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Assessing the factors influencing local governments' adoption of sustainability policies and programs: A case study of two southeastern Massachusetts towns, USA

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Abstract

This project identifies relevant factors that affect sustainability-related policy development and implementation in two local towns in the US. Different local government structures, geo-ecological conditions, and local politics were studied in two towns, Bridgewater and Marshfield in southeastern Massachusetts, which have contrasting government structures and policy-making processes, though they are similar in terms of demography and town size. In addition, since the towns are geographically contrasting -- inland vs. coastal -- they are likely to face different ecological issues given the realities of climate change. This study identified the factors by analyzing the towns' annual reports and conducting interviews with key stakeholders. Certain factors that influence each local government's adoption of sustainability policies and programs were explained based on each town's particular circumstances. The results can be employed to develop further large-scale research and appropriate strategies to support policy and program development.

Keywords: Sustainability; Public policy; Local politics; Environment; UN-SDGs

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1. Introduction

The 1992 Earth Summit was a UN conference on environment and development with the primary objective to put forth new commitments of national governments on global environmental issues. The Summit resulted in international attention on the role of cities as central contributors in the Earth's ecosystem (Brugmann, 1996). Also, since the United Nations' Sustainable Development Goals (SDGs) were established in 2015 by the UN General Assembly, local governments have been tailoring SDGs for their own situations (Slack, 2015).

To help local communities implement their sustainability-related efforts, we need to identify the factors that affect their efforts. This project aims to identify relevant factors that affect sustainability-related policy development and implementation in local towns in the US, such as different local government structures, geographic and ecological conditions, and the politics of local towns. To this end, we have identified two towns, Bridgewater and Marshfield in southeastern Massachusetts, which have contrasting government structures and policy-making processes though they are similar in terms of demography and town size. In addition, since the towns are geographically contrasting -- inland vs. coastal -- they face different ecological issues given the realities of climate change.

Existing research has identified various factors that influence policy-making and implementation (Portney, 2003; River et al., 2007; Tausanovitch and Warshaw 2014). Typically, those studies analyze data gathered through nationwide or state-wide surveys; as a result, they do not consider particular situations in individual towns or cities regarding sustainability policy and program adoption. To address this gap, we have analyzed the selected two towns' annual reports of the past five years and conducted in-depth interviews with relevant town officials, active residents, and environmental activists. This case study was designed to identify the most important factors that influence each local government's adoption of sustainability policies and programs, so that such factors can be explained based on each town's unique circumstances. The results can be employed for developing further large-scale research and proper strategies to support the policy and program development.

2. Literature review

2.1. Factors affecting local government adoption of sustainability policies and programs

Previous studies have identified numerous factors that influence local government adoption of sustainability policies and programs. In one study of rural Australian towns, for example, capacity, commitment, coordination, and community were identified (River et al., 2007). Another study identified financial independence, education, homeownership, a form of government, the International Council for Local Environmental Initiatives (ICLEI) membership, and the intergovernmental impacts of entrepreneurial state legislators in some California cities (Kwon et al., 2014). Using the relationship between the sustainability index and various socioeconomic characteristics, Portney (2003) showed that West Coast cities and cities with better-educated populations, lower poverty rates, higher median-aged populations, and less reliance on manufacturing industries were more likely to take sustainability seriously. Finally, a comprehensive study has suggested four key variables that contribute to effectively implementing local sustainability initiatives - political culture, institutional, economic, and intergovernmental variables. That study extended previous

research on local government sustainability efforts and created an integrated framework to compare the fifty largest US cities' sustainability program implementations (Saha, 2009).

These studies analyzed the data gathered through nationwide or state-wide surveys; as a result, they did not consider in detail the unique situations of individual towns or cities and the challenges they confronted regarding sustainability policy and program adoption. In this vein, the current study aims to uncover specific factors that influence sustainability policy and program development and implementation in two towns in southeastern Massachusetts. In this way, this study is expected to identify a wide range of factors that influence each local government's adoption of sustainability policies and programs, so such factors can be explained based on individual town circumstances.

While we aim to find specific and subtle factors, we begin our analysis with three obvious factors that have been identified through not only our observations but also prior research: i) government structure, ii) geo-ecological condition, and iii) local politics as the two towns have contrasting geo-ecological conditions and government structures. Hence, the main research question of this case study is as follows:

- Research Question (RQ) 1: What factors affect the two towns' adoption of sustainability-related programs and policies?

