Agriculture and Human Values (2024) 41:647–659
https://doi.org/10.1007/s10460-023-10506-7

Chinese food self-provisioning: key sustainability policy lessons hidden in plain sight

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Accepted: 26 August 2023 / Published online: 14 September 2023

Abstract
Drawing on an exploratory study of urban food self-provisioning (FSP) in China, this article argues that progress in sustainability scholarship can be accelerated by embracing a greater diversity of framings of sustainability. It brings four important empirical findings concerning the prevalence of Chinese urban FSP, the social diversity of its practitioners, their primarily non-economic motivations, and production methods meeting the criteria for organic food that are deployed by more than a third of urban food growers. On this basis, the article highlights the importance of greater attention to identifying and valuing 'already existing sustainability' in non-Western contexts, rather than privileging Western conceptualizations of sustainability that promise sustainability innovation in the future.

Keywords Alternative food networks · China · Food self-provisioning · Innovation · Maintenance · Sustainability

Introduction

The growing urgency of the need to propose responses to 'the continuing dramatic loss of species and their habitats—the biodiversity crisis—compounded as it is by the accumulating impacts of climate change' (RGS, RSGS and IGU 2021)[1] increasingly compels sustainability researchers to consider unconventional lines of thought. In the mainstream understanding of sustainability, sustainability gains are intrinsically associated with and dependent on the processes characterized by multiple and diverse meanings of positively valorized notions of *novelty* and *creativity*. These include *future-oriented* capacity building, ecomodernist technological innovation, civic participation and mobilization based on learned intentionality, and utilizing digitally enhanced communication and networking (Pandey et al. 2022; Seyfang 2006; Ferenčuhová 2021; Van der Straeten 2022)—processes whose combined power is deemed capable of sparking and facilitating the implicitly future-oriented *transition* to sustainability (Prost et al. 2023).

Although the mainstream notion of sustainability is typically perceived—by experts, policy makers, and activists alike—as value-neutral and universally valid, it 'should be understood as an outcome of a particular developmental trajectory deeply embedded in the social, political and economic contexts of western European and North American histories' (Mincyte 2011, p. 112). Central to this notion of sustainability are 'metrics, indicators and corporate eco-labelling' (Gillette and Vesterberg 2022, p. 249) and approaches based on market relations. The promotion of and transition towards sustainability are predicated on the

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[1] This joint declaration, signed by 79 geographical societies from 58 countries, including China, Czechia, and the UK, calls on the global community to urgently address the global climate and biodiversity crises.

importation and adoption of this formalized model of sustainability to non-Western parts of the globe (Marsden and Murdoch 2006).

To complement the dominant understanding of achieving sustainability through the adoption of actively and reflectively developed and implemented innovative processes of Western provenance, in this article we propose two interrelated changes to the perspective from which to consider sustainability.[2] The first change calls for extending the notion of sustainability to include what we call *already existing sustainability-compliant practices.* The second change proposes to diversify the notion of sustainability by drawing on findings about these practices from research in the Global South. The first change means, following Elizabeth Barron's argument (2020, p. 186), that we need to look for sustainability in the present, 'rather than focusing on creating it or simply waiting for it to emerge, in the future'. To our knowledge, this is a rarely considered—and yet, socially and materially hugely significant—aspect of global sustainability. We choose the term 'already existing sustainability' deliberately to refer to practices that are compliant with principles of sustainability and that are long-established and socially embedded. An example of these practices that is at the centre of this article is household food production or home gardening (Smith and Jehlička 2013; Jehlička et al. 2013; Ančić et al. 2019; Pungas 2019, 2020 and 2022; Daněk et al. 2022).

While market-based food practices commonly understood by practitioners and investigated by scholars as sustainable—such as community-supported agriculture (CSA), farmers' markets, and organic food box schemes—arguably also 'already exist', they tend to be niche, emerging, socially elitist, precarious, and in need of external support (Sonnino and Griggs-Trevarthen 2013). They hold a promise to deliver more robust sustainability benefits in the future, after achieving greater diffusion and/or scale. These market-based food alternatives are typically associated with innovation and creativity. Informal food practices such as household food production lack this association (although in reality they are not static, but constantly evolve in response to knowledge sharing and incremental innovations) and can be seen as an example of what Jan van der Straeten (2022, p. 155) calls, in the context of sustainability debates in the Global South, 'sustainability's other'. To us, the key difference between 'novelty-related' and 'already existing sustainability' is that, in order to bring wider sustainability benefits, the former relies on creating and diffusing new practices, while the latter is already achieving this objective.

The tendency in mainstream sustainability scholarship to valorize difference, novelty, creativity, and innovation positively seems located within a wider context of the popularity of theories of difference in the last century and the current neoliberal prioritization of innovation (Domínguez Rubio 2020). Historically, as Fernando Domínguez Rubio (2020, p. 37) reminds us, this relates to the fact that, in Western thought, 'the practices of maintenance […] have been traditionally dismissed for being reproductive, mechanical, and dull, if not alienating, degrading, and unworthy'. As a result, in the specific field of sustainability scholarship, informal practices have historically been marked by the (implicit) inclination to devalorize maintenance as 'merely reproductive' (Zhu et al. 2020; Domínguez Rubio 2020, p. 37) and hence unworthy of attention. On the other hand, the formal, market-based food alternatives [often referred to as alternative food networks or AFNs, a term coined by Terry Marsden (2000)] are valorized positively and associated with transformative potential.

Applying Domínguez Rubio's (2020, p. 39) distinction between the 'production of the new' and the 'production of the same' (i.e., reproduction) to the area of food practices, the former relates to AFNs and the latter to informal, non-market food practices such as household food production. In this article, in a move similar to Domínguez Rubio's call to emancipate the production of the same—maintenance practices—from their invisibility and association with repetition, exhaustion, and lack of creativity, we propose to recast informal food practices as important and valuable from the perspective of sustainability—both materially and as a topic of scholarly attention.

