


Food self-provisioning: a review of health and climate implications

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Review Article

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Non-technical summary. The industrial food system is widely considered to be unsustainable due to its undesired climate and health effects. One proposed alternative to these problems is a more local system of food provisioning. This means involving individuals, households, and communities in growing and acquiring edibles, like vegetables and other food stuff. This study based on a literature review found that food self-provisioning practitioners are mainly driven by health concerns and less by reasoning linked to the environment, like climate change adaptation and mitigation. We propose that the potential of food self-provisioning is underutilised in developing the sustainability of food systems.

Technical summary. In this article, we review and analyse the literature and concept of ‘food self-provisioning’ in order to understand its potential as a response to contemporary challenges. The focus of the study is on investigating the meanings related to environmental problems, particularly climate change, and issues of health. Firstly, we show how food self-provisioning is conceptualised vis-à-vis health and the environment; and secondly, what the (potential) implications of food self-provisioning to interlinked human and non-human health and beyond are. Based on the conducted literature review ($n = 44$), meanings of food self-provisioning are found to connect primarily to issues of human health and only secondarily to environmental questions, and even more marginally to climate change mitigation and adaptation. Our analysis cuts across the scales of households, communities, cities, and regions, including their diverse geographies, and hereby also comments on the questions of multilevel organising of self-provisioning, and what the notion of ‘self’ implies in this context.

Social media summary. The potential of food self-provisioning is underutilised in developing the sustainability of food systems.

1. Introduction

For sustainability studies building on systems theory (Bonnedahl & Heikkurinen, 2019; Daly, 1997; Georgescu-Roegen, 1975; Gowdy & Erickson, 2005) the findings of integrative environment-health sciences that recognise the interdependency between human bodily, mental, and spiritual health and the health of other living beings and the shared environment (Fisher & Murray, 2021; Patwardhan et al., 2015; Prescott et al., 2018),¹ is of relevance. For example, the conception of *planetary health* highlights ‘the interdependent vitality of all [...] biologically defined ecosystems (at micro, meso and macro scales)’ and ‘human-constructed social, political, and economic ecosystems’ (Prescott et al., 2018, p. 3). These notions are also closely related to the concept of *planetary well-being*, which seeks to address the shortcomings of ‘anthropocentric normative orientation, methodological individualism that disregards process dynamics and precludes integrating the considerations of human and nonhuman well-being, and the lack of multiscale considerations of well-being’ (Kortetmäki et al., 2021, p. 1).² Analogous remarks on the importance of simultaneously addressing the relation between ‘nature’ and ‘the social’ have been made in the field of *sustainable well-being* (Büchs & Koch, 2017; Helne & Hirvilammi, 2015; Kjell, 2011).

Food is one of the focal arenas of human–environment dynamics, which is affected by environmental changes, economic factors and cultural dietary traditions and new trends (Prescott et al., 2018). While climate change, disruption of nutrient cycle, and habitat and biodiversity losses pose challenges to food production (Rockström et al., 2009; Steffen et al., 2015), at the same time, the large-scale food production and processing industry itself is one of the major contributors to the environmental and health crises of our time (Heikkurinen et al.,

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¹This understanding has been an integral part of the knowledge of Indigenous peoples and, for example, the system of Ayurvedic medicine for centuries, and was introduced to western conceptions of health by the environmental movement in the 1970s and 1980s (Patwardhan et al., 2015; Prescott et al., 2018).

²See also Helne (2019) and Poelina et al. (2022).

2019a; Hyvärinen, 2020; Prescott et al., 2018). This environmental significance of food is underscored by Clark et al. (2020, p. 705) who show that ‘even if fossil fuel emissions were immediately halted, current trends in global food systems would prevent the achievement of the 1.5°C target and, by the end of the century, threaten the achievement of the 2°C target’. The health aspect again is emphasised by Wheeler and von Braun’s (2013, p. 508) study, reporting a ‘robust and coherent global pattern [...] of the impacts of climate change on crop productivity that could have consequences for food availability’, increasing the instability of the whole food system.

