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Reevaluating the Role of Urban Foraging in Tokyo Metropolitan Areas

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Abstract

Urban Foraging (UF) has gained increasing attention in recent years as a means of engaging with nature in urban environments and as an adaptive strategy for urbanization and green space reduction. While research on UF has been conducted in Western countries, studies in Japan remain scarce. This study aims to analyze UF practices and their impact in Tokyo metropolitan area. Through interviews with UF practitioners and local government officials, as well as fieldwork in Tokyo and surrounding areas, this study reveals key patterns in UF engagement. Findings indicate that individuals who forage more frequently tend to collect a greater variety of resources, including plants, fungi, and even engage in hunting and fishing. Common foraging sites include rivers, parks, and vacant lots, with food being the primary motivation. Many practitioners have childhood foraging experiences, and social media and community networks serve as important sources of knowledge. Furthermore, UF appears to influence practitioners' perceptions of nature. From an administrative perspective, many municipalities prohibit foraging in parks, although some adopt a more flexible stance. The study highlights the emergence of ethical considerations and informal regulations among urban foragers. Through food consumption, practitioners develop a deeper awareness of their relationship with urban nature. This study suggests that UF could foster novel human-nature relationships and enhance urban green space utilization. However, further research is needed to examine gender, socioeconomic differences, homelessness, foreign urban foragers, commercial exploitation, and overforaging concerns.

Keywords: Ecological knowledge; Greenspace management; Human-Nature Relationship; Urban biodiversity

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Introduction

In recent years, Urban foraging (UF) has gained increasing attention. Urban foraging is the practice of harvesting or gathering raw biological resources (fungi, plants, parts of plants, invertebrate or vertebrate animals, and fish) within urban and peri-urban settings. (Shackleton et al. 2017). In the United Kingdom, UF has gained prominence as a means of engaging with nature in urban settings, particularly in response to the lockdowns imposed during the COVID-19 pandemic (National Geographic 2020). UF is not merely a recreational activity but also serves as an adaptive strategy for expanding cities and the diminishing availability of urban green spaces. UF further provides an important perspective for reconsidering the relationship between urban residents and nature.

Currently, approximately 55% of the world's population resides in urban areas, and in developed countries, 41% of urban land use is allocated for residential purposes (United Nations 2018). Projections indicate that the influx of population into urban areas will continue to increase, making the use of urban green spaces increasingly significant. Urban green spaces encompass both formal spaces—such as parks and gardens—and informal spaces, including open spaces and forests within cities (Sardeshpande and Shackleton 2020). These green spaces play a vital role in ensuring a fulfilling urban life. For instance, they contribute to environmental conservation, disaster prevention, urban ecosystem preservation, environmental education, tourism, social interaction, landscape formation, and community development (Oncini et al. 2024). Against this backdrop, the utilization of urban green spaces has garnered growing attention, and these spaces are increasingly being recognized as sites for UF practices.

As the demand for sustainable urban development increases, a reexamination of the human-nature relationship has been progressing. Traditionally, environmental issues have often been framed within the dichotomy of "development versus conservation" (Kito 2009). Additionally, discussions on moving away from anthropocentrism have frequently been positioned in contrast to non-anthropocentrism. However, environmental ethics scholars argue that transcending such binary perspectives and focusing on the relationship itself

leads to a more profound understanding (Kito 2009, p.1-22). This perspective extends beyond environmental ethics and is increasingly being explored in multispecies studies.

In Japan, issues such as the decline of urban green spaces, dependence on rural areas for food, and the weakening connection between urban residents and nature have become increasingly apparent (Tokyo Metropolitan Government 2023; Kikuchi and Iiduka 2014). In response to these challenges, efforts have been made to create urban green spaces and develop green infrastructure (Tokyo Metropolitan Government 2024). However, human-nature interactions in urban areas have primarily been considered in terms of recreation and aesthetics. While the roles of urban green spaces include ecosystem conservation, public health promotion, and community formation (Tokyo Metropolitan Government 2024), UF has not been considered as a relevant practice.

Given this context, UF can be positioned not only as an adaptive strategy to address the challenges associated with urbanization but also as a practice that reexamines the relationship between humans and nature in urban settings. However, the specific conditions and dynamics of UF in Japanese urban areas remain unclear. Therefore, this study aims to analyze the actual state and impact of UF in the Tokyo metropolitan area and to reconsider the human-nature relationship in urban contexts through an examination of UF practices.

Factors of Urban Foraging

There are highly diverse forms of UF practice, and no universal image of Urban forager exists. However, common characteristics of UF include its practice in various urban locations, participation by individuals from a wide range of ages and social backgrounds, and its frequent regulation (McLain et al. 2014; Poe et al. 2014; Shackleton et al. 2017; Arrington et al. 2017). Furthermore, the motivations for engaging in UF are varied and include alleviating food insecurity, experiencing relaxation through contact with nature, and preserving traditional customs, with many cases involving an intertwining of these motivations (Arrington et al. 2017). Although research on UF has been expanding, the majority of existing studies focus on Western regions such as Europe and the United States. However, there has been a gradual increase in research from rapidly urbanizing regions in

Africa and Asia. This study first summarizes previous research conducted abroad before examining existing studies on hunter-gatherers in Japan and urban foragers. UF has four key aspects: social, economic, environmental, and administrative. This section summarizes previous studies based on these classifications.

