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Destination Management Organizations' Roles in Sustainable Tourism in the Face of Climate Change: An Overview of Prince Edward Island

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Abstract: Globally, destination management organizations (DMOs) are becoming increasingly known for their sustainable practices. Despite the importance of destination management organizations' sustainability initiatives in the face of climate change, minimal research has been undertaken on the topic in Canada. DMOs on PEI can inform tourists better if they know what other adaptive strategies are taken into consideration around Canada. Our work included host-community interviews and perceptions on DMOs' roles in improving tourism in the face of climate change. The interviews concluded that tourism officials in Prince Edward Island are becoming more conscious of climate change, but more has to be done to slow down the effects of the phenomenon. This paper also identified challenges facing DMOs in the area of sustainable tourism in the context of climate change. One of the recommendations was that DMOs should have access to techniques for mitigation and adaptation in addition to incentives that are sensitive to local situations. They may successfully advocate for climate change in this way and inform visitors if they are staying in risky places because of the consequences of climate change. The information on the standard operating procedures that DMOs use was intended to be useful to travelers, DMOs, and enterprises involved in the tourism industry. Future implications should discover new approaches for sustainability projects and to achieve a better understanding of how to enhance processes within the tourism industry, and more research on DMOs' sustainability practices in the face of climate change could help improve this field.

Keywords: DMOs; destination management organizations; climate change; tourism; Atlantic Canada; sustainability



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1. Introduction

Atlantic Canada is the easternmost region of Canada, comprising four provinces, Nova Scotia, New Brunswick, Newfoundland and Labrador, and Prince Edward Island [1]. This region contains a total population of just over 2.4 million people (2018), and across many scopes, it is recognized for its immense natural beauty, rich cultural heritage, and diverse tourism opportunities [1]. However, as we stand at the intersection of climate change and destination management, Atlantic Canada's DMOs (destination management organizations) face an unprecedented challenge [1,2]. While managing a destination in the face of climate change, DMOs frequently lack fundamental knowledge of climate challenges and lack authority over vital infrastructure and destination assets. It turns out that DMOs and their communities are the most underserved segments of the tourist ecosystem in terms of the assistance required for climate action [3]. However, this also offers a huge potential to

unlock tourism climate action at scale. Tourism-related knowledge needs to expand beyond destination marketing to include economic, social, and environmental aspects of tourism as DMOs' operating and external environments change [3]. This is because DMOs are increasingly expected to advise local level governance systems and tourism stakeholders on aspects of tourism strategy, policy, planning, and response to change. Efficient planning and management procedures, as well as collaborative efforts, are necessary due to the intricate nature of both sustainable development and tourism [4]. Thus, in order to effectively accomplish a shift towards sustainable tourism, a coordinating agency is essential. The DMO plays a crucial role in creating a vision, incorporating sustainability into the broader destination strategy, or even developing a specific sustainable tourism development plan, because sustainable development is a long-term strategic goal that must be taken into consideration beyond its operational tasks [5,6]. Because they play such a coordinating role within a tourist destination, DMOs are crucial to the move to sustainability [7]. In addition to the local DMO, local political authorities play a crucial role in establishing the policy framework required for sustainable development [8]. The DMO may be viewed as a conduit between the local tourist industry, which is responsible for implementing policies and contributing sustainable tourism offerings to development, and the political authorities (national, regional, and local), who should direct sustainable development through their policies [9]. In order to maintain perspective, guarantee a medium- to long-term planning horizon, and create a compromise between frequently at odds economic, environmental, and social interests in tourist development, such coordinating agents are required [6].

Changing weather patterns are making seasons less predictable, which threatens the sustainability and viability of tourism sectors throughout Atlantic Canada and around the world [10]. Furthermore, places may become less and less ideal for tourism as a result of gradual changes in their climate and growing dangers from related natural disasters like storms, floods, and sea-level rise [11,12]. The supply and demand for tourism is impacted by rising temperatures, shifting precipitation patterns, and an increase in the frequency and intensity of extreme weather events [10]. Climate change poses a hazard to tourism-related infrastructure, including natural attractions, recreational activities, and destination accessibility. Coastal locations are especially susceptible to coastal flooding and sea-level rise, which can harm tourism-related assets [10,13]. Additionally, tourism contributes to climate change and environmental degradation [14,15]. Destination management organizations (DMOs) must try to address these challenges. Depending on the organization's primary purpose, the abbreviation "DMO" might refer to either "Destination Management Organization" or "Destination Marketing Organization" [16]. Currently, the literature suggests that DMOs have not been able to make adequate strides in addressing these challenges with mitigation and adaptation strategies both nationally in Canada and internationally [2,14,17]. The literature has revealed through case studies that at the heart of this lack of action from DMOs on both levels (national and international) is a lack of instruction and training for staff on climate change [2,14,18]. In one example from an Island DMO off the coast of the British Isles, staff had not participated in any external workshops or training programs on climate change [14]. The literature also suggests that product changes that have been implemented by several DMOs were not a strategic response to climate change adaptation, but rather in reaction to changing consumer behaviors [2,14]. "In the last 15 years, the product development strategy has been around walking and cycling and active sports rather than sunbathing or sun beach culture". This offers a potential explanation for a case study determining that adaptation measures were virtually nonexistent for a DMO, while a few simple mitigation measures, such as encouraging recycling and switching to online brochures (easy, inexpensive changes, which are sustainable and environmentally friendly), were performed [2,14].

