

Tree Planting for Corporate Social Responsibility:
A guide for prospective investors

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Abstract

Tree planting is a growing corporate social responsibility (CSR) activity. Companies gain strategic benefit from engaging in tree planting for CSR and have done so for decades. The characteristics of reforestation and afforestation projects have historically made these initiatives less attractive to institutional investors and corporate sponsorship has filled the gap. Recently, firms have begun to place tree planting at the center of their value propositions. The world has reached a tipping point, recognizing the urgent threat of climate change and the potential of forest-based natural climate solutions. Companies are leveraging online tree planting platforms and social media trends to connect with their customers over trees and these firms are experiencing rapid growth and success and planting vast numbers of trees.

However, realizing long-term benefits from tree planting is an involved and evolving process. Several environmental, economic, and managerial factors must be carefully considered to achieve a positive outcome. Investing in a poorly run initiative may unfortunately waste limited CSR resources, be perceived as greenwashing, and in the worst case cause real environmental and social damage in the long term.

By highlighting key considerations and providing guidelines for decision makers, this paper is a resource for CSR managers who are considering investing in tree planting activities or evaluating their existing planting sponsorship. This guide prepares managers to assess the relationship between tree planting and business strategy, to evaluate the benefits and co-benefits of a potential planting project, to select appropriate services from the offerings of tree planting providers, and to develop a plan for engaging stakeholders with a tree planting campaign.

Chapter one outlines the tree planting value proposition, provides background information on the recent increase in corporate sponsored tree planting, and situates these activities within the growing field environmental CSR. Chapter two sets out considerations for developing a tree planting program that can deliver strategic benefits. It covers how firms can assess stakeholder needs, how biases affect manager decision making, and how an inappropriately planned project can result in greenwashing. Chapter three addresses the forestry economics that underpin the environmental benefits of tree planting and describes potential co-benefits, as well as the risk of negative outcomes for planting projects and investors, and strategies to mitigate these risks. Chapter four describes the services offered by tree planting organizations, current trends in connecting stakeholders with planting campaigns, and includes examples of innovative companies, campaigns, and platforms operating in this space.

Keywords: Corporate social responsibility, tree planting, forestry economics, climate change

Foreword

My Major Research Paper is a tool that can assist decision makers in effectively investing in tree planting activities for corporate social responsibility (CSR). This paper comes from a desire to pursue my interest in the low carbon transition and anchor it in the forestry sector, where I have years of personal experience planting trees and supervising reclamation projects. The last two years have delivered a growing number of public and corporate commitments to plant trees. I became intrigued by the rapid escalation in the scale of the planting projects that have been tabled and I realized that this phenomenon presented an opportunity for me to examine an emerging interface between business, society, and the environment in one of my oldest areas of interest. By researching this phenomenon, I was able to bring my past experience together with the components of my Plan of Study. During this period, I carried elements of the research into my independent art practice, thereby using interdisciplinary methods for inquiry into the systemic challenge of the low carbon transition.

As a student in the Graduate Diploma in Business and Environment Program, I became interested in the new ways companies are engaging with tree planting in their CSR strategies. This connects to the themes in my Plan of Study, beginning with the first learning component, sustainable entrepreneurship. In this paper I examine new opportunities and trends in the restoration economy and the behavior of start-ups operating in this space. My paper can serve as a guide for entrepreneurs who are involved in developing tree planting projects with corporate sponsorship. My second learning component covers the low carbon transition. This paper addresses the strategic role that tree planting can play in business strategies for decarbonization and its limits as an effective CSR strategy. Ecological Economics is my final learning component. For this paper, I considered aspects of forestry economics that intersect with ecological economic currents of thought. My writing about the permanence risk and co-benefits of tree planting for carbon sequestration involves the consideration of long time frames, the limits of natural systems, and equitable distribution, central aspects of ecological economics. This major research paper is meant to give an overview of an emerging phenomenon and to orient decision makers to the possibilities and limitations of tree planting for CSR. It maps out organizations involved in the restoration economy, offers a look at the complexity and uncertainty involved in realizing sustained, additional benefits from tree planting, and shows why trees have become compelling allies in a time of need. As any tree planter worth their salt will attest, tree planting can be a great game of skill and style, of suffering and joy, that is irreducible to numbers alone. I hope this paper can be a useful tool for moving beyond the promise of sheer numbers of planted trees and towards durable and invested relationships with forests.

Land Acknowledgement

I would like to begin by acknowledging that I, a settler, carried out this work in Toronto, or Tkaronto, a place that is located on land which is subject to the Dish With One Spoon Wampum Belt Covenant. The Dish With One Spoon is a treaty between the Anishinaabe, the Mississaugas of the New Credit, and the Haudenosaunee, through which they share and protect this territory and the living things within it. I am privileged to have the ability to do my work in this place and I am grateful to have had the opportunity to work in forests in the unceded lands of the Mi'kmaq of the Wabanaki Confederacy, the Woods Cree, the Beaver Lake Cree, the Dene Suline, the Plains Cree, the Beaver, the Kelly Lake Métis, the Stoney Nakoda, the Tsuu T'ina, the YeKooche, the Tse'khene, the Sekani, the Dakel, the Tsilhqot'in Nen, the Lheidli T'enneh, the Secwepemcúl'ecw, the Syilx tmix, and the Ktunaxa. It is also my duty to address the breaking of treaties, the ongoing and historical colonial violence against this land and its Indigenous Peoples, the rich histories of cultures living in relationship with these lands and the ongoing and critical work of land defenders.

People Acknowledgements

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Introduction

Goals

Tree planting is undergoing a surge in popularity as a method for carbon drawdown. The amount of private and public investment in tree planting has grown significantly since 2017 following multiple scientific publications highlighting its potential to combat climate change. This surge in popularity has been accompanied by technological changes that are altering the ways planting activities are carried out and transforming the ways companies connect with their stakeholders. This shift in the restoration economy presents a new opportunity for corporate social responsibility (CSR) investment and a corresponding set of new challenges on the path to successful investment outcomes.

This paper is primarily a guide for decision-makers who are considering investing in tree planting activities for CSR or evaluating their existing planting sponsorship. It also delivers an overview of many recent changes in the restoration economy, suitable for anyone with an interest in the rapidly expanding array of large tree planting projects. Chapter one provides background information on corporate tree planting and situates these activities within the growing field of environmental CSR. Chapter two lays out the potential benefits and co-benefits of tree planting to the environment, to society, and to stakeholders, as well as the risk of negative outcomes for planting projects and investors. Chapter three covers the economic and project management considerations that affect the outcomes of tree planting initiatives. Chapter four describes the services offered by tree planting organizations, the current trends in connecting stakeholders with planting campaigns and includes examples of firms that have successfully incorporated tree planting into their business strategies.

By preparing managers to assess the relationship between tree planting and business strategy, to evaluate the benefits and co-benefits of a potential planting project to select appropriate services from the offerings of tree planting providers, and to develop a plan for engaging stakeholders with a tree planting campaign, this paper can serve as a valuable tool and reference for CSR managers.

Research methodology

For the research, I conducted a qualitative analysis based on secondary academic research and combined this with a survey of news media publications. I consulted academic journals for background information on tree planting, CSR, and forestry economics. My research addresses ongoing changes in the restoration economy that began to emerge in the last three years, and I found there to be limited scholarship on this recent phenomenon. In order to supplement this content and to produce a more accurate picture of current trends, I used a Google alert with the search term “tree planting” to return newly posted online content, daily, for a period of 10 months, from October 2019 through July 2020. I filtered these results for relevant content which kept me up to date with news articles and press releases covering tree planting campaign launches and milestones for the duration of my research. In order to survey the offerings of tree planting providers, I examined grey literature including company annual reports, websites, and press releases from planting providers both in Canada and abroad.

Case study research plays an important role in understanding how innovative companies are successfully contributing to tree planting endeavors. In this paper I have included examples of organizations providing tree planting services and I have reviewed the successes and

shortcomings of some historic planting projects for insight into the range of outcomes that may arise from attempts to do good with trees.

Introduction to tree planting for CSR

In Canada, charity tree planting programs and employee volunteer events receive widespread support through corporate sponsorship. These programs allow firms to align themselves with their stakeholders' values and are used to offset contributions to climate change. Such activities are becoming an increasingly common form of CSR investment for firms across all sectors around the globe and often take place in public-private partnerships, as governments move to expand their tree planting commitments as well.

Tree planting for CSR is known to yield several benefits: improved environmental outcomes, employee engagement, and goodwill for the company. These benefits are the stock and trade of tree planting for CSR and they have been made available by tree planting charities and non-profits for decades. However, the recent growth in the popularity of tree planting has changed the landscape of this investment opportunity in numerous ways.

In today's marketplace, there is an increasing number of actors willing to invest in tree planting and a growing number of planting service providers vying for their contributions. New platforms have made it easier to invest in global planting efforts and to track project outcomes. Historic planting programs have had time to mature and be evaluated and as a result, the public is increasingly aware of both the benefits and limitations of tree planting for carbon drawdown. Stakeholders are better equipped to criticize poorly designed projects and careless investment and are requesting greater accountability in tree planting projects.

Companies like the Canadian clothing retailer TenTree have emerged as successful leaders in this new landscape by integrating tree planting activities within their business strategies. Managers hoping to replicate this success and to avoid the pitfalls of greenwashing need to acquire an understanding of the benefits and risks of planting projects, their underlying forestry economics, as well as the wide array stakeholder engagement strategies available for their programs. This paper aims to inform decision-makers with key considerations on these topics and to prepare managers to evaluate opportunities in tree planting sponsorship.