Social aspects

UF is inherently a social activity. Although it is relatively low-cost, the act of foraging requires the sharing of knowledge to identify productive sites in the appropriate season, to distinguish between edible and poisonous plants, and to transform the harvest into food, processed goods, and medicine. Knowledge is transmitted not only from the older to younger generations, but also within foraging communities. These social ties have clear benefits, fostering the protection of cultural heritage and traditions, a sense of belonging or inclusiveness, community promotion, as well as encouraging environmental conservation, sustainable food practices, and the stewardship of natural resources; all of which in turn can positively impact the wellbeing of those involved (Colinas et al. 2019). Furthermore, as knowledge is being passed on, it is said that urban foragers possess a wealth of ecological knowledge (McLain et al. 2014). Urban foragers are people who practice UF, and the term forager is used here to refer to all people who gather foraged food. Urban foragers also gravitate towards collecting native species rather than non-native species, however, they are said to practice their foraging methods in a sustainable way. For example, urban foragers focus on collecting non-native species and weedy species and tend to avoid collecting rare species. In addition, urban foragers are also highly concerned about issues related to nature conservation, and in some cases, urban foraging can be useful for species conservation (Poe et al. 2014; De Jong and Varley 2018).

Economic Aspects

One of the characteristics of urban foraging is that foraging is carried out with a primary focus on vegetation that is unique to the area. Despite the growing popularity of urban foraging, it still remains difficult to accurately calculate the number of people who use

these wild foods or the exact economic value of the vegetation. One reason for this is that foraging in urban areas is subject to numerous variations. This practice is sometimes undertaken for subsistence purposes, and it is often difficult to set precise boundaries or collect standardized data (Landor-Yamagata et al. 2018). Urban foraging also serves as an additional source of income and a safety net for food insecurity among low-income households and ethnic minorities (Shackleton 2021). In the United States previous research has shown that during the COVID-19 pandemic, low-income households were obtaining food through urban foraging (Sardeshpande et al. 2021). In addition, urban food demand is mainly dependent on supplies from rural areas, and this relationship between urban and rural areas can lead to excessive exploitation of rural ecosystem services (Oncini et al. 2024). At the same time, urban communities can also be a solution to meeting food needs. In addition, food supply in urban and peri-urban areas have the potential to reduce environmental impacts (Oncini et al. 2024).

Environmental Aspects

The potential of urban foraging to contribute to climate change in this section will be discussed in three broad categories: 1) the ability to store carbon in soil and biomass, 2) dietary habits for reducing footprints and mitigating climate change, and 3) creating resilience and adapting to climate change (Oncini et al. 2024).

As urban development progresses, there is a growing momentum to protect the remaining biodiversity in cities. Previous studies around urban foraging have also discussed diverse crops, their uses, biocultural diverse practices, collection as a risk to biodiversity, and ways to protect or increase biodiversity (Oncini et al. 2024). Therefore, there is an implication of a close relationship between biodiversity and urban foraging. According to Fischer and Kowarik (2020), urban foraging is important for enabling the reconnection between humans and nature, and for fostering positive attitudes towards biodiversity conservation.

On the flip side, there have also been discussions on the potential negative impacts urban foraging may have on biodiversity. If a rare species is collected or if the frequency of

native species being collected is too frequent, biodiversity may be put at risk. While some previous studies (Fischer and Kowarik 2020; Schunko et al. 2021) have found no evidence of such effects, the next concern would then be the issue of over-foraging (Fischer and Kowarik 2020). Over-foraging refers to the excessive collection of native species by foragers, and there are concerns about the negative impact this will have on the ecosystem. Finally, there is also debate regarding the potential for collection activities to alter and improve biodiversity. There is, however, a lack of peer-reviewed empirical studies that accurately quantifies this aspect of biodiversity in foraging. At the time of writing, it can be assumed that; foraging and urban food forests still tend to be taken for granted (Oncini et al. 2024).

Administrative Aspects

Despite the usefulness of urban foraging suggested by previous studies, foraging activities are not widely considered in public policy. Regulations vary greatly from city to city and country to country, ranging from explicit prohibitions to management plans that encourage foraging in urban areas to zero regulations at all (McLain et al. 2014). Although excessive collection may have an impact on ecosystems, majority of the previous studies have found that urban foragers behave in a stewardship-like manner (Oncini et al. 2024). According to McLain et al. (2014), large-scale urban park development has occurred in the past, and its management required centralization and specialization. The authority to make decisions regarfing the park and the authority to manage it was transferred to the local government and the park management company. The local government began to regard citizens as users, rather than as managers or co-producers of nature. There are still many unclear points in the law regarding urban foraging, and there is a need for greater transparency in the law and regulations, such as clarifying locations where foraging can take place (Schunko et al. 2021).

The State of Urban Foraging in the Tokyo Metropolitan Area

There are no papers that use the keyword urban foraging to deal with foraging activities in Japanese cities. Although the concept of urban foraging is not consciously used, there are several studies that focus on foraging activities. For example, in environmental folklore and environmental ethics, foraging activities themselves are recognized as minor subsistence. Minor subsistence is a livelihood that is passed down from generation to generation, and often practiced alongside one's main occupation, with little economic significance (Matsui 1998, p.247-268). As existing research focuses on minor subsistence mainly targets farming, mountain and fishing villages, there is little research focusing on urban cities.