In keeping with the growing body of work on home gardening, in this study we use the term food self-provisioning (FSP) to refer to this practice (Smith and Jehlička 2013; Smith et al. 2015; Piras and Botnarenco 2018; Vávra et al. 2018b; Yotova 2018; Ančić et al. 2019; Decker 2019; Goszczyński et al. 2019; Pungas 2019 and 2022; Gibas and Boumová 2020; Piras 2020; Sovová and Veen 2020; Jehlička et al. 2021; Svobodová et al. 2021; Šiftová 2021; Vávra et al. 2021; Suomalainen et al. 2023). FSP can be understood as growing one's own food using one's own (predominantly nonmonetary) resources (de Hoop and Jehlička 2017, p. 811) and is defined, more specifically, as a 'set of social practices outside the market economy that involves the production of food by non-farming households in residential gardens, on allotments and in collective (often urban) gardening projects which is, in many cases, accompanied by the non-monetized sharing of gardening produce in networks transcending the household' (Jehlička 2021, p. 1231). In this sense, FSP does not include food production by 'farmers whose entire or

[2] In this article, by 'sustainable food alternatives' we understand initiatives, practices, and behaviours that epitomize a response to the detrimental environmental and social effects of industrialized agricultural food production by re-localizing and re-embedding food production in social networks and by limiting its environmental impacts. However, we advocate for a broad definition that allows for both market and non-market approaches, formal and informal, top-down and bottom-up, emerging and already existing.

major part of production is intended for the market' (Daněk et al. 2022), but is rather equated with productive gardening.

As a form of localized food production, FSP delivers environmental benefits sought by more conscious, yet often market-based, AFNs (Sovová et al. 2021; Vávra et al. 2018a). Although FSP practitioners are rarely motivated environmentally (Smith and Jehlička 2013; Daněk et al. 2022), in terms of environmental indicators, the contribution of FSP to sustainable food provisioning is well documented. The low use of fossil-based inputs together with short distances between production and consumption sites lead to reduced CO_2 emissions for homegrown food compared to conventional agriculture (Vávra et al. 2018a). In many cases, FSP is accompanied by the closing of nutrient cycles and circular waste management through composting (Vávra et al. 2021). Food produced in the context of FSP often conforms to or even exceeds the criteria applied to organic food. Organic food standards allow the use of only organic fertilizers and rule out many types of pesticides. While FSP practitioners often produce food that complies with these criteria, although without certification (for example, both in Poland and Czechia around half of the populations are gardeners, and a quarter [Poland] and about a fifth [Czechia] of them produce this non-certified organic food; Smith et al. 2015), in many cases they go further. FSP is usually an ultimate variant of food relocalization, as 'food miles' of FSP tend to be low or none.[3] At the same time, these environmental benefits are closely intertwined with the social and economic aspects of FSP (Vávra et al. 2021; Sovová et al. 2021), as the associated widespread food-sharing networks strengthen social bonds (for example, 61 per cent of Czechs receive gifts of home-grown food) (Jehlička and Daněk 2019; see also Pungas 2019; Šiftová 2021; Smith et al. 2015; Vávra et al. 2018a; Vávra et al. 2021). To summarize, although the degree to which FSP practices deliver sustainability benefits varies, much food produced and distributed through these informal practices exceeds organic food requirements. Importantly, existing scholarship shows that, in many societies, FSP practices are widespread and performed by a third or half of the population (Alber and Kohler 2008; Jehlička et al. 2018). Even though not all FSP practitioners produce food in sustainable ways, the overall amount of food thus produced is significant and often exceeds volumes of commercial organic food production (Jehlička et al. 2012).

The second change of perspective that we propose is to consider the importance of already existing sustainability on the basis of research conducted in the Global South—in places that are 'peripheral to the global network of academic knowledge production' (Roast 2022, p. 403). Drawing on existing scholarship on FSP and sustainability from several European countries cited above, we sought to take this research to a new level. We chose to explore the situation regarding FSP and sustainability in China, a populous Global South country with far-reaching aggregate environmental impacts,[4] but also practices that represent leadership in terms of protecting 'quiet sustainability' practices (Smith and Jehlička 2013). This is a novel undertaking. The extant literature conceptualizes garden food production in China primarily as occupying ambiguous spaces in relation to contestations between rapid urbanization processes and modern urban governance on the one hand, and past-related economic informality on the other hand (He et al. 2018; Zhu et al. 2020; Roast 2022). Other—sustainability-related—conceptualizations have so far remained outside the focus of studies on Chinese FSP.

As the first step in this undertaking, we need to determine the degree to which FSP practices in China resemble or differ from current general knowledge on this topic. In this article, we build towards this by discussing the wider Chinese domestic policy context that affects these practices as well as the international academic context in which they are researched. We then proceed to outline the methods and limitations of data collection and analysis during our research in China. This enables us to present insights into the prevalence of FSP in China and the social background and motivations of its practitioners, and also into the ways this food is produced and distributed. Our findings—presented in our discussion—show that the results are strikingly similar to what has been discovered elsewhere (Vávra et al. 2018a; Jehlička et al. 2019 and 2021; Pungas 2019; Piras 2020). This enables us to take the next step—to lay out, in our conclusion, the implications of these findings concerning more general sustainability debates and to argue for the need to extend our understanding of sustainability by considering what we term 'already existing sustainability'.

Approaches to sustainability and food alternatives in China in policy and academic research

The official Chinese interpretation of sustainability is a top-down process that infuses the globalized, Western-originating concept of sustainable development with the legacies of traditional Chinese thinking, Marxist collectivist values, and the neoliberal approach of individualism (the Chinese concept *suzhi*, often translated as 'human quality') (Liu et al.

[3] For example, only 15 per cent of Czech gardeners travel to their garden by car, while 65 per cent do not need to travel at all, as the garden is next to their house, and the remaining 20 per cent walk or travel there by bike or public transport (de Hoop and Jehlička 2017).

