 2050.<sup>2</sup> Within a value chain so broad and deeply interconnected, participants should seek inspiration from and collaborate with others to accomplish their sustainability and business goals.

**The New York University Stern Center for Sustainable Business (CSB) and Deloitte believe in empowering organizations to make a measurable and attributable impact.** CSB enables current and future business leaders to unleash the transformative potential of business to solve societal challenges at speed and scale. Deloitte is committed to helping organizations address significant challenges and accelerate transformative solutions, helping pave the way for a more equitable and purposeful future.

CSB and Deloitte have collaborated to derive insights on how investments in sustainability drive business returns in the food and agriculture sector, specifically in five areas: processing, manufacturing, food services, restaurants, and retail. Our research, as summarized in this paper, demonstrates that regardless of where an organization sits along the value chain, sustainability strategies generate financial value. This publication introduces the study and its components, key themes, and insights into where and how value from sustainability is created, as well as actionable recommended steps to capture this value potential. We will also publish a full report with granular deep dives into each of the five in-scope value chain segments, to provide more specific detail on how organizations can maximize financial value.

The findings extracted from this research demonstrate that there is a clear business case for investing in sustainability strategies across the food and agriculture value chain, especially when we take the time to consider the holistic value impact. **Investing in sustainable and regenerative agriculture will enable companies to build more resilient and sustainable food systems to feed future generations and improve their financial performance.**

# Summary

Nearly all respondents we surveyed reported that they realized financial value from their investments in sustainability.

After decades of maximizing food production, increasing yields, and lowering costs to feed a growing population, the food and agriculture sector now urgently faces material environmental, social, and economic issues. Agrifood systems are responsible for one-third of global greenhouse gas emissions,<sup>3</sup> with 70% of freshwater used for food production.<sup>4</sup> Overall food security is being threatened by intensive agriculture that is degrading land and depleting soil fertility, leading to declines in soil health, loss of biodiversity, and reductions in crop yields. The negative impacts of climate change, rising consumer interest in healthier and sustainably sourced products, and concerns about employee and producer well-being all contribute to the need for meaningful change. Though progress is being made, the complexity of supply chains, interconnectedness of the food system, and escalating impacts from climate change render the current pace of change wholly insufficient. We set out to gain greater clarity of the value provided by sustainability strategies to help organizations increase investments and accelerate change.

To better understand the financial value drivers for investing in sustainability strategies across the food and agriculture supply chain, CSB and Deloitte leveraged CSB's [Return on Sustainability Investment](#) (ROSI™) methodology and framework for food and agriculture. We started with the 12 ROSI™ sustainability strategies (summarized in figure 4) to design a 25-question survey, completed by 350 executives across five value chain segments of the food and agriculture value chain:<sup>5</sup> processors, manufacturers, food services, restaurants, and retailers. This work was supplemented with interviews of food and agriculture company executives for further insights along with additional ROSI™-related research and case studies.

The survey, interviews, and research conducted for this paper have confirmed preexisting hypotheses but also uncovered new insights into opportunities for discrete actions that companies can take to realize value. In this paper, we present evidence for a strong, positive business case for investing in sustainability strategies in the food and agriculture space; **nearly all respondents we surveyed who invested in sustainability reported that they realized financial value from those investments.**<sup>6</sup> Furthermore, organizations that co-invest with others report even stronger financial performance. The research found that 60% of the respondents believed they would continue to see returns from future investments in sustainability and there are also demonstrated risks of inaction, as most organizations reported losing business value from not investing in sustainability. To be successful and maximize financial value, food and agriculture organizations must act and adapt, drive progress in the face of uncertainty, build enabling environments, and collaborate more broadly to bring others along in the sustainability journey.









# Key themes overview

Across the five in-scope value chain segments, we identified seven key themes.

**Figure 1: Key themes**

For more details, please refer to the Key themes and insights section.



Investing in sustainability strategies has demonstrated a strong, positive business case.



The cost of inaction through lost revenue and/or higher costs comes from delaying or withholding sustainability investment.



Opportunity-related benefits were discovered by many companies that originally focused their sustainability strategies on risk mitigation.



Financial benefits are affected by where a company sits on the value chain.



Realized financial benefits from sustainability investments don't fully mollify uncertainty about future value of such investments.



Benefits from sustainability investments are often unidentified or undervalued due to difficulties in measuring progress and value.



Collaboration brings even better results within the interconnected food system.

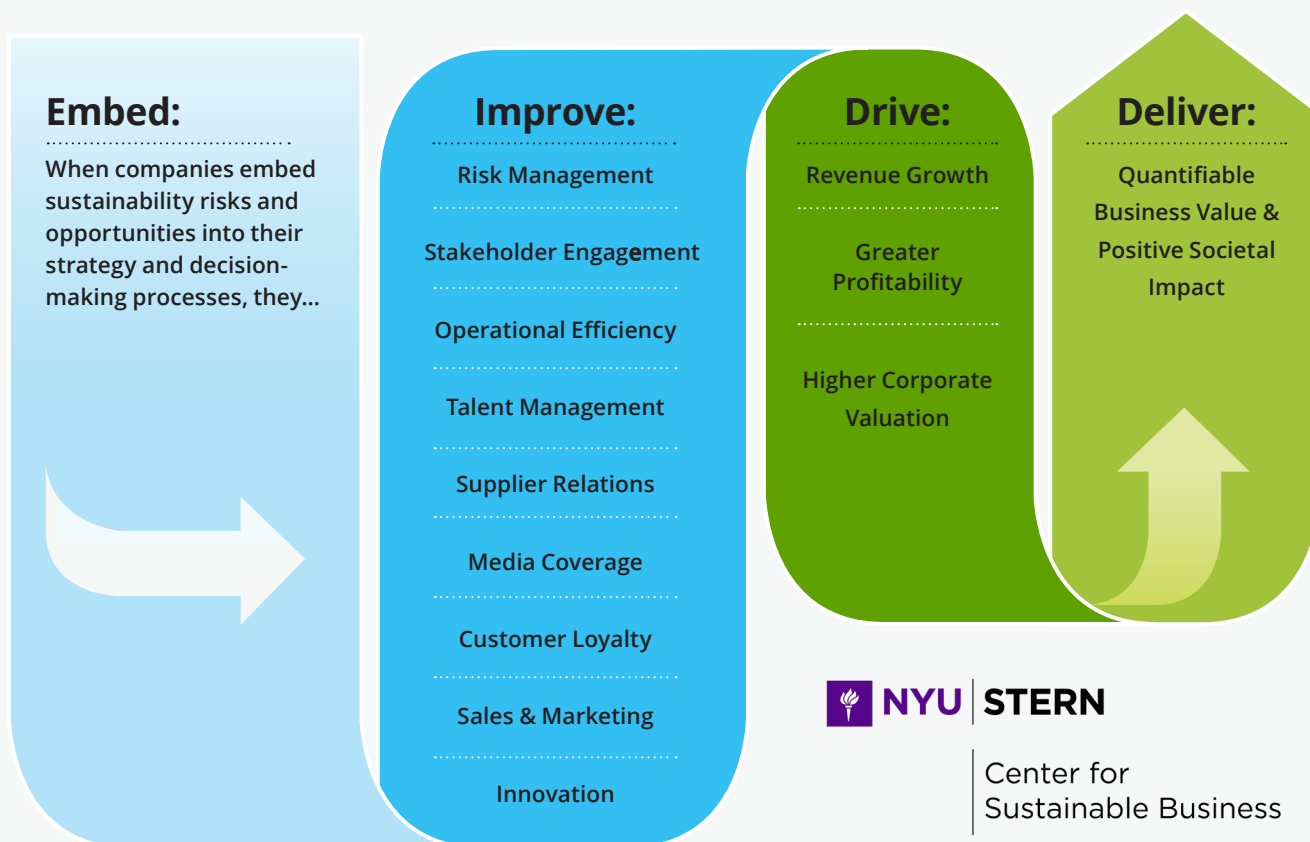
# ROSI™ methodology and the food and agriculture framework