In a study by Nagai, Matsuno, and Sawada (1948) on the use of wild plants by elementary school children after World War II, it was reported that the utilization of wild plants was encouraged as a response to wartime food shortages. In the same survey, 84.6% of elementary school children in Tokyo reported having consumed wild plants. However, the study concluded that their use was primarily limited to snacking, ceremonial purposes, and practices based on past experiences, while the use of wild plants as a substitute for vegetables was relatively rare. Furthermore, research related to Edible Landscapes (EL) has included surveys on UF in Tokyo (Kinoshita and Yoshikawa 1999). These examples illustrate that foraging activities in urban areas have persisted since before the war.

In previous research, studies on the practice of UF have been accumulating in various countries; however, the actual conditions of UF in Japan remain insufficiently understood. Based on the limited research conducted on Tokyo and other urban cities, it can be inferred that UF is practiced to some extent in Japanese urban areas. However, there is a lack of concrete data regarding its specific realities, as well as its social, economic, environmental, and administrative impacts.

Given this gap in research, this study aims to investigate the actual conditions of UF in the Tokyo metropolitan area, which includes Tokyo and the three surrounding prefectures: Saitama, Chiba, Kanagawa, as a case study of UF in a global megacity. The research seeks to explore how urban residents engage with nature through UF, examining the diverse forms

of UF practices and shedding light on the various relationships between humans and nature that emerge through these activities. Additionally, this study will assess both the positive and negative impacts of UF and analyze how the experiences gained through UF practice relate to urban green space management. Based on these objectives, this research will address the following objectives:

1. Who is engaged in UF, where does it take place, what resources are being foraged, and through what methods is foraging conducted?
2. How does the practice of UF by urban residents influence the regulatory measures and maintenance strategies of urban green spaces implemented by municipalities?
3. Through urban foraging, how does the relationship between urban foragers and nature evolve over time?