In parallel to the global system of food provisioning, many local initiatives are taking place. Some forms of local small-scale food self-provisioning have been claimed to offer ecologically and socially sustainable alternatives to industrial food production, as they are found to require relatively little space, chemical inputs, and transportation (e.g. Feenstra, 1997; Pungas, 2019; Seyfang, 2006; Shiva, 2009) and contribute, for example, to increased consumption of fresh vegetables and fruits (Sovová, 2015). These initiatives or practices include, for example, household and allotment gardening, community-supported agriculture, urban agriculture, and eco-villages or other communities aiming at a high degree of self-sufficiency in food and energy. While the practice of food self-provisioning has been on the decline globally due to factors such as industrialisation and urbanisation, ‘self-provisioning family farming continues to be a major mode of livelihood in the twenty-first century world’ (Vanhaute, 2012, p. 319). Recent evidence suggests that it remains as a rather common practice even in countries of the Global North (Schupp & Sharp, 2012; Vávra et al., 2018a). As an example, Vávra et al. (2018b) found that over 50% of the rural populations and over 30% of the urban populations in the studied regions in Germany, Czech Republic, and Scotland participated in food self-provisioning. In addition, it has been shown to have significant production potential, although some of this potential remains unactualised due to differences in skills, motivation, and access to land (CoDyre et al., 2015; Pulighe & Lupia, 2019; Sovová, 2015).

As the evidence above suggests, there is a need for increased research attention to food self-provisioning. A few earlier review articles focus on home gardening and its connections to food security and sustainable development, particularly in the Global South (Carstens et al., 2021; Galhena et al., 2013; Rajagopal et al., 2021; Saediman et al., 2021). Other reviews focus, for example, on urban agriculture and food security (Poulsen et al., 2015), quantification of local food self-sufficiency and food flows in urban areas (Schreiber et al., 2021), and sustainability in alternative food networks (Michel-Villarreal et al., 2019). However, to our knowledge, no literature review focuses solely on ‘food self-provisioning’ at the global scale, and specifically on its climate and health implications.

The purpose of this study is to investigate the meanings of food self-provisioning related to environmental problems, particularly climate change, and to issues of health across the scales of households, communities, cities, and regions, including their diverse geographies both in Global North and Global South. The article reviews and analyses the food self-provisioning literature by focusing on the two following questions: firstly, how is food self-provisioning conceptualised vis-à-vis health and the environment, and secondly, what are the (potential) implications of food self-provisioning to health and climate? In this article, health refers not only to physical and mental health of the individual, but to social and community wellbeing and the links between

environmental and human health (i.e. planetary health and planetary wellbeing). Food self-provisioning in the reviewed articles is seen as a practice of care advancing health in this wider conception. Based on the review, we define food self-provisioning (hereafter FSP) as a process of providing food for oneself, which does not have to limit to a human individual but can encompass broader notions of ‘self’, for example, a household, an organisation, or a community. Furthermore, the spatial scales of FSP range from balconies, home gardens, and allotments to community fields.

The study finds that FSP is mainly addressed as a source of fresh, nutritious, and healthy food, as well as social wellbeing at large. The implications of FSP to health and climate are manifold, partly actualised but also largely underutilised and underdeveloped on multiple scales. FSP is considered to provide positive individual benefits, like healthier eating habits and meaningful social interaction. Regarding climate change, FSP is seen to have mitigation potential, because it requires less fossil matter-energy via increased use of renewable inputs, proximity-based logistics, and employment of muscular labour, as well as potential for climate change adaptation through conserving and renewing agrobiodiversity and supporting communal resilience.

We argue that although the meanings of FSP connect primarily to issues of human health and only secondarily to environmental questions, and even more marginally to climate change mitigation and adaptation, this alternative mode of provisioning food stuff holds potential for sustainability. This is because FSP has the potential to localise food production and to involve individuals, households, and communities to meet their basic needs. This way FSP also connects to the questions of food security and to the adaptation and mitigation of various socio-ecological crises. In addition to outlining the emerging field of FSP, we contribute to the debates on ‘planetary well-being’, ‘planetary health’, and ‘sustainable well-being’ by showing how FSP is a manifestation of the interconnected well-being between humans and non-humans in practice, as well as has the potential to link the notions of well-being on different scales from local to global. Next, we briefly describe the literature review process, and then continue with the findings, discussion, and finally conclusions.

2. Methodology

2.1 Approach

The methodological approach used in this study can be described as a qualitative semi-systematic literature review. According to Snyder (2019), this review is suitable for conducting an overview of a topic with relatively broad research questions. Academic articles and book chapters with a specific focus on FSP, published in English and made available by the end of March 2022 were included in the review. Choices regarding the literature, analysis, and interpretation of findings were discussed with the whole author team along the process.