[4] It should be noted, however, that Chinese per capita negative effects concerning sustainability are significantly lower than those of Western societies (Global Footprint Network no date).

2018). The official Chinese variant of sustainability borrows heavily from the dominant Western approach to sustainability, as both the individual in terms of *suzhi* and socialist markets have an important role to play in sustainability projects. However, there are also important differences, as the contribution of grassroots participation and ecological citizenship are not seen as important (Pow and Neo 2013). Nevertheless, despite these specificities, the official Chinese concept of sustainability shares with the dominant globalized discourse the implicit future-related temporality, as the term refers to a vision that is in the making, that is yet to fully emerge, and that is linked to modernization and social progress.

'Ecological civilization' is a term that denotes this official discourse of sustainability as a guiding vision for societal development in China. At the practical level, it refers to 'establishing sustainable production and consumption patterns, to achieve human–human, human–nature and nature–society harmony, emphasizing the interdependence, mutual reinforcement and coexistence of human society and the natural environment' (Liu et al. 2018, p. 744). Based on discourse analysis of 705 articles in the Chinese-language *People's Daily* in 2015, Chen Liu and colleagues identified central components of the official Chinese construction of sustainable development. These include a blend of traditional Confucian and Taoist thinking about the harmony between human and nature, which places 'political unity, social stability and the integration of human society and nature' (Liu et al. 2018, p. 742) at the centre of the ecological civilization vision. This Chinese interpretation of sustainable development also includes clean economic growth that is closely related to the goal of poverty reduction. This, in turn, is seen as a way of achieving the key objective of Chinese modernization visions: to secure social harmony (Li et al. 2016).

Accordingly, what are typically considered food-related sustainability initiatives take the form of market-based projects that draw on concepts and models imported from the West, such as farmers' markets and CSA. These projects are often located within the framework of the concept of the eco-city (*shengtai chengshi*) which, according to Guo (2003, cited in Pow and Neo 2013, p. 2263), 'represents the apotheosis of China's pursuit of green civilization' as it 'promises economic progress, social stability and ecological protection of living habitats'. Examples of these projects include the 'Qianwei ecological village' in Dongtan, Shanghai, 'an idyllic getaway for streams of urban middle-class residents […] partaking in organic farming activities, village homestays and leading what is being promoted as a 'happy farmer's lifestyle'' (Pow and Neo 2013, p. 2271).

In this context, non-commercial, low-tech FSP invites associations with poverty and hardship. It evokes the notion of gardening as a response to economic need rather than conveying the notion of a modern, developed welfare society (Daněk et al. 2022). Furthermore, in the sphere of public policy, it is difficult to reconcile FSP with dominant ideas about modern agriculture, innovative food production methods and management, novel food marketing techniques, consumer choice, and the Chinese government's approach to public policies, which is characterized by 'technological managerialism' and 'broader scientism' (Si et al. 2015, p. 308).

However, the tendency to overlook sustainable informal food practices in China at the policy level is also reflected in international scholarship on Chinese food alternatives that focuses on AFN models imported from the West: CSA, farmers' markets, buying clubs, and recreational garden plot rentals (Si et al. 2015; Martindale 2021). Although no accurate data on the scale of these alternatives in China are available, researchers working in this area suggest that the number of these initiatives is very small. For example, in 2011, it was estimated that the number of CSA farms in China was just over one hundred (Gale 2011). And yet, it was these food innovations rather than the widespread, everyday practice of FSP that attracted scholarly attention. Thus, the extant scholarship on food alternatives in China remains heavily skewed towards the formal, market-based AFNs (farmers' markets and community-supported agriculture schemes in particular) and towards 'emerging innovations' such as community gardens. A brief search of article abstracts in the Social Science Citation Index of the Web of Science database conducted on 11 August 2022 using different combinations of keywords revealed the following numbers of articles:

- China + farmers' market* 18
- China + community garden* 13
- China + community-supported agriculture 8

In contrast, there were no article abstracts containing the word 'China' in combination with 'household food production' or 'food self-provisioning'. The search yielded seven articles with 'China' and 'home garden*' in their abstracts, but these articles did not relate to household food production.[5]

These are remarkable results, given the paucity of market-based AFNs in China on the one hand and the omnipresence of informal household food production in the countryside on the other (Oxfeld 2014). In the 'Moonshadow Pond' village where Ellen Oxfeld conducted her long-term research, the majority of inhabitants produced their own vegetables (Oxfeld 2014). Despite this clearly being a common practice in rural China, *rural* home-grown food has received little

[5] One of the rare and recent exceptions is Asa Roast's (2022) article on informal food production on urban 'empty land' (*kongdi*).

attention from sustainability scholars. At the same time, as shown above, the minuscule extent of formal, market-based *urban* AFNs has been a topic of a small but growing body of literature. The majority of those one hundred AFN ventures mentioned above, most of which appeared to be CSA schemes, were located in urban areas (Gale 2011 cited in Si et al. 2015). Our article, therefore, is also a contribution to redressing the balance in scholarly coverage of formal and informal food alternatives in China by focusing on household informal food production—FSP—in *urban* areas. The next section describes the methods, including their limitations, that we used in data collection and analysis of FSP in urban China.

Methods of data collection and the geographical distribution of the sample of respondents

Prior to setting out on our investigation of FSP in China, we had an indication, on the basis of our Chinese colleagues' observations and insights from local-level ethnographic studies of rural household food systems (Lora-Wainwright 2009; Oxfeld 2014), that FSP in China was likely to be a common practice. Later, this was also confirmed by Asa Roast's (2022) small-scale study for urban areas. To obtain more generalizable information concerning the scale and relevance of FSP and its possible environmental and social consequences, we commissioned a sociological survey aimed at collecting information about FSP in an urban environment. This section provides information about the method of data collection deployed in the survey.