Methods

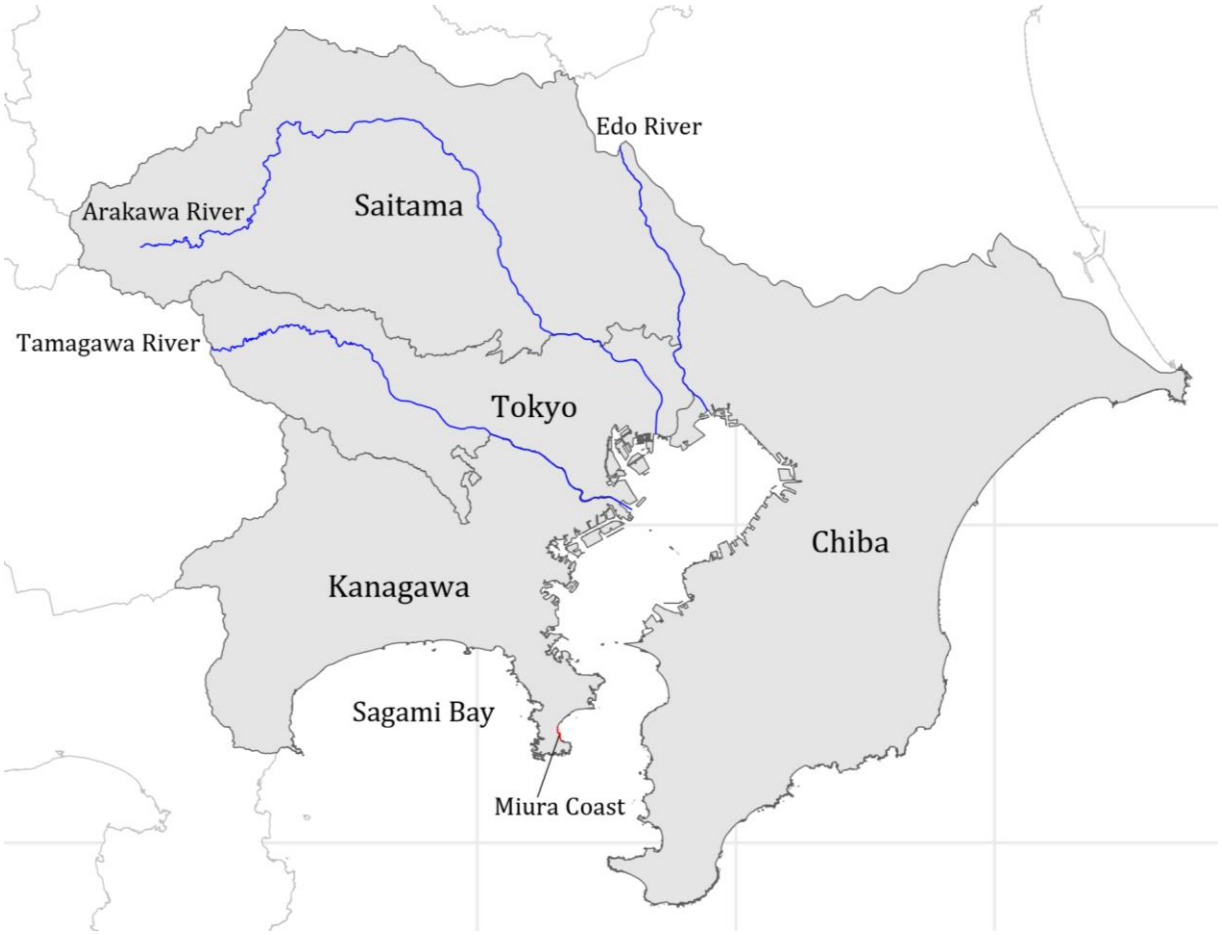
Site Selection

The survey sites of Tokyo, Chiba, Saitama, and Kanagawa prefectures are located in the Tokyo metropolitan area (**Figure 1**). As of July 1, 2024, the population of Tokyo is approximately 14.17 million, the population of Saitama Prefecture is 7.33 million, the population of Chiba Prefecture is 6.27 million, and Kanagawa Prefecture has a population of approximately 9.22 million, bringing the total to approximately 36.99 million (Statistics of Tokyo 2024; Saitama Prefecture 2024; Kanagawa Prefectural Government 2024; Chiba Prefecture 2024). This is equivalent to approximately 29% of Japan's population (Statistics of Bureau of Japan 2024). The total area is approximately 13,570㎢, which is equivalent to approximately 3.5% of Japan as a whole (Geospatial Information Authority of Japan 2024).

In the Tokyo metropolitan area, which is a global urban area, not only are there satoyama and vast forests in the suburbs, but also, depending on the location, there are areas of rich natural beauty, such as the Tama River and the Arakawa River. In terms of the green coverage rate, however, this has continuously declined (Ministry of Land, Infrastructure,

Transport and Tourism 2024). Part of this reason can be attributed to the decrease in the amount of agricultural land, despite green spaces being built in conjunction with and to complement urban development.

Figure 1: The map of Tokyo metropolitan area



Source: Created by the author

Semi-structured Interview

In this study, interviews with 14 men and women in their 20s to 60s who are practicing urban foraging in the Tokyo metropolitan area (TMA) were conducted (7 of whom are foragers and 5 of whom are municipality officials). The interviews were done both in person and online between July 2023 and August 2024. Semi-structured interviews were

used for the interviews. The attributes of the survey participants are shown in **Table 1**. The selection process for the interviewees or key informants was initially done through websites, social networking sites, and emails. Snowball sampling was then used to conduct interviews. For the municipalities, emails requesting interviews were sent to all the wards and cities in Tokyo and main cities in Saitama, Kanagawa and Chiba, and interviews were conducted with those who agreed (**Table 2**). Response to the questionnaire were received from the government offices that could not be interviewed.

Table 1. Attributes of survey participants (Foragers)

No.	Age	Sex	Birthplace/Residence	Interview Date	Method	Foraging Pattern	How to Use
UF1	28	M	TMA/TMA	2024.07.12	Online	Plants, nuts, shellfish, and fish	Eating
UF2	28	M	TMA/TMA	2024.07.09	Online	Plants and fish	Eating
UF3	28	M	TMA/TMA	2024.07.08	Online	Plants, nuts, shellfish, fish	Eating
UF4	Late 30s	M	Local/TMA	2023.9.6, 2024.8.20	Online	Plants, nuts, shellfish fish, animals, and mushrooms	Eating
UF5	Late 30s	F	TMA/TMA	2024.0718	Online	Plants and fruits	Eating
UF6	39	M	Local/TMA	2023.9.28	Online	Plants, nuts, shellfish fish, animal, and mushroom	Eating
UF7	over 65	F	Local/TMA	2024.7.10	Inperson	Plants, nuts, and flowers	Eating, dyeing, and decoration

Source: Created by the author

Table 2. Municipalities in Tokyo that responded

No.	City	Method	Interview Date
T1	Meguro	Online	2024.7.24
T2	Kodaira	Online	2024.7.31
T3	Machida	Online	2024.8.9
T4	Itabashi	Online	2024.7.17
T5	Kokubunji	Online	2024.7.12
T6	Ota	Written Response	2024.7.25
T7	Katsushika	Written Response	2024.8.21
T8	Chuo	Written Response	2024.7.12
T9	Adachi	Written Response	2024.8.16
T10	Nerima	Written Response	2024.8.20
T11	Tama	Written Response	2024.7.18
T12	Higashiyamato	Written Response	2024.7.11
T13	Musashino	Written Response	2024.8.6
T14	Mitaka	Written Response	2024.8.2
T15	Hino	Written Response	2024.7.17
T16	Kiyose	Written Response	2024.8.14
S1	Saitama	Written Response	2024.8.11
S2	Kawagoe	Written Response	2024.8.16
S3	Tokorozawa	Written Response	2024.8.6
S4	Ageo	Written Response	2024.8.31
S5	Kumagaya	Written Response	2024.8.9
K1	Yokohama	Written Response	2024.8.25
K2	Kawasaki	Written Response	2024.8.18
K3	Fujisawa	Written Response	2024.8.26
K4	Yokosuka	Written Response	2024.8.31
K5	Sagamihara	Written Response	2024.8.20
C1	Chiba	Written Response	2024.8.28
C2	Funabashi	Written Response	2024.8.14
C3	Matsudo	Written Response	2024.8.11
C4	Ichikawa	Written Response	2024.8.6

Source: Created by the author

For the interviews with foragers, a protocol based on previous research was followed, with interviews conducted from four perspectives: social, economic, environmental, and government. The government interviews primarily focused on responses to foraging. Each interview lasted between 15 minutes and 2 hours. Most interviews were recorded as audio files and fully transcribed in Google Documents.

