Research on the evaluation of landscape preference by citizens in Matsudo City

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Abstract: Based on the campaign activity of ‘My Favorite Scenic Spots of Matsudo City’ held by Matsudo City Hall, we collected and sorted 1,243 works submitted by 871 contributors from 2009 to 2018. According to the contributions and their attached introductions, a total of 310 scenic spots distributed across 11 regions were divided into 4 categories and 20 sub-categories based on their landscape elements. With the exception of some scenic spots that could not be marked with specific locations, 300 scenic spots were marked on Matsudo City map. The study analyzed aspects of these scenic spots, the number of contributors, and the contributions of the 11 regions in Matsudo City. We then looked at the distribution of different landscape categories, which showed some obvious characteristics in terms of distribution and the degree of resident awareness. For example, there are numerous scenic spots clustered along the eastern bank of the Edogawa River, whereas scenic spots in the central and eastern areas are more scattered and evenly dispersed. There are also temples, Jinja (Shinto shrines) and parks that are popular with citizens. Based on the characteristics noted above, this study assesses the current landscape situation and proposes possible directions for landscape planning and management in Matsudo City.

Keywords: landscape evaluation, scenic spots, citizens’ preference, Matsudo City

1. Background

The Landscape Act was promulgated in June 2004 and has played a positive role in fostering favorable urban and rural landscapes, enhancing the charm of the region, and promoting communication between regions. The national government, local governments, entrepreneurs, and residents have a responsibility and obligation to participate in the creation and maintenance of the landscape to prepare and preserve a more distinctive local landscape. Local residents must actively seek a deeper understanding of landscapes and take an active role in developing better landscapes in accordance with the basic philosophy. At the same time, there is a need for them to cooperate with the national and local governments in connection with the measures taken to develop favorable landscapes. Identifying the landscape characteristics preferred by urban residents is crucial to the formation of future resident-participatory local landscapes.

Hsu and Shimomura (2013) argued that landscape preference is an important research topic in landscape evaluation, and in previous studies in Japan, ‘naturalness’ has often been listed as a key evaluation factor for landscape preference. Hirao et al. (1995) explored the consciousness and compositional characteristics of favorite landscapes in Kyoto City and how they were evaluated when combined by analyzing a sample of 113 photographs displayed in the photography exhibition ‘My Favorite View in Kyoto’. Lee et al. (2002) explored the visual morphological characteristics of the landscape in Seoul by distributing questionnaires to collect citizens’ opinions on the landscape photographs. Shimomura et al. (2004) clarified the spatial structure and the characteristics of temporal change in favored scenery based on a questionnaire survey of Osaka citizens from the activity ‘My Favorite Scenery in My Town’. Yamamoto et al. (2005) concluded that there were seven types of landscapes that the citizens of Higashi-Hiroshima City preferred and six types of landscapes that they did not prefer. Fukui et al. (2008) explored the characteristics of landscape in Oita City by analyzing the top 84 scenic spots from the 1,617 valid responses to a survey entitled ‘My Favorite 100 Oita Landscapes’.

The authors of the above-mentioned studies have drawn conclusions through a systematic and effective research methodology, demonstrating the positive role that research on the landscape preferences of residents can play in exploring landscape characteristics. However, the studies are lacking in terms of the time span and amount of data collected. In the studies on landscape preferences in Kyoto (Hirao et al., 1995), Seoul (Lee et al., 2002), Osaka (Shimomura et al., 2004), and Oita (Fukui et al., 2008), the important historical and cultural backgrounds as well as the administrative and economic status of the study subjects give them a strong regional character in terms of their respective urban landscapes. In contrast, ordinary cities that lack such historical locations need to explore their landscape characteristics even further. In addition, these past studies largely explored the landscape elements and characteristics of the region, however a gap remains in the systematic study of the distribution characteristics.

Hsu and Shimomura (2013) also noted additional approaches that should be implemented, namely a wide range of sampling methods and increased evaluation studies based on on-site landscape perception, as well as photographic result.

Matsudo City (Figure-1) is located in the northwestern Chiba Prefecture.
It is adjacent to Tokyo and Saitama Prefecture across the Edogawa River to the west. It is about 20-30 kilometers away from Chiba City, where Chiba’s prefectural office is located. It is also about 10-20 kilometers away from central Tokyo. Before World War II, Matsudo station was surrounded by an urban area, particularly on the western side. The city began as a river port and post town during the Edo period. As neither an Ordinance-designated City nor a Core City, such as a typical city formed by migration, Matsudo City began rapid development in the 1960s with the population boom and urban sprawl of the Tokyo metropolitan area.