2.2. Local government structure and policy-making process

A long history of progressive reforms has produced a few institutional innovations that have aimed to improve the municipal government's responsiveness to citizens. However, the effectiveness of these innovations has been disputed (Tausanovitch and Warshaw 2014; Pateman 2012; Trounstine 2009; Lubell et al., 2009). Massachusetts, in particular, is notable for a history of participatory democracy that can be traced back to the inception of the Mayflower Compact. Most towns in Massachusetts (263 of the 301) operate with an open town meeting format, which allows town residents to vote on all legislative matters. Towns either employ a town manager or a town administrator with varying degrees of administrative authority, operating under the supervision of the elected select board. In a small number of towns in the Commonwealth, a town manager/town council exists, with the elected board acting as the chief legislative body of the town. In the cases of a town with open town meetings, the convened town meetings are considered the main site of the legislative process (MMA, 2018).

The Town of Marshfield has a town administrator-select board model of governance. Their format of town governance includes a three-person Board of Selectmen, a Town Administrator, and an open town meeting. This format renders the electorate the ultimate decision-maker on all financial and legislative decisions within the town. At the annual town meeting (ATM), held once a year in the spring, registered voters debate each line of the town's operating budget, as well as changes to bylaws, and can make amendments to proposed changes on the town meeting floor. These bylaw changes can encompass personnel issues, zoning issues, and even changes to the institutional design of the town's governance (e.g., changes to the size of a board). Per Massachusetts General Law, ATMs cannot adjourn for the year until the town's budget balances, meaning that the process of deliberation and voting can take several nights, if not longer. The town's various committees act as places for the development and review of policies, but the ultimate decision made on any issue that involves the town bylaws or budgets must reach the town meeting floor to be voted upon.

The town of Bridgewater, MA, formerly utilized the same governance model. In 2010, the town voted at an annual meeting to abolish the town meeting format of government and the select board in favor of a nine-person town council legislative body, as well as a town manager. Since 1 January 2011, the town has had seven district councilors and two at large, each serving a three-year term (MMA 2010). Under this governance structure, multiple members appoint bodies to serve in particular issue areas (such as Conservation), like Marshfield and other town municipality meetings. The major difference between Bridgewater and Marshfield, then, is the location of legislative power. While the power to make changes to the town rests in the hands of residents in Marshfield, the residents in Bridgewater elect officials to the town council whom they vest with legislative authority. Hence, our second research question is proposed as follows:

- RQ 2: Whether and how does government structure affect the two towns' adoption of sustainability-related programs and policies?

2.3. Geography and sustainability issues

By 2050, due to the process of urbanization continuing at a rapid pace, it is anticipated that approximately 70 percent of the global population will be in urbanized areas (Population Reference Bureau, 2015). This urbanization phenomenon continues and places increasing pressure on natural and urban environments regarding sustainability. Hence, we need to ask whether the world can simultaneously sustain four things:

- 1) economic development for all;
- 2) reasonable environmental stability;
- 3) continued population growth; and
- 4) decision-making without coercion (recent events suggest that coercion is not sustainable as an essential mode of mediation under conditions of widespread information flow) (Dias et al., 2020; Harrington, 2016).

Responding to this issue, there has been a burgeoning field of research about geography and sustainability. For instance, studies have addressed how human impacts on their settlement environment contribute to disturbance and increasing vulnerability in the environment, affecting ecosystem services, environmental health, and ultimately sustainability (Goudie and Viles, 2013). Geographers have also been attentive to the imbalances created by socioeconomic disparities and their impacts on communities. Hence, local governments are required to address socioeconomic and environmental conditions through sustainable development initiatives (Lawhon and Murphy, 2012; Truffer et al., 2015).

In addition, researchers have found that physical geography shapes the realization of the UN SDGs and China’s goal of ecological civilization (Peng et al., 2020). Some researchers have even generated several suggestions on how space, place, and scale can be better incorporated into sustainability-oriented policy programs in many countries, cities, and regions (Truffer et al., 2015). These studies provide insight into sustainability efforts following analyses of the importance of small-scale municipalities and geography. There is an emphasis on the importance of sustainable development at the local level (Hansen and Coenen, 2015). In order to understand the relationship between geography and local sustainability, we propose our third research question below:

- RQ 3: Whether and how does the geo-ecological condition, which refers to the ecological condition shaped by geographic characteristics, affect the two towns' adoption of sustainability-related programs and policies?