Plenty of recommendations were found around the world throughout the literature on what approach DMOs should take to deal with climate change that can be applied to regions in Canada [14,19,20]. On a national level, research concluded that governments should improve education and awareness of climate change for DMOs and their staff

and provide them with tools and best practices needed to measure impacts; accountable industry-wide standards to reduce environmental impacts caused by industry should be enforced; consumers should be educated about the impacts of their travels on their host destinations; and regional adaptation plans must be devised [14,21,22].

When devising these regional plans, it should be considered that the literature determined that the adaptation to generally slower, developing trends and impacts of climate change, which require innovation, the diversification of products, structural transformation, mitigation, etc., should be organized at the DMO-governance level [17]. When it comes to intensified and sudden climate change impacts, individual municipalities were determined to be able to cope better with them [17]. Crisis preparedness was also determined to be another important part of an organization's adaptive capacity to climate change [14,23]. The literature determined that DMOs have underwhelmed on both a global and national scale when it comes to adjusting their practices to adapt to and mitigate climate change. The literature also had plenty of suggestions on what approaches DMOs can take to change this narrative. There was a significant lack of literature regarding DMOs and climate change in the Atlantic Canada and Prince Edward Island regions.

DMOs in both Nova Scotia and Prince Edward Island were shown to have a major lack of climate change educational features (suggestions) on their web pages for tourists and regarding climate change impacts and how tourists can learn more about these impacts while they are traveling. The Tourism Industry Association of Nova Scotia and its subordinate DMOs (Destination Cape Breton and Destination Eastern and Northumberland Shores) had no climate change-impact-related sources available to the public or employees on their web pages [2,24]. The Tourism Industry Association of Prince Edward Island provided a list of workshops that are open to tourism operators to improve their practices when it comes to marketing. Workshops offered included Instagram reeling, social media strategies, and mixology. However, no climate change-education workshops were offered related to tourism practices.

Prince Edward Island was evaluated by the Global Destination Sustainability Index in 2023, coming in as the 10th most sustainable tourism destination in Canada and the 79th globally. While scoring highest in the social sustainability category at 70/100, their lowest score was in the destination management organization category at 26/100. Any existing literature is also becoming quite dated. Using the previous literature as a solid base, this current study aims to identify the DMOs in this region and evaluate their current response to climate change. This paper will also bring updated data to the conversation of how DMOs are dealing with climate change in the Atlantic regions and on PEI.

Climate change poses significant threats and intriguing opportunities for the tourism industry, demanding a fundamental reassessment of how DMOs operate and adapt [2]. Atlantic Canada, a region renowned for its stunning coastlines, forests, and vibrant communities, is facing the stark reality that climate change is leaving an indelible mark on its landscapes and livelihoods [1]. This region has experienced many tangible manifestations of climate change in recent years; these include rising sea levels, changing ocean temperatures, increased storm intensity, altered precipitation patterns, and warming surface temperatures [1].

Rising sea levels are having an impact on coastal communities because they put infrastructure and culturally significant places at risk from storm surges and coastal erosion. Two prominent instances include the deterioration of Prince Edward Island's coastal bluffs and the susceptibility of coastal villages like the popular tourist attraction Lennox Island First Nation [1]. As rising ocean waters cause changes in fish-species distribution, fish stock health, and the exacerbation of pre-existing stresses, Atlantic Canada's significant fisheries and seafood tourism are in upheaval [1,25]. The increased frequency and intensity of hurricanes, like Hurricane Fiona in 2022, are putting coastal towns' preparedness for emergencies and the durability of their infrastructure under strain. They are also having an adverse effect on tourism and the number of visitors to the island [1]. Erratic rainfall patterns and prolonged droughts have become a reality for farmers, affecting crop yields

and agricultural viability [1]. Year-round increasing temperatures have impacted many facets of most Atlantic Canadian life and its tourism activities, in addition to changed patterns of precipitation [1].

Island getaways are especially susceptible to the effects of climate change [26]. Because of their susceptibility, islands are becoming the center of attention for studies on climate change [26]. The implication for islands is that tourists from climate-sensitive destinations will probably be dispersed differently because of climate change [27]. Put another way, a lot of islands rely heavily on tourism to support their economies, and as a result, climate change poses a threat to this industry [27]. Island DMOs in Prince Edward Island (PEI) must strengthen their adaptive capacity to meet the environmental effects of climate change and adapt to the evolving traveler behavior, as indicated by the predictions made for islands under most climate change scenarios (Figure 1) [14]. All the Atlantic Province's economic sectors are affected differently by these climate change effects, but tourism is particularly affected in the context of this research.



Figure 1. DMOs on Prince Edward Island.

