

Residents' Sense of Place on Micro Small Public Spaces on Epidemic Perspective

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ABSTRACT: Like other historical preservation areas, the Fayuansi Community in Beijing's old city zone faces many problems such as high population density and a shortage of public spaces. As a community that has lasted for more than a thousand years, its block pattern embodies the early historical pattern of Beijing city. Micro Small Public Spaces (MSPS) in the community are of great significance to the physical and mental health of residents, especially during the COVID-19 epidemic. This research investigates the habit shifts of residents' usage of these spaces and introduces the theory of "Sense of Place", which is a concept that refers to the manner in which individuals relate or feel about the place they live, and conducts a questionnaire survey of residents in the Fayuansi community. After analyzing the residents' needs according to the survey, this study gives suggestions on the management of MSPSs, such as increasing the supply of both spaces and facilities, strengthening management, paying more attention to senior residents' needs, and providing more cultural events. All these measures would strengthen residents' sense of place and develop popular support for policy.

1. INTRODUCTION

The sudden outbreak of the COVID-19 pandemic at the end of 2019 swept the world, causing many negative impacts on almost everyone. The World Health Organization declared the outbreak a Public Health Emergency of International Concern on January 30, 2020, [1] and soon began to coordinate global preparedness and response to the pandemic[2]. China listed COVID-19 as a Category B infectious disease but took prevention and control measures as Category A infectious disease standards. By May 2020, China shifted its epidemic emergence status to a regular-Epidemic one [3]. Studies have pointed out that the isolation and change in residents' life trajectory due to epidemic prevention and control has exacerbated the negative emotions of urban residents, resulting in physical and psychological pressure and indirectly affecting residents' physical health. Meanwhile, Micro Small Public Spaces (MSPS), such as small parks in the community, have a positive effect on people's health conditions [4].

Based on a questionnaire survey of residents in Fayuansi community, a historical preservation area in Beijing, this study further points out that during the COVID-19 epidemic, MSPSs in the community played an important role in residents' physiological and psychological adjustment and were an important factor affecting residents' sense of place. The epidemic has changed residents' usage habits of MSPSs and furthermore,

has a significant impact on residents' experience and emotions.

2. BACKGROUND AND THEORIES

2.1. Fayuansi Community

Fayuansi community, also known as "the core of Western Xuanwu – Fayuansi Culture district," is one of the thirteen historical preservation areas in Beijing city. It reflects the early history of Beijing city and preserves the overall traditional urban style. Corresponding to the rich historical and cultural resources are the more complex and severe living conditions of the residents. For communities in historical preservation areas, there are strict standards for protecting cultural relics, features, and culture. The renovation of these communities is much more complex than that of normal ones. The population density in the community is high, and space resources are tight. The total population density is as high as 29,000 people per square kilometer, which is far greater than the average of 20,000 people per square kilometer in the central urban area of Beijing. The living conditions in the community are tense, and space resources are limited. Half of the permanent residents live in crowded and extra-crowded courtyards with little public space. The total area of 16.6 hectares in the community is mainly for residential use, and the proportion of MSPSs is only 6%. The aging of permanent residents in the community presents a significant problem. The proportion of residents over 60 years old in the community is 29%, compared to 19.6%, which is the

average level of Beijing city as a whole[5]. These elderly residents have limited daily activities due to the decline in physical function and have a high demand for public space within the community. Accessibility to these public spaces is essential for them [6].

The community underwent a new round of renovation that began in 2018. As part of this effort, scattered spaces along the streets were renovated and some unauthorized constructions were demolished, which resulted in the sorting out of some public spaces within the community. Renovations have also been carried out to increase the provision of MSPSs. The current spatial distribution of MSPSs in Fayuansi community is shown in Figure 1. The green areas in the picture represent the MSPSs, of which there are 5 spaces that are larger than 20 square meters.