As a city that lacks deep historical roots, it also is missing distinctive characteristics in terms of its landscape. Matsudo City can be described as a city with a noticeably ordinary landscape. Therefore, the residents' evaluation and preference of the landscape has greater importance and significance for the direction of its urban landscape development. As an ordinary city in Japan, its landscape characteristics require deep study and exploration.

The Landscape Guidance Group from the Urban Planning Department of Matsudo City Hall hosted a campaign activity called ‘My Favorite Scenic Spots of Matsudo City’, which solicited photographs or paintings from Matsudo citizens. ‘Places I like’, ‘places I want to cherish’, and ‘places with a calm mood’ were eligible for submission as part of this activity. The Matsudo citizens. ‘Places I like’, ‘places I want to cherish’, and ‘places with a calm mood’ were eligible for submission as part of this activity. The municipal government hopes that through such activities, citizens will once again discover the charm of Matsudo City. Since 2009, Matsudo City Hall has received a large number of contributions from locals.

Based on the data collected from ‘My Favorite Scenic Spots of Matsudo City’ from 2009 to 2018, this study aims to clarify the landscape characteristics of Matsudo City by analyzing the scenic spots of different classifications preferred by citizens and their distribution. This study also seeks to provide a direction for future landscape planning in Matsudo City.

2. Methodology

(1) Data Collation and Analysis

Statistics software are used to sort and classify the submitted data from 2009 to 2019 published on Matsudo City Hall website. Excluding several submissions that were taken in unknown locations or were not part of the urban landscape study, there were 1,243 submissions from 871 people. (Table-1)

<table>
<thead>
<tr>
<th>Year, Region, Photo</th>
<th>Example of submission data</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018, Yakiri Region</td>
<td>[Yakiri Rural Scenery (from Yakiri Bridge)]</td>
<td>In the midst of urbanisation, there is a vast rural scenery around the Sakagawa River in the Yakiri area. This expansive landscape is soothing to the soul. On the rooftop of the bridge, there are patterns of kusasi and the Yakiri-no-Watashi, which gives me a sense of familiarity. I would like to preserve this landscape, so close to the center of Tokyo, forever.</td>
</tr>
<tr>
<td></td>
<td>[Zelkova Avenue near Sunlight Pastoral Fifth Avenue]</td>
<td>The rows of zelkova trees here, together with those of the city road and the condominium site, form a row of four rows of zelkova trees which are rarely seen elsewhere. This creates an atmosphere of being in a forest, and many citizens visit here for a walk during all four seasons.</td>
</tr>
<tr>
<td></td>
<td>[Zelkova Avenue near Sunlight Pastoral Fifth Avenue]</td>
<td>This is the small rural scenery in the Yakiri area. The landscape is soothing to the soul, and the scenery is beautiful.</td>
</tr>
<tr>
<td></td>
<td>[Kogasaki Rural Scenery (from Kogasaki Bridge)]</td>
<td>Last year, I sowed the seeds of Japanese snake gourd in a corner of my house, and it bloomed for the first time. It’s a rare flower that blooms only at night, so I took this picture for everyone to see.</td>
</tr>
<tr>
<td></td>
<td>[Kogasaki Rural Scenery (from Kogasaki Bridge)]</td>
<td>In the nature, no one taught them, nor did they learn from anyone, but they grew up to be such good friends that they became intertwined.</td>
</tr>
</tbody>
</table>

(2) Visualization of Geographic Information

Google Earth and ArcGIS were used to sort out the 300 identifiable locations of the 310 scenic spots. These locations were then reflected on the map as visual geographic information, and the distribution of different landscape categories was studied.

(3) Discussion

On Dec. 7, 2020, a discussion was held with the person in charge of the Landscape Guidance Group, Matsudo City Hall to confirm some reference information that was required for this present study.

3. Landscape Preference by Regions

The whole administrative area of Matsudo City is divided into 11 regions as Figure-3 showing. Due to their different historical developments and geographical locations, each region has also formed its own regional characteristics and landscape features. Judging from the number of scenic spots, contributors, and contributions, the Matsudo Region, with 369 contributions is the most preferred region by citizens. The downtown area and the site of the Matsudo Shuku (stagecoach) are popular scenic locations. The numbers suggest that the Matsudo Region is the most popular and prominent landscape in Matsudo City. Although the number of scenic spots in the Tokiwadaira Region show no obvious advantage over the other regions, the large number of contributions for the same scenic spot reflects that Tokiwadaira is also a preferred landscape area. In addition, the number of scenic spots and contributions for Kogasaki and Yakiri are also significantly greater than those for other regions (Graph-1).