The purpose of this paper is fourfold:

1. To identify the role of DMOs in the climate change-influenced tourism of Atlantic Canada: this research focuses on understanding how DMOs can adapt and promote sustainable practices in the face of climate change. It seeks to define the evolving role of DMOs in mitigating the environmental impact of tourism and ensuring the resilience of tourist destinations in Atlantic Canada;
2. To assess the impact of climate change on tourism and DMOs: We aim to evaluate the current and anticipated impacts of climate change on the tourism assets and infrastructure of Atlantic Canada. This includes assessing vulnerabilities, such as coastal erosion, storm surges, changing wildlife patterns, and the effects of extreme weather events;
3. To explore new opportunities: Despite presenting formidable challenges, climate change also offers opportunities for Atlantic Canada's tourism industry. Our study will investigate these emerging opportunities, and how to improve practices across the sector;

4. Conduct local interviews: To see local perspectives on the topic of destination management organizations and climate change, local interviews were conducted with host communities from across Prince Edward Island.

After discussing DMOs in Canada and their sustainable practices, the overview also highlights that there is insufficient data in the Atlantic provinces, particularly in Prince Edward Island regarding DMOs' sustainability practices in the face of climate change. Following a review of the relevant literature, the overview discusses boosting sustainable tourism in Prince Edward Island by way of DMOs and establishing sustainability methods. This overview also contains interviews with host communities that are involved in tourism activities in the PEI region to assess the sustainability practices or the areas that require additional sustainability focus. Finally, but just as importantly, PEI and Canada's destination-management measures will be discussed.

2. Methodology

The purpose of this paper is to determine how DMOs affected tourism in Atlantic Canada, with a focus on PEI due to climate change impacts, and to better understand how, in the face of climate change, DMOs can adapt and promote sustainable practices. It aims to delineate the dynamic function of DMOs in ameliorating the ecological consequences of tourism and guaranteeing the durability of tourist spots in Atlantic Canada. Since there are no "formal" hypotheses to test, this research is qualitative in nature. To identify trends in this inductive and interpretative study, the below points were evaluated:

- Difficulties that DMOs encountered as a result of climate change;
- Strategies for mitigation and adaptation;
- Obstacles or problems that prevented the implementation of mitigation strategies;
- Views held by host communities regarding more environmentally friendly forms of tourism.

For the interview study, the participants were chosen from host communities who are involved in tourism activities and live in touristic areas on the island (e.g., Victoria by the Sea, which is a well-known tourist spot with its host community). We identified 5 members from host communities through convenience sampling through our visits to the host communities. We selected the members of the community who we thought would provide us with the best information. The participants are the members of host communities who interact with tourists and contribute to tourism activities on the island. The majority of research participants preferred doing their interviews via email over in-person interviews, hence we provided the participants in our research with an email including an informed consent document, which they could sign, scan, and return via email in preparation for the email interviews. It was also deemed adequate for them to respond with an email acknowledging that they had read the consent letter and that they were willing to participate in the study. All other data that may have been used to identify specific people was removed. Every participant was made aware that their participation in the study was completely voluntary and that they might end it at any moment. In this paper, all the interview material was utilized to develop the study's conclusions. Interviewees are identified by codes, such as R2, when direct quotes are included. Interview questions involved the following:

- How do you feel about climate change impacts on PEI? What has your experience been regarding various impacts you may have experienced personally?
- What is your relationship to tourism on PEI? How do you interact with tourists? What is your role in the host community?
- How do you feel about destination management organizations on PEI? How do you think host communities could be more involved with DMOs? What can host communities and/or DMOs do to be more environmentally friendly, in your opinion, or to promote sustainability in the tourism sector?
- What changes would you like to see in the PEI tourism sector?

3. DMOs' Roles in the Face of Climate Change

Destination management organizations are essential to encouraging and supporting sustainable economic growth within the tourism sector in Atlantic Canada in the face of climate change [28]. The primary duties of DMOs are covered in this section, along with how they assist and incentivize tourist operators in implementing sustainable practices [4]. In many areas, DMOs can attain funding for both internal development and for the development of coordinated events and programming [29]. Through efficient planning and implementation, this cash can be utilized to promote and finance sustainable practices and destination operations, indirectly benefiting local businesses and enabling buy-in and overall benefits from business cooperation. Sustainable firms can be given a head start, attractive marketing, and continued company operations success with the DMO and the responsible use of funds and financing [5].

DMOs frequently act as a centralized hub where a wide range of individuals, including local communities and companies, may interact and work together [30]. They have a unique opportunity as an often-non-profit organization to facilitate networking events, workshops, and meetings that allow businesses and stakeholders to share insights, best practices, and ideas related to sustainability and climate change [30]. As a central hub, these organizations can initiate cooperative efforts wherein several operators work together to achieve sustainable goals. These events can help businesses advance the development of sustainable operations within the destination by providing them with the opportunity to exchange information with experts and one another. DMOs may demonstrate a destination's commitment to sustainability and its efforts to combat climate change by using storytelling and their ability to create a unique, compelling brand. Those in positions of authority may impact their audience by highlighting pertinent markets, including those that employ sustainable practices. Advertising materials and other forms of communication must clearly and consistently convey the sustainability message if DMOs on PEI are to uphold and develop a sustainable image. Because of its dependability, the location is seen as a more sustainable option. This kind of well-planned marketing strategy may attract ethical travelers who choose to spend their time with establishments that adhere to a sustainable vision, which would increase the company of those who do so.