Fig. 1 Locations of MSPS in community

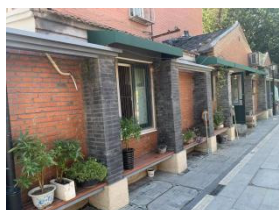


Fig. 2 MSPS in community



Fig. 3 MSPS in community



Fig. 4 MSPS in community



Fig. 5 MSPS in community

The Micro Small Public Spaces in the Fayuansi community have three notable characteristics: First, most of the MSPSs are located along the sides of the road and are distributed in discontinuous strips, as shown in Figures 2 and 3. These spaces are small, generally 1-4 square meters, and are mainly used for flower beds to define the boundaries of vehicles and reduce noise pollution from pedestrians and vehicles. However, they have limited functions and cannot be used as spaces for residents' activities. Secondly, the total supply of MSPS in the community is relatively limited and unevenly distributed. Lastly, as shown in Figures 4 and 5, the functions of MSPSs in the community are limited. With the exception of a space at the south entrance of Xizhuan Hutong (No. ① in Figure 1), which provides sports facilities, the space at the south entrance of Lanman Hutong (No. ② in Figure 1), which has a music interactive device, and the small garden at the north entrance of Lanman Hutong (No. ③ in Figure 1), which provides rest facilities, most other public spaces have only hard grounds and limited functions.

2.2. Micro Small Public Space (MSPS)

Some scholars have sorted out the formation process of the concept of MSPS and pointed out that the definition of MSPS is "the smallest type of urban public space that is most accessible, accessible and perceptible for people"^[7]. These small-scale spaces are embedded in the urban fabric and are often distributed in the form of small parks, small squares, small green spaces, and even open spaces at the end of streets, community entrances and exits, roadsides of ordinary streets, and storefront. They are of great importance for historical preservation areas where public spaces are very limited.

Jane Jacobs pointed out in "The Death and Life of Great American Cities" that diversity is the nature of cities, and vivid urban scenes are mainly derived from colourful and various small elements, the constant construction plan and renovation on small size space are more able to bring vitality to the city^[8]. In the 1960s, William. H. Whyte investigated the typical micro small public spaces such as pocket parks, and found that although such spaces are small, they have functions and vitality far beyond the scale. Especially in densely populated urban centres, its high accessibility plays an important role in social life^[9].

For historical preservation areas such as Fayuansi community, the micro, small, medium public spaces in the community are the most accessible and used place for the residents daily. Residents spontaneously choose to stay, talk, rest, and even to have recreational activities in these spaces^[10]. Studies have pointed out that these public spaces have the characteristics of "social centripetal force" in the community.

2.3. Sense of Place

Sense of place is a concept that emerged in the 1970s, in response to the development problems of global urbanization, such as the loss of local characteristics and the blurring of local identity. The concept refers to people's feeling to specified place, it's a dynamic process, a satisfaction, an identity construction between people and space [11]. Yi-Fu Tuan calls the universal attachment of humans to familiar places as "topophilia"[12]. For human beings, place is not only a physical existence, but also closely related to the spirit. It is precisely because research has found that there is a close relationship between places and human beings, especially for ones who are experiencing historical changes such as urbanization. Since the 1970s, "sense of place" has become one of the core theories in geographic research and urban and rural planning.

Commonly, there are three dimensions of Sense of Place, Place Attachment, Place Dependence, and Place Identity. In B.S. Jorgense's research, place attachment refers to the emotional connection between individuals, groups, and a specific space, which can be a physical space within a geographic scope or a community that includes cultural and human factors. Place dependence is the potential ability of place to satisfy people's pursuit of personal interests and goals. Place identity is a more complex concept, which refers to "an aspect of self-cognition, which is the part of personal cognition related to the actual environment, and this association includes the complex paradigms of the conscious and subconscious mind, such as ideas, beliefs, preferences, feelings, values, goals, behavioural tendencies, and skills related to this environment"[13].

3. METHODOLOGY AND QUESTIONNAIRE DESIGN

This study conducted a survey by distributing questionnaires to residents of Fayuansi community. Each respondent filled out two parts of the questionnaire. The first part is a survey on the usage habits of micro small public spaces by residents before and after the Covid-19 epidemic. The survey included questions about the accessibility of MSPSs, the average hours and frequency of visiting on a daily basis, activities carried out there, and residents' expectations for MSPSs in the community. The aim of the study is to understand how the Covid-19 epidemic has affected residents' behavior in using micro small public spaces.

Changes in behavior inevitably lead to changes in feelings. The second part of the questionnaire is based on three dimensions of Sense of Place: place attachment, place identity, and place dependence. 15 statements are used to measure the shift in feelings towards MSPSs under the impact of the Covid-19 epidemic. To measure the sense of place attitude, data were collected through the Likert five-scaling method that included the following questionnaire statements. To further refine the study results, data were also collected on the demographic characteristics of the research subjects, including gender, age, property status, number of years living in this

community, and education. All data were collected in Fayuansi community on June 28th, 2022.