As conducting a nationwide survey representative of the Chinese general population via a professional polling organization was beyond our financial means (and could also face a difficult and lengthy process obtaining approval from the authorities for such a nationwide survey), the research team used the opportunity to cooperate with academic partners from several Chinese universities (Harbin Institute of Technology Weihai Campus, Guilin Tourism College, Liaoning Normal University, Guizhou Normal University) and the Chinese Leisure Philosophy Professional Committee to conduct a survey in regions where students from these universities live, as students from these universities kindly agreed to act as voluntary interviewers for the survey.

To prepare for field research using voluntary data collectors, in March 2019 the team organized two methodological seminars as special parts of two academic conferences on FSP that were held at Guilin Tourism College and Guizhou Normal University in southern China. Both seminars provided a full day of training to the partner universities' teaching staff and selected post-graduate students who were willing to be involved in the research project. The training programme included the main principles of sampling, interviewing, data recording, and data coding. Parallel to that, a fieldwork manual was prepared with detailed instructions both for the faculty responsible for the field research at the cooperating universities and the student interviewers. These materials as well as the questionnaire were translated into Chinese. The survey questionnaire intentionally replicated the series of questions that had previously been asked during the research on FSP conducted by some of the team members in Czechia, Poland, and Croatia (Smith and Jehlička 2013; Smith et al. 2015; Jehlička et al. 2021).

Because of the chosen method of data collection, we knew we would not be able to assure the national representativeness of the data. Therefore, we applied measures aimed at reducing the possibility that the sample of respondents would substantially differ from the general urban population in China and, at the same time, would provide a reasonable guarantee that the sample would include respondents representing various demographic and socio-economic subpopulations. To that end, we used quota sampling, with gender, age groups, and educational attainment serving as variables for building the sampling frame,[6] and we provided interviewers with instructions about how to select respondents in a way ensuring that each subgroup defined by a sampling frame was properly represented.

As the fieldwork was fully dependent on the availability of students from cooperating Chinese universities and the accessibility of potential respondents to them, neither regional nor urban/rural quotas were applied. However, the name of the province, the size of the municipality, and the rural/urban legal status (*hukou*) of respondents were collected. The student interviewers were instructed not to conduct the survey with their relatives and close friends, but rather approach people whom they did not know personally. For the purpose of quality control, two of the four universities also recorded information about the interviewer (name and ID), while the other two universities did not provide such information to the research team. The information about the research conduct of individual interviewers showed that 62 per cent of them collected data from five respondents, while 28 per cent of them collected data from four respondents.[7]

The population of interest was defined as an adult population. The key research questions focused on FSP as a set of social practices outside of the market economy that involves the production of food by non-farming households. For this reason, the interviewers were instructed not to include professional farmers or members of their families

[6] The most recent official data from the Chinese National Bureau of Statistics available at the time of our survey (2019) was used to develop a sampling frame.

[7] The remaining 10 per cent of the interviewers conducted interviews with either very few respondents (2–3) or a larger number of respondents (7–10).

among respondents. The data were collected in the summer of 2019, during the university vacation period, which enabled students to make interviews not only in cities in which their universities were located but also in places where students came from. The survey data were collected via face-to-face interviews in which interviewers posed questions to respondents using structured questionnaires and recorded their answers by paper-and-pencil method.

The process of data collection was supervised by members of the teaching staff from the four cooperating universities. Altogether, 1,188 questionnaires were collected. After recording the data in machine-readable form, a common dataset was created, and standard data quality checks were performed. These checks revealed, however, that despite the instruction not to do so, some interviewers included professional farmers and members of their families in the sample. The data from such questionnaires were deleted from the sample. Similarly, the data obtained from twelve respondents younger than 18 years were deleted from the sample. During the data checking it also turned out that some interviewers did not record the gender or age of respondents. We decided to keep these data. We do not know the gender of 20.5 per cent of respondents that were included in the final sample with which the analysis reported below was conducted. After data checking and cleaning, the final sample consisted of 948 respondents.

It is clear, therefore, that the results from the survey cannot be considered representative of the general Chinese population and can provide only a rough estimate of the overall prevalence of FSP in China. At the same time, however, we consider the information collected in this way as sufficiently reliable to provide basic insights into the social background and motivations of FSP practitioners in urban China, their methods of food production, and also whether there are differences in the level of involvement in FSP among diverse demographically and socio-economically defined subgroups.

In terms of the geographical distribution of the final sample of respondents, it turned out that over 91 per cent were citizens holding their residential status in cities (the city *hukou*), while fewer than 9 per cent of the respondents had rural *hukou*. As only 5 per cent of the respondents claimed that they lived in towns with less than ten thousand inhabitants, a substantial proportion of respondents with rural *hukou* actually lived in urban settlements.

Nevertheless, the sample of respondents cannot be considered representative of the Chinese urban population because of the way the survey was organized (i.e., in cooperation with the teaching staff and their students from four universities who were willing to work with us). Although the interviewers were able to conduct at least some interviews in the majority of Chinese provincial level units (24 out of 33), the geographical distribution of respondents was highly non-representative. Seventy-six per cent of respondents came from two provinces: from Shandong, one of the largest Chinese provinces, located in the north-east coastal area (n = 521; 55 per cent of respondents); and from Guangxi province, located in the south coastal area (n = 198; 21 per cent of respondents). These are the provinces in which the universities providing the majority of student interviewers are located. Thus, in terms of geography, our sample represented rather well the urban population of the two large coastal provinces that account for about 12 per cent of the total Chinese population. Respondents from these two provinces were supplemented by 233 respondents from 22 other provincial-level units, which accounted for the remaining 24 per cent of the survey participants.[8]

Results

Prevalence of FSP among respondents and its relation to their demographic and socio-economic background

The analysis of the data revealed that 68 per cent of respondents own or use a garden, field, or orchard for food production, located either by the house where they live or elsewhere—for example, at a country cottage, in the city's vicinity, or in a similar place where they produce their own food. This is a staggering figure, and despite the lack of national representativeness of the sample, to us, this clearly suggests that FSP is widespread and is practised by a significant share of the Chinese urban population.