DMOs on PEI may play an important role in assisting business by offering sustainability training as well as training to improve capacity and business resiliency regarding climate change consequences [31]. This is similar to how they can use collaboration and knowledge sharing. DMOs can help identify specific needs and challenges faced by operators in their jurisdiction because they are frequently highly specific to the destination's context [28]. With this information, they may help operators develop their capacity through channels including climate-resilient practices, sustainable practices, and crisis planning and management by customizing training and resources [32]. In addition to boosting the region's much-needed resistance to climate change, operators may encourage more sustainable economic growth and make the whole area a more responsible and resilient vacation destination by fulfilling this educator role. Increasing consumer knowledge of and desire for sustainable products and services offered by tourism-related businesses requires effective marketing and promotion [33]. DMOs work to promote and support businesses that utilize sustainable practices by leveraging their resources and influence to enhance the destination's image. DMOs may draw attention to the distinctive features of sustainable businesses, such their dedication to community involvement, environmental preservation, and ethical tourist practices, through focused marketing campaigns [34]. DMOs, who play a crucial role in shaping the future of PEI's tourist economy, must remain adaptable, creative, and responsive to ensure the continued success and sustainability of the sector. Prince Edward Island (PEI), a picturesque province in Canada, is renowned for its verdant landscapes, red sandstone cliffs, and charming coastal villages [35,36]. Its unique beauty and rich cultural heritage, deeply rooted in Indigenous and Acadian traditions, attract over 1.6 million tourists annually [37]. The island's history, notably the Charlottetown Conference of 1864, which paved the way for Canada's confederation, is another significant

draw for visitors [37]. However, this influx of tourists can also pose challenges. The environmental impact is considerable, with increased waste generation, water consumption, and carbon emissions associated with travel [38]. The island's delicate ecosystems, including its famous beaches and dunes, can suffer from overuse and pollution [39]. Moreover, the local community also experience adverse effects. While tourism provides economic benefits, it can also lead to increased prices for goods and services, potentially making life more expensive for residents [40]. The seasonal nature of tourism can also create unstable employment, with jobs plentiful in the summer but scarce in the off-season. Therefore, while tourism is a vital part of PEI's economy and helps share its unique culture and history with the world, it is crucial to manage it sustainably. This way, the island can continue to welcome visitors without compromising its environmental integrity or the well-being of its local community. Promoting sustainable tourism in Prince Edward Island (PEI) is crucial to preserving its unique environment and culture, yet when it comes to the era of climate change, it gets harder to promote sustainability and safety for tourists. To help provide a safe and enjoyable environment to tourists, education becomes a key component [41]. Tourists can be informed about the importance of environmental protection and cultural respect through various mediums like signs, brochures, and digital platforms [42]. This can encourage responsible behaviors, such as not littering, sticking to designated paths, and respecting wildlife, and they can be informed of the climatic extremes in the area while they visit the island and be aware of the potential risks in the destinations they are traveling to.

Putting an emphasis on walking, bicycling, and public transit not only lowers tourism-related carbon emissions but also eases traffic, improving the area's quality of life for locals [43]. Both inhabitants and visitors gain from investing in these infrastructures since they promote a healthier and more active lifestyle [44]. By switching to renewable energy, tourism's negative environmental effects are reduced. This action reduces reliance on fossil fuels, curbing pollution and decreasing greenhouse gas emissions. This investment can also lead to long-term cost savings and a more sustainable energy infrastructure for the community. Including the local community in the decision-making process ensures that their interests and concerns are considered. This helps prevent negative impacts on the environment and cultural heritage. Local communities are the first to notice environmental and cultural asset degradation in their immediate surroundings. For example, restrictions could be put in place by DMOs on the quantity of tourism activities, and traveler movement inside protected areas might assist in reducing negative effects on the environment and preserve the integrity and vitality of the location [45,46]. These restrictions may also lessen the detrimental effects on resources. The expectations of tourists and the volume of tourists visiting these places are currently the main issues facing many cultural and historic sites. Site administrators need to understand that the sites they are responsible for will never change in size, which implies that in order to safeguard the sites, visitor volume and behavior must be under control [45]. Engaging the community fosters a sense of ownership and pride in their region, creating a more sustainable and harmonious relationship between tourism and the local population [47]. By implementing these strategies, a destination can promote sustainable tourism, where economic benefits are balanced with environmental and cultural preservation. This approach not only ensures the well-being of the community but also contributes to a more sustainable and enjoyable travel experience for tourists.

In conclusion, DMOs may support sustainable tourism practices on PEI by integrating the local community in tourism planning and development. This will benefit the local people and help to preserve the environment and culture, all while ensuring that this lovely island remains a well-liked tourist destination for many years to come.

4. What Can DMOs Do for Sustainable Tourism?

To promote sustainable tourism on the island, destination management organizations (DMOs) can undertake several initiatives. To create and carry out sustainable tourism programs, DMOs should work in conjunction with local businesses, non-profits, government

agencies, and Indigenous communities [14,48]. With the use of partnerships, a coordinated and inclusive approach to sustainability may be guaranteed.