Statements:

Place Attachment

1. MSPSs make my living in Fayuansi community more comfortable.
2. MSPSs make me more willing to live in this community.
3. I want more MSPSs in this community.
4. I think this community is better than a community without MSPSs.
5. MSPSs bring me closer to the community.

Place Identity

1. MSPSs are an indispensable part of the Fayuansi community.
2. MSPSs in community have become part of my life.
3. MSPSs are very important to inherit the culture of Fayuansi community.
4. The status of MSPSs is ideal for me.
5. MSPSs can represent the image of community very well.

Place Dependence

1. The facilities in the MSPSs can meet my daily needs.
2. MSPSs in the community are more important to me than parks outside the community.
3. MSPSs in the community are important to my physical health.
4. MSPSs in the community make me feel good.
5. MSPSs in the community are good for me financially.

Scale data were collected at the original level and coded as 1 through 5 with strongly disagree coded as 1 and strongly agree coded as 5. The question data were coded as 1 or 2 for gender and 1 through 5 for the remaining demographic items.

4. DATA AND FINDINGS

The respondents of this questionnaire are residents of Fayuansi community. This research adopted a questionnaire distribution method based on the age ratio of community residents, provided by the neighborhood committee. A total of 110 questionnaires were distributed, and 102 valid questionnaires were collected, resulting in an effective recovery rate of 92.7%. The sample's basic characteristics are reasonably distributed, making them representative and effective.

4.1. Analyses on habits shifting in the use of MSPSs before and during the epidemic.

Distance is an important indicator of accessibility, and an increase in distance leads to a decrease in the frequency of residents' use of MSPSs in the community. Studies have pointed out that 300 meters is a threshold distance in accessibility, and public spaces within 300 meters are positively correlated with mental health indicators [14]. As shown in Fig.7., 52% of the residents took less than 5 minutes to walk from their residence to the nearest MSPS. (Note: Natural walking speed is 60-80 meters per minute for adults, the 5-minute walking distance is 300-400

meters .) However, if these less functional roadside MSPSPs are excluded, the scope is limited to 5 MSPSPs that are more than 20 square meters and are multifunctional, then the proportion of residents within a 5-minute walking distance will drop to 8.8%, as shown in Fig. 7.

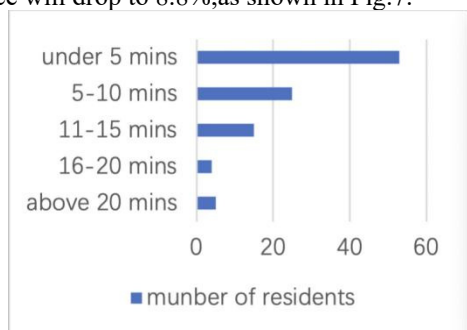


Fig.6 The time it takes for residents to walk to MSPSPs.



Fig.7 The time it takes for residents to walk to functional MSPSPs.

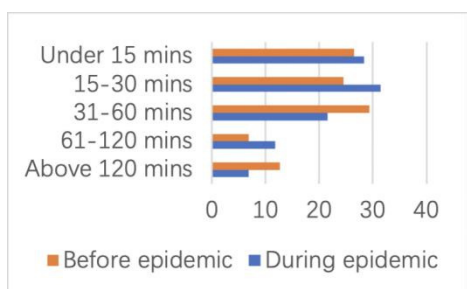


Fig.8 The duration of residents' activities in MSPSPs

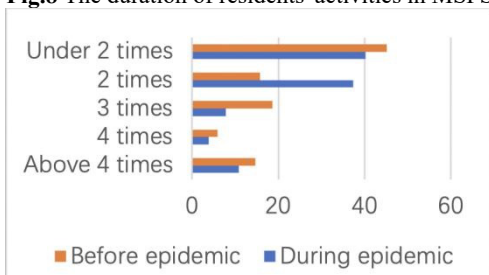


Fig.9 The frequency of residents' use of MSPSPs

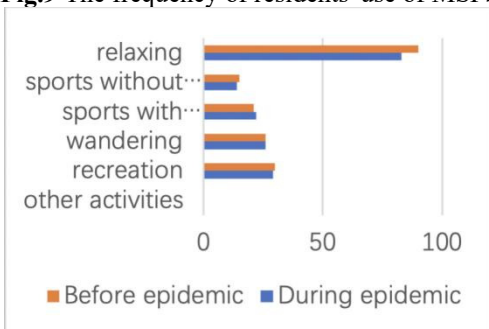


Fig.10 The purposes of residents' use of MSPSPs.