The **Return on Sustainability Investment (ROSI™)** methodology, developed by NYU Stern CSB, bridges the gap between sustainability strategies and financial performance, helping to build a better business case for both current and planned sustainability initiatives. For corporate management, ROSI™ can improve corporate strategy and decision-making by accounting for and quantifying the full range of costs and benefits, including intangibles. For investors, ROSI™ improves decision-making, valuation, and communications assessing where relative value exists in corporate strategies and investments and better integrating, measuring, and reporting on financial performance driven by sustainability strategies.

Figure 2: ROSI™ framework overview

## Return on Sustainability Investment (ROSI™) Framework

Sustainability Drivers of Financial  
Performance & Competitive Advantage





# Sustainability strategies

Based on the ROSI™ methodology, NYU Stern CSB developed a framework for the food and agriculture value chain<sup>7</sup> that identifies 12 strategies that drive value and measure the financial impacts to develop more resilient organizations and unlock financial value. The strategies are summarized below with detailed narratives found on the [CSB website](#).

**Figure 3: ROSI™ sustainability strategies**

1. This strategy includes energy management and buy and/or sell insets/offsets, which were included in the survey.
2. This strategy was not included as a stand-alone option for respondents to select in the survey but is referenced in the paper as it relates to each strategy.



**Climate Change  
Mitigation & Adaptation<sup>1</sup>**



**Soil Health**



**Biodiversity &  
Ecosystem Conservation**



**Chemical Management**



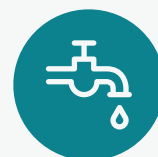
**Sustainable Sourcing**



**Animal Stewardship**



**Food Waste**



**Water Stewardship**



**Employee &  
Supplier Wellbeing**



**Food Safety &  
Nutrition**



**Sustainable Packaging**



**Brand Marketing &  
Communications<sup>2</sup>**

Figure 4: ROSI™ Sustainability strategies overview and key value drivers

ROSI™ strategy	Why it's important	Select key improvement factors
<b>Climate change mitigation and adaptation:</b> Actions taken to reduce carbon emissions including energy management, decreasing deforestation, adopting agroforestry projects, carbon capture and storage, buying and/or selling insets/offsets	Climate change negatively affects crop and animal productivity, water availability, and food availability, which increases supply chain instability and negatively affects human health and well-being. <sup>5</sup> It exposes companies to transition risk (associated with policy and market changes that may increase costs) and physical risks due to extreme weather, causing asset impairments and supply disruptions, and raising costs and input prices.	<ul style="list-style-type: none"> <li>• Risk management: reduced loss of productivity, regulatory requirements, carbon taxes</li> <li>• Operational efficiency: energy savings</li> <li>• Supplier relations: engagement on scope 3 emissions</li> </ul>
<b>Soil health:</b> Improving soil health with climate smart agriculture	Soil fertility is critical for crop productivity and health, yet approximately one-third of the world's cropland soil is degraded due to erosion, nutrient depletion, acidification, and salinization. <sup>9</sup> Improving soil health can protect against drought; fend off plant disease, weeds, and pests; drive increased yields; and restore the soil's carbon sequestration properties.	<ul style="list-style-type: none"> <li>• Risk management: reduced productivity, regulatory risk, volatility of supply</li> <li>• Operational efficiency: water savings, lower insurance costs</li> <li>• Supplier relations: improved farmer productivity</li> </ul>
<b>Biodiversity and ecosystem conservation:</b> Protect and conserve biodiversity and ecosystems	Declining biodiversity negatively affects ecosystems by making crops more susceptible to pests and disease and increasing the threat of species extinction (e.g., declining number of pollinators necessary for producing fruits, vegetables, and nuts). <sup>10</sup> EU passed the first-ever national restoration law to restore ecosystems, habitats, and species across the region. <sup>11</sup> Similarly, the USDA is taking a voluntary approach to conservation by funding conservation projects under the Regional Conservation Partnership Program. <sup>12</sup>	<ul style="list-style-type: none"> <li>• Risk management: risk of reduced productivity (e.g., farming dependent on pollinator and soil microfauna)</li> <li>• Sales and marketing: customer promotion</li> <li>• Media coverage: positive coverage</li> </ul>
<b>Chemical management:</b> Reduce the use and misapplication of harmful chemicals	Chemicals misused in food production (fertilizers, pesticides, herbicides, and fungicides), <sup>13</sup> food packaging, and food processing (to preserve quality, improve texture and appearance, extend shelf life) can have significant environmental and health consequences. <sup>14</sup>	<ul style="list-style-type: none"> <li>• Risk management: reduced regulatory fines</li> <li>• Operational efficiency: lower input costs</li> <li>• Sales and marketing: organic price premium</li> </ul>
<b>Sustainable sourcing:</b> Sustainable and responsible supply chain sourcing	Ensure the supply chain is producing or procuring products and ingredients in a manner that is socially and environmentally responsible, for example, sustainably farmed (using regenerative agriculture, deforestation-free, limited chemical use) and protecting worker welfare (no use of forced or child labor, offering living wages).	<ul style="list-style-type: none"> <li>• Risk management: reputational risk, regulatory risk, operational risk (supply disruptions)</li> <li>• Sales and marketing: customer loyalty</li> <li>• Supplier relations: supplier resiliency, profitability and market access</li> </ul>
<b>Animal stewardship:</b> Raise, treat, and/or source animals responsibly	Animals subject to stress and pain are more prone to disease and produce lower-quality meat, milk, and eggs. <sup>15</sup> Some grazing practices lead to deforestation, soil degradation, and pollution of streams and waterways. <sup>16</sup> Animal feed can lead to excess greenhouse gas emissions, <sup>17</sup> while the excessive use of hormones and unnecessary antibiotics for animal growth can result in human health issues. <sup>18</sup>	<ul style="list-style-type: none"> <li>• Risk management: reputational and regulatory risk</li> <li>• Operational efficiency: improved animal productivity, use of byproducts</li> <li>• Sales and marketing: price premium</li> </ul>

