

Mechanisms and actual condition of the “Citizen Forest (*Shimin no Mori*)” scheme for conserving green spaces in Yokohama, Japan

緑地保全を目的とした横浜市の「市民の森」制度の仕組みと実態

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Abstract: The Citizen Forest (*Shimin no Mori*) scheme, established in 1971, aims to protect green space in Yokohama, relying on cooperation between forest owners to preserve green spaces open to all citizens. The purpose of this study is to clarify the actual condition of these open forests. To accomplish this goal, our study focuses on the 36 citizen forests open to the public. Our research methods include field surveys and interviews with city staff. In examining how these contracts have played out in the real world, we found that most people use the land for walking, running, bird watching, etc. However, there are also places where access is difficult and others where garbage is scattered throughout the site. We conclude that while the Citizen Forest scheme is effective in preserving green space, it is necessary to raise awareness of citizen forests, maintenance and renewal of signs, enhance guidance for access, promote the improvement of littering and waste disposal, and enhance facilities to increase public use. It is necessary to maintain and update signs in an easy to use by the public. However, it is probably difficult to install a toilet in the future since operation and maintenance of the toilet requires labor and expenses.

Keywords: citizen forest, green spaces, Yokohama, recreation area

要旨: 横浜市の市民の森制度(1971年制定)は、山林所有者等の協力のもと緑地を保護し、市民の憩いの場として利用することを目的としたものである。そこで、本研究の目的は、市民の森制度設立目的にある市民の憩いの場としての実態を明らかにすることである。調査対象は開園している36ヶ所とした。調査方法は現地調査と市職員への聞き取り調査である。その結果、利用者の利用目的としては主に散歩、ランニング、野鳥観察などが挙げられる。しかし、アクセス方法がわかり難い場所やゴミが散乱している場所も見られた。緑地保全としては効果を発揮していると考えられるが、多くの人に利用してもらうには、サインの管理や更新、市民の森の認知度を上げるための広報活動の強化、市民の森へアクセスを容易にする案内の充実、利用者に対するゴミに関するマナー向上の促進、施設の充実が必要だろう。一方、トイレの充実は、維持管理に係る労力や費用を考えると難しいだろう。

キーワード: 市民の森、緑地保全、横浜市、憩いの場

I Introduction

Kanagawa Prefecture is about 40% (4) covered in forests, most of which are distributed in the western part of the prefecture. Yokohama City, to the east of the prefecture, is close to the center of Tokyo and the prefecture's main economic hub (5). In Yokohama, forests account for about 9% of the total land mass, and in 1971 the city established a “Citizen Forest (*Shimin no Mori*)” scheme to protect this land (8). This system protects green spaces, cooperating with landowners to use forests as public recreational areas. In 1972, the year after the scheme was established, four citizen forests opened: Iijima, Kamigo, Shimonagaya, and Miho (see Table 1). This number has

continued to grow, and as of April 1, 2016, 43 land plots (~527 ha) have been designated as citizen forests in Yokohama, 36 of which are open to the public (9).

There are few opportunities to gain experience and learn about contact with the forest and the use of wood from the forest in everyday life in modern society (3). This research focuses on citizens' recreational areas, as described in the citizen forest's main goals. The purpose of this study is to clarify the actual condition of the public recreational areas.

Previous studies concerned the behavior of forest owners (1), management by residents (2), and consciousness of the current state of administrative officials (7). However, no research has

clarified the actual condition of the citizen forests. This study has the possibility to present improvement points of citizen forests to increase users.

II Research target and methods

This paper focuses on the 36 public forests in Yokohama (Table 1), some of the 43 forests designated as citizen forests as of April 1, 2016. We studied the number of entrances, public toilets, benches, and signs (guide and information signs for users) in each site. In order to investigate the above items, we conducted a field survey in 2016 for 36 citizen forests. We interviewed people at city hall to obtain any information that could not be obtained from our field survey.

Two of the forests in our study area—Hitorizawa and Segami—are adjacent to one another and the boundary between the two is unknown (Table 1). We therefore considered the two forests as one. A part of Nakatamiyanodai forest, meanwhile, could not be investigated, in part because of no-entry area.

The relation between two variables was based on Pearson's correlation coefficient test using SPSS statistical software version 22, considered significant at $P \leq 0.05$.