2.4. Local politics and sustainability

Politics is everywhere as human beings are in nature political animals. While local communities often encounter political situations, there is no clear definition of local politics (Savage and Warde, 1993). Nevertheless, most people understand that local politics often concerns the power struggles of stakeholders and the impact of their actions on local affairs, including local programs and policies (Shin, 2013; 2014; 2016).

Most theories of urban politics, particularly in the United States, tend to focus on drawing an overall profile of local urban politics, revealing the most significant elite groups, and generalizing about the patterned process of domination. On the whole, those theories are conceived in two ways, generally defined by urban theorists as elite theory and pluralist theory, while there are some variants between the two contrasting perspectives in the United States. On the one hand, the elite theory of urban politics emphasizes certain groups of power elite's formidable influence on local urban politics and policy formation (Keller, 2017). On the other hand, the pluralist theory of urban politics underscores the pluralistic, diverse, and dispersed exercise of power among various leaders, depending on issues over time (Dahl, 2005. Between those two contrasting theories, urban regime theory leads us to look into the cooperation and collaboration among various community entities, such as government, economic corporations, and civic organizations (Stone, 1993).

These theories have agreed that there are powerful groups in local urban affairs, while the overall configurations of the power structure and the degree of its influence on the policy formation process are still under debate. As a result, they have tended to emphasize the meso-macro level of a power struggle among powerful groups in urban politics while dismissing the internal dynamism in a power structure, which can eventually affect the configuration of urban politics. However, it is also significant to pay attention to urban politics at the meso-micro level because individuals even within the same group often hold different values and stakes and struggle with one another to dominate their positions in the group. The need to deal with this complexity in urban politics requires us to see relationships among stakeholders at the meso-micro-level (Shin, 2009).

Local politics also takes place with reference to various issues such as race, gender, immigration, resource allocation, economic development, housing, policy, and many others (Ben-Tovim et al., 1986; Besley et al., 2012; Dearlove, 2011; Holman, 2014). Also, local sustainability often undergoes local politics since sometimes economic and environmental commitments clash with each other (Temenos and McCann, 2012). On the other hand, this is often driven by different driving forces: technology-led, market-led, state-led, and citizen-led (Scoones, 2016). Hence, our fourth research question is proposed as follows:

- RQ 4: Whether and how local politics affect the two towns adoption of sustainability-related programs and policies?

3. Study areas and research methods

3.1. A brief background of Bridgewater and its sustainability

Bridgewater is located approximately 25 miles south of Boston, MA, and approximately 35 miles east of Providence, Rhode Island. Before colonization, Bridgewater was known by the Native American name Saughtucket but was later purchased by Captain Myles Standish who named the town after a Duke from England. On 3 June 1656, Bridgewater was incorporated as a separate town from Duxbury through the Old Colony court at Plymouth. Formerly, the town was a plantation granted to Duxbury as compensation for the incorporation of Marshfield. Bridgewater is well known for its ironworks factories, one of which is appropriately named Bridgewater Iron Works and is a registered historical site in MA (Cabana, 1998).

Since the founding of the town, the population has grown steadily. According to the 2019 US Census QuickFacts, Bridgewater had an estimated population of 27,619. The male population was 47. 1%, while females made up 52.9% Ethnicities of Bridgewater residents in 2018 consisted of 78.5% white (Non-Hispanic), 12.9% Black or African American (Non-Hispanic), 1.99% Two+ (Non-Hispanic), 1.55% Asian, and 1.3% White (Hispanic). The median household income reported in 2019 was approximately $95,675, which was higher than the median average in the United States of $62,843. At least 9.4% of the population lives below the poverty line, which was found to be more than the national average of 11.4%. In terms of housing and living, the median property value in the town of Bridgewater was $358,900, which is higher than the national average of $217,500. When comparing the homeownership rate to the national average of 64%, Bridgewater ranked higher with 71.6%.