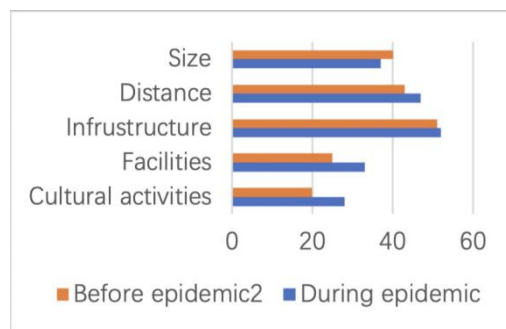


Fig.11 The MSPSP qualities that residents value.

As shown in Fig.8 and Fig.9, before the COVID-19 outbreak, 51% of residents spent less than 30 minutes in MSPSPs per day, and 60.8% of residents visited MSPSPs every day with a frequency of 3 times or less. However, this group increased to 59.8% and 77.5% respectively during the epidemic. At the same time, the group who spent longer time and used more frequently in MSPSPs before the epidemic decreased. During the epidemic, the average time residents spent in MSPSPs decreased by 7%, and the average visit frequency decreased by 9.1%. This may be related to the restriction placed by government and the residents' concerns about possibilities of infection in social activities during the epidemic.

Compared with the duration and frequency, the usage patterns and demands of residents in Fayuansi community for MSPSPs have not changed significantly. As shown in Fig.10. and Fig. 11, the proportion of residents who chose to walk, sit, and rest (relaxing) in these spaces exceeded 80%, both before and during the epidemic. This may be because that most of the MSPSPs in community are too small and lack of facilities. Residents' requirements for space availability decreased slightly during the epidemic, but requirements increased in other aspects. There is an obvious increase in demands for sports and entertainment facilities and community cultural activities. This may be because residents want their needs for cultural and sports activities can be met more within the community during epidemic.

4.2. Demographic Analysis on Sense of Place

Table 1. Demographic data on Sense of Place

Demography Features		Mean					
		Place Attachment		Place Identity		Place Dependence	
		Before C-19	During C-19	Before C-19	During C-19	Before C-19	During C-19
Gender	Male	3.830	4.178	3.854	4.052	3.564	3.888
	Female	4.006	4.296	3.862	4.144	3.498	3.772
Age	Under 15	3.818	4.150	3.514	3.834	3.500	3.800
	15-29	3.978	4.264	3.964	4.166	3.690	3.874
	30-59	3.916	4.298	3.822	4.164	3.524	3.892

	Above 60	3.964	4.206	3.972	4.096	3.414	3.684
Property status	owned	3.904	4.316	3.904	4.176	3.524	3.913
	rent	3.950	4.202	3.826	4.056	3.526	3.752
Years living in FYS Community	Under 10	3.952	4.196	3.786	4.098	3.582	3.850
	11-20	3.706	4.294	3.908	4.132	3.578	3.952
	21-30	4.080	4.480	3.880	4.200	3.540	3.860
	31-40	3.782	4.018	3.692	3.908	3.292	3.656
	Above 40	4.096	4.314	4.024	4.156	3.494	3.722
Education level	Primary school	4.144	4.308	3.764	3.910	3.438	3.546
	Middle School	3.880	4.160	3.872	4.034	3.478	3.758
	College	3.916	4.262	3.838	4.156	3.602	3.886
	Post-graduated	3.932	4.598	3.964	4.570	3.600	4.166
	others	4.198	4.600	4.000	4.602	3.732	4.466

In terms of gender, both before and during the epidemic, women’s average values of place attachment and place identity exceeded men’s, but in the dimension of place dependence, men’s average value exceeded that of women. Women are more emotionally aware of the MSPSPs in community and their importance both in life and cultural heritage, but they are more aware of the role of these spaces in practical interests. The degree of recognition is lower, and at the same time, it is believed that the status quo of MSPSPs in the community is far from their expectations. This is reflected in the low evaluation of the five items of women's place dependence and the fourth statement of the dimension of place identity, " The status of MSPSPs is ideal for me". During the epidemic, all the indicators of sense of place increased for both genders, but in terms of the specific growth rate, the average increase in males was 7.8 %, slightly higher than 7.4% of women.