It should be noted that this paper presents a limited means of valuing forests. Forests herein have been valued primarily in terms of monetary and potential carbon storage in order to assist in managerial decision making. The value of forest biodiversity is not addressed in this paper and neither are the cultural and spiritual dimensions of forests. Forests also provide critical habitat for amphibians, birds, and mammals and host over 60,000 species of trees (FAO & UNEP, 2020). Individual tree planting initiatives must also be accountable to these considerations since planting projects have the potential to be implemented at enormous scale. Bastin et al. (2019) claim that Canada could increase its forested land by over twenty percent in pursuit of climate change mitigation (Natural Resources Canada, 2020). Collectively these tree restoration projects can shift entire landscapes and reshape the value and meaning of forests.

When land is valued exclusively in terms of potential carbon storage, outstanding land claims and ownership value may be excluded at the expense of local peoples (Baldwin, 2009). The global carbon market has been criticized for relying “on a form of sovereign colonial power – “carbon colonialism” – that disproportionately favors states and multinational corporations over local actors” (Baldwin, 2009, p.238; Rathi, 2020b). Investors need to be aware of this exploitative dynamic and ensure that they do not carry out colonial harm through sponsorship.

Projects should be carried out with local support and meaningful involvement, and to the benefit of local communities (Oregon State University, 2019).

Chapter 1: The tree planting value proposition

Chapter one introduces the motivations for and methods of corporate tree planting and situates these activities within the growing field of environmental CSR.

1.0 Chapter Summary

Tree planting is a common form of CSR activity (Church et al., 2019; Stubbs & Cocklin, 2008; Rondinelli & Berry, 2000). Employee volunteers gather to plant trees in their communities and companies sponsor restoration when local disaster strikes. However, much of today's CSR investment in tree planting has shifted from planting trees to planting forests. Global brands like Microsoft, Enterprise, and Timberland, are funding tree planting at a scale that transforms entire landscapes (Abdelhamid, 2015; Baertlein, 2020; Smith, 2020). Their campaigns are part of the marked increase in public and private tree planting commitments that began in 2017, following publications (Bastin et al., 2019; Griscom et al., 2017; IPCC et al., 2018) on the potential of forestry activities to drawdown atmospheric carbon. Each of these studies highlights reforestation as a cost-effective natural climate solution with widespread application potential.

Participating firms come from all types of industries, from finance and technology, to consumer goods, extraction, and transportation, all aiming to sequester significant amounts of carbon with trees. As BBC reporter Mark Kinver observed, "Trees have become a central component of governments' and businesses' strategy to achieve net-zero carbon emissions" (Kinver, 2020). At the 2019 world economic forum in Davos, business leaders committed to planting a collective trillion trees (Magill, 2020). Canada plans to plant two billion trees by 2030

and Ethiopia holds the world record of planting 353 million trees in one day (Liberal Party of Canada, 2019; Pereira, 2019). These trees are being planted in addition to those planted in regular forestry activities. The Bastin et al. study estimates that Canada has 78 million hectares available for restoration through tree planting (2019). Theoretically, these additional trees can reduce atmospheric carbon by adding to the approximately three trillion trees on the planet today, moving us closer to the nearly six trillion trees that were present at the beginning of human civilization (Crowther et al., 2015).

1.1 Investment in environmental CSR is growing

Businesses are experiencing an “escalation of pressure for CSR” (Basil et al., 2009, p.389). Environmental CSR has historically received a small slice of the CSR pie, but its share is rapidly increasing. A 2019 survey of 250 U.S. based multi-billion-dollar companies, covering all major industries in the corporate sector, found that between 2016 and 2018 that the median growth rate of cash given to the environment increased by 26%, though the environment received just 4% of total corporate giving (Chief Executives for Corporate Purpose, 2019). This growing investment coincides with mounting evidence of the linking environmental and financial performance, the shift to stakeholder primacy, and growing stakeholder concern over climate change.

A substantial amount of empirical evidence supports the business case for sustainability. Friede, Busch, and Bassen evaluated the results of 2200 primary studies and found that sustainability performance is associated with higher corporate financial performance (2015). For example, a 2012 study by Ameer et al. assessed the top 100 sustainable global companies in 2008, as identified by the Jantzi Social Index, from both developed countries and emerging

markets. They found that these companies exhibited sustained and increasing higher financial performance than control companies over the period of 2006-2010 (Ameer & Othman, 2012). Firms with high sustainability have been found to have a lower cost of capital, a positive correlation with operational performance, and superior financial market performance (Clark, Feiner, & Viehs 2014). The strength of the business case is making environmental CSR increasingly attractive as an investment.

In his 2020 annual letter to investors, BlackRock CEO and Chairman Larry Fink announced the company's move to center sustainability in their investment approach and emphasized the importance of stakeholders to long-term business success, stating "a company cannot achieve long-term profits without embracing purpose and considering the needs of a broad range of stakeholders" (Fink, 2020). Hearing this message from the world's largest fund manager signaled the mainstream shift from shareholder to stakeholder primacy, with sustainability as the central stakeholder concern.

The effects of climate change are an increasingly visible public priority. In 2018, the U.S. government's Fourth National Climate Assessment struck a blow to climate denialism and reported on the growing harm to the economy, infrastructure, and human and ecological health caused by climate change. The federal report states:

The continued warming that is projected to occur without substantial and sustained reductions in global greenhouse gas emissions is expected to cause substantial net damage to the U.S. economy throughout this century, especially in the absence of increased adaptation efforts. With continued growth in emissions at historic rates, annual losses in some economic sectors are projected to reach hundreds of billions of dollars by the end of

the century—more than the current gross domestic product (GDP) of many U.S. states. (U.S. Global Change Research Program, 2018)

The high stakes of climate risk have made mitigation an increasing CSR priority.

Businesses and stakeholders alike recognize that anthropogenic climate change is a threat to ecological integrity and therefore long-term prosperity. Mitigating this environmental crisis requires a reduction in emissions and a drawdown of atmospheric carbon. Businesses are responding to climate-related risk and stakeholder pressure by reducing and offsetting emissions and conveying these commitments to their stakeholders. A growing number of companies are investing in tree planting projects to meet these goals.

1.2 Why tree planting attracts CSR investment: The “basic goodness” of trees

Most people can't name how much carbon one tree captures from the atmosphere, but comfortably assume that an additional tree provides some additional unit of benefit. This is the hopeful 'basic goodness' of planting trees. Companies that contribute to planting activities get in on the 'good' that additional trees represent. Planting a tree is a tangible action that offers a powerful political message of hope and investment in a better future, thus, sponsoring trees builds goodwill and can contribute to a firm's license to operate.

Trees are planted to commemorate historic events and valued individuals, and stands of trees are planted to remediate or beautify natural areas. Many Canadians even have direct experience planting trees, to these ends, in community groups or employee volunteer programs. For example, in the summer of 2019, Rogers Communications held seven employee engagement events with Forests Ontario, where hundreds of volunteers planted trees together (Forests

Ontario, 2019). This type of planting gives groups a sense of agency, an opportunity to connect with one another, and the satisfaction of doing something good in their community.

A central strength of tree planting for CSR is that its optics are simple. Trees are a small enough increment to apply to the purchases of an individual consumer. A carbon footprint is more easily represented by a number of trees rather than a tiny fraction of an industrial project, like a manure treatment plant, whose complexity is much more apparent (Waddell, 2017).

Sponsoring companies work with intermediaries, tree planting non-profits, and platforms, that carry out the tree planting operations on their behalf. The Arbor Day Foundation and One Tree Planted both offer planting services at the price of one dollar per tree (One Tree Planted, 2020). Dollars and trees are units that consumers can easily understand. This plays an important part in marketing, as is demonstrated by the highly successful #TeamTrees campaign, which follows the one dollar for one tree model (Arbor Day Foundation, 2020).

1.3 Strategic CSR: Volunteering, trees for transactions, and carbon offsetting

While all corporate tree planting programs may benefit from the perceived goodness of trees, companies do so while employing different types of sponsorship to strategically advance their priorities. Following Porter and Kramer's (2006) shared value framework, the difference between responsive and strategic tree planting for CSR lies in the motivations and potential impacts of the CSR engagement. Porter and Kramer were the first to argue that the CSR practiced at that time (2006) was not reaching its full potential value since it was responding to stakeholder pressure rather than leveraging a firm's strengths and using CSR programming strategically to advance company priorities. This insight has been the basis for the belief that

firms can develop responsible solutions to CSR issues that also provide operational and competitive advantages to the firm (Fisher et al., 2009).

When an employee volunteer tree planting program is initiated as a generic response to environmental conditions or to mitigate the negative impacts of a firm's activities, it falls under the category of responsive CSR since it involves responding to corporate and social norms. This can produce legitimacy for the firm and increase its license to operate. However, volunteer activities can also address issues in a way that advances a firm towards its competitive priorities which could be categorized as strategic CSR (Basil et al., 2009).

A 2009 survey of 990 Canadian companies, on company support for employee volunteering and CSR, found that the main perceived benefits were an improvement in the company's public image (33%), improvement in employee morale (21%), improved relations with the surrounding community (18%), and helping to maintain a healthy community (8%) (Basil et al., 2009). Company support for employee volunteering has also been shown to increase employee productivity, retention, and recruitment (Geroy et al., 2000; Peterson, 2004). When employee volunteering results in these benefits, it constitutes strategic CSR by producing value for the firm (Basil et al., 2009).