<b>Food waste reduction:</b> Improve food loss and waste management	Roughly one-third of food produced for human consumption is lost or wasted globally with 14% of food produce lost between harvest and retail. <sup>19</sup> This degree of inefficiency has significant economic, social, and environmental impacts resulting in economic losses of approximately \$1 trillion. <sup>20</sup>	<ul style="list-style-type: none"> <li>• Risk management: regulatory risk</li> <li>• Operational efficiency: use of byproducts and waste</li> <li>• Supplier relations: help upstream and downstream partners reduce waste</li> <li>• Sales and marketing: increased revenues</li> </ul>
<b>Water stewardship:</b> Invest measures to reduce water use and improve water quality	Water is essential for growing and processing food with approximately 70% of groundwater withdrawals used to irrigate food, fiber, and industrial crops, and for livestock. <sup>21</sup> The United Nations estimates there will be a 40% shortfall of the available global water supply by 2040 if current consumption and production patterns do not change. <sup>22</sup>	<ul style="list-style-type: none"> <li>• Risk management: reduced water access and license to operate</li> <li>• Operational efficiency: water cost savings</li> <li>• Stakeholder engagement: improved community engagement</li> </ul>
<b>Employee and supplier well-being:</b> Invest in employee well-being to promote healthy and equitable working conditions	Food companies depend on the knowledge, skills, creativity, and productivity of their employees and supply chain workers. Regulations exist to protect employees from discrimination based on race, gender, or disabilities; injury (OSHA) and cost of related health care; human trafficking; abuse of migrant workers; environmental impacts (EPA); hate crimes; and loss of privacy. Challenges within supply chains include labor shortages, reliance on temporary workers, job safety, poor worker living standards, low wages, and exploitation (including sexual harassment and forced and child labor).	<ul style="list-style-type: none"> <li>• Risk management: reduced employee lawsuits and human rights litigation</li> <li>• Operational efficiency: better productivity</li> <li>• Media coverage: positive coverage</li> <li>• Talent management: better retention and recruitment</li> </ul>
<b>Sustainable packaging:</b> Implement sustainable packaging solutions to minimize environmental impact	Packaging represents 5% of the energy used in the life cycle of a food product, making it a significant source of greenhouse gas (GHG) emissions. <sup>23</sup> Approximately 36% of all plastics produced are used by the food industry, including single-use plastic products for food and beverage containers, approximately 85% of which ends up in landfills. <sup>24</sup>	<ul style="list-style-type: none"> <li>• Risk management: regulatory risk</li> <li>• Operational efficiency: light weighting, lower costs due to substitution or reuse</li> <li>• Sales and marketing: appeals to customers looking for sustainable packaging</li> </ul>
<b>Food safety and nutrition:</b> Provide healthy nutritious food products and ensure safe food products	The requirement that food is safely produced, packaged, and delivered to avoid illness or adverse health impacts is table stakes for food companies. Consumers are taking a greater interest in ingredients that offer a health boost beyond basic nutrition and seeking out products distinguished by health claims.	<ul style="list-style-type: none"> <li>• Risk management: regulatory and reputation risk</li> <li>• Innovation: new products</li> <li>• Sales and marketing: customer loyalty through belief in the safety of the brand and potential health benefits</li> </ul>
<b>Brand marketing and communications:</b> Communicate credible sustainability initiatives and product attributes	Research shows that products marketed as sustainable are growing at a faster rate than conventional products and, on average, sell at a premium price. <sup>25</sup> To achieve a sales uplift from sustainable marketing, companies need effective communication to deliver sustainability as a driver of consumer preference. Research shows that while category claims are paramount, certain sustainability claims expanded brand reach by 24–33 percentage points above a category claim alone. <sup>26</sup>	<ul style="list-style-type: none"> <li>• Sales and marketing: appeals to customers' sustainability interests</li> <li>• Media coverage: positive coverage</li> </ul>



# Key themes and insights

Leveraging survey data, stakeholder interviews, secondary research, and the Return on Sustainability Investment (ROSI™) framework pioneered by the NYU Stern Center for Sustainable Business (CSB), our research has revealed the following key findings:

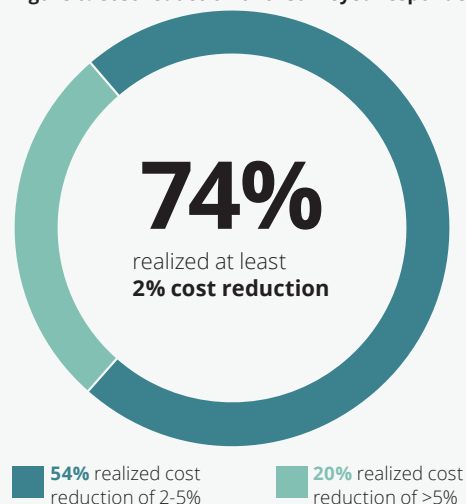
**Investing in sustainability strategies has demonstrated a strong, positive business case.** Nearly every respondent reported that investing in sustainability strategies has helped their organization realize financial benefits. **Of the 350 global food and agriculture executives surveyed, 99% reported experiencing revenue growth and 98% reported cost reductions in the three years prior** to the survey as a result of their investments in sustainability strategies. Further demonstrating the scale of these benefits, 79% of total respondents achieved at least 2% revenue growth and 74% realized at least 2% cost reduction.

When looking across the value chain segments, there was not one clear strategy that rose to the top for contributing to the greatest revenue increases or cost reductions, but when we look at each node in the value chain, the difference in effectiveness of each strategy becomes apparent. For example, when ranking top strategies that contributed to revenue increases, processors selected improving food loss and waste management, and retailers selected sustainable packaging solutions. Respondents were also asked to rank the top strategies that contributed to decreases in costs—food service providers selected energy management, while manufacturers selected raising, treating, and sourcing animals responsibly. *For details on top value-driving strategies for each value chain segment, review our upcoming full report.*

Figure 5: Revenue growth of surveyed respondents



Figure 6: Cost reduction of surveyed respondents





**The cost of inaction through lost revenue and/or higher costs comes from delaying or withholding sustainability investment.** Failing to take sustainability action can be costly for both businesses and the planet alike. Although nearly all survey respondents reported that they realized financial benefits from the sustainability strategies they implemented, the majority shared that they also lost value due to delays in or a lack of additional investments in sustainability initiatives. This was found in the form of revenue loss for 57% of respondents (e.g., due to customers switching to other companies or brands) and in the form of cost increases for 68% of respondents (e.g., due to increased regulatory costs, stranded assets, reduced access to and/or increased cost of capital). Companies must take quick and decisive action on sustainability strategies to maximize potential opportunities and avoid the cost of inaction. For example, CSB's annual analysis of consumer purchasing of consumer packaged goods in the United States finds that sustainable milk consumption is growing exponentially while conventional milk consumption is in deficit growth. In 2019, the first year we analyzed that data, the two largest dairy producers in the United States (Borden and Dean) went into bankruptcy. They struggled to evolve fast enough to keep up with changing consumer preferences.