From the perspective of age, the mean values of the two age groups of 15-29 and 30-59 in the three dimensions of sense of place are higher than those of the two age groups below 15 and above 60. The elderly over 60 have the highest mean in place attachment, but the lowest mean in place dependence, showing the contradiction between emotional identity and community satisfaction with the needs of the elderly. During the epidemic, the impact of MSPSPs on all residents is positive, but it is worth noting that the growth rate of residents aged 30-59 in three dimensions is higher than that of other age groups. It shows that this group recognizes more value of MSPSPs in the epidemic.

From the perspective of property status, before the epidemic, residents living in self-owned houses and residents living in rented houses had a small difference in the three dimensions of sense of place, but after the

epidemic began, residents living in self-owned houses have an average 9.5% growth in three dimensions of sense of place, far exceeding the 6.2% growth rate of the rental residents. In addition to the property status, this study divided residents into five groups according to the length of time they lived in the Fayuansi community (Table 1). The mean values of the three dimensions and the changes in the indicators during the epidemic are highly similar to the results grouped by age. Residents who have lived in the community for 11-40 years show a higher sense of place than those who have lived in the block for 10 years or less. Also showing inherent tension is the group of residents who have lived in the community for more than 40 years. These residents basically overlap with the group of residents over the age of 60, and their average place attachment index is higher than that of other groups, showing that long-term residence has a significant effect on place attachment, but they have a lower recognition on whether their needs have been met in community.

Analysis of residents with different educational levels shows that the improvement of education level will significantly improve the residents' sense of place indicators. Not only did the average sense of place increase with the level of education, but the growth rate of the sense of place before and during the epidemic also increased. The increase in the sense of place index for the primary education group after the epidemic was 3.6%, while that for the postgraduate group increased by 15.9%. However, it cannot be simply understood that education determines the sense of place of residents. There are still many details in the indicators of three specific dimensions. For example, in terms of place attachment indicators, the emotional recognition of the primary education group to MSPSPs in community is higher. However, the differences in the sense of place indicators of middle school, college and post-graduated groups before the epidemic were very small, and the epidemic has had different impacts on different groups, resulting in their sense of place in MSPSPs fluctuates in different magnitudes during the epidemic.

4.3. Analysis on Sense of Place

This study used SPSS 18.0 software for statistical analysis, and got results as below:

Table 2. Residents’ Sense of Place shifting before and during epidemic

dimen sions	stateme nts	Before epidemic		During Epidemic		De via nce	Ind epende nt-Sa mpl e T Tes t
		Me an	S. D.	Me an	S. D.		
Place Attachment		3.932	0.769	4.248	0.768	0.316	- 4.944
	Statem ent 1	3.720	0.788	3.990	0.862	0.270	- 4.388
	Statem ent 2	3.880	0.664	4.140	0.745	0.260	- 3.6

							82
	Statement 3	4.1 20	0.7 35	4.5 30	0.6 40	0.4 10	- 7.0 94
	Statement 4	3.8 60	0.8 79	4.2 50	0.8 72	0.3 90	- 5.7 16
	Statement 5	4.0 80	0.7 80	4.3 30	0.7 22	0.2 50	- 3.8 41
Place Identity		3.8 60	0.8 21	4.1 04	0.8 95	0.2 44	- 3.8 63
	Statement 1	4.0 90	0.7 05	4.4 40	0.6 69	0.3 50	- 5.8 66
	Statement 2	4.1 10	0.7 70	4.4 20	0.7 76	0.3 10	- 5.3 10
	Statement 3	4.1 10	0.8 07	4.2 50	0.9 09	0.1 40	- 2.2 30
	Statement 4	3.3 70	0.9 33	3.4 60	1.1 23	0.0 90	- 1.1 54
	Statement 5	3.6 20	0.8 90	3.9 50	0.9 99	0.3 30	- 4.7 53
Place Dependence		3.5 24	0.8 48	3.8 16	0.8 92	0.2 92	- 4.1 64
	Statement 1	3.3 00	0.9 63	3.5 90	1.0 37	0.2 90	- 3.6 43
	Statement 2	3.5 60	1.0 01	4.0 20	0.9 75	0.4 60	- 5.3 88
	Statement 3	3.9 70	0.6 96	4.3 00	0.7 28	0.3 30	- 5.4 41
	Statement 4	3.9 50	0.7 50	4.3 20	0.7 60	0.3 70	- 6.1 47
	Statement 5	2.8 40	0.8 29	2.8 50	0.9 59	0.0 10	- 0.1 99