Over the course of the past decade, the town has gone from being predominately rural farmland to a modernized urban environment with an increasing amount of commercial development, low-density neighborhoods, and educational buildings of Bridgewater State University (McGrath & Watson, Bridgewater Open Space and Recreation Plan, 2009). While the increase in population has had some positive effects, the land that was once farmed has since become developed and used for commercial purposes. In recent years, proposals to create a greenbelt to restrict building in areas along the Town river have been announced and reviewed in attempts to protect the water resources and open space (McGrath & Watson, Bridgewater Open Space and Recreation Plan, 2009). Through the implementation of solar panels, LED lights, and other economically and environmentally friendly alternative energy forms, the town of Bridgewater has been able to cut costs significantly. Zoning rules and regulations have allowed for more resident housing as well as commercial buildings. An increase in the size of the community fostered committees has included the Community Preservation Committee, the Board of Health, the Disability Commission, and many others within the local government (Boards, Committees and Commissions, n.d.). These groups fund many open spaces, historical preservations, and many affordable housing opportunities.

3.2. A brief background of Marshfield and its sustainability

Marshfield is a town located in the South Shore area of Massachusetts. The town is located on the coast of the Atlantic Ocean and is 20 miles away from Bridgewater, MA. Marshfield is a historic town nestled between Plymouth and Boston, MA. The town was founded in 1640 by a man named Edward Winslow, who was a passenger on the historic Mayflower voyage (Krusell, 2007). Throughout the years, Marshfield has been home

to industries such as shipbuilding, cotton mills, nail and tack factories, agriculture, beach resorts, and fishing. In the present day, the town maintains an interest in fishing, but most of this activity is now recreational rather than commercial (Krusell, 2007).

According to the 2019 US Census QuickFacts, the current population of the town is 25,967 residents. Approximately 52.2% of Marshfield's population is female, while 47.8% of the population is male. The median age of the population is 45 years old. According to Census results, the population of Marshfield is 97.6% White, 2.1% Hispanic or Latino, 0.6% Black or African American, and 0.5% Asian. The median household income in Marshfield is $102,560. The median housing value for homes in Marshfield is $460,900. Lastly, the percentage of people who are living in poverty within the town of Marshfield is 6.2%.

Due to the diverse coastal ecosystem, Marshfield is the habitat for many different species. Residents and tourists utilize approximately 200 acres of beaches and waterways for entertainment as well as commercial and recreational fishing. Wetland protection regulations are very important and restrict building and other arrangements (Urban Harbors Institute, 2014). As sea levels rise and beaches erode, environmental, economic, and societal sustainability has never been more important in Marshfield. The town has several environmental committees and departments working together to make Marshfield more sustainable, including the Waterways Committee, Conservation Commission, and many citizen efforts (Town of Marshfield, Massachusetts, n.d.). However, as sea levels rise, the task of protecting the town increases as the dunes on the beaches as well as wetlands are negatively affected environmentally and economically (Urban Harbors Institute, 2014).