Literature was searched from Scopus and Web of Science databases with ‘food’ and ‘self-provisioning’ as key words. While we recognise that there are many other terms used in the literature about this topic, focusing on these key words provided a more reasonable number of results and helped to narrow down the scope to articles and book chapters focusing specifically on the practice and processes of food self-provisioning. Limitations of the search are discussed in more detail in Section 4.4. First search in Scopus (with search string “TITLE-ABS-KEY [food AND “self-

provisioning”]) yielded 86 results. After scanning the titles and abstracts of these documents, 39 of them were deemed as relevant for further review. Literature that was omitted at this stage did not focus solely on FSP; the focus was either more broadly on food security issues, local food systems, alternative food networks, etc., or on survival strategies of non-human species. A complementary search was done in Web of Science (search string: Food [topic] and ‘self-provisioning’ [topic]). This search produced 101 results. After scanning through titles and abstracts and removing overlaps to the previous search in Scopus, five additional documents were added to the list, resulting in a total of 40 articles and four book chapters.

The articles and book chapters chosen for the review were carefully read to identify themes relevant for the research questions. The findings were categorised under the broad themes of ‘environment’ and ‘health’ in an Excel file, and separate notes were kept at the side. Additional data extracted in the file included all relevant publication details, summary of methodology, and summary of results. The interest was also in how each publication defined the concept ‘food self-provisioning’, and this information was collected in notes. The Excel file served as a basis for the analysis.

The identified themes were then more carefully considered in terms of their similarities and differences to form categories under which findings could be grouped. The approach was informed by general systems thinking, as it included classification regarding the *scale* at which different systems (household, community, city, region) were discussed, and identification of dynamics between the categories according to the systems theoretical *input-process-output* scheme (see Curry et al., 2006). This enabled the study to make the individual findings part of the larger process of FSP and analytically display its myriad set of relations. The ‘scale’ of a system and the system’s ‘input, process, and output’ hereby served as an analytical frame for describing the findings in this article.

2.2 Data

The review data consist of literature published between 2005 and 2022, with the most active phase of publications taking place between 2017 and 2021 (Figure 1). Forty articles were published in 26 different journals, with *Sustainability*, *Geoforum*, and *Journal of Rural Studies* the most common journals. In addition,

the data included four book chapters in three different books, concerning topics of the commons, degrowth, and socio-metabolism of local food systems, published between 2017 and 2020. See the Supplementary materials (Table S1) for a full list of articles and book chapters.

The reviewed studies employed either quantitative (41%), qualitative (34%), or mixed (25%) research methods. Most case studies are situated in Europe. There is a specific set of studies focusing on FSP practices in central and eastern European countries, with Czech Republic dominating the sample: Czech Republic (18 studies), Croatia (4 studies), Bulgaria (3 studies), Poland (3 studies), Estonia (2 studies), Hungary (2 studies), Lithuania (2 studies), Latvia (1 study), Moldova (1 study), Romania (1 study), Bosnia-Herzegovina (1 study), Serbia (1 study), and Slovenia (1 study). Other European countries include Denmark, France, Germany, Greece, Italy, Netherlands, Norway, Portugal, and the UK. Other regions of the world covered in the literature include Australia, East Asia (Mongolia, Japan), and South and North America (Brazil, Colombia, Canada, the USA) (Figure 2).

Most of the reviewed literature concentrates mainly on home or allotment gardening of private households. A small minority focuses specifically on smallholders’ FSP activities or FSP in an urban context. Most reviewed studies focus on domestic vegetable/fruit production and their thematic scopes include the assessment of the prevalence of FSP regionally and across different socio-economic classes; values, meanings, and motivations associated with FSP; sustainability of FSP practices; types of products grown; rate of self-sufficiency; food security; as well as nutrition and health aspects of FSP. Overall, the most frequently addressed thematic focus is related to understanding people’s motivations for participating in FSP.