Table 1 Research target

Name	Area (ha)	Opening date	Name	Area (ha)	Opening date
Iijima	5.7	1972/4/5	Tsunashima	6.1	1991/10/26
Kamigo	4.9	1972/4/10	Oiwake	32.9	1994/3/26
Shimonagaya	6.1	1972/4/15	Minamihonjyuku	6.3	1995/9/17
Miho	39.5	1972/11/4	Araizawa	9.6	1998/5/24
Kamariya	11.8	1973/11/7	Niiharu	67.2	2000/3/26
Mine	13.0	1974/10/8	Maioka	19.5	2001/5/5
Shishigaya	18.6	1975/4/26	Sekigaya	2.2	2003/4/2
Seya	19.1	1976/4/24	Kamoihara	2.0	2005/4/2
Hitorizawa ^{*1}	67.1	1977/4/12	Komaokanakago	1.1	2007/4/28
Kozukuejyoshi	4.6	1977/10/1	Kanazawa	24.8	2011/5/17
Segami ^{*1}	48.2	1979/7/7	Fukaya	3.1	2012/4/1
Shomyoji	10.7	1979/7/11	Nakatamiyanodai ^{*2}	1.3	2012/7/20
Kumanojinjya	5.3	1980/7/19	Imajyuku	3.0	2013/3/15
Bukenji	2.3	1983/4/23	Kajigaya	2.9	2014/4/1
Jike	12.4	1983/10/28	Kawawa	4.0	2014/4/1
Masagarigafuchi	6.5	1984/10/25	Shimbasi	3.3	2015/1/16
Wuethrich	3.2	1987/5/30	Kashiwatyo	1.9	2015/9/1
Yasashi	5.1	1991/4/28	Asahinakita	11.5	2016/4/1

*1: We combined Hitorizawa and Segami in our analysis because the boundary between the two is unclear. *2: A part of this forest could not be investigated.

III Outline of Yokohama's citizen forest scheme

We use documents (8) and (10) to outline how the citizen forest system works. The program began in 1971 as a unique initiative of Yokohama. Any land covered with trees and with an area of

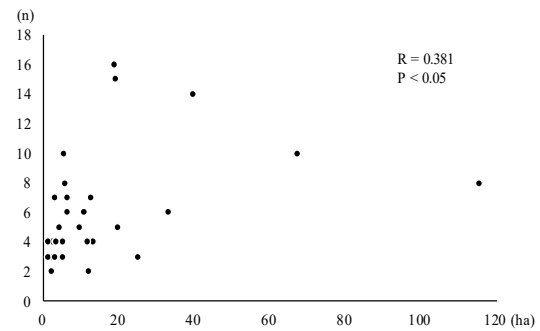


Fig. 1 Relationship between forest area and number of entrances Since 2007, the reason why the public toilet has not been established in recent years was judged from the location condition and the staying time of the user.

2 ha or more in relation to citizen forests was considered eligible to become public recreational land. Citizen forests could be used by the public from sunrise to sunset.

Forest owners and Yokohama (i.e., the mayor) signed a 10-year contract prohibiting the development of the land or any change in traits. Forest owners received the following three preferential measures: 1) reduction of fixed property and city planning taxes, 2) receipt of “green space development incentives” from the city at the end of each year, and 3) receipt of a “continuous lump sum” when renewing the contract.

Designated citizen forests are open to the public and managed in cooperation of between the forest owner and a group for the protection of the land (*Aigokai*), formed by nearby residents. This group is responsible for cleaning and patrolling the forest.

The park green space office entrusts the land management and facility inspections to a third-party business, who is responsible for maintaining the property along the garden road and open spaces.

IV Results and discussion

1. Actual condition of park facilities

Most people using citizen forests utilized the land for walking, running, bird watching, etc. at our field survey. In this way, they are valuable open spaces in a predominantly urban landscape.

A statistically significant ($P < 0.05$) weak correlation ($R = 0.381$) was observed between land area and number of entrances (Fig.1). Therefore, there tends to be a positive relationship between a forest's number of entrances and its land area. However, some small forests have many entrances in case of elongated forest compartments. For example, Kumanojinjya citizen forest has 10 entrances due to its unique shape, despite its small area of 5.3 ha.

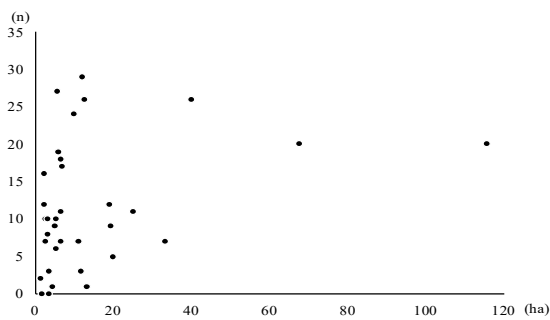


Fig. 2 Relationship between forest area and number of benches

There was no statistically significant correlation between land area and number of benches. This number probably depends on the length and shape of the walkways rather than simply the size of the forest (Fig.2).

Table 2 Relationship between opening date and number of public toilets

Name	Opening date	Number of public toilets	Name	Opening date	Number of public toilets
Iijima	1972/4/5	1	Tsunashima	1991/10/26	0
Kamigo	1972/4/10	0	Oiwake	1994/3/26	2
Shimonagaya	1972/4/15	1	Minamihonjyuku	1995/9/17	1
Miho	1972/11/4	0	Araizawa	1998/5/24	1
Kamariya	1973/11/7	0	Niiharu	2000/3/26	2
Mine	1974/10/8	1	Maioka	2001/5/5	1
Shishigaya	1975/4/26	2	Sekigaya	2003/4/2	0
Seya	1976/4/24	1	Kamoihara	2005/4/2	1
Hitorizawa*1	1977/4/12	2	Komaokanakago	2007/4/28	0
Kozukuejyoshi	1977/10/1	1	Kanazawa	2011/5/17	0
Segami*1	1979/7/7	2	Fukaya	2012/4/1	0
Shomyoji	1979/7/11	0	Nakatamiyanodai*2	2012/7/20	0
Kumanojinjya	1980/7/19	1	Imajyuku	2013/3/15	0
Bukenji	1983/4/23	0	Kajigaya	2014/4/1	0
Jike	1983/10/28	1	Kawawa	2014/4/1	0
Masagarigafuchi	1984/10/25	1	Shimbasi	2015/1/16	0
Wuethrich	1987/5/30	1	Kashiwatyo	2015/9/1	0
Yasashi	1991/4/28	1	Asahinakita	2016/4/1	0

*1: We combined Hitorizawa and Segami in our analysis because the boundary between the two is unclear. The same number of toilets are shown. *2: A part of this forest could not be investigated.