Some companies have chosen to embed tree planting in their business model by linking the number of trees they plant to their number of transactions (Daily Hive, 2019), planting tree(s) per product sold (TenTree International, 2019), or by contributing a percentage of profits to reforestation projects (Faruqi et al., 2018). This 'trees planted for service rendered' practice has been successful and is popular around the world. For example, the Dutch bank bunq offers a SuperGreen credit card, for which they plant a tree each time a customer uses the card. bunq reported to the press in April 2020, that demand for this card had increased at a rate of 250

percent each day since its launch (Finn, 2020). Australian bicycle company Reid Bikes promises to plant one tree for every bicycle they sell in 2020 (Bicycle Retailer and Industry News, 2020).

A company that makes the link between the trees they sponsor and their carbon emissions is taking another strategic step. Carbon emissions can be difficult to conceptualize because carbon dioxide is an invisible gas and its myriad sources are distributed across supply chains. When firms plant trees to offset their carbon, they often quantify and represent their carbon in numbers of trees. These firms gain credibility by disclosing their emissions and also make their emissions easier to visualize. Emissions disclosure is a necessary step in becoming carbon neutral or taking a leadership position in addressing climate change. For example, Microsoft has become a tech leader in emissions targets, pledging to become carbon negative by 2030 and to remove the majority of its historic scope 1 and 2 emissions by 2050 (Smith, 2020). The *Greenhouse Gas (GHG) Protocol Corporate Accounting and Reporting Standard* defines scope 1 emissions as “direct GHG emissions”, scope 2 emissions as “electricity indirect emissions”, and scope 3 as “other indirect emissions” (Smith et al., 2004, p. 25). This standard is widely used by companies for quantifying and reporting their GHG emissions and provides further detail on classifying emissions by scope from direct operations and along the the value chain (Smith et al., 2004).

A significant part of their efforts in meeting their 2030 goal will rely on nature-based solutions, including tree planting. Microsoft has committed to planting 250,000 trees in 2020 and is doing so through a collection of smaller tree-based campaigns run by their advertising department (Wymetalek, 2020).

Chapter 2: Strategy development

Chapter two presents considerations for a strategic approach to developing a tree planting campaign.

2.0 Chapter summary

Tree planting programs can be designed to offer companies a valuable carbon emission mitigation pathway, the human resource benefits of volunteer activity, and a positive association with the ‘basic goodness’ of planting trees. How should a potential investor decide which of these benefits to pursue?

The benefits available to a particular firm stem from the program’s ability to fulfill stakeholder needs. Firms can prepare for their investment in tree planting by carrying out a materiality assessment to better understand these needs. Investors also need to be aware of the structural and psychological factors that influence manager decision making throughout the program creation. For instance: smaller companies may benefit more from investing in local planting projects; managers respond differently when projects are framed in financial versus nonfinancial and measurement bases; and, executive compensation schemes can be structured to improve long-term CSR outcomes.

A tree planting campaign must also be considered in relation to company strategy. Tree planting has a greater benefit when it is part of a transformational, low carbon CSR strategy that addresses scope 1, 2, and 3 emissions. Media have picked up on the shortcomings of corporate tree planting schemes that aim to offset carbon without first reducing emissions. This defensive use of CSR may be criticized as ‘greenwashing’. Firms can also communicate about their CSR activity in a way that reduces the risk of skepticism among stakeholders.

2.1 Materiality assessment

Companies who are engaged with the sustainability issues that are most relevant to their financial success and to their stakeholders' values stand to benefit the most from their CSR investment. These sustainability issues can be identified and prioritized through materiality assessment, a valuable part of developing a CSR strategy (Bellantuono, Pontrandolfo, & Scozzi, 2016; Calabrese, Costa, & Rosati 2015). If a materiality assessment finds climate change to be a material issue for a particular firm, this can be taken as evidence of the need for carbon emission reduction and removal, a need that can be partially met through tree planting.

Materiality assessment is a process informed by expert insight and stakeholder feedback which aims to identify issues that have the highest stakeholder importance and those that have significant financial and business implications. The quality of the assessment can be enhanced by incorporating members from outside of the company, thereby reducing bias and broadening perspectives. The process of carrying out such an assessment is valuable in itself since it can generate engagement and provide a forum where legitimate concerns and innovative ideas may be voiced. These effects may in turn produce further benefits by boosting awareness, morale, and reputation which build enthusiasm for sustainability programs (Anderson, 2016).

Khan et al. (2016) have differentiated between the financial performance outcomes of addressing material versus non-material sustainability issues. The authors mapped material sustainability investments for each industry into firm-specific sustainability ratings. With this dataset, they found evidence that firms who perform well on material sustainability issues significantly financially outperform firms with poor ratings and that performing well on immaterial sustainability issues did not result in a loss of financial performance. These results

demonstrate that using materiality assessment can increase the efficiency of sustainability investments, steering investments towards those that create the most value for shareholders. Their results also show that even misdirected investments in sustainability have minimal or no value implications (Khan et al., 2016). These findings make the case for investing in CSR since there appear to be significant upsides and little risk to taking action. Managers who would like to quantify these benefits can consult the framework and tools for assessing return on sustainability investment in the work of Atz, Van Holt, Douglas, & Whelan (2019).

2.2 Structural and psychological influences in manger decision making

Every CSR department is subject to biases that affect decision making. These structural forces and psychological factors influence the effectiveness of CSR programs. At a high level, CSR practices are influenced by their external legal environment and cultural framework and thus vary across cultures in different countries (Krumwiede et al., 2012). Decision making in CSR investment also varies according to the size of the firm. Small and medium enterprises (SME)s typically don't have a CSR department. This is especially relevant in the Canadian context, where 97.9% of firms are small businesses with between one and ninety-nine employees (Government of Canada, 2019). Instead, SMEs perform CSR by collaborating with their local communities, where they are able to build social capital, address negative issues with precision, and contribute more impactfully (Fisher et al., 2009).

These differences should be taken into account when evaluating the trade-offs between investing in local or international tree planting projects. By sponsoring local projects, a firm may be better equipped to leverage and build on their social capital and close networks to produce value. However, international projects may offer lower project costs and allow for a greater

number of trees to be planted at a potentially larger ecological benefit. These benefits may be easier to quantify and communicate through sustainability reporting than the less tangible social benefits an SME may gain from local investment.

Fisher et al. highlight the differences in CSR approaches between SMEs and larger firms in their 2009 study. They argue that SMEs operate within a more socialized and networked environment than larger organizations and that their public accountability flows from social approval and recognition in close networks rather than through public reporting. The authors show that social capital can be a tool that helps SMEs to build trust and enable collective action. This form of strategic CSR meets immediate needs for SMEs and avoids the reactive, promotional, and bureaucratic dimensions that SMEs perceive in large firm's CSR (Fisher et al., 2009).

In large companies, CSR decision making is often decentralized. Investment decisions are made by middle managers who are influenced by whether projects are described in terms of dollars versus trees. Recent research suggests that decentralized CSR governance is easier to facilitate and has a greater ability to enhance morale (Pirson & Turnbull, 2018) and handle complexity (Wong et al., 2011), so critical CSR investment decisions are commonly made by middle managers. A study observing middle manager behaviour has shown that the way CSR investment is measured and represented affects managers' decision-making behavior. Interestingly, the authors found that "nonfinancial measures draw attention to the tangible activities underlying CSR (e.g., planting trees, serving meals), and thereby make the society-serving nature of such programs salient" (Church et al., 2019, p.121). This behavior is related to the decision-maker's underlying personal norms towards CSR. Significantly, "Participants who are supportive of CSR invest more in tree planting when they decide on the number of trees to

plant (a nonfinancial measurement basis) than when they decide on the amount of money to spend planting trees (a financial measurement basis)” (Church et al., 2019, p.117).

This finding shows that the choice to represent a project in terms of numbers of trees rather investment dollars is consequential. Managers can be mindful of this bias in their own decision making and in its effect on project promotion. Other stakeholders may be similarly positively influenced by the representation of a project in numbers of trees rather than in investment dollars. This is likely why we observe a trend towards numerical measurement in tree planting campaign names such as Enterprise’s “50 Million Tree Plan,” Canada’s “Two Billion Tree Plan,” and the “Trillion Tree Initiative” launched at the 2020 world economic forum (Abdelhamid, 2015; Liberal Party of Canada, 2019; Temple, 2020).

Corporate governance factors also play an important role in the long-term effectiveness of CSR strategy. A greater number of women on a board of directors may improve CSR (Bear et al., 2010) and executive compensation can be structured to improve longterm CSR outcomes. Although women directors remain a minority in boardrooms around the world, Lin et al.'s (2018) assessment of ownership structure, board gender diversity, and charitable donation among Taiwanese electronics firms found that while “board size, firm financial performance, and foreign institutional investors were irrelevant to charitable donation” (p.667), “companies with at least three female board directors make greater charitable donations” (p.666). The authors attribute the influence of female directors to the difference between their interests and the interests of domestic institutional investors. “The interests of female directors are possibly more aligned with those of other stakeholders, while domestic institutional investors are possibly more focused on the profit maximization of shareholders” (p.656).

Francoeur et al.'s findings support these results. They studied the relationships between gender-diverse boards and various dimensions of corporate social performance in a sample of Fortune 500 companies in the U.S.A. Their results show that gender-diverse boards have a greater impact on stakeholders with limited power over the firm, i.e., the environment, contractors, and the community, rather than employees and customers, which are understood to be more powerful stakeholders (2019).