From 2009 to 2018, there was no significant change in the data from year to year, yet there were distinct distribution characteristics in the 10 years of accumulated data. Many scenic spots are distributed along the Edogawa River. Combined with the regional analysis above, they are mainly distributed in the Kogasaki, Matsudo, and Yakiri regions, where the scenic...
spots are more densely concentrated. The number of contributors and contributions is low, but there is a significant number of scenic spots. Corresponding to the obvious concentration in the west, the eastern area of the city is sparse. In particular, there are a few scenic spots in the southeast area, namely the Tobu and Mutsumi. There is one scenic spot that received the largest number of contributions, 21st Century Park. Many other spots are also distributed around it. (Figure-4)

Referring to the Area Divisions of the Urbanization Promotion Area and Urbanization Control Area in the Matsudo City map, in the Urbanization Control Areas along the west and the southeast side of the city, the evaluation objects are preferred and are of a concern to the citizens, especially in the Yakiri and Tokiwadaira regions.

By analyzing the changes in the distribution of contributions over the years, it can be seen that citizen preferences have gradually moved west. The scenic spots represented by 21st Century Park have received less attention over the years, and the contributors have become more focused on the bank of the Edogawa River on the west side of the city.

4. Element Characteristics and Their Distribution

When studying Yashio City, Morinobu and Arai (2010) divided the landscape elements into 8 categories: residential area, field, farmland, Jinja, temple, road, river and waterway. In this study, elements are integrated and divided according to the previous study and the landscape status of Matsudo City. By referring to the Basic Knowledge of Landscape by Aomori Prefecture, the landscape elements are classified into 4 categories: Nature, History & Culture, Normal Infrastructure, and Scenic View.

The arrangement of scenic spots is based on specific scenic spots that are representative and within the scope of public awareness. For example, when the object described by a contributor is a school rather than a particular building or garden at this school, different landscapes here are all summarized as ‘school’. A contribution including several elements such as waterscapes, structures, and plants in a park are all summarized as ‘park’. In addition, different scenic spots on a long landscape belt, such as the Edogawa River or Sakagawa River, combined with different watersheds, have their own landscape characteristics, which are summarized as three scenic spots: Edogawa River Upper, Middle, and Lower.

The classification results and statistics of submitted data are shown in Table-2. Among these landscape elements, Parks and Squares, Waterfronts, and Temples and Jinja account for a large proportion of the number of spots, as well as the number of contributors and contributions. Especially for scenic spots such as parks and squares, a large number of contributors have submitted a considerable number of works as their favorite landscapes (Table-3). The 4 element categories and their characteristics of distribution...
will be analyzed and explained in greater detail.

(1) History and Culture

A historical and cultural landscape is mainly composed of three broad elements: (1) Religious places, such as temples and Jinja, such as Hondoji Temple, Sokoin Temple, and Matsudo Jinja; (2) Places with history or objects related to local culture, such as Mabashi Bridge, the Old Saito House, and Gennroku Matsudo Village; (3) Stone monuments or statues set up for historical and cultural significance or commemoration, such as the Edogawa River Milestone, Echo Memorial Monument, and the Statue of ‘Mori no Sasayaki’.

The downtown area of the Matsudo Region features a historical and cultural landscapes with a relatively high density of scenic spots, and the elements of the landscape, as the category would suggest are also mainly historical and cultural. More specifically, this historical and cultural landscape is concentrated on the eastern bank of the Edogawa River in the Matsudo Region, which was once the location of the ancient Matsudo Shaku. A large number of cultural heritage and historical sites are concentrated in this area, especially around Mito Street between the Joban Line and Edogawa River.

However, a large number of the contributions consist of temples and Jinja around the city, such as the Hondoji Temple, Tozenji Temple, Shoryuji Temple, Sokoin Temple, Takao Jinja. The scenic spots that possess elements of monuments as well as history and culture are more scattered. Most of which these locations lack support and receive less attention. (Figure-6)