The prevalence of FSP among respondents to the Chinese survey was higher than the already high prevalence revealed by the representative surveys conducted in several European countries, which included both urban and rural populations (Smith et al. 2015; Jehlička et al. 2021). On the basis of the findings in this literature, it is reasonable to expect that the prevalence of FSP among the rural population in China is higher than among urban dwellers. It is likely, therefore, that a representative sample of Chinese respondents would reveal a substantially higher prevalence of FSP in China than in Europe.

How was FSP related to the demographic and socioeconomic characteristics of respondents? Table 1 provides their basic demographic and educational characteristics (separately for all respondents and those who practise FSP) and compares it to the composition of the general adult population in China.

[8] No respondents were interviewed in Shanghai and Chongqing municipalities, in Gansu, Hainan, or Qinghai provinces, in the Macau Special Administrative Region, or in Ningxia Hui, Xinjiang Uyghur, or Tibet autonomous regions.

Table 1 Demographic and educational composition of the sample of whole respondents compared to that of respondents who practise FSP and the composition of the Chinese general adult population

Indicator	Category	Share among all respondents (%)	Share among respondents practising FSP (%)	Share among the general adult population (%)
Gender	Male	49.3	50.0	50.4
	Female	50.7	50.0	49.6
Age	18–29	23.0	19.5	20.1
	30–44	26.7	23.2	28.2
	45–59	28.7	33.1	29.4
	60+	21.7	24.1	22.3
Education	Incomplete or Primary	16.6	19.1	24.8
	Lower Secondary	11.2	13.3	34.5
	Upper Secondary	37.6	33.1	15.1
	Tertiary	34.6	34.4	15.4

Sources The authors' survey, Chinese National Bureau of Statistics: China Statistical Yearbook 2019, and Population Census 2020 (see http://www.stats.gov.cn/sj/ndsj/2019/indexeh.htm and http://www.stats.gov.cn/english/StatisticalCommuniqu/index.html)

In terms of gender and age, the sample of respondents was very similar to the composition of the general adult population in China. While the gender composition of FSP practitioners was practically identical to that of the general adult population, younger people were slightly under-represented among FSP practitioners. Nonetheless, we can safely claim that, although older respondents were more likely to practise FSP than younger ones—between 67 per cent and 70 per cent of those aged 45 and above—younger cohorts (18–44) were also involved in FSP at a high rate, as between 52 and 53 per cent of them grow food. Importantly, then, FSP is a widely accepted social practice even by the youngest cohorts of the Chinese urban adult population. This is an important finding for any consideration concerning the long-term prospect of this activity and the sustainability benefits it brings.

The survey revealed a similar degree of diversity when it comes to the educational attainment of FSP practitioners. The sample was biased towards people with a higher level of education when compared to the general adult population of China. However, this bias would be substantially lower if the respondents' level of education were compared with the urban population, which is generally better educated than rural dwellers.[9] The share of food self-provisioners was the highest among the respondents with primary (79 per cent) and lower secondary (81 per cent) education. In contrast, the lowest engagement with FSP—60 per cent—was among respondents with upper secondary education. This may give the impression that Chinese FSP is a subsistence activity of the uneducated and poorer segments of society that decreases with growing educational levels and the socio-economic status of the population. However, the data show that the respondents with tertiary (university level) education were involved in FSP activities to a greater extent than those with upper secondary education: more than two-thirds—68 per cent—of urban respondents with university degrees produced some of their food.

The questionnaire also provided detailed information about the occupational and social status of respondents using 15 different categories of occupational/social status. Generally, at the time of the survey, two-thirds of respondents (67 per cent) were employed, while one-third (33 per cent) were not. The proportion of FSP practitioners among the employed (69 per cent) was similar to that among economically non-active respondents (67 per cent). Because of the lack of reliable representative data, it is difficult to assess the extent to which the sample reflects the general occupational structure of the Chinese adult population. Nonetheless, we can claim that the sample includes a reasonable diversity of respondents in terms of their occupational and social status. High levels of participation in FSP apply to all types of occupational or social status. With the notable exception of clerks (only 43 per cent of them produce their own food), the percentage of respondents practising FSP was higher than the share of respondents who did not grow food across all other occupational and social status groups, and exceeded 64 per cent in all groups that could be distinguished. For example, 65 per cent of urban professionals, 70 per cent of the retired, and 74 per cent of the self-employed produced some of their food.

[9] The Chinese National Bureau of Statistics has not yet published a detailed breakdown of the 2020 Population Census, so direct comparison of the educational attainment of respondents with that of the Chinese urban population in general could not be conducted.

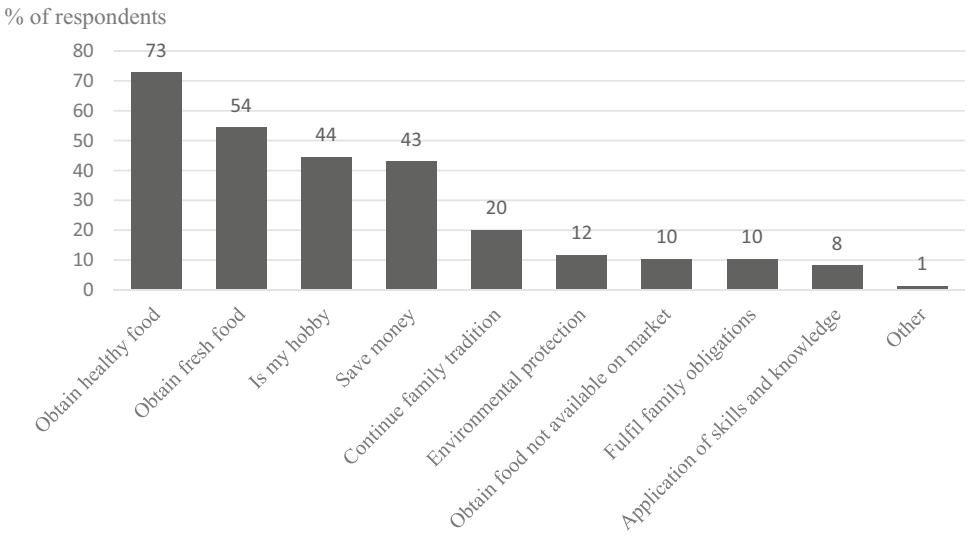

Fig. 1 Main motivations for food self-provisioning: percentages of respondents mentioning specific motivations as being among the three most important for them