A 2005 study on the association between executive compensation and CSR in 90 publicly traded Canadian firms found that firms using a long-term compensation scheme for executives, were more likely to mitigate environmental risks associated with their products (Mahoney & Thorne). Tree planting campaigns often take place over long timeframes and may outlast the tenure of the leaders who initiate them. Long-term projects, like Enterprise's fifty-year commitment to plant one million trees each year, need to consider how new executives and managers will be incentivized to support legacy commitments. Financial compensation incentives for executives and non-financial measurement framing can be part of a long-term strategy for success.

2.3 Limitations and greenwashing

Managers who are aware of the limitations and common criticisms of tree planting for CSR are in a better position to make an investment that is impactful and to communicate about their contributions effectively. In the public discourse on tree planting for carbon drawdown, experts stress that investments in tree planting should not replace emissions reductions. When private and public tree planting campaigns have been used defensively to draw attention away from high emissions or in substitution for emissions reductions, they have been criticized as

greenwashing. Firms must adequately communicate their CSR actions in order to reduce the risk of skepticism among stakeholders.

Bastin et al.'s 2019 article, *The global tree restoration potential*, is the most recent in a series of scientific publication (Griscom et al., 2017; IPCC et al., 2018; Bastin et al., 2019) to fuel enthusiasm for trees as a natural climate solution. The authors claim, "there is room for an extra 0.9 billion hectares of canopy cover, which could store 205 gigatons of carbon in areas that would naturally support woodlands and forests" (Bastin et al., 2019, p.76). However, critics believe the authors overestimate the potential of forest restoration to mitigate climate change (Friedlingstein et al., 2019; Lewis et al., 2019; Skidmore et al., 2019) and point out that an overemphasis on trees is potentially harmful. "The claim that global tree restoration is our most effective climate change solution is simply incorrect scientifically and dangerously misleading" (Friedlingstein et al., 2019, p.2). Importantly, "forest restoration is of lower importance than rapidly reducing fossil fuel emissions" (Lewis et al., 2019, p.2). Thus, a company that invests in tree planting to offset their carbon footprint should do so after, or in addition to, reducing emissions throughout their operations, energy sources, and supply chains. If tree planting is prioritized over emissions reductions, a company may miss the opportunity to achieve cheaper, greater, and more certain reductions in scope 1, 2, and 3 emissions and risk exposure to criticism for this oversight. It should also be recognized that due to the limited nature of potentially forested land, tree planting alone cannot bring down atmospheric carbon levels to meet Paris targets and tree planting for carbon drawdown cannot continue indefinitely (Skidmore et al., 2019).

Messages about the limitations of tree planting in combatting climate change have made it into the mainstream media. Bloomberg.com has recently run articles titled: "Planting Trees is

Good, But Cutting Emissions Is Better” (Flam, 2020); ““Trillion Trees’ Plan is Risky Climate Strategy, Scientists Say” (Magill, 2020); and, “Why Trees Aren’t the Simple Climate Solution They Seem to Be” (Rathi, 2020b). Stakeholders are part of an informed public who understand that large companies have the biggest effect on environmental conditions when they address their internal environmental management practices.

Firms that plant trees but do not address their own emissions have been criticized of ‘greenwashing’, which Lyon and Maxwell characterize as “the selective disclosure of positive information about a company’s environmental or social performance while withholding negative information on these dimensions” (Lyon & Maxwell, 2011, p.5). Such accusations can have a lasting negative impact on the company’s image. For this reason, tree planting has a greater benefit when it is part of a transformational, low carbon CSR strategy that has demonstrably reduced its scope 1, 2, and 3 emissions.

Heavy emitting industries like energy and airlines are most susceptible to this critique. In reaction to the recent announcement by Hopper, a travel booking app, that it will plant four trees for every flight booked on its service, CBS News put it succinctly, “If you buy a tree-based offset today, you’re sponsoring a reduction that won’t be fully effective until perhaps 2040.” Hopper predicts that by following their plan it will take nearly 25 years for each flight’s carbon to be offset (Larnaud, Jan. 28, 2020). This plan exceeds the timeline that the IPCC has set out for stark emissions reductions. “Without ... a sharp decline in greenhouse gas emissions by 2030, global warming will surpass 1.5°C in the following decades, leading to irreversible loss of the most fragile ecosystems, and crisis after crisis for the most vulnerable people and societies” (IPCC et al., 2018, vi).

Other companies in the travel industry have acknowledged this weakness and changed their strategies accordingly. Responsible Travel, based in the United Kingdom, was an early adopter of tree planting for CSR. In the early 2000s, they offered tree planting offsets for vacations. The company later abandoned this idea and began to focus on providing low emission travel by train and bike to local destinations because they “believe that the travel industry’s priority must be to reduce carbon emissions, rather than to offset” (Waddell, 2017).

Tree Canada has been criticized for working with global fossil fuel giant Royal Dutch Shell (Balamir, 2011), which currently supplies 3% of the world’s energy and whose GHG emissions continue to increase (Bouso & Zhdannikov, 2019). Shell Canada was awarded Tree Canada’s Ultimate Award in 2011, for having contributed over \$1 million to the organization. At the time the award was given, Shell had been involved with Tree Canada for 13 years and had planted over one million trees, resulting in an estimated 650,000 tonnes of sequestered CO₂. In a 2011 press release covering the award, Shell president Lorraine Mitchelmore stated “Shell shares Canadians’ concerns about climate change and is taking action to address CO₂ emissions from our operations ... In Canada, tree planting and the purchase of carbon emissions offsets are an important and visible part of our CO₂ management strategy” (Tree Canada, 2011). However, scope 1 and 2 emissions, from production and refining operations, make up a small percentage of Shell’s total emissions, the majority of which come from scope 3, the oil and gas products that Shell sells (Bouso & Zhdannikov, 2019). Mitchelmore’s description of Shell’s tree planting as ‘visible’ points to the utility of the campaign’s optics, rather than a claim to substantial carbon reduction. Shell’s award has remained visible on Tree Canada’s website, along with another Ultimate Award winner, TC Energy, to this date.

Shell has continued to invest in tree planting for CSR, more recently moving to offset some of their scope 3 emissions. Scottish ministers have also criticized this campaign as greenwashing (Carrell, 2019). In 2019, Shell made an agreement with Forestry and Land Scotland to provide 5 million dollars in funding over five years for the planting or regeneration of 1 million trees in Scotland. This will earn Shell carbon credits to offset approximately 20% of the emissions generated by their fuel sales to consumers in the UK. This is an incrementally more appropriate scenario for investing in tree planting for CSR, since the company will move beyond addressing scope 1 and 2 emissions, however, the new campaign has also been characterized as greenwashing because the benefits of tree planting remain dwarfed by the impacts of the company's fossil fuels. Jo Ellis, head of Planning and Environment for Forestry and Land Scotland, pointed out that this contribution is "dwarfed by what (Shell) is still spending on investigating new oil and gas reserves and in blocking initiatives to set legally binding emissions reductions targets" (Donovan, 2020).

Governments have similarly been accused of using tree planting to defend their continued investment in the fossil fuel economy. In February 2020, the United States Republican Party proposed a three-part climate strategy. The plan was accused of using tree planting as greenwashing (Holden, 2020; Waldman, 2020) because the bill prioritized carbon drawdown over the critical need to reduce emissions. One part of the bill, named The Trillion Tree Act, addressed planting trees to absorb carbon, but the strategy did not address the reductions of fossil fuels that scientists say are necessary (Holden, 2020).

Tree planting for CSR has also been criticized for its limited ability to change consumer behavior and for its potential to have the inverse consequence. When tree planting offsets carbon, it can be used to justify business-as-usual consumption behavior while many of its positive

benefits can only manifest on a timeline that exceeds Paris agreement targets. If a company is using a transactional model and a tree is planted for each product purchased, the consumer can feel ethically righteous that their consumption is sustainable or they may even buy more, to ostensibly increase their positive their impact on the environment.

Other criticisms of tree planting for CSR are based on the suite of challenges and uncertainties that are particular to reforestation for carbon offsetting. A 2008 study by the David Suzuki Foundation compared tree planting offsets with fossil fuel emission reduction offsets. This study found that energy efficiency and renewable energy projects were more deserving of investment and that there were “many problems with tree planting projects.” These issues: additionality, double counting, leakage, permanence, timeliness, quantification, and impacts on other sustainability objectives (David Suzuki Foundation, 2008), are at play in the forestry economics that underpin tree planting projects. Chapter three will address these topics.

Furthermore, tree-planting for carbon sequestration is a mitigation strategy that cannot be indefinitely employed and is therefore not a durable solution for carbon reduction for any company in the long term. On one hand, forestry mechanisms can be used to ‘buy time’ in the short term, since the world is not on track to meet its Paris Agreement targets (Milius, July 17, 2019). On the other hand, costs will increase in the long-term as the pool of land available to reforest becomes smaller and more difficult to access. As climate change advances in the coming years, the amount of land available for afforestation and reforestation will be significantly reduced, meaning this is an opportunity with a limited timeframe (Bastin et al., 2019).