In addition, participant observation was conducted with UF4 in March 2024 and UF7 in June 2024. The field notes taken at that time are also included in the results.

Results

What, Where and How They Forage?

This chapter examines the reality of UF practices in the Tokyo metropolitan area by clarifying "what is foraged, where, and how." The results of this study are not exhaustive, and similar to previous research, it was not possible to identify a typical urban forager. However, this study confirmed that even within the Tokyo metropolitan area, urban foragers exhibit significant diversity in terms of age, gender, social class, place of origin, income, and occupation.

In analyzing the species collected by the interviewees, notable differences were observed between UF1, UF3, UF4, and UF6 compared to the other interviewees. The collected species were primarily identified based on interviews, but it should be noted that UF1, UF3, UF4, and UF6 actively update YouTube channels and blogs related to UF, and their online content was also referenced. Additionally, it is possible that interviewees did not recall all collected items during the interviews, and thus, some may not be reflected in the data.

UF1, UF3, UF4, and UF6 engage in a diverse range of UF activities, including not only fishing and shellfish collection but also hunting (**Table 1**). Their foraging frequency ranges from two to three times per week to approximately twice per month. Notably, UF1 and UF3 are friends and conduct most of their UF activities together, resulting in similarities in the species they forage. In addition to commonly consumed species such as mugwort, wild leek,

ginkgo, and loquat, they also collect less commonly eaten species. Their fishing and shellfish collection activities extend beyond the Tokyo metropolitan area, particularly to Tokyo Bay and the Miura Coast. Regarding hunting, they occasionally target raccoons and palm civets—both designated as harmful animals in Tokyo—primarily conducting their activities in the mountainous areas of Chiba and Saitama prefectures.

Conversely, other interviewees primarily collect species traditionally used as edible wild plants, with a relatively lower frequency, ranging from once per month to once per season. The analysis of UF patterns in **Table 1** revealed that interviewees who engage in UF more frequently tend to participate in time and cost-intensive activities such as fishing, mushroom gathering, and hunting. However, no participants were found to forage daily or rely on gathered items for most of their diet. Most interviewees engage in UF as a hobby, and the quantity collected per outing is typically limited to one or several meals.

The UF activities of the interviewees were highly diverse, with reported collection sites including rivers, coasts, mountains, satoyama (undeveloped woodlands near populated areas), urban parks, open spaces near their homes, gardens, and farmland. Notably, frequent mentions were made of UF activities along the Tama, Arakawa, and Asakawa riverbeds, in urban parks, and on Miura coast, indicating that these locations serve as key UF sites.

Fieldwork was conducted with UF4 and other urban foragers to examine UF activities in rivers and urban parks. The river fieldwork took place on March 24, 2024.

For the river fieldwork, UF4 and others selected a site based on three criteria: (1) being an urban location, (2) having a maintained environment conducive to foraging wild plants, and (3) maintaining a hygienic environment. Based on these considerations, they chose the Asakawa River (**Figure 2**). The riverbed area is situated in a quiet residential neighborhood that, despite being within the city, retains a suburban atmosphere.

Figure 2: The map of Asakawa River

Source: Created by the author

On the fieldwork day, participants gathered at the station near the Asakawa Riverbed and proceeded toward the river. The 10-minute walk to the riverbed yielded findings of Japanese parsley along the way. Upon arrival, they crossed stepping stones to access a sandbank where they collected mustard greens, rape blossoms, chickweed, Japanese parsley, sow thistles, and daylily. While checking the flavors of rape blossoms and mustard greens by tasting them raw, they refrained from swallowing them due to concerns about potential bacterial contamination. During breaks, participants exchanged ideas about cooking methods and discussed the physical effects of consuming excessive amounts of certain plants.

The fieldwork also revealed interactions between interviewees and other urban foragers. UF4 initiated a conversation with a couple picking rapeseed flowers, who revealed that it was their first time foraging. Later, we encountered the group of a large gathering of Chinese individuals collecting wild leeks in bulk. Conversations indicated that they were foraging for personal consumption. The volume of wild leeks collected was substantial, with six or seven large plastic bags filled.

During discussions, UF4 emphasized that UF is "a new way of connecting with nature" and "a process of discovery—like realizing, 'This is how you eat it!'" UF in urban environments, he noted, is not merely about gathering ingredients but also about engaging with new aspects of nature and diverse food cultures.

The primary use of collected species among urban foragers is food, with a few instances of non-food-related applications. This study did not yield any findings of hunting-related foods being used for purposes other than food, while wild plants and fruits were occasionally used in non-culinary ways.

How they acquire UF knowledge

The interview results revealed that interviewees primarily acquire knowledge through social media, picture books, UF communities and the internet. While knowledge transmission occurs intergenerationally and within local regions, there is considerable diversity in how urban foragers acquire and share information.