**Opportunity-related benefits were discovered by many companies who originally focused their sustainability strategies on risk mitigation.** Many companies expressed that managing downside risk was a primary motivator behind their decisions to invest in sustainability strategies. In our interviews, cost avoidance (a form of risk mitigation) emerged as a key incentive for companies; a significant proportion of respondents cited brand and operational risk management as main motivators for investing across their own operations (41%) and in their supplier operations (42%). However, when asked about benefits realized

“If we don’t implement practice changes for lower-carbon milk, then our long-term penalty would be much greater because there won’t be a place on shelves for our product.”

– Senior Vice President Dairy Foods GDI & International, Land O’Lakes

after implementing these same sustainability strategies, there was an increase in responses for additional areas such as sales and marketing, operational efficiency, and supplier relations. Rather than solely focusing on managing downside risks, companies can capture greater value by taking a more holistic view and anticipating potential opportunity-related benefits when evaluating and deciding on their sustainability investments. *Our forthcoming full report will provide more detail on which sustainability strategies provided the most value for survey participants from each value chain segment.*



**Financial benefits are affected by where a company sits on the value chain.**

The value generated by investments in sustainability strategies is unevenly distributed across value chain segments. There exists continued supply limitations or shortages for sustainably produced inputs that translate to upstream organizations such as processors holding greater negotiating power. According to our survey, processors and food service providers<sup>27</sup> were the best performers for revenue growth, while retailers, food service providers, and restaurants<sup>28</sup> were the best performers for cost reduction.

In contrast, midstream companies such as manufacturers have struggled to realize the same level of return on their investments; they face challenges getting access to upstream supply of inputs and are pulled in multiple directions by various downstream customers who have different needs. In many cases, upstream organizations such as processors reap the benefit of capturing price premiums on sustainable products sold; manufacturers pay this premium to processors but often cannot pass the cost along to their customers. In our survey, across both revenue and cost-saving metrics, manufacturers realized lower rates of revenue

“Modeling conducted by third-party economists on the cost-benefit ratio of ag climate initiatives for McDonald’s US found that every dollar invested in mitigation generated nearly three dollars of benefits resulting in enhanced supply chain resiliency.”

– US Sustainability Lead, McDonald’s

growth and cost reduction compared to other value chain segments.<sup>29</sup> Our work in the food value chain has shown that improving energy management and investing in water stewardship are high value-driving and cost-reducing strategies throughout the agricultural supply chain and particularly for manufacturers; however, we did not see that reflected in the survey results. Only 25% of manufacturers identified improving energy management and 15% identified investing in water stewardship as top financial value-driving strategies,<sup>30</sup> and only 21% and 14% identified these strategies as their top cost-reducing strategies,<sup>31</sup> respectively. Possible explanations behind this finding include that there may potentially be a lack of clarity among manufacturers on which strategies drive the most value, they may be balancing a proliferation of needs upstream and/or downstream, or they may potentially not have the resources to implement value-driving strategies.

## Case study:

Sourcing sustainable palm oil is a strategy companies implement to avoid deforestation and labor exploitation in their supply chains. Violations can lead to nongovernmental organizations’ (NGOs) pressure campaigns and possible supply disruptions, making risk mitigation the key motivating factor for companies. A large food processor using the ROSI™ methodology to measure the benefits of its no deforestation, peat destruction, or exploitation of labor (NDPE) programs identified sales and marketing benefits (ability to sell to higher-margin customers focused on sustainable inputs), operating efficiencies (lower costs related to reduced customer grievances), and improved employee relations (improved retention and productivity) in addition to risk mitigation benefits, resulting in a 10-year NPV of \$72 million.

Compared to upstream players, downstream organizations such as retailers can more quickly adjust their product mix and sourcing strategies to respond to customer needs. Manufacturers' operations are often capital-intensive, and greater upfront investment is needed to make changes to product formulations or to introduce new sustainable products, limiting their flexibility to adapt quickly to changing market demands. When manufacturers are unable to promptly respond to consumer preferences, they miss out on revenue opportunities. Despite the complex dynamics associated with their position in the value chain, manufacturers have significant opportunities to reap benefits from investing in sustainability—in some cases, these benefits may not be directly tied to only explicit revenue increases or cost reductions but may also include more intangible benefits, as outlined in the McCormick case study spotlighted.

**Realized financial benefits from sustainability investments don't fully mollify uncertainty about the future value of such investments.** Although companies are already realizing value from their sustainability investments, some leaders are skeptical about the ability to garner and measure future returns. Our survey found that even though the majority of respondents (60%) expect value from sustainability strategies to increase<sup>32</sup> in the

“Retailers serve as a catalyst for change.  
When consumers demand more sustainable  
products, they don't start at the farm, they  
start at the store.”

– VP of Climate & Environment, Ahold Delhaize

## Case study:

McCormick was considering adopting a sustainable sourcing program for its iconic spices (black pepper, cinnamon, oregano, red pepper, and vanilla) but was concerned about potentially facing increased costs in doing so. The company used the ROSI™ methodology in 2020 to identify and monetize the following potential benefits: 1) preserve/improve market share, sales, and profitability; 2) increase brand value resulting in lower cost of capital; 3) reduce risk and avoid associated costs; and 4) increase earned media coverage. Results showed benefits of \$6 million in the first year, with the potential to increase by 60%–70% over six years, as well as net benefits in NPV terms of \$3.7 million and a return on investment (ROI) of 11%.







next two years, a significant portion (40%) report that they expect value to either remain the same or to decrease.<sup>33</sup> This stands in contrast to nearly all respondents experiencing revenue increases and cost reductions from sustainability strategies in 2022.<sup>34</sup> This uncertainty reflects concerns of diminishing marginal returns on current strategies, particularly from “low-hanging fruit” initiatives, and the need to address more complex strategies to make progress toward stated sustainability goals and objectives. Furthermore, businesses tend to evaluate sustainability efforts over a three- to five-year time horizon, yet the benefits of sustainability investments will continue to accrue over a much longer duration. As initiatives become more complex, investment in some strategies (e.g., improving soil health with climate smart agriculture, water stewardship, and biodiversity conservation) inherently presents greater risk and opportunity but requires a longer timeline to realize benefits; as solutions continue to scale, they will be better able to unlock future value. Withholding investments from longer-term plays can lead to undervaluing and underinvesting at best, and doing so can threaten a company’s license to operate. As the word “sustainability” suggests, these types of investments inherently have a lasting, long-term focus. Better measurement and collaboration can help mitigate risks and boost confidence about future returns.