(2) Nature

The natural landscape includes the nature-related elements. The following seven types of landscape elements in the types of Nature are discussed in this study. 1) Contributions focusing on plants like trees or flowers, such as the Lycoris of Koganehara 5-chome, the row of Sakura (Japanese cherry) trees along Shin-Sakagawa River, the Empress Tree in the field, and the Matsudo Flower Line. 2) Waterside landscapes of rivers, creeks, or storage tanks, such as the Sakagawa Waterway, Fureai Matsudo Waterway, Yakiri no Watashi (ferry), and Kokubun River Waterway. 3) Rural landscapes focusing on farmland or farmhouses, such as the Sakai Pear Farm, the Yakiri Leek Field, the Kogasaki Allotment Garden, the Kanegisaku Nursery. 4) Natural paths, such as the trail along Rokumagawa Waterway, Fureai Matsudo Waterway, Yakiri no Watashi (ferry), and Kokubun River Waterway. 5) Urban roads, such as the Faculty of Horticulture of Chiba University, Kogasaki Junior High School, and Takagi Second Elementary School. 6) Natural paths, such as JR East Japan Vehicle Base, trains near Kitakogane Station, and the Chimney of Wanagaya Clean Center. 7) Illumination equipment or landscapes that emphasize the night scenic of the city, such as the night scenic of Matsudo Old Isetan Street, and the Light Festival near the Ryutsu Keizai University. 8) The landscape of the cemetery, such as the Matsudo Cemetery and the

as the Tortoise of Shinakagawa River, the Cat of Benten Jinja, the Ducks near Sakagawa Water Square, and The Rescue Dog in Kogasaki.

The distribution of natural landscapes is denser in the middle and lower reaches of the Edogawa River, which features a larger number of contributions. There are notable clusters in the Kogasaki Region, the bank of the Edogawa River in the Matsudo Region, and the farmland near the Nakayakiri and Shimoyakiri in the Yakiri Region. Among them, several scenic spots with a large number of contributions, such as the Matsudo Flower Line, Edogawa River, and Sakagawa River, are also located on the westernmost edge of the city. The natural landscape in the east is relatively scattered, and there is no obvious feature of concentrating in a certain area. Whether it is the western riverside area with dense scenic spots or the eastern area with scattered landscapes, the types of landscape elements have not been found to have obvious characteristics, and the distribution of various elements is relatively even. (Figure-7)

(3) Normal Infrastructure

The Normal Infrastructure landscape has the largest number of scenic spots, as well as the largest number of contributions received in the past 10 years. The landscape related to Normal Infrastructure can be characterized by the intimate relationship it shares with residents. It mainly includes the following urban landscapes related to human life and production: 1) Parks and squares used as public open spaces in the city, such as The Konemoto Park, The Shin-Matsudo First Park, and Kogasaki Sports Square. 2) Events held for festivals, commemorations, or other purposes, such as Koganeshuku Matsuri (festival), Edogawa Fireworks Festival, and Fire Training Center Disaster Prevention Activity. 3) Urban roads, such as the Nemoto Intersection, Kamiyakiri Outer Ring Road Construction, and the Matsudo Old Isetan Street. 4) Landscapes relating to the railway or train, such as JR East Japan Vehicle Base, trains near Kitakogane Station, and the Tokiwadaira Station Platform. 5) Landscape of the schools, such as the Faculty of Horticulture of Chiba University, Kogasaki Junior High School, and Takagi Second Elementary School. 6) Buildings or structures in the city, such as Matsudo City Hall, the Matsudo Building, and the Chimney of Wanagaya Clean Center. 7) Illumination equipment or landscapes that emphasize the night scenic of the city, such as the night scenic of Matsudo Old Isetan Street, and the Light Festival near the Ryutsu Keizai University. 8) The landscape of the cemetery, such as the Matsudo Cemetery and the
Yabashira Cemetery. 9) Residential housing complex areas, such as Tokiwadaira Danchi and Makinohara Danchi.

The Normal Infrastructure scenic spots are obviously concentrated near the downtown area where Matsudo Station is located, and they mainly consist of building elements. The distribution characteristics of other elements of Normal Infrastructure are basically consistent with the distribution of the corresponding urban infrastructures, such as railways and roads. Among the park and square elements, there are notably two scenic spots with total of 106 and 127 submissions over the 10-year period, namely Tojo House Park in the Matsudo Region and 21st Century Park in the Tokiwadaira Region. Other high-profile attractions include the Matsudo Festival, the Chimney of Waragaya Clean Center, the Faculty of Horticulture, Chiba University, and Tokiwadaira Danchi. (Figure-8)

(4) Scenic View

The number of scenic spots is the main criteria among the Scenic View landscape elements. Based on the evaluation of the submitted works and attached introductions, contributions emphasizing the view from one spot to another spot are summarized as Scenic View landscapes in this study. This would include such activities as viewing Mount Fuji from the Edogawa River Embankment, Yabiri no Watashi and Sky Tree, viewing the Matsudo Urban Area from Kanayama Jinja, etc. The analysis of Scenic View landscapes in Matsudo City will be elaborated in more detail in the other study.