UF1–UF6 mainly relied on social media platforms such as YouTube, picture books, information exchange with friend, or personal empirical knowledge. Specifically, UF3 stated:

> "We look things up together when we chat. Basically, we share knowledge with each other rather than being taught. There are a lot of things we already know. We study spontaneously… We don't attend study groups, but since we're all friends, we manage on our own." (UF3)

While social media has facilitated knowledge dissemination, it has also introduced risks, such as unregulated UF by individuals with insufficient expertise. UF4 and UF5 expressed concerns regarding the environmental impact of information sharing on social media:

> "If you post about where you forage online, people will flock there. That's why I don't share locations on the internet. Some people have bad manners, leaving trash behind or damaging the site, which leads to foraging restrictions." (UF4)

> "I'm not in favor of posting about foraged foods on social media. In the past, children learned these things naturally from their grandparents or local fishers. Now, people who don't truly understand foraging are spreading half-baked knowledge." (UF5)

These findings highlight the complexities of knowledge transmission among urban foraging, balancing knowledge-sharing benefits with concerns about environmental and social consequences.

Change in Consciousness of Nature among Urban Foragers

The ways in which interviewees perceive and develop awareness of nature exhibit distinct patterns. Two primary patterns were observed regarding the sequence in which awareness of the natural environment emerged. In one case, an interest in nature preceded the initiation of UF practices, while in the other case, awareness of nature was enhanced as a consequence of engaging in UF activities. The former case corresponds to practitioners UF4 and UF5. For instance, UF provided the following reflections:

> "I believe my interest in nature has significantly expanded. Engaging with nature directly, I have come to recognize the intricate balance between diverse flora and fauna. While such ecological principles are taught in textbooks, they are truly internalized only through direct experiences in natural settings. My initial interest in the environment was modest, but it has deepened through foraging and consuming wild species." (UF5)

Conversely, most of the interviewees reported an increase in environmental awareness as a direct result of their engagement in UF. For instance, UF1 remarked on the reproductive capacity of invasive species, while UF3 developed a heightened sensitivity to changes in ecological cycles. UF7 noted that plants teach her environmental changes, offering valuable insights into ecological dynamics:

Some interviewees acknowledged the limitations of individual efforts in addressing large-scale environmental issues such as climate change and biodiversity conservation, occasionally expressing a sense of powerlessness. However, others, such as UF4, recognized the importance of local conservation efforts within their immediate foraging areas, leading to tangible actions:

> "While individual actions may not generate large-scale environmental change, they influence the sustainability of personal foraging practices. Understanding ecological shifts and the movement of species has prompted me to reassess how I approach foraging to ensure its continued viability." (UF3)

Moreover, some interviewees emphasized an intuitive connection to nature through food. This experiential bond deepened their sense of gratitude and appreciation for natural cycles:

> "Before engaging in UF, I did not actively perceive nature. My observations were limited to broad categories such as 'grass' or 'the sea.' However, through UF, I began distinguishing between native and non-native species and assessing their edibility and culinary potential. These insights have transformed my emotional responses to nature, bringing joy upon encountering certain plants and concern when they are absent." (UF4)

The above findings demonstrate the diversity in environmental awareness among interviewees, shaped by their unique backgrounds and experiences. In some instances, environmental consciousness predated UF practice, while in others, UF served as a catalyst for deeper ecological engagement. This heightened awareness manifested in various ways, including increased sensitivity to climate fluctuations, invasive species proliferation, and ecological changes. Some practitioners translated this awareness into conservation efforts within their foraging areas, while others sought sustainable approaches to foraging that balanced personal enjoyment with ecological stewardship.

Legal Regulations on Urban Foraging

In many municipalities, UF activities are prohibited under local park regulations. These prohibitions are generally based on the Urban Parks Law and related legal frameworks. Most local governments explicitly prohibit the collection of plants and fruits within parks. However, exceptions exist; for instance, Mitaka City and Tokorozawa City do not explicitly prohibit plant collection in their park regulations. Nevertheless, Mitaka City effectively restricts UF by stating that "Picking for personal purpose is not permitted."

Historical records suggest that local governments may have referenced national guidelines when formulating urban park regulations. For example, Tama City officials indicated that the enactment of urban park bylaws was influenced by national policy directives. Several justifications have been provided for prohibiting UF in parks. First, the use of public land for private gain is deemed inconsistent with principles of public land

management. Additionally, vegetation within government-managed land is considered municipal property, and collection is generally restricted unless justified by public interest. Concerns over food safety, including risks of food poisoning and unauthorized commercial resale, further reinforce these regulations. Lastly, from an ecological perspective, restricting plant collection serves to protect biodiversity and maintain park functions.

Nevertheless, certain municipalities adopt a more flexible approach. In Katsushika Ward, small-scale plant collection for ornamental purposes is permitted within reasonable limits. Similarly, Mitaka City allows children to collect plants for play or exploration. In Nerima Ward, local authorities offer case-by-case guidance, permitting the collection of fallen fruits and seeds within common-sense boundaries.

Interviews with interviewees revealed diverse perspectives on legal regulations governing UF. While many urban foragers acknowledge the legitimacy of park regulations and the principle that public spaces should not be privatized, their adherence to these rules varies. For example, UF5 consciously avoids foraging in private spaces but is more active in public spaces. Additionally, UF3 and UF6, who share UF-related content on social media, exhibit heightened legal awareness and take precautions in their public communications. Some urban foragers also expressed concerns regarding governmental management of green spaces, particularly the frequent mowing of vegetation and the use of herbicides. UF7 questioned the rationale behind municipal grass-cutting practices:

> "I wonder what those responsible for mowing actually think about it. Are they merely following orders, or do they consider ecological impacts?" (UF7)

From these findings, it is evident that interviewees hold diverse views on legal frameworks and the management of public spaces. While some strictly adhere to regulations, others adopt more flexible interpretations. Additionally, practitioners who disseminate information publicly tend to be particularly mindful of legal considerations.