3. Findings

In this section, the results of the literature review are presented. First, the different definitions of ‘food self-provisioning’ are considered, after which the results are discussed from health and environmental perspectives at the identified scales ranging from households to regions/countries. Overall, health-related meanings are much more prevalent in the FSP literature in various scales than environment-related meanings. Household is the most

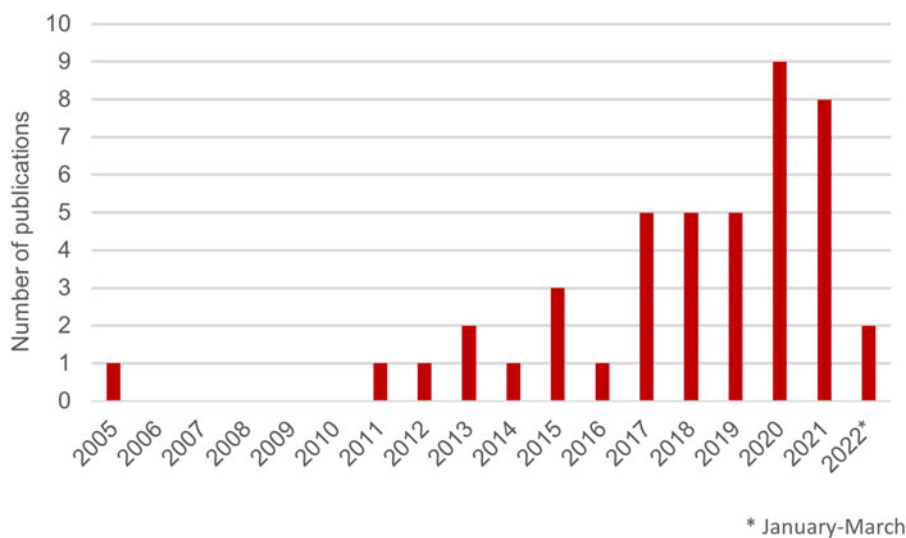


Figure 1. Annual distribution of publications on FSP. Note that data for 2022 only applies for months January–March.

Number of studies on FSP per country

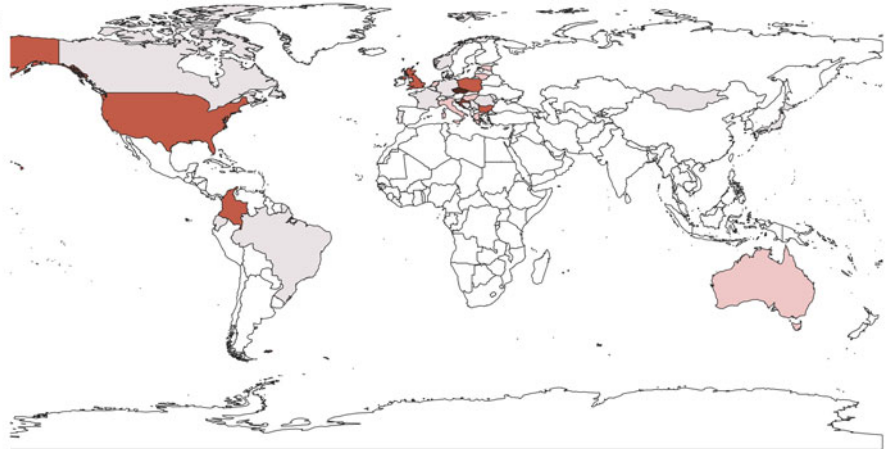


Figure 2. Geographical representation of studies on FSP. Nine out of 44 articles included study sites in two or more countries. GIS data source: Natural Earth, <https://www.naturalearthdata.com/downloads/50m-cultural-vectors/> (accessed 19 April 2022).

frequently found unit of analysis in the reviewed studies. With regards to environmental concerns, and particularly climate change, the discussion is much scarcer, and meanings could be identified at fewer scales. See Table 1 for a summary of findings.

3.1 Definitions of FSP in the literature

Overall, FSP is defined and used in different ways in the literature depending on the scale of the 'self'. Typically, with respect to individuals, households, and communities, FSP is defined as food production, consumption, and/or exchange/gifting outside of the market (Balázs, 2018; Colby & Kennedy, 2017; De Hoop & Jehlička, 2017; Smith & Jehlička, 2013; Sovová et al., 2021). Most commonly, FSP is perceived as growing food in allotments or community gardens or on the premises of an apartment building, house, or summer cottage, and consuming and sharing the yield without selling it (Smith et al., 2015). For example, Balázs (2018, p. 296) considers FSP through a 'food as commons' framework and based on previous literature defines community-based FSP as 'the production and distribution of food by means other than buying and selling: in other words, a non-market distribution of local foods. It is accomplished primarily by gifting and bartering'. However, it must be noted that FSP may bring economic benefit to its practitioners, at least seasonally, through avoiding spending money on food on the market (Jehlička et al., 2021; Vávra et al., 2021). In some cases, individuals and households who produce food for themselves may also sell some food on the market (Ivanova et al., 2021; Kirkpatrick & Davison, 2018; Pinto-Correia et al., 2021; Pulighe & Lupia, 2019; Vávra et al., 2018b). However, when the 'self' covers a larger region, FSP is typically considered solely with respect to its contribution to food circuits through the formal marketing routes (Porter et al., 2014).