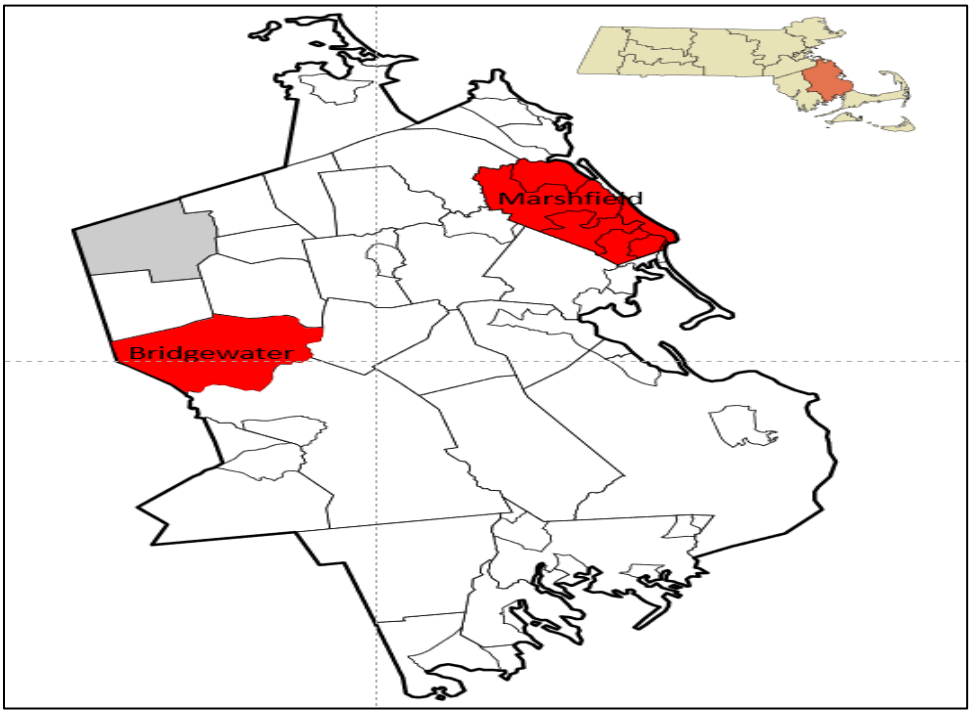


Figure 1. Location of Bridgewater and Marshfield in Massachusetts, USA

Responding to these challenges, the town has made a commitment to green energy usage beginning in 2021 with the new introduction of solar panels in 2020 (Kukstis, 2019). There are a variety of committees and groups working towards making the town societally sustainable. The residents of the town have been working together to accomplish many things including joining opioid litigations, improving transportation, and improving meal programs and resources (Town of Marshfield, Massachusetts, n.d.).

3.3. Town annual report analysis

We gathered five town annual reports from each town (years 2015 – 2019). The average page numbers of Marshfield's town report were 252, while that of Bridgewater was 154. A content analysis enables us to assess detailed efforts for diverse aspects of the sustainability of a local community. Thus, we compared the overall differences in three common sustainability aspects: environmental, economic, and societal. While there exist many different dimensions of sustainability (James, 2015), we refer to the Institute for Sustainable Communities' definition: 'throughout the world, people want the same things: access to clean air and water; economic opportunities; a safe and healthy place to raise their kids; shelter; lifelong learning; a sense of community; and the ability to have a say in the decisions that affect their lives.

The Institute identifies that 'climate change, income inequality, and social justice are the biggest threats to building strong, sustainable communities.' The three threats are fundamentally linked to the three dimensions of sustainability: 1) environmental sustainability, 2) economic sustainability, and 3) societal sustainability. The environmental sustainability refers to all kinds of environmental issues in a local town. The economic sustainability deals with a local town's sustainable economic development. The societal sustainability addresses all sorts of anti-discriminatory and social justice issues in terms of race, gender, socioeconomic status, age, disability, etc.

For a systemic document analysis, we created a coding scheme. After identifying sustainability-related contents in the town reports, we classified them in terms of 1) types of action (e.g., policy, program, project, service, funding, and vote); 2) timeliness (ongoing, new, or completed); 3) sustainability dimensions (environmental, economic, or societal); and 4) themes (refer to Table 1). For clarification, 'policy' refers to regulations regarding sustainability while 'program' means the two town governments' assistance actions to address environmental, economic, and societal issues. 'Project' indicates a sequence of tasks implemented by the towns such as public housing or water management in order to deal with sustainability while 'service' indicates an individual's or an organization's actions to help town residents with sustainability issues. 'Funding' refers to any governmental actions for obtaining and receiving grants to address sustainability. 'Voting' is independently classified because it reveals types of decision-making between the two contrasting government structures.

For a systemic document analysis, the three faculty researchers trained the three student researchers with the content analysis method. The research team then collaborated to develop a coding scheme, and faculty mentors were responsible for overseeing the students' coding. The coding process was both open and structured. The six project members identified and defined the themes by reviewing two town reports together. Themes are extracted to be broader, so each theme functions as a discrete and simplified unit of meaning that include specific actions. Along the line, the societal dimension focuses on social equity, justice, and anti-discriminatory actions for underprivileged community members. After creating the theme inventory, the team members practiced coding two town reports together. After the coding training, each member coded two town

reports respectively. Through this intersubjective coding training, we were able to increase inter-coder reliability (Cronbach's alpha: 8.7).

Table 1. Theme inventory for coding

Dimension	Theme (Specific Action)	Explanation
Environmental (1)	Sustainable Environmental Protection (1)	Efforts to protect environment through sustainable planning for climate change, sewage & waste management, beach & seawall repair, green space, clean-up, sustainable gardening for protecting living conditions for humans
	Environmental Conservation (2)	Efforts to conserve animals, plants, physical spaces, etc. Without a conspicuous purpose of seeking benefits for humans
	Green Energy (3)	Efforts to reduce fossil-fueled energy and increase alternative clean energy
	Natural Resource Protection (4)	Efforts to protect nature such as water, fisheries, land, etc. As resources
Economic (2)	Local Economic Development (5)	Efforts for downtown revitalization, local markets, mixed zoning, local seafood export, etc.
Societal (3)	Measures For Disadvantaged Residents (6)	Efforts for socio-economically marginalized residents through affordable housing, public housing, donation, medical service, financial, educational and legal assistance, etc.
	Measures For People with Disability (7)	Efforts for people with disability through accessible building, transportation, etc.
	Measures For Elderly Residents (8)	Efforts for elderly residents through nursing home, medical service, health program, education, free meal, final assistance, etc.
	Social Justice (9)	Efforts for unspecified, general social justice