**Benefits from sustainability investments are often unidentified or undervalued due to difficulties in measuring progress and value.**

Our survey results and interviews with stakeholders revealed that many face difficulties in measuring and tracking value from sustainability strategies. When asked about the challenges faced in operationalizing sustainability claims, 41% of respondents identified difficulties in measuring, monitoring, reporting, and verifying sustainability claims as a top-three potential impediment to meeting demand for products with such claims. Not quantifying value can make it hard to secure, continue, or grow investment, especially when risk avoidance and intangible benefits are overlooked.

Measurement is important but difficult to do. Many variables drive revenue increases and cost reductions, making it challenging to isolate a single strategy as the main driver of value creation; all of our survey respondents reported a myriad of sustainability

“There are a lot of assumptions around customer loyalty, brand, operational risk management, and stakeholder engagement. Anecdotally it helps, but we struggled to comprehensively quantify that value.”

– Cargill

strategies. Additionally, some strategies and results are difficult to measure at scale. For example, quantifying the impact of investments in biodiversity depends on tracking small microorganisms and migrating birds, and connecting changes to crop yield.

Even for things that we can measure and account for, such as carbon, it is hard to do so with sufficient credibility. Existing frameworks can help, such as monitoring, reporting, and verification (MRV) for carbon credits or insets, or disclosures recommended by the Taskforce on Climate-related Financial Disclosures (TCFD) and CDP. Organizations that are successful in developing a robust measurement framework work extensively across functions and with third-party advisers, including NGOs, to ensure credible measurement of benefits.

## Case study:

A privately held company providing food services to operators and in-store bakeries applied the ROSI™ methodology to quantify the benefits of renewable energy strategies to achieve the company's GHG emissions reduction targets. Key benefits identified were: (1) reduced regulatory risk, (2) reduced market risk, (3) increased sales to existing and new customers, (4) increased revenue from price premiums, and (5) reduced hiring costs. Based on planned projects in place, the cumulative benefits were estimated at approximately \$700 million over five years.

**Collaboration brings even better results within the interconnected food system.**

Companies understand that value chain cross-collaboration and co-investment can help increase value from investing in sustainability strategies. Today we are seeing more collaboration to implement sustainability strategies, particularly those addressing water and climate change. Our survey found that the vast majority (84%) of respondents are currently co-investing with organizations across the food value chain<sup>35</sup> to fund their sustainability

“Supply chain, regenerative agriculture, food waste, and balanced portfolio all depend on our capability to evolve and engage the stakeholder ecosystem, including suppliers.”

– CSR Performance & Transformation Manager, Groupe Bel

strategies. Of respondents who reported that they participate in co-investing, 43% are doing so with upstream suppliers in their supply chain, which in some cases entails co-investing with farmers, ranchers, and producers. The survey data also revealed a statistically significant positive association between companies that reported engaging in pre-competitive collaboration and/or external partnerships and those that achieved revenue growth of more than 5%; companies that participate in advanced forms of collaboration are reaping more value.

While farmers, ranchers, and producers were not in scope for the survey, they were involved and considered in the creation of ROSI™ and the food and agriculture framework. They play an important role as the first link in the food value chain, and collaboration with them is critical. Some of the of greatest sustainability impacts can come from initiatives at the farm and ranch level—as such, farmers, ranchers, and producers need to be provided with the right support, incentives, and risk mitigation mechanisms to implement management changes. The case study featuring Mars demonstrates how collaboration up and down the value chain can provide valuable returns.

## Case study:

CSB and Mars built a model to measure the benefits to Mars' suppliers (large intermediary off-takers) of investing in a fund to support farmers in sustainable practices. The fund works with smallholder farmers to restore degraded natural ecosystems, build sustainable supply chains, and improve the livelihoods of rural communities. The analysis showed that stable, sustainable supply chains can improve operating efficiency by increasing the number of suppliers that are professional commercial partners (mitigating price volatility through price transparency) and farmers adopting sustainable practices (reducing risk of crop loss by sustainable farming practices) and gaining direct connection to groups of farmers/suppliers with fewer intermediaries. Assuming an investment of US\$1 million to US\$3 million for an off-taker in its coconut supply chain, and using conservative assumptions, the ROI ranged from 20% to 33%.<sup>36</sup>







## Reflection on key themes

Please refer to the "Survey and interview scope and approach" section in the appendix for details on the approach and methodology on the research survey and interviews conducted.

These findings are from a point in time and reflect an evolving space. Future perceptions and actions will be shaped by changing regulations, the trajectory of climate change impacts, new technologies, shifts in consumer preferences, and an evolving competitive landscape. Carbon reduction goals are widespread across the food and agriculture value chain as a strategy to mitigate climate change; more than 95% of survey respondents report that their companies have GHG reduction targets for scopes 1 and 2, with 46% of all respondents also including scope 3. Going forward, organizations in the industry are encouraged to expand their focus beyond only carbon and greenhouse gases; industry players can consider addressing other areas of concern including biodiversity and ecosystem conservation and water stewardship. It will be interesting to see how companies will approach nature more broadly in their sustainability strategies. This shift in focus is on the horizon, with about one-third of survey participants pursuing strategies to both protect and conserve biodiversity and invest in water stewardship in their own operations,<sup>37</sup> along with the recent disclosure recommendations from the Taskforce on Nature-related Financial Disclosures (TNFD) and science-based targets for nature from the Science Based Targets Network (SBTN).



Path forward



# Path forward

It's imperative for players across the food and agriculture value chain to invest in sustainability to address urgent and material issues threatening the industry. Though the survey revealed an almost universal positive ROI for investments in sustainability in the past, the question still remains on how to drive optimal value from future investments. Companies can take several actions to drive value:



#### **Act and adapt**

Take action today while positioning yourself strategically to capture value from the advancements of tomorrow



#### **Drive progress in the face of uncertainty**

Drive progress in implementing sustainability strategies despite changing regulations, measurement difficulties, and more



#### **Invest in your enabling environment and establish key partnerships**

Create a supportive internal enabling environment through discrete initiatives while forming key partnerships



#### **Pursue collaboration and co-investment opportunities**

Collaborate across the value chain to drive support for your sustainability efforts and support systems-wide change



# Act and adapt

1

What companies can do today is different from what they will be able to do tomorrow, and being ready to pursue the latter requires preparation. Do what you can today while monitoring advancements in technology and the increasing affordability of solutions.