Discussion

The results of the above survey provide a glimpse of the complex situation of urban foraging in the Tokyo metropolitan area. As we were unable to clarify the economic aspects of urban foraging in this survey, we will discuss the characteristics and issues of urban foraging from three perspectives: social aspects, environmental aspects, and administrative management and regulations.

Discussion 1: UF Sites and the Formation of Ethical Awareness among Urban foragers

Based on the results of this study, it has been found that interviewees predominantly engage in UF in public spaces such as rivers and urban parks. The interviewees demonstrated a strong tendency to avoid foraging on private land, in contrast to rural areas where foraging on common land and even private property is often permitted under traditional rules (Forestry Agency 2004). While national and quasi-national parks, nature reserves, and prefectural natural parks are subject to legal restrictions on foraging, just as in urban areas (Yamagata Prefecture 2024; Niigata Prefecture 2021), rural regions exhibit a distinct practice of communal land use for foraging. This difference highlights a fundamental contrast between urban and rural foraging activities: whereas rural foraging practices are governed by long-standing traditional rules, urban land use is regulated primarily through governmental laws and policies.

In rural areas, these traditional rules have been shaped by historical and communal traditions and have been implicitly passed down among residents. However, UF does not necessarily function within such autonomous frameworks of agreement. While conflicts may arise in rural settings despite the existence of traditional norms, UF lacks publicly recognized communal guidelines beyond formal legal regulations. Nevertheless, as indicated by the interview findings, urban foragers have begun to form their own ethical norms and codes of conduct. This emerging ethical framework appears to stem from concerns regarding resource depletion due to excessive foraging and the degradation of foraging sites. Additionally, urban foragers have expressed apprehension about the ease with which

inexperienced individuals can engage in foraging through information disseminated on social media.

One initiative aimed at mitigating environmental degradation caused by UF is the targeted harvesting of invasive species. Urban areas tend to harbor a higher proportion of invasive species, as they provide favorable conditions for their proliferation and experience high human traffic, which facilitates their introduction (Tsuchiya , Saito, and Hironaka 2013). Compared to their rural counterparts, urban foragers in urban environments are likely to encounter invasive species more frequently. Many urban foragers advocate for the protection of native and endemic species while adopting a strict stance against invasive species. This attitude is exemplified in their practice of actively utilizing invasive species under the principle of "if it is edible, consume it extensively." Such practices suggest a potential contribution to biodiversity conservation. However, it is important to note that the primary motivation behind these actions is not necessarily biodiversity conservation per se, rather factors such as palatability and the improvement of foraging site biodiversity.

Discussion 2: The Transmission and Transformation of Foraging Knowledge

UF practices involve the rediscovery of traditional foraging knowledge. Many interviewees had prior exposure to regional food cultures during childhood and had experienced eating wild edible plants as part of their daily lives. Although such experiences are typically forgotten in urban settings, UF serves as a means for urban foragers to revisit and reaffirm these memories and knowledge.

Moreover, the proliferation of the internet has enabled the widespread dissemination of foraging-related information. Individuals can easily access data regarding the palatability of various species and appropriate cooking methods. This has facilitated the excavation of foraging knowledge through online resources, aligning with the growing significance of social media and online communities for urban foragers.

Urban foragers who seek to supplement their foraging knowledge often rely on the internet and social media. Contemporary technological advancements have made it easier to obtain information about species identification, distinguishing characteristics, and

necessary precautions. However, according to the interview findings, knowledge acquired through images, videos, and text remains inferior to hands-on experience. Consequently, there is a growing emphasis on experiential learning through direct interaction with foraged materials - "seeing, touching, eating, and learning."

Furthermore, urban foragers who actively disseminate information via social media (such as UF1, UF3, UF4, and UF6) play a crucial role in promoting ethical UF practices. However, the increased accessibility of foraging knowledge via social media also facilitates the entry of individuals with insufficient experience or expertise. This has contributed to a rise in foraging and fishing activities, which, in turn, has led experienced urban foragers such as UF5 to express concerns about the sustainability of these practices.

Discussion 3: The Relation between Urban Foragers and Nature

Not all urban foragers necessarily perceive a strong connection with nature. However, some urban foragers recognize their relationship with urban nature through the act of "eating." Eating is a fundamental and embodied activity, and UF4, for instance, noted that engaging in UF has altered their perception of the natural landscape. This suggests that while industrialized and economically driven urban environments are dominated by artificial structures and exhibit a weaker connection to nature compared to rural areas, the act of eating can serve as a medium through which individuals recognize their continuity with the surrounding natural environment. Furthermore, as Kashio (2018, p199-222) pointed out, the act of eating foraged ingredients obtained through UF involves the deliberate selection of species, a process that inherently entails exploration. Through both conscious and unconscious exploration in daily life, UF practitioners' vague categorizations of "grass," "nuts," or "animals and fish" transform into more detailed and specific perceptions, such as "wild garlic," "ginkgo nuts," and "American catfish."