3.4. In-depth interviews

In addition to the town report analysis, the six researchers investigated the town government websites and searched local environmental activist groups by using the online search engine. Then, the researchers interviewed the Bridgewater town manager, two Bridgewater town committee members, and one Bridgewater environmental activist while interviewing two Marshfield environmental activists. Unfortunately, we were unable to interview Marshfield town officials due to their unresponsiveness to our interview requests. We prepared five interview questions about awareness of sustainability, eleven questions about sustainability programs, actions, and processes, and four demographic questions. Due to the pandemic, the interviews were conducted via a virtual conference tool Zoom, telephone, and written interview.

4. Research results and implications

4.1. Town annual report analysis outcomes

Through the town report analysis, we answered RQ 2: Whether and how government structure affects the two towns' adoption of sustainability-related programs and policies? As shown in Table 2, we found clear differences between the two towns. 31 percent of Bridgewater's sustainability-related actions consisted of projects, while 34.5 percent of Marshfield's actions were voted. These results suggest that Marshfield's government structure influences the type of the actions as it is governed on the local level by the open town meeting form of government. On the other hand, Bridgewater is led by seven Precinct Councilors, and two 'at-large councilors,' with an appointed Town Manager, Assessor, and Tax Collector. The differences between the two towns suggest that many sustainability-related actions of Marshfield were decided by the residents' voting whereas many relevant actions of Bridgewater were driven by elected officials.

Table 2. Type of sustainability-related action in the two towns

			Type of action							
			Policy	Program	Project	Service	Funding	Vote	Event	Total
Town	Bridgewater	Count	15	29	35	6	21	4	3	113
		% within	13.3%	25.7%	**31.0%**	5.3%	18.6%	3.5%	2.7%	100.0%
	Marshfield	Count	7	14	41	10	9	51	16	148
		% within	4.7%	9.5%	27.7%	6.8%	6.1%	**34.5%**	10.8%	100.0%
Total		Count	22	43	76	16	30	55	19	261
		% within	8.4%	16.5%	29.1%	6.1%	11.5%	21.1%	7.3%	100.0%

The comparison of the two towns' actions according to the sustainability dimension enabled us to answer RQ 3: Whether and how do geo-ecological conditions affect the two towns' adoption of sustainability-related programs and policies? As shown in Table 3, both towns' sustainability actions were predominantly environmental. However, Marshfield had a much higher percentage (83.8%) of environmental dimensions than Bridgewater (56.6%). Given the geo-ecological condition of Marshfield, facing potentially damaging sea level rise as a coastal town, this difference makes sense. The theme analysis result supports this inference (refer to Table 4), with 51.4 % of the sustainability-related actions coded as 'sustainable environmental protection.' While Bridgewater also invested in 'green energy' action (24.8%), the chronological comparison of Bridgewater's sustainability dimensions shows that the town's increasing efforts concentrated more on societal sustainability (see Table 5). The town actually increased the measures for disadvantageous residents.

Table 3. Sustainability dimensions between the two towns

			Sustainability Dimension			
			Environmental	Societal	Economic	Total
Town	Bridgewater	Count	64	43	6	113
		% within	**56.6%**	38.1%	5.3%	100.0%
	Marshfield	Count	124	22	2	148
		% within	**83.8%**	14.9%	1.4%	100.0%
Total		Count	188	65	8	261
		% within	72.0%	24.9%	3.1%	100.0%

Table 4. Theme analysis between the two towns

Theme	Town name			
	Bridgewater		Marshfield	
	Count	% within	Count	% within
Sustainable Environmental Protection	16	14.20%	76	**51.40%**
Environmental Conservation	9	8.00%	34	23.00%
Green Energy	28	**24.80%**	5	3.40%
Natural Resource Protection	15	13.30%	10	6.80%
Local Economic Development	8	7.10%	2	1.40%
Measures For Disadvantaged Residents	12	10.60%	6	4.10%
Measures For People with Disability	7	6.20%	4	2.70%
Measures For Elderly Residents	17	15.00%	11	7.40%
Social Justice	1	0.90%	0	0%
Total	113	100%	148	100%