**Act now:** According to our research, delaying or withholding sustainability investments results in lost revenue and/or higher costs. To avoid this, initiate sustainability strategies that are easy to implement or require a relatively lower investment of time or resources and drive operational improvements—“low-hanging fruit.” Examples of such actions include reducing energy use<sup>38</sup> through energy-efficiency upgrades, lowering input costs through decreased chemical use,<sup>39</sup> and securing tax deductions through food donations.<sup>40</sup> Additionally, utilize technologies available now, such as inventory management platforms for demand planning to reduce food waste and more efficient equipment to cut down energy emissions. Capturing quick wins sets the foundation for continued sustainability investments and taking on more complex strategies in the future.

**Adapt:** Strategies with less obvious business cases today could shift to have a strong ROI because of policy shifts, emerging technologies, economies of scale, changing consumer preferences, and a number of other factors.

Shifts in policy can have negative and positive effects. New regulations may initially increase business costs through new reporting requirements or banned ingredients, but they can also improve access to new technologies through tax incentives and credits.

To prepare for different scenarios and to stay informed about evolving policies and regulations, engage with industry associations and participate in discussions on best practices.

New solutions emerge while maturity and scale increase the ROI for existing technologies. Companies are encouraged to regularly review and consider adopting technologies that align with their sustainability goals, such as Internet of Things (IoT) sensors and data analytics tools that extract sustainability insights. Gain insight into emerging technologies through partnerships with startups, research institutions, and tech innovators.

To stay on top of the best and latest strategies, create cross-functional connections among internal business units such as government relations, technology, operations, sustainability, and finance. Establish a cadence for that cross-functional team to revisit ROI estimates for existing and prospective investments, leveraging trend forecasts for policy and technology in your industry to adjust financial forecasts accordingly. These actions will help position you to take action and adapt your sustainability strategies in the face of constant change.

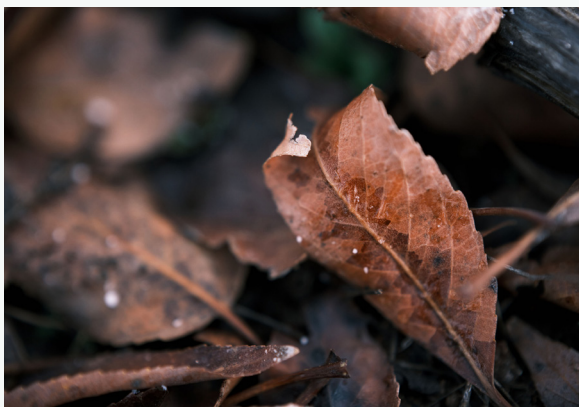
# Drive progress in the face of uncertainty.

2

The business case for sustainability has been made, but if you are feeling uncertain about the future and the long-term ROI of your sustainability investments, you are not alone—however, neither are you stuck. Companies can continue making progress in capturing value from implementing sustainability strategies despite the uncertainties of changing regulations, measurement difficulties, and more.



Although the future regulatory environment is quite uncertain, new regulations can be positive catalysts for change and can unlock areas of new value. For instance, consider guidance released under the USDA's Food Safety Modernization Act<sup>41</sup> that imposes new requirements on foreign supplier verification programs for food, or the EU regulation on deforestation-free products, which (when applicable in late 2024) will require operators selling certain commodities to ensure that products are not contributing to forest degradation.<sup>42</sup> Regulations such as these necessitate the development of new transparency, traceability, and sustainability measurement capabilities. This, in turn, can create an opportunity for organizations to leverage these capabilities to develop and market product portfolios with novel sustainability attributes. Leading organizations will see these new regulations as an opportunity to innovate and differentiate, opening the door to new revenue opportunities.



The survey results and additional CSB research indicate that many benefits of sustainable strategies are overlooked. Failing to quantify some or all of the benefits when calculating the ROI generally occurs when data is unavailable to track results, intangible benefits and avoided costs are not considered, and sustainability is not embedded across the organization and in the company's financial processes. Companies that leverage measurement and tracking tools to capture more data and holistic benefits will make better-informed decisions, increase confidence around sustainability strategies, and reap greater long-term benefits and value creation.



There are several things you can do to improve in this space:

**Define clear value metrics.** Outline key performance indicators (KPIs) that align with your sustainability goals; establish measurable targets for environmental, social, and economic impact; and set up processes to track over time. These KPIs are key to driving management decisions for an organization. When goal setting, consider different time horizons depending on the scale and realistic velocity of change in various areas. Additionally, do not rely on external ESG reporting metrics as your guide for selecting sustainability strategies and making broader management decisions; these industry reporting metrics are largely output-oriented (i.e., they measure whether an action has been taken and not whether outcomes have been achieved).

**Implement robust measurement architecture.** Invest in advanced measurement methodologies to accurately quantify the impact of sustainability initiatives and integrate life cycle assessments and comprehensive impact assessments into the measurement processes.

**Enhance data capture processes.** Implement systems for real-time data capture to ensure a continuous and accurate flow of information through tools that capture granular data on resource consumption and environmental performance, among other areas. Further, invest in the underlying data management infrastructure and data governance processes to ensure optimized insight generation and decision-making.

**Adopt improved tools.** Leverage technologies to better track, verify, and value efforts such as carbon reductions and removals; for example, Deloitte's ClearCarbon™<sup>43</sup> digital solution, which is designed to transform carbon into an asset, allowing organizations to transparently demonstrate real sustainability impact, fortify trust throughout the value chain and beyond, and generate new revenue streams by quantifying the effectiveness of an organization's CO<sub>2</sub>e emissions reductions and removals strategy.

**Track the return on sustainability investment.** Employing the ROSI™ methodology (or some version of the approach) to track intangible and tangible value associated with specific sustainability strategies and practices from the beginning can allow companies to better understand the ROI needed to fully embed sustainability into their strategy and achieve competitive advantage. Currently, very few companies are tracking those financial returns, and ESG reporting is divorced from financial reporting. Doing so will help not only improve environmental and social outcomes and capture financial value, but also unlock new opportunities for organizations across the food and agriculture value chain.

While the future is far from certain, leading organizations are harnessing this uncertainty and see change as an opportunity to drive transformation in their products and services that enable competitive advantage.

ClearCarbon™ is a digital solution designed to transform carbon into an asset, allowing organizations to transparently demonstrate real sustainability impact, fortify trust throughout the value chain and beyond, and generate new revenue streams by quantifying the effectiveness of an organization's CO<sub>2</sub>e emissions reduction and removal strategy.