Additionally, UF provides urban foragers with a direct and tangible awareness of the environmental impact of their foraging activities, fostering an immediate and concrete relationship with the environment. This experience contributes to an increased awareness of pollution and safety concerns, leading practitioners to perceive environmental

degradation as a personal issue. Beyond making environmental problems more salient, UF also emphasizes seasonal and cyclical patterns within urban settings, as noted by Matsui (1998). Interview findings suggest that urban foragers develop a deep understanding of these cycles by repeatedly visiting the same locations. As a result, they become more acutely aware of disruptions in natural cycles, particularly those caused by recent climate change.

Discussion 4: Urban Foragers and Municipalities

At present, UF activities conducted by urban residents are not officially sanctioned from a public policy perspective, nor do they exert direct influence on government regulations governing land use. However, urban foragers may have a certain degree of influence on the maintenance and management of green spaces. Given their frequent interaction with foraging sites, they are highly attuned to environmental changes and demonstrate a commitment to preserving these locations. This suggests that urban foragers have the potential to propose management strategies that are tailored to the unique characteristics of their foraging environments, in contrast to the uniform land management policies implemented by government authorities.

For instance, areas that are considered weeds by municipal authorities may serve as valuable sources of edible plants for urban foragers. Similar to previous studies (McLain et al., 2014), the findings indicate that reconsidering a blanket approach to vegetation control and adopting a more context-sensitive management strategy could be beneficial. By incorporating the environmental awareness and expertise of Urban foragers, a sustainable model for urban green space management could be developed. However, there are currently no established criteria for distinguishing knowledgeable Urban foragers from those who lack sufficient expertise. Thus, methods for identifying Urban foragers who can effectively collaborate with public authorities must be explored.

Conversely, the expansion of UF presents several challenges. Notably, the risk of environmental degradation due to improper foraging techniques, lack of adherence to ethical norms, and insufficient knowledge regarding target species cannot be overlooked. For example, practitioners who cannot distinguish between native and invasive species may

inadvertently harvest rare or protected species. Furthermore, although not extensively examined in this study, interviewees reported cases where foreign residents engaged in excessive foraging, potentially exacerbating ecological disturbances. Such concerns are among the reasons why authorities have imposed restrictions on foraging activities.

Additionally, UF practices must consider the potential toxicity of harvested species. The increasing popularity of UF may lead to food poisoning incidents among individuals who lack adequate knowledge of toxic plants and fungi. Furthermore, excessive foraging may provoke conflicts with local residents, raising concerns about community tensions. To mitigate these risks, it is imperative to establish not only legal regulations but also ethical standards and self-regulatory measures among Urban foragers themselves.

Limitation

There were several limitations to this study. For instance, the use of snowball sampling prevented an in-depth analysis of differences in UF practices based on gender and social attributes. Additionally, this study did not sufficiently examine UF practices among homeless individuals and foreign residents, nor did it adequately address the commercial aspects and issues related to overexploitation. Furthermore, given the characteristics of the interviewees, the findings cannot be considered fully representative of the diverse UF practices within the Tokyo metropolitan area. A more comprehensive investigation is needed to capture the variations in UF practices across different age groups and locations. Based on these limitations, future research should aim to elucidate UF practices across diverse demographic and socio-economic groups, as well as explore the various forms that UF takes in urban environments.

Conclusion

This study aimed to elucidate UF practices in the Tokyo metropolitan area and examine the relationship between urban foragers and nature. To achieve this, interviews were conducted with urban foragers and municipalities, focusing on social, economic, environmental, and administrative aspects. The findings revealed that urban foragers exhibit diverse social and economic attributes, confirming, as in previous research, the absence of a singular, typical urban foragers profile. The foraged items included not only traditionally consumed plants and fruits in Japan, such as mugwort, loquat, and ginkgo nuts, but also invasive species like goldenrod and American catfish. Moreover, UF practices were conducted in a wide variety of locations. The acquisition of UF-related knowledge was facilitated through social media, the internet, workshops, and events.

Engaging in UF heightened foragers' awareness of the natural environment, with some individuals taking personal initiatives to maintain foraging sites. However, many expressed a sense of helplessness regarding broader environmental issues such as climate change and biodiversity conservation. At the same time, some urban foragers reported that consuming foraged foods deepened their connection to nature, allowing them to perceive the vitality of the natural world. While UF is not officially sanctioned by public authorities due to concerns regarding public safety and urban land use regulations, foraging within certain boundaries—such as avoiding disruption to landscapes and ecosystems—is often informally tolerated. Consequently, the legal and public space dynamics surrounding UF practices remain complex and variable.

The findings of this study suggest that, similar to previous research, the diverse practices of UF contribute to the formation of ethical awareness and indicate the potential for site-specific environmental management. Additionally, this study highlights an aspect that has been insufficiently addressed in prior research: UF plays a role in rediscovering knowledge related to foraging. Notably, the active utilization of invasive and underutilized species beyond traditional food sources may contribute to biodiversity enhancement.

Moreover, the embodied experience of consuming foraged foods fosters heightened sensory awareness among urban foragers.

Building on these findings, future research should expand its scope to include a more diverse range of urban foraging, further elucidating the social, cultural, and ecological significance of UF in urban settings.

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