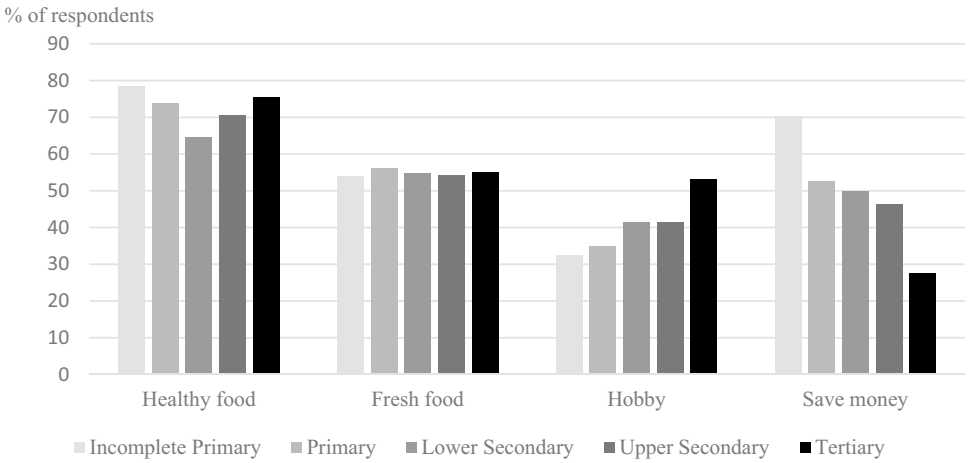

Fig. 2 The four main motivations for food self-provisioning by respondents' level of education: percentages of respondents mentioning specific motivations as being among the three most important for them

Food self-provisioners' gardening motivations and sharing practices

The findings presented in the previous section suggest that, among Chinese urban residents, FSP is an activity in which all social groups, including many affluent and highly educated people, are involved and, therefore, it is not an activity driven primarily by economic needs. This is confirmed by the findings concerning the main motivations for practising FSP. The questionnaire included a list of nine potential reasons for engaging in FSP, and the respondents were asked to indicate up to three 'most important' motivations for this activity. They could also choose 'other reasons' as an option and specify what other potential reasons they had for this activity; only one per cent of respondents chose this option. In Fig. 1, it is evident that the main motivations for FSP among the respondents were related to the desire to acquire food that is 'healthy' or 'fresh', motivations that were among the top three reasons for 73 per cent and 58 per cent, respectively, of respondents. Forty-four per cent of respondents claimed that one of the main motivations for FSP was that it was a hobby, and 43 per cent were motivated by the desire to save money, but both of these were far lower in importance than the first two motivations (healthy and fresh food). The remaining five motivations were considerably less relevant than the first four. A minority of respondents mentioned family traditions (20 per cent) or obligations (10 per cent). Only 12 per cent of respondents declared motivations directly linked to the protection of the environment, while only 10 per cent of respondents mentioned FSP as a means of obtaining food that was not available through the market.

As we expected the portfolios of motivations for engaging in FSP to differ across diverse social groups, we systematically analysed the influence of selected demographic and socioeconomic factors on motivations for FSP. Surprisingly, in most cases, the difference among a range of subgroups of respondents was not significant. Neither the gender nor age

of respondents had any effect on their motivations for engaging in FSP. Educational attainment and socio-economic status influenced some motivations but had no effect on others. A typical pattern is shown in Fig. 2.

While the desire to have healthy or fresh food was shared fairly evenly across educational levels, people with higher educational attainments tended to declare more often that FSP was their hobby. Less well-educated people mentioned more frequently financial savings as one of their main motivations for FSP. It should be noted, however, that saving money was not the main motivation for FSP even for the respondents with the lowest educational attainment.

Finally, we collected some information about how respondents produced and made use of the food they grew. The data show that a substantial part of Chinese homegrown food is produced with methods used in organic food production. Fifty-eight per cent of the respondents either use no fertilizers or only organic fertilizers. Similarly, 45 per cent of respondents used either no method of pest and mould control or exclusively organic, manual, or mechanic methods of control. The combination of these two criteria reveals that 36 per cent of respondents avoided using any industrially produced chemicals. Therefore, their production method could be considered as meeting the criteria for organic farming. In contrast, only 4.5 per cent of FSP respondents produce their food using exclusively chemical fertilizers and chemical methods of pest/mould control, which is a standard combination in conventional agricultural production. The remaining Chinese urban food self-provisioners combine methods used in organic food production with methods used in conventional food production.

In addition, the survey showed that 89 per cent of respondents practising FSP do not have to travel at all to their garden or their other food growing place or, if they have to travel, they walk or use a bike to get there. When this information is used in combination with information about the avoidance of industrially produced chemicals, it could be calculated that 32 per cent of respondents produce food in a way that minimizes the ecological footprint of this type of food production. The inclination to engage in the 'organic farming' type of FSP was lower among the youngest generations (under 30), which may suggest that FSP may become less organic in the future. However, the 'organic farming' type of FSP was also less often used by people with lower education and lower social status, which could lead to a more optimistic future outlook of the 'organic farming' type of FSP, as the education levels of the Chinese population are constantly rising over time.