# Invest in your enabling environment and key partners.

Organizations can become better suited to support sustainability efforts by implementing internal changes and developing a supportive external ecosystem. As mentioned prior, data measurement and tracking are key to operationalizing many sustainability efforts. With that data foundation built, a company can integrate sustainability into core business decisions and connect them to its mission and values, making it a fundamental aspect of the company's identity and operations. For example, more than 2,000 companies disclosed in 2020 that they were already using or planning to introduce an internal carbon price within two years to embed sustainability into business operations.<sup>44</sup> Internal carbon pricing can take many forms; by assigning a monetary value to each ton of GHG emissions to a specific project, companies can ensure that the environmental impact of their operations becomes a tangible and quantifiable factor that can inform decision-making.



Decision-making and prioritization are also influenced by financial incentives. Almost all (98%) respondents reported that their respective company ties executive compensation to performance against sustainability goals for the company, and 59% have been doing so for three or more years. Aligning financial incentives for a broad range of business leaders and employees can be a powerful tool for progress, because doing so incentivizes more leaders to engage in sustainability-related work. In particular, financial leaders need to be involved in sustainability investment decisions as financial disclosure reporting rules become more common. Reporting on sustainability goals and actions will require new financial processes to ensure the accuracy of reporting and achievability of stated goals

Efforts to establish an enabling environment go beyond internal operations, especially to tackle scope 3 emissions. Companies should encourage and incentivize suppliers to adopt sustainable practices through vehicles such as longer-term supplier contracts, enhanced payment terms, cost sharing for capital expenditures, and funding to support the transition to regenerative farming practices, among other areas. Companies are able to maximize value only with the proper enabling environment both within and outside of their organizations.

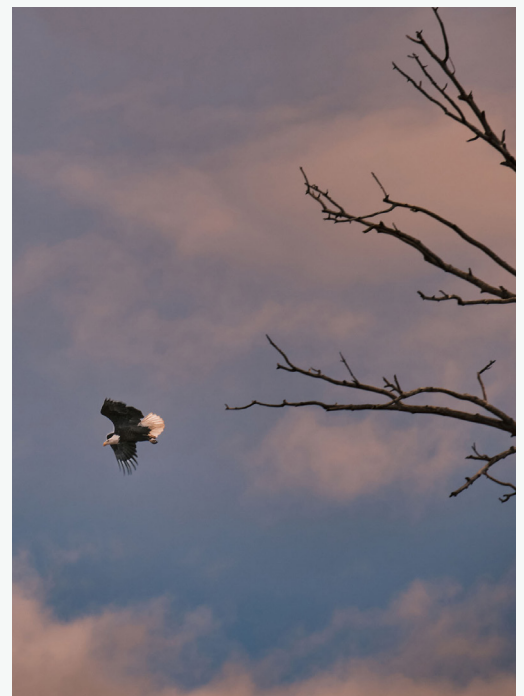
# Pursue collaboration and co-investment opportunities.

There is demonstrated appetite to collaborate across the value chain, as illustrated by the 84% of survey respondents who reported that they are co-investing to fund sustainability. The survey data shows a statistically significant positive association between companies engaging in pre-competitive collaboration and/or external partnerships, and those that achieved revenue growth of more than 5%. Pre-competitive collaboration provides opportunities for companies to work with competitors on shared areas of focus to drive change at the industry level, ranging from setting industrywide standards to data and knowledge sharing. Pre-competitive groups such as the World Business Council for Sustainability Development (WBCSD) are action-oriented and provide members with opportunities to drive progress in various topic areas that align with member interests.



The industry is interconnected already, and more connections can be found through trade organizations and industry conferences. Opening conversations about sustainability with suppliers, customers, competitors, vendors, and other players can help drive support for sustainability initiatives and lead to collaboration on efforts and investments. Regardless, the food and agriculture value chain begins where farmers, ranchers, and producers sit, and early collaboration with them is tantamount to successful food and agriculture sustainability transformations.

This research conducted by NYU Stern CSB and Deloitte offers evidence of positive returns from investments in sustainability in the food and agriculture sector. However, it also highlights some uncertainty about the difficulty measuring and longevity of those returns. With these steps in mind, businesses can continue to move forward and realize the benefits of investing in sustainability (and avoid the costs and risks of not doing so) with greater confidence, in both the results they can achieve and in their ability to prepare for and adapt to changing dynamics.



# Survey and interview scope and approach

### Survey methodology and approach

We conducted the survey portion of our research to understand the motivations of food and agriculture companies for investing in sustainability strategies, the value realized from their investments, and their outlook on the potential value from future investments in accordance with the NYU Stern Center for Sustainable Business (CSB) ROSI™ framework. The survey was co-designed by CSB and Deloitte, and survey results were collected and tabulated by an external vendor. The results of this survey can be used to understand opportunities for food and agriculture companies to realize value from investing in sustainability.

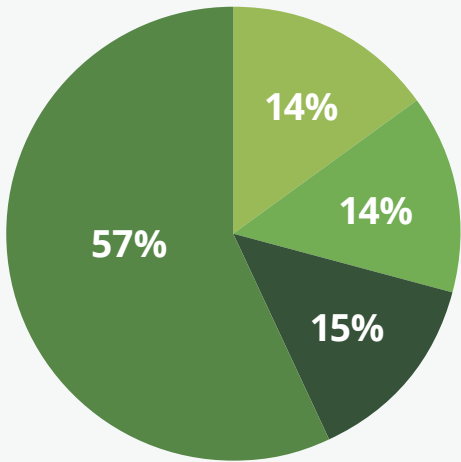
### Survey approach

Leveraging the input of subject-matter specialists in agriculture and sustainability, NYU Stern CSB and Deloitte co-designed a 25-question survey. A third-party research and survey firm helped facilitate a double-blind survey to minimize potential biases in responses, supporting with the collection of a total of 350 anonymous responses from executives representing food and agriculture companies across four countries: Germany, the Netherlands, the United Kingdom, and the United States. Three respondents operating exclusively in the fish and seafood and/or forestry and timber sectors were excluded from analysis.

### Respondent overview

Though the survey is not globally representative, respondents were distributed across four geographies and multiple value chain segments. Respondents were required to operate in the processor, manufacturer, food service, retail, or restaurant value chain segments and at least one of 12 sectors in-scope (dairy, meat and poultry, row crops, etc.).

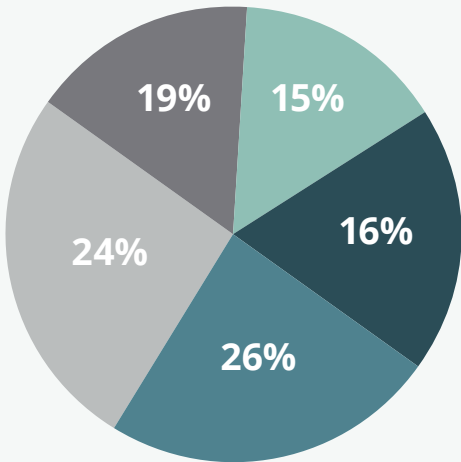
Figure 7: Respondent demographics by geography



Key heading

- United States 200
- Netherlands 50
- United Kingdom 50
- Germany 50

Figure 8: Respondent demographics by value chain node



Key heading

- Food Services & Commissaries 91
- Restaurant 84
- Retailer 65
- Processor 54
- Manufacturer 56



To identify stakeholders with adequate background in their companies' sustainability investments, respondents were required to be in roles that are VP level or higher and have a role in ESG, procurement, finance, sales, marketing, strategy, or sustainability. All companies represented had a minimum of US\$250 million in annual revenue or equivalent in their local currency in 2022.