(5) Distribution by Area Division

Matsudo City has a total of 1,689 ha in the Urbanization Control Area, accounting for 27.5% of the city's area. The number of scenic spots located in the Urbanization Control Area accounts for 30.6% of all spots, and the number of contributors and contributions accounted for 39.5% and 40.6%, respectively. It shows that among the landscapes preferred by citizens, the Urbanization Control Area only has a slight advantage over the Urbanization Promotion Area in general. However, the situation of each landscape classification differs slightly: historical and cultural landscapes are more numerous in the Urbanization Promotion Area. Natural landscapes are extremely numerous in the Urbanization Control Area, with more than 55% of both the number of contributors and contributions, although it occupies less than 30% of the area. The Normal Infrastructure landscape has a lower number of scenic spots in the Urbanization Control Area but has a higher number of contributors and contributions. The Scenic View landscape, on the other hand, has a more significant numerical advantage in the Urbanization Control Area. (Figure-9)

5. Conclusion

(1) The scenic spots preferred by citizens in Matsudo City are mainly concentrated in the western area of the city adjacent to the bank of the Edogawa River. There is no obvious gathering trend in the central and eastern areas, and various types of landscapes are scattered and evenly distributed. The eastern bank of the Edogawa River in Matsudo City can be considered as an important landscape preservation area for planning and maintenance.

(2) Areas with dense scenic spots also have their own landscape characteristics. The Kogasaki Region is characterized by natural and Scenic View landscapes, which are closely related to the special geographical location and have formed promising viewing conditions. The characteristics of much of the farmland in the Yakiri Region are exceedingly prominent and are attracting natural and Scenic View landscapes attention. The three regions along the Edogawa River can be planned and constructed as a
natural base with a landscape belt featuring Scenic View landscapes.

(3) The designation of the Urbanization Control Area plays an important role in promoting the landscapes of Matsudo City, particularly for natural landscapes and the landscape with park elements. The coordination between landscape optimization and area division is important and deserves more attention and consideration in the future.

(4) In Matsudo City, there are several scenic spots that are highly preferred compared to other scenic spots. These include 21st Century Park, Tojo House Park, Matsudo Flower Line, Hondoji Temple, and Sakagawa River. They have received such a significant number of submissions from many citizens in the past ten years and have an extremely high reputation among citizens. In the future, they can also be planned and promoted as important scenic spots that represent Matsudo City. In addition, based on the trend of citizen preference slowly moving west over the years, 21st Century Park is the largest scenic spot to garner the most attention in the past and could serve a guiding role in landscape planning in the east.

(5) Although a small number of scenic spots have received preferences and attentions over the years, the distribution is relatively scattered, so unified integration is urgently needed. For example, the series of various historical and cultural landscapes may contribute to the establishment of the overall landscape image of Matsudo City. While the scenic spots in this study are classified as elements and categories for the convenience of explanation, there are inseparable connections between various types of landscapes. For example, the natural landscapes in the central and eastern regions are particularly connected with the parks and squares. Unified arrangement and consideration should be carried out to make the landscape of Matsudo City more holistic in the future.

The results of this study demonstrate that citizens landscape preferences effectively reflect the landscape characteristics of a city. For other ordinary cities like Matsudo City, a large collection of information from citizens about their perceptions of the city's landscape would be useful for exploring the characteristics of the landscape. Few cities do this as consistently as Matsudo City did for more than ten years. This type of information collection would contribute to the creation of better urban landscapes in ordinary cities, especially those lacking particular kinds of landscape characteristics.

Notes and Reference

1) Ordinance-designated City (政令指定都市): Cities that are included in the areas of prefectures, but under the current system, they are treated differently from ordinary cities in terms of their organization, powers, etc. 22)
2) Core City (中核市): Cities can be designated to handle affairs instead of Ordinance-designated cities for efficiency. 22)
3) Region (地域): Municipal boundaries are usually divided into multiple geographic areas, considering natural, social, economic, and cultural conditions. The regional division criteria may occasionally differ slightly. Based on this campaign activity, Matsudo City is divided into 11 geographical areas. 22)
4) Area Division (区域区分): To create a better urban environment, urban planning areas are divided into “Urbanization Promotion Area (Priority areas for urbanization within 10 years)” and “Urbanization Control Area (No permission will be granted except for the construction of buildings for agriculture, forestry, and fisheries, and for planned development above a certain scale).”. 22)
18) Geospatial Information Authority of Japan: <https://www.gsi.go.jp/> update on 2021.09.05, accessed 2021.09.05