Firms with a comprehensive low-carbon strategy must adequately communicate their CSR actions in order to reduce the risk of skepticism among stakeholders. According to Vollero et al., “The integration of a company's strategic CSR approach and its communication practices

may help to enhance effective stakeholder engagement, prevent accusations of greenwashing and avert the negative associated consequences (e.g., skepticism among stakeholders)” (Vollero et al., 2016, p.120). They recommend a proactive approach, using two key strategies to communicate CSR achievements and create stakeholder engagement while avoiding accusations of greenwashing:

- ‘Telling the truth’, i.e., express the company’s environmental commitment with information richness and fact-based language. Managers should avoid selective disclosure and decoupling strategies in CSR communications, conveying a balanced view of actions and initiatives. In this direction, the use of certifications, straightforward language and messages with specific data may reduce stakeholder skepticism.
- ‘Telling the story’, explaining both the firm and the consumer’s role in the process of environmental sustainability. ‘Telling the story’ does not mean the CSR activities should be portrayed as the organization’s sole purpose but it involves presenting the full impact of a product/service and what each actor can do to contribute to the overall process.

(Vollero et al., 2016, p.134)

Chapter 3: Planning for long-term benefits and risks

Chapter three covers the forestry economics that affect the outcomes of tree planting initiatives and outlines the potential benefits and inherent risks in forestry-based carbon storage ventures, as well as strategies for mitigating these risks.

3.0 Chapter summary

Tree planting can be a beneficial natural climate solution and a worthy CSR investment when it meets the criteria of additionality, permanence, and timeliness while avoiding the pitfalls of leakage and displacing investment in higher priority carbon drawdown projects or other sustainability objectives. Complex forestry economics underpin carbon offsets and tree planting projects have the unfortunate history of failing to adequately quantify and address these issues. From a managerial standpoint, these factors must be adequately assessed in the early stages of a project to form a complete picture of project costs and benefits.

A planting campaign that remains accountable to these criteria can produce environmental benefits by sequestering carbon from the atmosphere. Careful planning considers the local context and can produce ecological and socio-economic co-benefits. These co-benefits may not be readily financially quantifiable, but they can nonetheless enhance the project's permanence and impact.

The risks to successful forest-based carbon drawdown are substantial. Tree planting for CSR risks misdirecting energy and attention away from fossil fuel emission cuts and the preservation of existing forests. The inherent difficulty and cost of accounting for the full range of climate and human-related risks to a tree planting project may lead to the overestimation of the project's potential carbon storage. Plantations face significant climate change-related risks and projects are also threatened by low seedling survival and permanence risk.

Some voluntary and compliance carbon markets verify tree planting projects for carbon offsets, but most tree planting for CSR takes place outside of these markets. Managers can look to offset market protocols for guidance in assessing various project dimensions, however, most investors rely on a third party organization to independently verify carbon offsets and co-

benefits. Start-ups are beginning to address the need for greater transparency in these projects and the TerraMatch platform can help connect corporate sponsors with vetted project developers.

3.1 Forestry economics

Tree planting has been legitimized as a carbon dioxide removal pathway by scientific research (Bastin et al., 2019; Griscom et al., 2017) and various carbon markets and trading schemes have operationalized the set of conditions that are necessary to create legitimate forest-based offsets. These governing bodies require that projects meet the criteria of additionality, permanence, and timeliness, and avoid leakage and negative impacts on other sustainability objectives before they are approved as legitimate offsets.

In order for a tree planting project to function as a negative emission pathway, the trees must be planted in addition to those that would have otherwise been planted, through government programs or commercial practices, or grown through natural regeneration. This ‘additionality’ is subject to the challenge of information asymmetry since landowners or offset sellers may have private information about their opportunity costs that are unavailable to assessors. Therefore, a project may appear to be additional when it is not (Mason & Plantinga, 2013).

Offsetting carbon with tree planting also relies on the premise that the captured carbon will not be released back into the atmosphere for a given amount of time. This ‘permanence’ can be threatened by wildfire, pests, and logging (Hamrick & Gallant, 2017). The trees need protection from future harvest and biotic threats, so the strength of local institutions and the ability of governments and local people to manage fire and pests affect permanence. Longer project timelines are associated with greater permanence risk.

The ‘timeliness’ of a project reflects the ability of the trees to sequester carbon within a timeline that is relevant to climate change mitigation goals. Plantation trees begin storing carbon at a very slow rate due to the relatively small size of the seedlings. The carbon sequestration benefits of planting trees materialize over decades and centuries as forests mature (Magill, 2020). Since most of the carbon storage takes place many years after the trees are planted, these benefits won’t accrue in the short, 10 year, timeframe for reaching Paris targets, as laid out by the IPCC (2018). The longer the time frame, the greater the uncertainty and risk associated with realizing the theoretical project benefits.

The long-term preservation of one forested area may displace the economic pressure of forest carbon loss to other areas. This ‘leakage’ means that the carbon stored in the protected trees is not additional since the carbon has been released elsewhere. For example, researchers using an econometric model of afforestation in Ontario found that enough land could be converted from farms to forest to have the effect of raising agricultural land prices, resulting in increased deforestation of land outside of the offset program to create more agricultural lands. Their findings suggest that at low carbon prices, many carbon offsets from afforestation may in fact be non-additional (Murphy et al., 2018). Additionally, a carbon offset can only be counted once. If the benefit is claimed by more than one organization, the total benefits are distorted by double counting.

Forest plantations can negatively impact other sustainability dimensions like biodiversity and water availability. Plantations can have large land and water footprints when they are grown at large scales (IPCC et al., 2018). Specifically, they can “deplete soil water, reduce surface runoff and streamflow through enhanced water consumption, thereby intensifying water scarcity” (Zhang, 2020). For example, China has been investing in afforestation since the 1970s

and plans to continue to increase this investment with \$28 million in private support from Alibaba and Alipay (Zhang, 2020). However, in China, black locust plantations have been widely used in areas that are natural grasslands and this practice has changed the water cycle and could have unintended consequences to local and regional water security (Schwärzel et al., 2020). Forest management can handle these trade-offs by planting appropriate species and taking hydrogeological factors into account (Zhang, 2020). Nonetheless, plantations that are imposed on grasslands have an ecological cost of habitat and biodiversity loss.

Canada has its own history of afforestation failures. Canadian researchers discovered that enhanced afforestation in the late 1970s actually increased the severity of the fire that ravaged Fort McMurray in 2016. Peatland in the area had been partially drained to enhance the growth of black spruce. These areas were found to have burned more severely due to their loss of water content. Boreal peatland is generally resilient to burn severity but this area released much more carbon from its store because it had been drained (Wilkinson et al., 2018). Forestry practices have improved since the '70s, but afforestation, reforestation, and peatland carbon reserves remain vulnerable to complex risks that will evolve over the next century. These risks are introduced in section 3.3.

3.2 Benefits and co-benefits

A well-designed tree planting project is more impactful than the sheer number of trees it plants. Reforestation and afforestation can offer significant co-benefits to the environment, to stakeholders, and to society at large:

Co-benefits are additional environmental, social, or other benefits arising from a carbon project that are quantified based on metrics or indicators defined by the project developer,

a co-benefits certification program, or third-party carbon project standard that accounts for both climate and co-benefits. (Hamrick & Gallant, 2017, p.26)

Reforestation can benefit biodiversity, habitat, air filtration, water filtration, flood control, and soil fertility (Griscom et al., 2017). These ecological co-benefits depend on forestry expertise to determine appropriate species selection, density, and planting specifications for each planting site. Appropriate species selection takes into account native gene pools, resilience to future stressors like wildfire and pests, as well as the timeframe intended for the period of carbon storage. New forests can also offset some of the vulnerabilities associated with the built environment and the effects of climate change. For example, plantations in Southern Ontario have reduced flooding and helped to protect local infrastructure (Rathi, 2020a).

Some of these co-benefits have been quantified as ecosystem services. A report commissioned by Forests Ontario valued the ecosystem services provided by 24 million seedlings planted between 2008 and 2018 and found that these 15,000 ha of plantations provide a recreation value of \$23 million per year, an aesthetic value of \$11 million and a pollination value of \$26 million on top of the average of 21,000 tons of sequestered carbon each year over the 10-year period (Forests Ontario, 2019).

Tree planting programs may focus on producing socio-economic co-benefits by targeting job creation in underemployed groups. For example, Reid Bikes is partnering with a non-profit that employs poor rural workers for tree planting (Bicycle Retailer and Industry News, 2020). Timberland's contribution to tree planting in Haiti, 25 million trees over the next five years, partners with the Smallholder Farmers Alliance which has a social enterprise model that aims to increase farmer resilience, improve food security, and contribute to gender equality while combatting climate change (Clinton Foundation, 2020). These co-benefits can also help

incentivize the preservation of the forest, thereby enhancing forest carbon permanence. Trees for the Future works with African farmers to plant trees using a ‘Forest Garden Approach’ which involves building a living fence out of trees to delineate the edges of farmland. This helps keep people and livestock out of the farm while increasing water retention in the soil. Since the trees become part of the farm infrastructure, farmers are incentivized to keep the trees standing (Rathi, 2020a).

In some situations, planning for eventual harvest may yield co-benefits. Research shows that reforestation activities achieve the most significant carbon reductions when the timber is used in long-term product sinks or as biomass fuel. When timber is used in building, it can displace the carbon-intensive production of cement and steel and burning biomass for energy can displace the use of fossil fuels (van Kooten, Bogle & de Vries 2015).

Each plantation is highly context-specific, from its landscape and ecology to its social and economic milieu. The long-term benefits of tree planting are highly dependent on a project being suitability tailored to these conditions and benefitting the local people. This means that project design and implementation are much more important for success than the sheer number of trees that are planted. Project management teams need to have adequate geographic expertise and the ability to handle the complex logistics of restoration as well as other activities like scientific research, specialized recruitment, and technical modeling to produce durable benefits (Faruqi et al., 2018).