**The survey is not designed to be representative of the overall food and agriculture sector. Survey participants had to meet the following requirements:**

- Minimum seniority of VP level in their organization
- Work at an organization with a minimum revenue of US\$250 million
- Hold a role in ESG, procurement, financial planning and analysis, sales, marketing, strategy, sustainability, or finance
- Value chain segment of represented organization is a processor, manufacturer, food service,<sup>45</sup> retail, or restaurant<sup>46</sup>
- Represented organization operates in at least one of the following sectors: beverages (alcoholic), beverages (non-alcoholic), confectionery, dairy, meat and poultry, prepared foods (goods ready for consumption, e.g., snack packs, pre-made breakfast), specialty crops (e.g., fruits, vegetables, nuts, flowers), row crops (e.g., corn, soybeans, wheat, canola, oats)

Results of this survey are subject to sampling variation. The vendor estimates at 95% level of confidence that each survey result has a confidence interval of +/- 6.9 percentage points in the United States, and +/- 13.9 percentage points in the remaining markets.

#### **Stakeholder interviews**

To supplement and further investigate findings from the survey data, we conducted nine stakeholder interviews with companies across the food and agriculture value chain. *Please refer to the Contributors section for details on companies we interviewed.*

# Survey analysis

## Descriptive analysis

The descriptive analysis assessed patterns in aggregated responses based on survey respondent demographics by value chain node, sector, or geography. Per the parameters outlined above, three manufacturers operating within the forestry and seafood sectors were excluded, leading to a sample size of 347 respondents considered in the descriptive analysis of the data. There were no outlier data points that were excluded based on expert evaluation.

## Significance testing

In addition to descriptive analysis, regression analysis and significance testing were conducted on a subset of survey data. Eight models were created:<sup>47</sup>

- **Models 1 and 2:** Revenue growth/cost reduction from sustainability strategies compared to sustainability strategies executed in a company's own operations
- **Models 3 and 4:** Revenue growth/cost reduction from sustainability strategies compared to sustainability strategies executed in a company's supplier operations
- **Models 5 and 6:** Revenue growth/cost reduction from sustainability strategies compared to whether a company had sustainability goals and executive compensation tied to ESG performance
- **Models 7 and 8:** Revenue growth / cost reduction from sustainability strategies compared to types of financing sources for sustainability investments

The outcome was divided into a binary response for companies that reported either greater than 5% revenue growth or cost reduction in 2022 from their sustainability investments or less than 5% revenue growth or cost reduction in 2022 from their sustainability investments. This split was intended to demarcate the difference between outperformers as a result of sustainability investments with the highest rates of revenue growth or cost reduction.

All models were tested for collinearity using a variance inflation factor (VIF) test. The results were then checked to see if any variables had a VIF value above 5 to determine whether there was a case of collinearity. No collinearity was found in the models presented. A  $p$  value cutoff of  $p < 0.1$  (i.e., 90% confidence interval) was used for the results presented.

Models presented include various controls including whether the firm is publicly or privately owned, the geographies where they operate, what sector they operate in, and their customer base (B2B versus B2C).

All models were also checked to ensure adherence to the specifications of a logistic regression as detailed below:

- **Binary outcomes** – Responses were coded to be binary.
- **No multicollinearity** – Models were checked for multicollinearity using a VIF test.
- **No extreme outliers** – Given the predictor and response variables were binary, there were no outliers that showed up.
- **Linearity** – This applies to cases where the predictor variable is continuous. Given the predictor variables used were binary, this assumption does not apply.



## Assumptions and limitations

Given that the survey data is composed of self-reported data from individuals who work at represented companies, there is a potential bias introduced by the respondents' results. Respondents provide results based on their specific purview and experience. Potential social desirability bias may also influence results. Options in the survey questionnaire were presented in a randomized order and options were randomized in their display.

The results of the survey analysis provided do not seek to convey any causal conclusions. The results reported from our significance testing are focused on identifying correlations in data. The results are also subject to potential omitted variable bias. While a wide variety of control variables have been included to reduce the omitted variable bias, there still exists a possibility that some omitted variable bias may skew the results.

The quality of the results presented is also a product of the quality of the results collected during the survey. Thus, all the limitations of the survey analysis discussed above also apply to the underlying data for the significance testing.

# Contributors

*Acknowledgments of contributors across the NYU Stern Center for Sustainable Business (CSB) and Deloitte Consulting LLP in the creation of this paper*

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## Stakeholder interviews

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# Endnotes

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6. Ninety-nine percent of respondents reported seeing revenue growth, and 98% reported seeing cost reduction associated with investments in sustainability strategies.
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27. Processors and food service providers realized the highest rates of revenue growth (>2%); processors represented the largest proportion of respondents who realized >5% revenue growth.
28. Retailers, food service providers, and restaurants realized the highest rates of cost reduction (>2%), with retailers and restaurants having the largest proportion of respondents who realized >5% of cost reduction.
29. Manufacturers represented the smallest proportion of respondents who a) realized >2% cost reduction, b) realized >5% revenue growth, and c) realized >5% cost reduction.
30. Twenty-five percent and 15% of manufacturers ranked improving energy management and investing water stewardship as their top three strategies that drove financial value in their own operations.
31. Twenty-one percent and 14% of manufacturers selected improving energy management and investing water stewardship as one of their top strategies that led to decreased costs or achieved cost efficiencies.



# Endnotes (cont.)

32. Forty-three percent expect value to increase somewhat, and 17% expect value to increase significantly.
33. Nineteen percent expect value to remain the same, 17% expect value to decrease somewhat, and 4% expect value to decrease significantly.
34. The survey was conducted in 2023; respondents were asked to respond specifically about 2022 when reflecting on the prior year.
35. Includes survey respondents who reported participating in co-investment with upstream suppliers, downstream suppliers, organizations outside their supply chain (e.g., academic institutions, NGOs), and through pre-competitive collaboration.
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38. Thirty-seven percent of respondents report engaging in improving energy management.
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46. A minimum quota of five respondents by value chain segment was imposed for data collected by Wakefield.
47. All models excluded observations in which survey respondents responded they "did not realize revenue growth/cost reduction in 2022 from sustainability initiatives" or "did not track revenue growth/cost reduction in 2022 from sustainability initiatives," reducing the sample size to 342 observations.





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