DMOs can work with local authorities and urban planners to incorporate sustainability principles into destination planning [49]. This includes promoting sustainable infrastructure development, preserving natural and cultural heritage, and integrating sustainable transportation options [50].

While engaging with local communities, including Indigenous communities, it is highly important to respect their cultural heritage and involve them in sustainable tourism decisions, this can be done through consultation processes, community-based tourism initiatives, and economic opportunities for local businesses [51,52]. DMOs can educate visitors, local communities, and tourism businesses about sustainable tourism practices [53]. This can involve providing information on responsible travel, promoting local conservation efforts, and raising awareness about the importance of sustainable practices. DMOs can support conservation efforts by promoting responsible wildlife viewing, supporting protected areas, and advocating for sustainable practices in ecologically sensitive areas. This can help preserve Canada's rich biodiversity and natural landscapes. DMOs have the authority to endorse and accredit lodgings and services that adhere to sustainable tourism standards. This can involve promoting trash minimization, water conservation, energy-efficiency techniques, and local and organic food programs. To encourage and promote Indigenous tourism experiences, DMOs can collaborate with Indigenous communities [52,54]. This can entail upholding traditional Indigenous customs, encouraging business opportunities for Indigenous companies, and advocating for genuine cultural experiences that strengthen Indigenous communities [51,52].

DMOs may combat climate change by supporting electric car infrastructure and promoting eco-friendly modes of mobility like cycling and public transportation. Additionally, they can motivate tourists to travel sustainably and participate in offset programs to lessen their carbon footprint. By promoting trash reduction, eco-friendly transportation choices, and local and sustainable food and beverage vendors, DMOs may encourage sustainable practices during events and festivals. The effects of tourism on the environment, nearby communities, and cultural heritage places should be studied and observed by DMOs. These statistics can point out areas that need improvement and serve as a roadmap for sustainable tourism practices. DMOs on PEI may help preserve Canada's natural and cultural resources, assist local communities, and guarantee the long-term viability of the nation's tourist sector by putting these programs into action.

5. Host Communities' Insights

Host communities are an often-overlooked aspect of tourism [55]. People in host communities are also likely to have ideas and solutions to problems they have identified in their sector of tourism. One of the aims of this paper is to encourage DMOs to involve host communities in their decision-making practices and explore the potential of host communities in the implementation of sustainability practices [56,57]. In other areas of the world, such as Madagascar, studies have been conducted which report the importance of using local guides on tours [58]. Not only do the tourists then show increased awareness of the ways that the environment is tied to the people of the region, but they also care more about climate change and/or environmental degradation in the area as well as understanding the cultural significance of the natural world to the people who live there and their identity [59]. This is likely to remain true for PEI as well. For example, guides who understand the importance of dune systems in extreme weather events such as Hurricane Fiona are going to be more emotionally tied to the impacts of tourist degradation than guides from elsewhere who do not understand the impact of degradation. The host community is also an integral part of any DMO. Input is essential from community members in order to ensure that the structure and development of sustainable tourism is acceptable and sensible for the local area [60]. The implementation of community input is not as simple as it may sound. Within a host community, there are many different factions

which often exist in opposition. For example, high- and low-income communities will have different needs from the tourism industry. Minority communities will interact with the tourists differently than majority communities [61]. And rural hosts will have a different perspective than hosts living in town. All parts of the heterogeneous host community should be accounted for, not simply those of the vocal few. Surveys and public-input events can be helpful in achieving this aim [61].

Host communities have a large indirect impact on the tourism in an area, but there are only three scenarios where tourists and hosts are interacting. During the purchase of goods and services, through physical proximity at an attraction, and during information exchange [61]. These three interactions are those where PEI entities should focus their attention and sustainable-tourism-programming efforts. Goods and services should be environmentally friendly, information exchange should include sustainability information and conservation work, and tourists and hosts should be working together to protect the environment and promote sustainable tourism [62].

In the interest of this report, interviews were conducted with five members of host communities on PEI. Given the abundance of tourism on the island, the whole province acts as a host community, but some people have worked in regions that are specifically tourism destinations. Respondents were asked about their experience of climate change impacts on PEI and their role in the host community. They were then asked to give their opinions about DMOs and sustainability recommendations for the tourism sector on PEI in the face of climate change.

When asked about how they feel about climate change impacts on PEI and what their experience has been regarding various impacts that they may have experienced personally. Respondent 1 said the following:

"I think anyone can look back on their host community a notice changes over time, but I have noticed drastic changes in the last five or six years alone. It's been quite alarming, especially as more and more outsiders (for lack of a better term) begin to want to spend more and more time in my home region. There is the much more visible spectrum of climate change effects such as less snow at later periods of winter, stronger storm cells that lead to massive damage in areas that were never touched before, etc. but there are also the less visible but more potent changes, such as the boom in tick populations and the correlated rise in Lyme."

Most respondents expressed climate anxiety, and almost all of them spoke about Hurricane Fiona. Respondent 3 said the following:

"I will probably have to go through many more Fionas and even storms worse than Fiona."