As shown in Table 2, among the five items that measure place attachment, item 3 is the most recognized by the residents, showing that the residents of Fayuansi community have a very clear demand for the increase in MSPSPs, which would reflect the superiority of the community in the eyes of residents, and enhance the willingness to live in the community for a long period. However, the relatively low mean value of statement 1 shows that the capacity of MSPSPs in community still needs to be improved.

In terms of place identity, due to the particularity of historical preservation areas, 59.8% of the survey respondents have lived in the community for more than 10 years. As mentioned above, long-term experience has a significant role in promoting the formation and strengthening of place identity, and MSPSPs are more likely to become part of these long-term residents' identity with the place and themselves. Therefore, the mean values of

statement 1, 2, and 3 are relatively consistent. Residents generally recognize the representativeness of MSPSPs to the community, in terms of practical utility, cultural significance, and the importance of identity. However, residents' recognition of the status of MSPSPs is low, which shows that the renovation of MSPSPs can influence improving the place identity of residents.

In the dimension of place dependence, residents have the lowest recognition of MSPSPs. Residents emotionally recognize the practical utility and cultural significance of MSPSPs, and they can also recognize the important role of MSPSPs on physical and mental health, but they are not satisfied that their needs are not well met by these spaces. Among the statements that measure specific interests, residents' recognition is the lowest. This may be because in the Fayuansi community with limited space resources, the provision of MSPSPs in the community must be based on demolishing illegal buildings and cleaning up occupied public areas. In this process, public interests' conflict with private interests of individual residents. On the other hand, MSPSPs as public facilities cannot bring business benefits to the residents, which is also the reason why the residents have low recognition of this statement.

The survey results show that, residents' habits of using MSPSPs have changed during the epidemic, which cause the shifting of residents' sense of place. From the perspective of 15 statements in three dimensions, the indicator of residents' sense of place increased by 7.5% on average, indicating that the importance of MSPSPs to residents has increased due to the epidemic, both emotionally and practically. Among the three dimensions, the highest degree of recognition among residents is still place attachment, and the lowest degree of recognition is still local dependence during the epidemic. However, it is worth noting that place dependent dimension with the lowest recognition also has the largest increase during the epidemic. It shows that MSPSPs have played a greater role in residents' lives, and residents are more aware of its role in physical and mental health during the epidemic.

5. Conclusion and Suggestions

The research results indicate a significant shift in residents' usage habits and feelings towards MSPSPs. During the Covid-19 epidemic, residents spent less time in these spaces and reduced their frequency of visiting, but their requirements for MSPSPs grew. Residents now recognize the importance of MSPSPs in terms of place attachment, place identity, and culture. However, their feelings about MSPSPs in satisfying their daily needs are mixed. On the one hand, residents acknowledge the importance of these spaces for their physical and mental health, but on the other hand, they express dissatisfaction with the status quo due to the insufficient supply, uneven distribution, and weak functionality of MSPSPs. Many MSPSPs in the community are also occupied by residents and filled with old junk, resulting in low recognition of these spaces by residents in the dimension of local dependence. Additionally, the demolition of illegal constructions to

create MSPSs has created conflicts between public and private interests.

For Fayuansi community, it is the basic method to improve the sense of place of residents to develop more space resources and provide them for public use. Researchers have pointed out that for historical preservation areas with limited space resource, it is necessary to shift the focus from "place design" in purely physical form to "place operation"[15](Liang, 2020). The resident committee should keep the existing MSPSs for public use, increase the supply of new spaces and facilities, and pay more attention to the needs of the elderly. The community plans to launch a new round of innovation starting in 2023, in which more MSPSs will be provided. Knowledge of these characteristics can be useful in formulating and implementing policy. Strategies that appeal to the sense of place can be employed to develop popular support for policy, even if the connection is only symbolic.

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