Importantly, the data analysis also revealed that FSP is an activity connected with a high level of generosity, as a substantial portion of self-provisioned food is donated to other people or exchanged with them. Only 19 per cent of respondents do not give or exchange any part of their harvest with other people. On the other hand, 26 per cent of respondents give or exchange less than a tenth of their production, 25 per cent of them give or exchange between one-tenth and one-quarter of their production, 18 per cent give or exchange between one-quarter and one-half of their harvest, while the remaining 12 per cent of respondents donate or exchange more than half of their harvest. The typical recipients of these gifts (partners in exchanges) are members of the family, relatives, friends, and neighbours. The level of generosity does not differ significantly across various demographic and socio-economic groups. The generosity of food self-provisioners also means that the impacts of FSP in Chinese society are more far-reaching than just the individual households of those practising FSP.

Discussion

To our knowledge, this article is the first account of Chinese urban FSP produced on the basis of data obtained from a large sample of respondents. Earlier analyses of urban informal community gardens (He and Zhu 2018), self-claimed lots (Zhu et al. 2020), and *kongdi* gardening (Roast 2022), which can be considered variants of FSP practices, were based on much smaller samples of food-growing respondents [four in the case of community gardens (He and Zhu 2018); 38 in the case of self-claimed lots (Zhu et al. 2020); and 36 in the case of *kongdi* plots (Roast 2022)].

Our research yielded four key and novel findings about Chinese urban food self-provisioners. They concern: (i) the prevalence of this practice; (ii) the social makeup of its practitioners; (iii) their motivations; and (iv) their approaches to food-growing (methods of cultivation).

Although it was not the original intention of our research project, the way the student interviewers selected their respondents resulted in a set of respondents who were almost entirely urban dwellers. This accidental bias in our sample, however, makes our findings even more compelling, as such a high percentage of food-self provisioners among urban dwellers was unexpected. In the popular imagination, an extensive scale of FSP is associated with the rural rather than the urban setting. It can be inferred, from various localized, small-scale studies, that the extent of FSP in the Chinese countryside is likely to be vast. The structure of Chinese agriculture is based on a large number (over 200 million; FAO 2014) of very small holdings (the average size was 0.6 ha in 2010; FAO 2014). Many of these smallholders also produce food for their own consumption. Although the number of rural dwellers whose livelihood depends on farming is decreasing, the majority of people living in the countryside keep producing large volumes of food for their own consumption. For example, as Oxfeld (2014, p. 47) discovered, 23 out of 35 rural households with which she

worked 'still self-provisioned all of their vegetables'. In this context, the first key finding of our research is that FSP is a practice that is widespread also in urban areas and that the scale of Chinese urban FSP (in terms of the percentage of urban dwellers engaged in this practice) is unlikely to vastly differ from its extent in rural areas.

Second, Chinese urban FSP is remarkably socially diverse. People of all occupational and educational backgrounds (including the majority of university degree holders interviewed for the project) produce their own food, and all age cohorts, including students, are involved in the practice. This finding contrasts with the more elitist profile (affluent, highly-educated middle class) of the participants in market-based AFNs—both in the West (Tregear 2011) and in China (Si et al. 2015).

Third, and equally importantly, the involvement in FSP in urban China is not primarily a response to economic needs, as the two most popular motivations for producing food are to obtain food that is both healthy and fresh, followed by FSP being a hobby. This finding is of huge significance, as most people are not being forced into growing their own food out of hardship or necessity. Instead, they choose to do it for more positive reasons, although one of the key motivations appears to be the desire to reduce exposure to unhealthy food. It is likely to be related to widespread fears in China about the safety of food in the retail sector and to food-related health scandals (Si et al. 2015).

Although the desire to avoid unhealthy food as a reason to practise FSP appears to be stronger in China than in other countries where FSP was studied, the other motivations as well as the social makeup of FSP practitioners appear remarkably similar to the findings of the previous research on FSP outside China (Smith et al. 2015; Jehlička et al. 2021). An important exception was the protection of the environment as a reason for involvement in FSP. It was chosen by 12 per cent of Chinese urban food growers, which is a significantly higher proportion than in European countries (around two per cent in both Czechia and Poland; Jehlička et al. 2013; Smith and Jehlička 2013).

Even more important than environmental motivation is the practical application of cultivation methods that are compatible with environmental sustainability. This is the fourth key finding. Regardless of whether they are motivated by the desire to contribute to environmental protection, more than a third of Chinese urban food self-provisioners produce non-certified organic food. The common inclination in rural China to produce organic food is also confirmed by Oxfeld's (2014) findings about many villagers making sure they grow their own food without resorting to industrially made fertilizers and pesticides. Similarly, urban growers using empty, as-yet-undeveloped land (*kongdi*) for informal gardening in Chongqing placed emphasis on chemical-free food production (Roast 2022).

Chinese urban FSP turned out to be similar to this practice in Europe in two other respects. First, in the overwhelming majority of cases, it is the shortest possible food chain involving zero or very low food miles, as the garden is either next to the house where food growers live or within walking or cycling distance. Second, the fact that more than four-fifths of Chinese urban FSP practitioners share some of their produce with other people suggests not only a high level of generosity but also that food-sharing networks are very likely to extend widely beyond food-growing circles.

On the basis of the striking similarities between the profile and behaviours of Chinese FSP practitioners and those investigated in Europe in the last decade, we could hypothesize that the environmental benefits of Chinese FSP per capita would be of similar significance to those discovered by the previous research. The average greenhouse gas emissions reduction achieved by FSP 'ranges from 42.3 kg (conservative estimate) to 91.6 kg CO_2eq/person/year (generous estimate)' (Vávra et al. 2018a, p. 1020). We would argue, therefore, that the environmental dimension of FSP deserves an urgent and concerted research effort in the Chinese context.