Table 5. Chronological change of Bridgewater's sustainability dimensions

			Sustainability dimension			
			Environmental	Societal	Economic	Total
Town report year	2015	Count	5	7	0	12
		% within Town report year	41.7%	58.3%	0.0%	100.0%
	2016	Count	14	2	0	16
		% within Town report year	87.5%	12.5%	0.0%	100.0%
	2017	Count	12	3	2	17
		% within Town report year	70.6%	17.6%	11.8%	100.0%
	2018	Count	19	16	4	39
		% within Town report year	48.7%	**41.0%**	10.3%	100.0%
	2019	Count	14	15	0	29
		% within Town report year	48.3%	**51.7%**	0.0%	100.0%
Total		Count	64	43	6	113
		% within Town report year	56.6%	38.1%	5.3%	100.0%

4.2. In-depth interview outcomes

We acknowledge that the interview results are not representative because they we couldn't interview various stakeholders. Nonetheless, based on the interview results, we can partially answer RQ 4: Whether and how do local politics affect the two towns' adoption of sustainability-related programs and policies?

In the cases of Bridgewater and Marshfield, we identified the existence and the influence of local politics on the two towns' adoption of sustainability-related programs and policies. Specifically, in the case of Bridgewater, based on the interviews with the stakeholders, we could identify the local politics around sustainability policy and program between the town manager and committee members, who are composed of some concerned citizens with technical expertise. The Town Manager maintained that most residents are not concerned about sustainability, but there is a small group of residents, who are often at odds with him about town affairs. On the other hand, one of the interviewed town committee members said that the town manager lacks a long-term vision and policy implementation action plans, and he also has a management problem. He is concerned that it hinders the town from making progress toward sustainable community building. The two parties have very

contrasting viewpoints toward each other, which obviously triggered local politics around community issues, including sustainability.

In addition, Bridgewater underwent a local politics around plastic bag ban ordinance recently. The Bridgewater Green Committee (BGC), the only environmental citizen group in Bridgewater, proposed a plastic bag ban ordinance with the help of an economics professor at Bridgewater State University. The Bridgewater Town Council voted 7-1 in favor of a plastic bag ban. According to the BGC leader, BGC collaborated with many residents and a BSU economy professor to hold open forums for the town residents and get expert advice on the legal process, presentation to the town council, and get a petition from BSU students. The BGC leader acknowledged that the BSU professor's help was crucial to passing the ordinance. According to these interviewees, the collaborative politics of the citizen group and local experts was a definitive influence on the ordinance adoption.

Also, in the case of Marshfield, a plastic bag ban bylaw was proposed by two environmental activists and approved by Marshfield voters at an annual town meeting several years ago. The two environmentalists worked with other supporting citizens, particularly the Marshfield High School Green Team, an extracurricular group at the high school. During the interview, the environmentalists mentioned that they were involved in local politics since there was a strong anti-bylaw group, which was composed of some town politicians and business owners. In order to convince the town residents, they had numerous meetings with local stakeholders and lots of presentations to them. They also drafted citizen's petitions, collected signatures, and then sought endorsement from town boards and finally town meetings while none of the Town Boards gave them any support. They acknowledged that the high school Green Team's presentation was very influential when the town residents voted on the proposal. While we did not interview the town officials about the town politics, the interview with the environmentalists demonstrates how citizen-led sustainability initiatives in a local town can enter into local politics and how they can be successful in their efforts.

5. Conclusion

Through this case study of two local towns in southeastern Massachusetts in the US, we investigated whether and how such factors as local government structures, geographic and ecological conditions, and the politics of local towns affect sustainability-related policy development and implementation of the two towns. We identified that the two towns have contrasting government structures and policy-making processes. Also, while the towns are similar in terms of demography and town size, they are geographically contrasting -- inland vs. coastal. We can anticipate that the geo-ecological conditions make them face different environmental and societal issues, given the realities of climate change. We confirm that the three factors played crucial roles in influencing two towns' adoption of sustainability-related actions in Massachusetts. As a result, we suggest below some implications for future research and strategic actions for sustainability, particularly for citizen-led groups and organizations.