While most of the studied literature focus on fruit or vegetable cultivation, Hendrickson et al. (2020) include raising livestock, foraging, hunting, and fishing under the concept of FSP. Yotova (2018) expands the idea of self-provisioning from food growing to the preparation of home-made food products. Sovová et al. (2021, p. 12) use the framework of care to understand FSP from a more abstract perspective as 'a caring practice that entails both altruism and conviviality, as well as responsibility and commitment'. Pungas (2020) also discusses FSP from the perspective of care.

3.2 Meanings related to health at different scales

3.2.1 Household

At the scale of households, FSP is connected to many health-related meanings attached to the practice itself and the product that is consumed as a result. On a smaller extent, FSP is also discussed with regards to food and nutrition security.

The motivations for households to participate in FSP seem to revolve around the perceived healthiness of self-grown food (Ančić et al., 2019; Colby & Kennedy, 2017; Jehlička & Smith, 2011; Jehlička et al., 2013; Kirkpatrick & Davison, 2018; Mincyté et al., 2020; Palmioli et al., 2020; Šiftová, 2021; Sovová, 2015; Vávra et al., 2018a, 2021), with economic scarcity in a much smaller role (Colby & Kennedy, 2017; Jehlička et al., 2013; Schupp & Sharp, 2012; Šiftová, 2021; Sovová, 2015; Vávra et al., 2018a). These findings are similar across a variety of geographic contexts, including Europe, North America, and Australia. Second, FSP seems to be an enjoyable hobby, or a meaningful free-time activity for many (Jehlička et al., 2021; Mincyté et al., 2020; Sovová & Veen, 2020; Svobodová et al., 2021; Vávra et al., 2021), with people reporting health benefits such as stress relief, getting exercise, and finding tranquillity and relaxation from interaction with nature (Mincyté et al., 2020; Pungas, 2020; Sovová & Veen, 2020).

For some, FSP may also signify a form of self-care (Mincyté et al., 2020; Pungas, 2020), or care for their families and small children through provision of healthy food (Mincyté et al., 2020; Sovová et al., 2021). In addition to health meanings attached to the practice itself, the grown variety of plants may also imbue health meanings of their own. Traditional plants and foods grown in home gardens may have cultural meanings as medicinal remedies (Ivanova et al., 2021; WinklerPrins & de Souza, 2005; Yotova, 2018). On the contrary, FSP may be viewed as 'obligatory hard physical labor', which is why people may not want to participate in it (Mincyté et al., 2020, p. 48).

On a more fundamental level, FSP can be a strategy for households to ensure food and nutrient security under poverty, noted in studies from South America, Europe, and East Asia (Hernández et al., 2022; Konstantinidis, 2022; Krstić et al., 2017; Lehmann-Ushner & Kraehnert, 2017), but this receives less attention in most of the studied literature. FSP may improve intake of important nutrients in rural households (Lehmann-Ushner & Kraehnert, 2017) or be linked to an increase in overall

Table 1. Summary of findings: environment and health-relevant meanings in FSP literature at different scales of 'self' (household, community, city, region, country), across the input-process-output scheme (drivers, processes, outcomes), and examples of articles and book chapters from the review discussing these meanings.