Among the other concerns are rising temperatures, erosion, invasive species, ocean warming and acidification, and winter snow impacts. Climate change is a concern for islanders and, as tourism is such a huge industry for PEI, it is important to make sure that industry is incorporating sustainable practices to mitigate and adapt to climate change. Respondent 4 said the following:

"I think in many ways climate change really hit a lot of islanders in the face with Fiona, but to me it's been visible for far longer. It has been hard to notice the winters slowly becoming wetter and warmer every passing year, especially as someone who participates in a lot of winter sports. I see them out there still, trying to make snow in poor conditions, only for the rain and warmth to wash it all away. It seems like a futile effort. After Fiona too, what was once a very thick forest of mixed woods has been stripped away. Everything has changed so drastically. However, I have also seen recovery, and certain things give me hope. There is a trail by Cavendish called Homestead. While it has become stripped of its trees, what remains is a paradise for songbirds and shrubs to thrive. I always recommend that trail to people going birdwatching, and they always find a wide variety there."

The respondents were asked if they had any recommendations for DMOs' involvement in sustainability on the island. Increased education about the importance of environmental

conservation, an open dialogue between host communities and regional DMOs, and appeals to private landowners were some of the ideas. The main issues that were brought up several times were the preponderance of cruise ships, and the high level of emissions that they generate, and the lack of adequate public/sustainable transport on the island. For many tourists, to reach far-flung areas of the island, or even Cavendish, they must rent a vehicle, as the transit system is not built to cater to such needs. Respondent 5 summarized the general sentiments well:

“I feel the DMOs have a responsibility to encourage folks to protect the islands habitat and wildlife by informing visitors on eco-conscious conduct while visiting the island, while islanders can lead by example by reducing waste and spreading the word about dune management and wildlife safety.”

Another issue that was discussed was the sidelining of host community interests in the pursuit of tourist profit. For example, PEI is facing a housing crisis while many summer cottages stand empty for nine months of the year. The respondents would like to see DMOs and the tourist industry in general prioritizing not only the environment but also the host community instead of making the destination as attractive as possible at the expense of the local environment and residents. This is why host community involvement in DMOs is so important. The understanding of the needs and issues coming from the people themselves is integral to decision making, and sustainability policies and practices will need to be implemented by host communities, and so must be amenable to all parties.

For the question “How do you think host communities could be more involved with DMOs and what can host communities and/or DMOs do to be more environmentally friendly, in your opinion?” Respondent 4 said the following:

“Based on my experience, I think a lot of DMOs should step up their game. Even governmental organizations, like Public Health and Health PEI who organized the COVID response at the bridge, created loads of disposable waste, and a rather inefficient system that caused large amounts of emissions. However, I find that places like Parks Canada, another governmental organization, manage their jurisdiction quite well. It is a difficult situation on the island as so much land is privately owned. Most DMOs in that regard have little regulation to be able to manage things sustainably. Ground-up initiatives to promote sustainable practices in relevant industries are far more viable here than in other provinces, as they appeal directly to private owners without stripping them of their freedom. These initiatives have and continue to work but should be ramped up. Promotion of education through public school funding and good online classes should give people the opportunity to learn.”

Considering the environmental protection concerns, Respondent 5 said the following:

“Dune protection is a well-known problem for islanders, and many of us have experienced the frustration of tourists or their unsupervised children disrupting the dunes, as well as feeding wildlife on beaches or in urban areas. As well, tourism generates a lot of waste, such as from Cow’s paper/plastic ice-cream bowls with plastic spoons or from local restaurants supplying plastic or Styrofoam to-go containers for takeout or leftovers. Tourism also generates a lot of emissions from cruise ships and personal vehicles as the island is not overly accessible by many other means. I feel the DMOs have a responsibility to encourage folks to protect the islands habitat and wildlife by informing visitors on eco-conscious conduct while visiting the island, while islanders can lead by example by reducing waste and spreading the word about dune management and wildlife safety.”

Overall, when respondents were asked about what changes they would like to see in the PEI tourism sector when it comes to sustainability and climate extremes, Respondent 3 mentioned the following:

“I don’t think I necessarily want to see changes within the tourism sector as much as I want to see changes in our dependency upon it and want to see the government take the environment into account more. Our Island is small, and we need to find a different

source to become Independent as I believe we can't sustainably support the level of tourism we need. People both locally and globally need to better understand the effects of climate change on vacation spots and how tourism can and has negatively impacted those places."

For further thoughts, Respondent 4 added the following:

"I remember during the summer I had many moments where visitors would come up confounded about all of the destruction. They would ask why all the trees were down, sometimes with sadness, other times with an appalling sense of blame as if we hadn't taken care of our land. They often had no idea that Fiona had occurred, while most of us on the island are constantly hearing about the fires raging across the country. It sorts of made me realize that most of them had no concept of PEI existing outside of their summer vacation, which is understandable for most tourists anyway. However, it was sad to see that sort of disconnect with fellow Canadians. I think a lot of islanders have a shared identity especially from those events, as I'm sure people in other provinces bond over their natural disasters as well. However, this identity is a strength of the tourism industry, and I think it allows us to be an excellent destination for people no matter what the condition of our land."

All the above statements are alarming when it comes to climate extremes and DMOs' roles, as the host communities are informing DMOs in a way on what strategy to follow for tourists and tourism destinations to thrive on the island.