Conclusion: implications for thinking about sustainability

The last decade or so has witnessed growing critiques of the mainstream concept of sustainability. Here we wish to highlight two lines of this critique and, by relating them to our findings about urban FSP in China, propose a possible way of rethinking sustainability. The first line of critique addresses the West-centredness of the concept of sustainable development (Mincyte 2011), its application to studies of sustainability outside the West, and the sustained efforts of international actors, including international organizations and environmental and development NGOs, to export the concept to non-Western worlds (Jehlička and Smith 2011). In response to this, there has been increased attention to the attempts in non-Western contexts to elaborate the concept in ways that are more sensitive to specific national contexts, traditions, needs, and preferences (Jehlička and Jacobsson 2021). This endeavour is motivated by the recognition of the need for a more diverse and inclusive concept of sustainability.

In this respect, this article on sustainable practices in China is an important addition to the debate about the urgent need to move the endeavour of uncovering new impetuses for the way we think about sustainability to places beyond the Western 'core'. Given China's growing economic and political international standing, significant efforts have recently been invested in identifying key components, objectives, and underlying value systems of the

official, government-led discourse of sustainable development in that country (Li et al. 2016; Liu et al. 2018). However, despite some differences from the Western variant in terms of traditional ideologies and values, as mentioned at the beginning of this article, the Chinese interpretation of sustainability is also related to—and the promotion of sustainability relies on—making the difference in terms of capacity building, creativity, and innovation, i.e., on developing new, future-oriented market-based initiatives and solutions. It seems, therefore, that the influence of the Chinese official approach to sustainability on the diversification of more general sustainability debates has limited potential.

The second line of critique of the mainstream notion of sustainability relates to the lack of attention shown in expert-led versions of sustainability to the routinized and 'the mundane, small and everyday activities undertaken at the household level' (Fidali and Larder 2022, p. 114) that are performed by ordinary people. The last decade has produced a growing body of work, empirically linked to the Global North, on a range of related concepts, including 'environmentalism of everyday life'/'sustainable materialism' (Schlosberg and Coles 2016), 'emplaced sustainability' (Fidali and Larder 2022), and 'quiet sustainability' (Smith and Jehlička 2013). We believe that there is a strong need, in sustainability scholarship, to take this endeavour to places where these everyday sustainable behaviours are widespread but rarely researched – i.e., to 'epistemically peripheral' societies in the Global South, like China.

This exploratory study of urban FSP in China provides a tentative response to both critiques. It demonstrates, using China as an example, that societies outside the Global North harbour valuable, socially embedded, diverse, and widespread everyday practices that bring significant benefits to sustainability. These findings enable us to extend what counts as sustainability-compliant practices. This means that, in contrast to the conventional approach to promoting sustainability by identifying and/or creating opportunities and conditions under which sustainable behaviours or policies can emerge and develop, our approach highlights the significance of already existing behaviours as contributing to the diversification of the ways we think about sustainability.

We propose that sustainability scholarship and policy informed by this type of research will accelerate both insight and action by embracing a greater diversity of the framings of sustainability. This will open the door to less formalized approaches that require greater attention to what we term, in this article, already existing sustainability, rather than privileging innovation. Among other things, this reduces the policy-share burden placed upon promises and plans sketched out in an idealized future and gives credit to everyday behaviours and routines such as FSP that are occurring in the present.

This research on Chinese FSP has necessarily been based on a relatively unconventional method of data collection. We recognize that this places limits on claims to generalizable validity for our findings. Future research projects on Chinese FSP should address the limitations of our investigation, including, crucially, establishing with greater accuracy the volume of food produced this way and accounting for its significance in meeting Chinese households' food needs. This could be achieved by conducting a survey on FSP based on a nationally representative sample of the Chinese adult population combined with more systematic qualitative research aimed at FSP practices, material outcomes, and motivations in greater detail. Future research projects should also attend to the mismatch between the findings of small-scale ethnographic studies about the importance—in quantitative terms—of FSP as a source of food in rural China, and our findings about the prevalence of FSP as a practice in Chinese urban contexts. While the former studies have difficulty making claims about the significance of FSP on a scale that transcends the studied locality and thus showing its significance for sustainability, from our research we know that FSP in urban China is a widespread and popular (with practitioners, not necessarily with the authorities) phenomenon that brings significant sustainability benefits. Indeed, it would not be difficult for these practices to be presented as a powerful example of Chinese cultural and practical leadership on this vital dimension of progress towards sustainability and wellbeing. But we also recognize that there is a clear and urgent need to put more reliable figures on the volumes of the food produced and consumed in relation to these practices. Among other things, this calls for a more integrated, transdisciplinary approach to studying FSP and similar informal and sustainable practices.

We argue, therefore, that the urgent relevance of our research, and the consistency of our findings (both internally and with the international comparisons we reference in this article) strongly confirm the need for systematic, large-scale, and transdisciplinary research projects on Chinese—urban and rural—FSP. On the basis of the insights generated by our current research, we assert that the fate of Chinese food self-provisioning is of great significance for the sustainability of the Chinese—and global—food system.

Acknowledgements The authors are grateful to the students from Harbin Institute of Technology Weihai Campus, Guilin Tourism College, Liaoning Normal University, and Guizhou Normal University for conducting the interviews. Special thanks to Prof. Liu Er, Prof. Liu Chenye, Prof. Wu Yaping, and Prof. Yang Deyun for instructing students on fieldwork activity. Extra thanks to Prof. Liu Er for collating, screening, and pre-processing the gathered data. Special thanks to the members of the Professional Committee of Leisure Philosophy, Ji Juanli, Li Yinfeng, Liu Guiling, and Zhao Zijin, for their case interviews and detailed interview records, and to Prof. Örjan Sjöberg and Dr Terezie Lokšová for suggesting useful sources for this article. The authors also thank Huiying Ng for valuable comments on an earlier draft, the three

anonymous reviewers for their constructive comments on the submission's previous version, which contributed to its significant improvement, and Patty A. Gray for making the article a smoother read.

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