Each citizen forest has a different number of signs with different content. Citizen forests with active protection groups (*Aigokai*) have information signs with reports of the group's activity, citizen forests with parking lots have parking signs, etc. However, some of these informational signs are not updated, others are difficult to read due to damage, etc.

In this study, we did not consider the differences in the content of informational signs and instead compared the number of signs. A statistically significant ($P < 0.01$) correlation ($R = 0.564$) was observed between land area and number of information signs (Fig.3). As the area grows, users need more information. Since there is no person to guide or monitor users

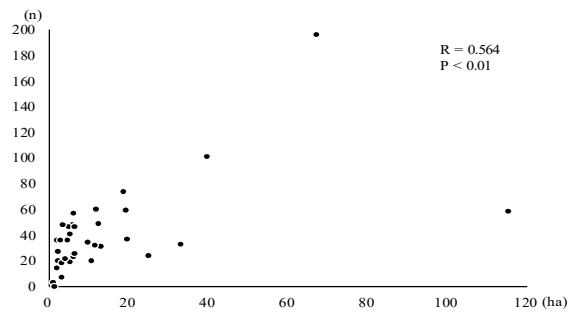


Fig. 3 Relationship between forest area and number of information signs

from the results of field survey, an increasing number of signs are necessary.

No citizen forest has more than three toilets (Table 2), and few forests installed toilets after 2007. This is probably due to the cost and work involved in installing and maintaining bathroom facilities.

Some forests had garbage scattered on the ground. While some citizen forests have installed garbage cans or dumpsters, many are not equipped with garbage facilities. It is necessary to encourage users' proper disposal of garbage and the protection groups to engage in cleanup.

2. Results of Interviews

Some of our information could not be obtained through field studies or informational documents, and therefore we also interviewed city officials. We found that Yokohama often requests that forest owners register their land as citizen forests. However, few forest owners actually do so. This may be because Yokohama's only publicity of citizen forests is through pamphlet and a website. We can therefore assume that awareness of citizen forests is not high.

Forest owners registering their property as citizen forests are eligible for specific incentives. They are exempt from all property and city planning taxes. In addition, each forest owner is paid 30 JPY per square meter as a green space development incentive, and 300 JPY per square meter as a lump sum when renewing their contract after 10 years.

The reason why the public toilet has not been established since 2007 was judged from the location condition and the staying time of the user. However, the biggest reason is probably due to the labor and financial costs of maintaining these facilities.

Our interviews also illuminated what happens when information signs become damaged. The person who installed the sign has an obligation to repair damaged and indecipherable

signs. In other words, the city restores city signs and the protection group restores any signs they install. Each organization performs periodic maintenance inspections to find any damaged or undocumented information signs.

Yokohama collects reports from each protection group 2–4 times a year to keep a record of their activities. Further cooperation between the two organizations is necessary to deal with problems relating to illegible signs and litter.

There are also complaints from local residents and users, many related to other users' behavior and access methods. Examples of the former include illegal dumping of garbage, theft of plants, and accidents between bicyclists and runners. To solve the latter, detailed access methods are published on pamphlets and website. However, city officials are often asked about the best way to access citizen forests: many are difficult to access. Therefore, better descriptions of each forest should be posted on informational maps, and the webpages with access instructions should be readily available.

V Conclusions

Through the Citizen Forests scheme, Yokohama is promoting the preservation of green spaces. However, while the maintenance of these facilities promotes their public use, this maintenance is also expensive. For the most people to make effective use of the forests, we suggest the following improvements. It is necessary to maintain and update signs in an easy to use by the public. However, it is probably difficult to install a toilet in the future since operation and maintenance of the toilet requires labor and expenses.

It is necessary to increase awareness of the forests by increasing the distribution of pamphlets and expanding public relations on the city's website, since it seems few are aware of the citizen forest program. Access to these lands is difficult to understand except for those who live nearby, so it is important to improve information signs and provide easy-to-understand pamphlets to aid access. Scattering garbage disturbs the landscape and reduces users. Therefore, it is necessary to improve garbage disposal in the forest and on walking paths through signs, pamphlets, and the Internet.

There is a need for as many people as possible to use citizen forests, as these facilities are maintained through public taxes. These facilities give people an opportunity to be exposed to nature, a crucial experience in an urban area where children are becoming unable to recognize specific trees (6). It is important to make these forests into facilities that attract users and are easy

to navigate.

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