6. Managing the Destination and Recommendations for DMOs

Roles within a DMO will continuously have the need to adapt to the challenges unique to its given location. Proper management has the power to uplift local communities and economy, yet more focus needs to be held on social and environmental patterns to ensure a successful and sustainable tourism operation [63]. Regions within Atlantic Canada are in a position to promote both an array of unique culture and natural beauty unique to this area of the world. A DMO promoting this region would be successful in capitalizing on these two aspects for successful economic development [64]. However, the effects of climate change need to be factored as a variable on the long-term success of these locations to both preserve and promote Atlantic Canada's traditional culture and natural landscapes [65]. Sustainable tourism practices would benefit host communities and visitors alike by protecting ecosystems, animals, culture, and history. These characteristics are what make places in Atlantic Canada appealing, so in order to be successful and preserve the area over the long term, a DMO must implement sustainable tourism policies [63].

Culture, ecology, and economics are symbiotic aspects of tourism in a local environment. Stressors of climate impact and increased tourism capacity offer new challenges in which all three aspects must remain successful as they are what bring in the large level of tourism [65]. For a tourist, climate is a top priority in decision making about a location [66]. While the warming of Atlantic Canada regions due to climate change can extend the ideal tourist season and draw in larger numbers as a result, this means that while economics may be able to benefit, the two other aspects of culture and ecology become increasingly threatened [65]. A location such as Prince Edward Island is reliant largely on warm-weather tourism, and while longer warm seasons can benefit the local economy, the warming and increased storm surge of the region is putting local attractions at risk [65]. An example of this is the loss of Prince Edward Island's iconic Teacup Rock at Thunder Cove after the event of Hurricane Fiona in 2022. Teacup Rock had been used as a primary image by destination management organizations as a natural tourist attraction, yet due to increased storm-surge activity and severity to the region, the fragile landmark had been completely washed away [38].

Due to a largely newfound transition in sustainable tourism practices for many DMOs, there remains a lack of literature and methodology on how to transition while still prospering the culture, ecology, and economy of a region [63]. This remains especially true for regions within Atlantic Canada who are in a significant position of environmental

transformation in the face of climate change [65]. For in the present literature on these matters, correlations largely state that sustainable tourism aids in the prosperity of host communities, furthers sustainable education, and protects overall environment all while allowing a significantly better tourism experience and cultural exchange between host and tourist [65]. The tourism sector will continue to face increased challenges because of climate change; thus, destination management must respond and adapt as needed. Currently, destination management is seeing success with its sustainable tourism initiatives [66].

The reliable climate dependency of a region is one of the primary priorities a tourist considers for decision making and the attractiveness of a region for travel [67]. Therefore, regardless of a lack of publications into sustainable tourism in Atlantic Canada, the tourism industry's dependence on climactic resources makes it one of the most vulnerable industries and should be operated with this in mind [68].

Environmental aspects of tourism have in the past not been a prominent area of concern to tourists when, compared to socio-cultural and economic areas, it is proven to need just as much care for a successful tourism location [65]. As part of sustainable tourism practices, a destination management organization should incorporate more avenues for both a host community and tourist to learn the value of sustainable tourism [69,70]. This can include, but is not limited to, recognizing areas of environmental preservation, providing visitors with environmental education for the region, and highlighting the negatives of unsustainable travel etiquette [65]. Environmental education should find dune protection and fragility awareness as a main concern especially within Prince Edward Island [39]. June to September sees a spike in tourism, with many visitors choosing to unwind, explore, and go swimming along the shore [39]. At present, there is a lack of informative signs and awareness signifying that human foot traffic can uproot and destroy the marram grass systems that allow sand particles to build up and continue to build dune systems surrounding the PEI coast [39]. Sentiments brought forth by both locals and National Park staff is that more dune ecosystem protection needs to be present especially when it comes to climate impacts. What should be common knowledge is being heavily lost to both locals and tourists [39]. With a world connected largely by the internet, a DMO should take advantage of not only physical signs to further environmental education to the region but provide warnings on regional websites signifying the need for aspects such as dune-ecosystem-fragility awareness before a tourist is able to arrive at their tourism destination [39].

Several staff of already sustainable tourism DMOs had recommended that data collection and awareness to their location offer the most fundamental aid in keeping its tourism sustainable [71]. Means of collection include standardizing data collection from local businesses for destination awareness, or to provide host communities and visitors with surveys to more sustainable methods of practice a DMO should focus on [71].

For Atlantic regions such as Prince Edward Island, the tourism industry has made itself one of the primary drivers in economy [38]. Climate change effects are however altering much of the landscape that gives the province its appeal [38]. Coastal erosion and the vulnerability of infrastructure and long-standing landmarks to the region, such as the picturesque lighthouses, grow ever more vulnerable near the shrinking shorelines [38]. As a result of its location, as a low-lying island, Prince Edward Island finds itself as a familiar area to flood risk especially around touristic coastal regions [72]. There is growing worry among DMOs that they need to switch to more sustainable methods of promoting and executing tourism, lest they lose the things that make a place appealing to tourists [66]. For instance, several beaches on Prince Edward Island with sand dunes had to be immediately maintained after Hurricane Fiona forced the closure of those beaches to visitors. With storm surges expecting to grow due to climate change, many tourism amenities risk seasonal closure during peak tourism times such as the popular golf courses and restaurants residing on coastal areas across the island. A storm to the degree of Hurricane Fiona in 2022 left some of these establishments with flood and wind damage to such a degree that they were left unable to operate, or at the worst, fully closed, during the local tourism season [38,72].