3.3 Risks

Fossil fuel emission cuts and the preservation of existing forests rank above tree planting as priorities for climate change mitigation (Magill, 2020). The greatest risk in sponsoring tree

planting for CSR lies arguably in misdirecting energy and attention from these priorities (Temple, 2020). This risk was introduced in Chapter 2, under the heading *Limitations and greenwashing*, but it bears repeating that a company should invest in tree planting to offset their carbon footprint only after reducing scope 1 to 3 emissions. Similarly, companies can prioritize existing forests and their timber and soil carbon stocks by addressing deforestation practices in their own supply chains, especially in key commodities like soy, timber, and palm oil (Hamrick & Gallant, 2017).

The next largest risk to tree planting for CSR is the potential for overestimating their benefits. Tree planting projects that do not account for the full range of climate and human-related risks may overestimate their carbon storage potential (Magill, 2020). This accounting is affected by:

The method of analysis, the assumed baseline, land tenure, other assumptions relating to the length of time horizon, discount rates, and postharvest carbon storage and regeneration. As a result, a wide variety of forest offset values could be justified, which makes it difficult to accept any, particularly if one is serious about addressing climate change. (van Kooten et al., 2015, p.379)

Researchers working with an econometric model of afforestation in Ontario found that “estimates of the percentage of carbon sequestration from afforestation that is additional under a hypothetical offsets program varied greatly in response to the carbon price, the discount rate, and the sequestration rate” (R. Murphy et al., 2018, p.49). The difficulty of accounting for additional carbon dioxide removal has resulted in the approval of many offset projects that were later found to have likely led to higher net emissions (Song, 2019; Anderegg et al., 2020). Unfortunately,

“the costs of monitoring and verifying the creation of carbon offsets can be extremely high” (van Kooten et al., 2015, p.379).

Reforestation and afforestation projects also face significant climate risks. Research shows a growing risk to the potential of forests to mitigate climate change (Anderegg et al., 2020). Climate change influences physical and biotic factors that affect forest growth and health and forest carbon permanence. Severe natural disturbances can turn forests from carbon sinks into carbon sources. Drought, fire, insects, and fungal pathogens present risks to plantations that must be assessed and quantified as a scientific basis for long-term carbon storage in forests (Anderegg et al., 2020). Wildfire can release the carbon that was stored in trees and soil. When trees die from insect infestation they decompose and release stored carbon into the atmosphere. Human activity like road-building and extractive activities also stress forests and reduce their carbon-storing capacity. “Inadequate treatment of permanence carries major risks that disturbance-driven reversals in (forest-based natural climate solution) projects could worsen climate change, which is especially dangerous if (such projects) are used to justify further fossil fuel emissions” (Anderegg et al., 2020, p.7).

In the short term, young plantations risk low survival rates if they receive insufficient silvicultural planning and intervention. Trees require varying degrees of support depending on their environmental conditions. This may involve land preparation, fertilization, herbicide application, and periodic thinning. The upfront costs of these activities may appear prohibitive, but they may greatly improve tree survival. Sagar Aryal, chief technical officer for the Plant-for-the-Planet Foundation, estimates that the projects listed on their platform in the Trillion Tree campaign have an average survival rate of 40 percent. He believes the survival rate could be doubled (Vyawahare, 2019), which suggests that there risk of poor survival is significant.

Many of the environmental and social-economic co-benefits that restoration programs generate are not fully financially valued by the market. This makes them more difficult to quantify for cost-benefit analysis. It may also mean that incentives to degrade the land persist after reforestation and outweigh the incentives for conservation (Faruqi et al., 2018). When countries with weak enforcement institutions receive funding for reforestation, deforestation may decrease and forest management may improve, however, due to corruption the benefits may not reach rural populations who therefore have little incentive to conserve the forests (Gren & Aklilu, 2016). This is a permanence risk and may explain why the land was deforested to begin with.

3.4 Strategies for success

Tree planting projects are logistically complex and require high-quality project management to achieve long-term success.

Suitable species for planting need to be identified for the landscape. The costs and benefits of the project need to be modeled and quantified. Local stakeholders must be consulted and engaged. And once the project has been developed and implemented, continued management and monitoring are required to ensure that vegetation is established and growing as planned. (Faruqi et al., 2018, p.34)

Mitigating climate risks depends on accurate and adequate quantitative risk assessment. Prospective investors should be aware of whether risks have been adequately assessed and how these risks may change over time. Fortunately, “rigorous quantification of current and future permanence risk is increasingly possible” (Anderegg et al., 2020, p.7). Carrying out this level of assessment requires scientific expertise and “spatially explicit and regularly updated risk data”

(Anderegg et al., 2020, p.4). This data forms the basis for the careful selection of lands that are appropriate for afforestation and reforestation and for what safeguards are needed to protect their biodiversity and water availability (Schoppy, 2019).

Forest carbon project developers often rely on a third-party carbon project standard to account for climate and co-benefits. Voluntary standard bodies began to be formed by non-profits in the mid-2000s in response to the market uncertainty surrounding tree planting projects (Hamrick & Gallant, 2017). Today the Verified Carbon Standard is the most common standard used internationally in the voluntary carbon market and the Gold Standard is the second most widely recognized standard. Each standard uses different methodologies and may specialize in certain locations or project types. A verifier will use standardized methods for recording and reporting of co-benefits, ensure permanence and additionality, and prevent double-counting and leakage. “In 2016, 99% of offsets in the voluntary carbon markets were certified by a third-party standard” (Hamrick & Gallant, 2017, p.15). This third party verification improves the credibility of a tree planting initiative and can reduce stakeholder skepticism in response to CSR. (Vollero et al., 2016).

Many of the least expensive tree planting investment opportunities are found in developing nations. In these countries, weak institutions and insecure property rights pose a risk for forest carbon offset projects. Where this is the case, contracts that create incentives for self-enforcement can be used to help mitigate this risk (Gren & Aklilu, 2016). Involving smallholder farmers, targeting specific species preservation, and new approaches to land conservation can also contribute to sustainable forestry practices (Faruqi et al., 2018). Some offset programs, including California’s cap-and-trade system, manage the permanence risks of forest-based natural climate solutions by estimating risks and creating a corresponding buffer pool, an extra

margin of offsets that aren't counted towards the benefits to account for the risks. Others, such as the New Zealand Emissions Trading Scheme, address permanence risk by distinguishing between temporary and permanent offsets (Anderegg et al., 2020, p.5).

Prospective investors may also seek out the services of start-ups that aim to address the need for improved transparency in reforestation projects. For example, Regen Network is conducting a pilot project in Peru that stores information on reforestation and monitoring activities in a blockchain and seeks to use smart contracts to pay frontline communities for their efforts. Their project registry and ledger provide a direct and secure connection between donors and community members and facilitate the exchange of satellite-based deforestation alerts and drone imagery (Regen Network, 2020).

The World Resources Institute recently launched its platform TerraMatch which seeks to match funding offers with vetted planting projects outside of carbon markets. This initiative is endorsed by the United Nations and targets major corporate partners and aims to complement tree planting alliances like the Trillion Tree initiative, by solving the challenges that funders face. TerraMatch's algorithm can help funders find projects with experienced and trustworthy project leadership who are equipped to handle large volumes of financing. "All funders and project developers on TerraMatch follow the principles of forest and landscape restoration, an approach that centers the experiences and priorities of the people living in the landscape to maximize environmental and economic impact" (U.N. Environment, 2020).

Chapter 4: Tree planting organizations and emerging trends

Chapter four describes the services offered by tree planting organizations and current trends in connecting stakeholders with planting campaigns and includes illustrative examples of these strategies at work.

4.0 Chapter summary

The number of charitable, non-profit, and for-profit organizations who act as tree planting intermediaries is rapidly expanding. A large portion of the global tree restoration potential exists abroad, and several new intermediaries have launched web-based platforms that improve access to international investments and provide customized user experiences. This chapter outlines the activities of the most established Canadian organizations and major international planting platforms so that CSR decision-makers can become familiar with their offerings.

Technology is changing the way that stakeholders engage with corporate-sponsored tree planting campaigns. Social media, tree tracing, and personalization have become common strategies for stakeholder engagement as companies seek to gain credibility by making their projects increasingly verifiable. Other companies are leveraging trees to promote environmentally friendly consumer behavior and sponsoring massive record-setting planting feats. This chapter shows prospective investors how these strategies are being successfully employed in active campaigns.

4.1 Tree planting non-profits in Canada

Tree planting investors choose from a growing selection of intermediaries and program offerings in Canada and abroad. In Canada, the two largest organizations planting trees with corporate sponsorship are Tree Canada and Forests Ontario. Both organizations run volunteer activities and fund large scale planting projects. Collectively they list close to 300 corporate supporters. Annual contributions from their individual sponsors range between one thousand and one hundred thousand dollars (Forests Ontario, 2020; Tree Canada, 2020b). One Tree Planted, a US-based non-profit has also begun planting in Canada. They have planting projects in North

America, Latin America, Africa, and Asia and currently work with partners in British Columbia, Quebec, and Ontario. They are a newer arrival, founded in 2014, and are rapidly expanding, doubling year over year, under their “One dollar. One Tree.” model (One Tree Planted, 2020). The U.S.-based Arbor Day Foundation is the world’s largest tree planting organization. They have a history of partnerships in Canada and carried out planting in British Columbia for the #TeamTrees campaign. Their planting projects lie primarily outside of Canada, in the United States and abroad (Arbor Day Foundation, 2020).