6. Future research directions

Based on our research findings, we suggest future research directions. First, we found that sustainability education, or more precisely, the public's awareness of sustainability, can be a crucial factor. Almost all

interviewees emphasized that educating their residents is a priority. The following Bridgewater town manager's quote from our interview strongly demonstrates this perspective:

> *I find that most Bridgewater residents really don't think in terms of sustainability, I mean, that's something that people in my office take much more of a quiet leadership role in implementing than it does from sort of a grassroots population, … I think honestly the biggest challenge I would've said money up until a few years ago. I think now the biggest challenge comes with how we articulated the benefits of whatever the sustainability program is, how we articulate that to residents, and where we desperately need resident buy in. I think our biggest challenge internally is making sure that we can bring the residents along with us you know and a lot of that depends on education.*

This underlines our interpretation that local governments and sustainability-related groups should work on community-based sustainability education program development. Since each community has unique situations and issues, educators need to contextualize their programs by addressing community-specific sustainability issues.

Second, we found that local sustainability citizen groups often lack resources, expert support, government support, and effective communication skills and strategy. The two towns' environmental groups were voluntary activist groups operated by a few committed citizens without technical expertise in environmental issues. They began their activism with individual interests in environmental issues and passion for the movement. When they addressed the plastic bag ban, both groups sought help from local experts and professionals, which was not forthcoming from the town governments. While citizen-led sustainability activism is grass-roots, democratic, and desirable, it needs technical, administrative, and financial support from local governments and institutions. Collaborations among citizen groups, local governments, and local organizations is more effective and instrumental to educate and mobilize the public for sustainable community development. Social media can be a useful tool to reach out to a wider audience and promote and disseminate useful programs to the target audience.

Third, along this line, citizen groups also need to use better communication skills and strategies. According to the environmental groups in the two towns, when the plastic bag ban proposals were approved, the public presentations were crucial to convincing the residents and the town council members to vote for the proposals. The Marshfield environmentalists recalled that a high school student from the Marshfield High School Green Team delivered a powerful speech at the town meeting. They even acknowledged that their proposal would have not been approved without her speech. Since the student appealed to the audience's emotion with her sincerity and sense of urgency, her pathos seemed to play a critical role in the three rhetorical elements: logos (logical appeal with reason), ethos (ethical appeal with credibility), and pathos (emotional appeal with moving story, words or tone). Additionally, when Bridgewater passed the ban ordinance, BSU's economic professor presented the council with a petition signed by about 700 BSU students supporting the ban. Hence, the professor's rhetoric seemed to rely on logos by effectively delivering an expert's opinion on the issue at the town council meeting. Our interpretation of these events is that when citizen-led or community groups persuade their citizens and audience, it is more effective to employ rhetorical strategies by choosing appropriate presenters and content for the audience.

Lastly, when citizen groups introduce their sustainability-related initiatives to their community, it would be better to display no financial burden from the initiatives to the community. The Marshfield environmentalists recalled that they had faced a serious concern about the financial burden of their initiative from the town residents. While the town residents deal with sustainability issues, they don't want any economic damage from the new sustainability initiatives. That is why it is often more effective to present sustainability initiatives as economic boosters. For instance, green energy technologies positively influence the economy (Zhang et al., 2021). Hence, framing is critical when it comes to politics (Matthes, 2012).

7. The limitations of the study

We also acknowledge some limitations. First, the research outcomes can't be generalized due to the nature of this case study. Hence, we do not argue that our findings and implications apply to every local community. Some communities might confront other barriers to sustainable community development. However, the three factors we studied – government structure, geo-ecological condition, and local politics – could be the foundation for a large-scale state-wide and nationwide research project to verify their influences on local communities' adoption of sustainability programs and policies.

Second, we chose the three factors through our preliminary analysis of and speculation about the contrasting characteristics of the two towns. However, there might be other main factors in different towns and regions. Hence, we can't maintain that the three factors should be considered for other research that would intend to find factors that influence local towns' adaptation of sustainability programs and policies.

Third, the interviews were limited to town governmental officials and environmental groups. However, it would be more helpful to interview diverse stakeholders, including local businesses and nonprofit organizations relevant to sustainability. Through this, any further research could capture more comprehensive views about local sustainability.

Finally, along this line, the political strategies we suggested above may be limited benefits depending on local communities' specific situations. For instance, some communities are already educated enough to come up with various initiatives for sustainability. Hence, an effective starting point to help sustainability initiatives in a community should be developed within the context of specific situations.

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