The ability of DMOs to educate the visitors on the effects of climatic extremes on the island is one crucial aspect of this. For instance, some tourists did not realize they were at risk of floods or hurricanes during Fiona, even though they were staying in Airbnbs or other locations that are floodplains [73]. The DMOs are in a good position to advise visitors, and the places they are visiting ought to provide further details about the kinds of climate change impacts that people could anticipate or have already encountered. Additionally, DMOs ought to collaborate with climate scientists to install more educational signage about these risks in tourist destinations [73].

Expectations of greater averages of precipitation and flooding across Prince Edward Island means that the loss of access to local amenities will leave devastating damage to the tourism sector, and in turn local economy and ecology [38]. Coastal and inland flooding that grows more present to the region will not only provide closure to popular tourist locations, but general access to regions due to road closure will occur and negatively impact a tourist's satisfaction [38]. To mitigate flood damage, DMOs and residents must fight for policy change and increased adaption methods to lessen hazard levels on both society and the environment [38].

The Atlantic Canadian area, including Prince Edward Island, has several options for implementing various changes to foster more sustainable tourist practices. Last but not least, a DMO that is ready to make the switch to sustainable operations should push for changes in government policy and practice that acknowledge the vulnerability and danger of unsustainable tourism at the levels of stakeholders [74]. In order to implement transformative change and adopt a sustainable tourism model that guarantees longer-term benefits, a DMO must pay attention to and share information from various levels of the tourism industry, community, stakeholders, and government [74].

7. Discussion and Conclusions

Climate change is a long-term global hazard that affects all businesses, including the tourist industry [75]. There may be implications for DMOs in other locations even though this paper emphasizes the significance of DMOs in the Atlantic region. According to one study's results, island destinations are at a turning point in their development, and major strategic changes are required to support the DMOs' definition of success for these destinations going forward [76]. While many of the studies discussed DMO roles, the studies looking into climate change impacts are still sparse when it comes to tourism and DMO practices. One study discussed that in the context of climate change, the study's findings suggest that past contentment with a coastal destination is insufficient to draw returning visitors [32]. As a result, DMOs may serve as the suppliers of climate knowledge through easily available channels (such as government websites and social media) to promote awareness raising and lower the risk of future climate change for visitors [32]. Especially in vulnerable island destinations, DMOs must have access to adaptation and mitigation techniques as well as incentives that are sensitive to the needs of their local communities and have a global understanding of climate change to effectively advocate for tourism and sustainability on PEI in the face of climate change. Another implication for DMOs could be planning and readiness against climate hazards and the vulnerability during climate extremes. One study discussed that DMOs need to have a multifaceted attitude that enables them to embrace their management position with the same fervor with which they have embraced their marketing function in order to plan and organize to address vulnerability and prepare for dangers [77]. In addition to considering the health and welfare of its citizens, they must see the destination as more than just a place for tourists. They should also actively collaborate with institutional players in resilience planning, crisis management, and other areas [77].

To conclude, this paper stated that DMOs are responsible bodies for sustainability in a destination and DMOs are also core organizations for informing tourists of the potential impacts of climate change in the tourism destinations, yet host communities reported that they would like to see more DMO involvement when it comes to the sustainability

of tourism activities in the face of climate change. As was already indicated, one crucial aspect of this is DMOs' ability to educate visitors on the effects of harsh weather on the island. The destinations they are visiting should offer more information on the kinds of climate change impacts that people could expect or have already experienced. The DMOs are in an excellent position to assist tourists. Additionally, DMOs need to work with climate specialists to post more educational materials about these dangers in tourist areas. It is necessary to conduct further research on the relationship between tourism and climate change's consequences on the travel industry. DMOs and tourism organizations should work towards promoting sustainability and the well-being of tourists on Prince Edward Island if the industry is to thrive in this ever-changing climate. This study is not without limitations. One limitation that can be noted is that PEI-related studies in tourism, sustainability, and climate change were found to be extremely limited, hence we integrated Atlantic-wide or world-wide studies in this paper. This paper contributes highly to the literature, providing local interviews with host communities based on the PEI region and recommendations for DMOs when it comes to climate extremes. Although the study focused on Prince Edward Island, it should be highlighted that the problems associated with climate change and the tourism industry are global in nature. We conducted this research based on the sparse data in the literature, yet future research should investigate more the practices of DMOs in the face of climate change. More quantitative research could also be helpful for future researchers. Therefore, we urge more study in the PEI region to provide industry and DMOs with the tools they need to transform their products into eco-friendly travel destinations.

More investigation into how other local marketing organizations have addressed the subject of climate change may shed light on successful strategies used elsewhere and raise awareness of the problem among marketing professionals in general. Further research into the ways that DMOs throughout the globe have tackled the subject of climate change may illuminate effective tactics employed in different contexts, increase public awareness of the issue, and stimulate the creation of creative adaptive solutions.

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