Outside of the programs offered by the largest charities, some companies are also developing their own planting programs tailored to their promotional needs. For example, in 2019 7-Eleven launched its “Buy this Cup. Plant a Plant” initiative with Restoration Packaging. They pledge to plant a local tree or shrub in areas in need across the country for every hot drink purchased in their Canadian stores and estimate that this will result in 20 million plants per year (Daily Hive, 2019). In December 2019, the Canadian electronic-payment company Telpay donated two hundred and fifty thousand dollars to the city of Winnipeg, towards efforts to plant trees in its urban forest which is under threat from pests and disease (CBC, 2019).

Tree Canada – A closer look

Tree Canada is Canada’s largest national non-profit charitable organization dedicated to tree planting. They began operations in 1992 and provide a wide range of services in the promotion of planting and nurturing trees. Tree Canada has planted over 82 million trees on behalf of businesses and organizations. Over 90% of these trees were planted by professional tree planters in rural areas. The remaining trees were planted by municipalities and volunteers in urban areas (Tree Canada, 2020a).

Tree Canada's National Greening Program runs large-scale seedling planting projects which are supported with corporate sponsorship. It is a tree planting for CSR service that can be tailored to match various transactions (per product sold) and milestones or to offset paper or energy consumption (Tree Canada, 2019). For example, Telus offsets the biomass from their paper consumption by planting with Tree Canada, at a rate of approximately 50,000 trees per year (Vroom, 2019).

Operation ReLeaf is another Tree Canada program which began in response to the 1998 ice storm and offers grants to areas across the country in need of tree planting due to natural disaster and infestation, such as their ongoing 80,000 tree campaign to reforest areas burned by wildfire in Fort McMurray (Burnup, 2019). Tree Canada's also runs a Partners in Planting program, which conducts tree planting based team building activities.

The level of sponsorship involved in Tree Canada's operations is extensive. Their website lists eight corporate sponsors who have contributed at least one million dollars to date. They list five sponsors who have contributed \$100,000+ in the last twelve months, ten sponsors who have contributed \$50,000+, forty-nine with \$10,000+, and ninety-seven with \$2,000+ (Tree Canada, 2020).

Forests Ontario – A closer look

Forests Ontario is "the only non-profit charity in Canada that oversees all aspects of forest restoration from beginning to end, or from seed to survival" (Forests Ontario, 2019, p.9). They maintain their own tree seed database and seed bank and have a suite of awareness programs and an educational strategy alongside their afforestation and reforestation efforts.

Forests Ontario is mainly government-funded, at 82%. Individual and corporate contributions make up 10%, of funding, not for profits and charities 6% and investment and other income fund two percent.

In total, Forests Ontario provides financial and technical assistance for planting close to 3 million trees per year. In Ontario, their 50 Million Tree Program began in 2008 and provides trees for property owners with room for 500 or more trees. 29 million trees have already been planted in this program which is funded by the federal government as well as corporate sponsors and donors. These planting efforts aim to restore Ontario forests, increase forest cover, and mitigate flooding. Forests Ontario has also been hosting community tree planting Community Tree Plant events for over a decade. In 2019 this initiative involved more than 500 volunteers who planted over 5000 trees.

Forests Ontario also plants trees in other provinces through their national tree planting division, Forest Recovery Canada. This division leads employee engagement tree planting events across the country. Their major sponsors include Canopy Growth (\$100,000), Honda Canada, Howland Green, and Rogers Communications. They listed over one hundred sponsors with contributions below the \$100,000 mark in 2019 (Forests Ontario, 2019).

The Arbor Day Foundation – A closer look

In the U.S.A., the Arbor Day Foundation is the largest non-profit organization dedicated to planting trees. Their million-plus members, supporters, and partners plant trees in the U.S. and abroad. They have planted over 300 million trees in numerous campaigns involving corporate sponsorship since their start in 1972. It is one of the world's largest operating conservation foundations and is involved in education as well as planting at the city and forest level. Their

vision involves trees to address the issues of global poverty and hunger along with environmental challenges (Arbor Day Foundation, 2019).

In March of 2019 the foundation launched its 100 million tree initiative, ‘Time for Trees’, which aims to reach its goal by 2020. It is also carrying out planting activities for the popular 30 million tree #TeamTrees campaign (Arbor Day Foundation, 2020). In 2015, funding for Enterprise’s 50 Million Tree Pledge made up approximately 20% of the Arbor Day Foundation’s annual reforestation budget. Enterprise chose the Arbor Day Foundation because the plantations are professionally managed and have an above-average survival rate. According to estimates, ten million trees in this program result in twenty-seven billion dollars of environmental benefits (Abdelhamid, 2015).

4.2 Strategies for stakeholder engagement

Tree planting platforms

A wave of start-ups have become intermediaries between planting projects and investors, and they are making project information and promotional materials more accessible to funders. These companies host online platforms and present individuals and companies with a ‘menu’ of tree planting program options. Their sites allow users to choose where their trees are planted and commonly list a cost per-tree rate for each project and offer pre-calculated offset benefits. This makes it easier for managers set up transaction-based programs, such as offsetting the carbon from their office supplies or business travel emissions etc. Two of the largest such platforms are Barcelona based Tree-Nation, which has planted over 6 million trees in Europe, the U.S., Asia, the Middle East, and South and Central America (Tree-Nation, 2020c) and One Tree Planted, an American non-profit charity with planting projects across the globe who has also planted 6

million trees. They are experiencing rapid growth, having doubled and tripled in size each year since they were founded six years ago (One Tree Planted, 2020).

Online platforms commonly provide updated information on the trees that have been sponsored with images, geolocation, and project details. Automation is used to quickly produce a profile or page for each tree or customer with individualized offset calculations, photos, etc. This is helping tree planting campaigns to address the ambiguity of planting trees to offset emissions by showing customers that donations result in real trees. According to Rachel Dodds, director of the Hospitality and Tourism Research Institute at Ryerson University in Toronto, “for offsetting, there are so many different tools without clear outlines of where the money goes or what it’s used for that the consumer is often just left confused” (Waddell, 2017). Personalized information empowers customers to research and follow their trees’ progress, which builds confidence in the project and increases customers’ interactions with the planting campaign.

For example, Primal Europe, a cycling apparel retailer, plants one tree for each purchase through Tree-Nation. Each online customer receives a certificate that indicates where the tree is located along with more information on it is associated reforestation project (Morely, 2020). On a larger scale, Plant-for-the-Planet’s platform hosts the Trillion Tree campaign. Organizations register their planting projects on the platform, which functions as a project aggregator and a marketplace for diverse projects, with cost per tree ranging from ten cents to fifty-five dollars. The hosts aim to further improve their projects by enriching their offerings with data on carbon sequestration potential and by implementing a review system where project assessment can be crowd-sourced from credible sources (Vyawahare, 2019).

Social media

Many tree planting campaigns are promoted on social media channels with their own hashtags. This facilitates consumer word of mouth via social media which can have a positive effect on CSR communication credibility (Vollero et al., 2016). For example, Warner Music Group's new planting campaign has its own website and uses the hashtag #WMTREE. They have partnered with One Tree Planted on a project that will plant 100,000 trees in the Amazon in 2020. The trees will be presented as a holiday gift to the company's employees, with ten trees per employee and an additional tree for every post on Twitter or Instagram that uses their hashtag (King, 2019).

Personalization

Several new technologies are contributing to the personalization of the sponsorship experience. Artificial intelligence is being used to identify and track trees, blockchain is enabling smart contracts and drones are providing improved project documentation. The following examples show how these strategies are being used simultaneously to improve end-consumer confidence in tree planting sponsorship.

The 'My Roots in Africa Project' is a new start-up that aims to have people in the African diaspora plant over 200 million trees across Africa by 2024. This tree planting program will personalize contributions by using artificial intelligence to identify and geo-tag the trees with blockchain technology. Funders will be able to track the exact location of the tree they have funded and see it via satellite imagery on Google Maps (Adepoju, 2019). The trend toward personalization serves as a kind of accountability for the sponsor or consumer, who is assured that the same tree is not allocated to more than one person.

The Seneca Park Zoo has set up a planting program with Ranomafana National Park in Madagascar and aims to increase transparency via tech solutions in order to encourage giving

and improve tree survival rates. Visitors to the zoo who donate towards a tree can follow their tree's progress online. Each tree is tracked from nursery to maturity with its own QR code, photographic record, and geolocation tag. The project also aims to use tree-recognition artificial intelligence in the near future. The program manager believes that the photos give a tangible form to an individual's abstract act of goodwill (Vyawahare, 2019).

Leveraging trees to change behavior

Some companies are leveraging their tree planting programs to promote behavior that helps them to achieve other sustainability outcomes. Outdoor apparel retailer Timberland, part of VF Corp., has committed to planting 50 million trees by 2023. They are using trees to incentivize customers to choose slower, less emission-intensive shipping by offering to plant a tree for choosing this option in online purchases. They report a 14% uptake of the option, which could reduce their shipping costs by up to 20% (Baertlein, 2020). Enbridge Gas reduced their amount of paper bills by offering to plant a tree with Forests Ontario for every customer who switched to electronic billing,

Massive public tree planting events

Tree planting events are scaling up, attracting thousands of volunteers and media attention by attempting to set records for the number of trees planted in one day. Several government planting programs have held such events in recent years. Ethiopia recently broke the world record for the number of trees planted in a twelve-hour period by planting 350 million saplings in a single day in 2019, at hundreds of different planting sites with assistance from the European Union (Pereira, 2019).

Corporate investors are involved in these events as funders in public-private sponsorships. For example, a newly launched tree planting campaign in Ghana involves several

private sector actors, Uganda Brewing Limited, Stanbic Bank, Uganda Electricity Generation Company Limited, Total Uganda, KCCA, New Vision Limited, Citi Bank Uganda and Liberty Assurance, who will combine their CSR efforts to plant 40 million trees each year for the next five years. The planting activities are planned to make an impression by taking place all on the same day. Even the announcement of this initiative was designed to attract attention. The collaboration was announced at a 2-day relay race whose baton symbolized the private sector taking part (Businge, 2020).

Changes to tree planting technology

Changes in technology are also making the tree planting itself less costly and more efficient. Several companies are in the trial stages of developing tree planting drones that have the potential to reduce costs and scale up reforestation projects. The British company BioCarbon reports success rates ranging from twenty percent in temperate regions, to seventy percent in tropical climates which they say is similar to the outcomes of germination and early growth rates from manual seed-planting in these areas (Irish Tech News, 2020). Land Life reforests land that has been degraded through desertification, drought, wildfires, or over-farming. They use technologies like drones, satellite imagery, and automated planting systems to analyze the land before planting trees and claim that this allows them to plant faster, more efficiently, and at a larger scale (Land Life Company, 2020). The Canadian start-up Flash Forest claims that their growth system and drone technology can reduce growing time and cut planting costs by up to seventy-five percent (Borgobello, 2019). Drones are also being used to improve project monitoring. They can survey reforested areas and produce aerial imagery with greater detail than satellites (Vyawahare, 2019).

4.3 Case studies

Tree-Nation – A closer look at a tree planting platform

Tree Nation's platform is designed around consumer choice. They offer trees as e-gifts and calculators for tracking and offsetting an individual or company's CO₂ emissions. Individual customers may choose in which country they would like to plant and which of 300 profiled tree species they would prefer to plant. The cost per tree varies between planting projects. These projects are profiled with a series of icons representing the project's co-benefits. They can be followed, commented on, rated, and 'liked' online. When a tree is 'planted' by the customer, the platform creates a virtual tree page with pictures of the tree and its location that can be shared on social networks with location and species information and a downloadable 'tree certificate' signed by the manager of the plantation project (Tree-Nation, 2020a).

Their company sponsorship program page invites clients to "Take care of your brand by taking care of the planet". They offer companies their own "Company Forest" page which can track the CO₂ offsets from the specific species and locations they sponsor. They are able to link trees to individual products and services by providing a code for each tree planted. These stats and promotional materials make it easy for their corporate client to communicate about their sponsorship and/or carbon neutrality. Tree-Nation uses gamification with end-customers so that they return to monitor their trees and ultimately remaining engaged with the sponsored trees over a longer period of time (Tree-Nation, 2020b).

#TeamTrees – A closer look at a social media campaign

TeamTrees was launched in 2018 by Jimmy Donaldson, a YouTube star known as MrBeast, who set out to fund the planting of 20 million trees in less than two months in

celebration of his milestone of reaching 20 million subscribers. The campaign was launched and promoted via social media. Donors were listed and ranked by contribution on its website (Smith, 2019). TeamTrees received the support of over eight hundred thousand donors and exceeded its goal by funding 22 million trees and counting which will be planted internationally through the Arbor Day Foundation (Team Trees, 2020).

The campaign attracted high profile donors from social media and tech which increased its viral popularity (Leskin, 2019). Tesla CEO Elon Musk's one-million-dollar contribution lines up with his company's green mission to advance renewable energy. YouTube and the tech sector have been criticized for the hidden environmental cost of the massive energy expended by their servers. Contributors to #TeamTrees countered this narrative and sought legitimacy by backing a project which frames itself as a movement to fight climate change.

TenTree – A closer look at a company with trees as its mission

The Canadian apparel company TenTree has explicitly tied its business strategy to tree planting. As its name suggests, it plants ten trees for each product sold, a value proposition which appeals to its young, environmentally conscious consumer base. They were founded in 2012 and are growing rapidly through partnerships with established international retailers (Faruqi et al., 2018) and with the approval of the fashion critics at Vogue (Cernansky, 2020). To date, they have planted over 42 million trees and have the goal of planting 1 billion by 2030 (Leighton, 2019).

The similarity between TenTree and TeamTrees extends beyond the portmanteaus and alliteration common to their names. TenTree's website solicits customers to "Join the Movement. Begin your planting journey with 10% off" (TenTree International, 2019), showing the extent to

which they frame their company as an environmental cause. Their core customer base is made up of millennials who are willing to purchase a responsibly produced sweatshirt for seventy dollars in order to ‘join the movement’. They have been successful in reaching millennials through social media promotion and have one of the most-liked photos on Instagram with over 15 million likes to date (Leighton, 2019). The post is a picture of a tree seedling overlaid with the words “Double Tap to Plant a Tree.” The caption includes milestones where the number of likes will be met with a number of trees planted, 5 million likes for 500 thousand trees, 20 million likes for 1 million trees, and so on (Tentree International, 2019).

Each piece of apparel comes with a tag identifying the ten trees specific to the garment. This code can be used to track the location where the trees will be planted (TenTree International, 2020). TenTree also invests in developing compelling visuals and storytelling for each reforestation project. These are the mechanism they use to connect customers with their impact, an essential part of their business model (Faruqi et al., 2018).

Conclusion

Reforestation is attracting worldwide attention for its potential to fight climate change (Bastin et al., 2019; Faruqi et al., 2018; Griscom et al., 2017) and a significant amount of finance is flowing from companies, governments, and non-governmental organizations into tree planting programs (U.N. Environment, 2020). Indeed, as Griscom et al. have identified, “Forest pathways offer over two-thirds of cost-effective (natural climate solution) mitigation needed to hold warming to below 2 °C and about half of low-cost mitigation opportunities. Reforestation is the largest natural pathway and deserves more attention to identify low-cost mitigation opportunities” (2017, p.11648). Indeed, afforestation and reforestation have a mitigation

potential of 0.5-3.6 GtCO₂y⁻¹ with a cost ranging from \$5 to \$50 USD (IPCC et al., 2018). At the same time, recent evidence has revealed the increasing vulnerability of forest-based natural climate solutions to climate-related risks (Anderegg et al., 2020).

Climate change is expected to cause serious disruption to business as usual (Allen & Craig, 2016) with an estimated USD\$54 to USD\$69 trillion in global economic damage with a warming of 1.5 to 2 degrees Celsius by 2100 (IPCC et al., 2018). Climate change has therefore become a CSR priority across all industry sectors. According to the IPCC, reforestation and afforestation are most appropriate as carbon dioxide removal pathways, for compensating for residual or historical emissions (2018). However, companies aiming to fight climate change can do so most effectively by first addressing their own emissions and by eliminating deforestation from their supply chains (Hamrick & Gallant, 2017; Magill, 2020). Failure to do so may result in missed opportunities and accusations of greenwashing.

Companies that invest in tree planting activities can do so to their strategic benefit. This may involve employee volunteering or funding local or international projects. Firms must ensure that projects are equipped with skillful forest management and that plans are based on scientific assessment. Projects should be designed to maximize co-benefits and aim for permanence over time horizons of 50 to 100 years or more (Anderegg et al., 2020).

Changes in technology have led to several emerging strategies for engaging stakeholders with tree planting campaigns: planting intermediaries are using online platforms to connect investors with planting projects and customized services; social media is increasingly used to advertise; and, artificial intelligence is helping to track trees and personalize the sponsorship experience.

Efforts to improve the transparency and verifiability of tree planting projects are underway. Over the next decade, “new satellite missions will provide enhanced data which will further enable more rigorous permanence risk assessment at global scales and will promote robust ecosystem model assessments, benchmarks, and comparisons” (Anderegg et al., 2020). However, many challenges continue to threaten the success of corporate-sponsored tree planting projects.

Despite the marked increase in tree planting initiatives, “the world is not on track to meet the target of the United Nations Strategic Plan for Forests to increase forest area by 3 percent worldwide by 2030” (FAO & UNEP, 2020, p.9). Each region faces its own socio-economic, institutional, technological, financing, and environmental barriers to wide-scale tree planting for carbon drawdown (IPCC et al., 2018). The effectiveness of human interventions in decreasing permanence risks needs to be better understood and the tools and datasets available to estimate these risks need to be more widely used (Anderegg et al., 2020).

Coordinated corporate and industry effort is needed to address these challenges (Allen & Craig, 2016) and to support the implementation of the ambitious actions necessary for limiting global warming to 1.5 degrees Celsius (IPCC et al., 2018). The World Resources Institute’s TerraMatch platform is an example of the type of new initiatives that are needed to mobilize knowledge, facilitate investment in credible projects (U.N. Environment, 2020), and move us closer to achieving the large-scale planting targets set out by the Trillion Tree campaign, the Bonn Challenge, and the AFR100 (FAO & UNEP, 2020).

The amount of finance flowing into tree planting and the urgency of climate change have made it even more important for potential investors to replace the fuzzy ‘basic goodness’ of tree planting with an informed evaluation of project benefits and a calibrated assessment of risks.

This paper is a step in that direction, but it is limited by the emerging nature of this trend and the rapidly shifting landscape of the restoration economy. Therefore, the opportunity to expand on this research is extensive. An inventory of corporate sponsorship in forest-based natural climate solutions would be useful for tracking this phenomenon as it develops. Further research could provide empirical evidence on motivation for participation, on project outcomes, and could examine public-private partnerships, and identify best practices and models for success. This body of knowledge could provide a valuable resource for investors, project partners, governments, and citizens concerned with corporate sponsorship in tree planting and its role in mitigating climate change.

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