Scales	Meanings			
	Environment	Examples	Health	Examples
<i>Household</i>				
Drivers	Role of environmental values as motivators for FSP	Ančić et al. (2019), Kirkpatrick and Davison (2018), Schupp and Sharp (2012), Sovová (2015), Sovová et al. (2021), Vávra et al. (2018a)	Role of health-related reasons as motivators for FSP	Balázs (2018), Jehlička and Smith (2011), Jehlička et al. (2013), Colby and Kennedy (2017), Kirkpatrick and Davison, (2018), Vávra et al. (2018a), Sovová et al. (2021), Šiftová (2021), Vávra et al. (2021)
Processes	Environmental sustainability of FSP practices	Smith et al. (2015), Pungas (2019), Šiftová (2021), Vávra et al. (2021), Hernández et al. (2022)	Consumption of fruits and vegetables / Growing plants for medicinal use	Sovová and Veen (2020), Ivanova et al. (2021), Sovová et al. (2021)
Outcomes	FSP having potential for climate change mitigation and adaptation	Vávra et al. (2018a), Jehlička et al. (2021)	Food and nutrient security / Perceived health benefits of (allotment) gardening	Lehmann-Uchner and Kraehnert (2017), Hernández et al. (2022), Konstantinidis (2022), Pungas (2019), Sovová and Veen (2020), Pungas (2020)
<i>Community</i>				
Drivers	Conservation of local landraces	Ivanova et al. (2021)	Sharing of food, knowledge, and skills	WinklerPrins and de Souza (2005), Jehlička and Smith (2011), Smith and Jehlička (2013), Smith et al. (2015), Sovová (2015), Sovová et al. (2021), Vávra et al. (2021)
Outcomes	–	–	Social and cultural wellbeing	Sovová and Krylová, (2019), Sovová and Veen (2020), Ivanova et al. (2021), Jehlička et al. (2021)
<i>City</i>				
Outcomes	–	–	Food security	Porter et al. (2014), CoDyre, Fraser and Landman (2015), Sovová (2015)
<i>Region/country</i>				
Drivers	Role of environmental values as motivators for FSP / Alternative social imaginaries	Ivanova et al. (2021), Córdoba et al. (2021), Jehlička et al. (2021), Sovová et al. (2021)	–	–
Outcomes	–	–	Food security	Pinto-Correia et al. (2021)

We omitted certain cells that had no data (processes at the community, city and region/country scales, and drivers at the city scale) to improve the readability of the table.

consumption of fruits and vegetables compared to households not engaged in FSP (Sovová, 2015). However, it depends on the context whether FSP is perceived as some form of a coping strategy in economic scarcity. Konstantinidis (2022, p. 4) found that self-provisioning did not increase during the financial crisis in Greece, hence challenging 'the narrative of the turn to the land as a widespread coping strategy during the crisis'. In some contexts, such as that in Canada, gardeners were found to pay a significant premium for self-grown fruits and vegetables (CoDyre et al., 2015), suggesting that it may not be accessible to lower-income households, and in the Czech Republic, Jehlička et al. (2013) found that FSP is slightly more common among the more affluent households.

3.2.2 Community

At the community scale, FSP can be identified to improve community wellbeing through practices that involve sharing of food, knowledge, and company of others. Practices of sharing and gifting food with family, friends, neighbours, and co-workers is widely discussed and noted in the literature (Ančić et al., 2019; Balázs, 2018; Córdoba et al., 2021; Daněk & Jehlička, 2020; Feola et al., 2020; Hendrickson et al., 2020; Jehlička & Smith, 2011; Jehlička et al., 2013, 2019; Pinto-Correia et al., 2021; Piras, 2020; Pungas, 2019; Smith et al., 2015; Sovová, 2015; Sovová et al., 2021; Vávra et al., 2021; WinklerPrins & de Souza, 2005). The element of sharing not only food but knowledge, a traditional way of life, and company of others seems to be important (Harper & Afonso, 2016; Mincyté et al., 2020; Pungas, 2020; Sovová & Krylová, 2019; Sovová & Veen, 2020; WinklerPrins & de Souza, 2005). Smith et al. (2015, p. 241) found that 'it is in the relationships around the nurturing and sharing of produce and skills as much as in the getting and consuming of food that the significance of these practices lies, both for the practitioners and the world beyond'.

Implications of FSP to food sovereignty and hence community wellbeing are also discussed in some articles. FSP is understood to represent 'a potentially radical step towards food sovereignty' as it empowers local communities and provides means of challenging the industrial food system and the harms it causes (Colby & Kennedy, 2017, p. 196). For Sovová (2015), FSP addresses food sovereignty by shifting power positions within the food system back to the local level and close to the people it concerns. Jehlička et al. (2021, p. 156) argue that instead of seeing FSP through the dichotomy of hobby vs. economic hardship, a better framing would be by understanding it 'as a socially diverse and widespread practice that generates large volumes of food for reasons of autonomy and community care'. WinklerPrins and de Souza (2005) use the term 'economy of affection' to describe reciprocal gifting practices among self-provisioning newly urbanised households in Brazil. Practice of sharing is linked to improved social relations and trust (Balázs, 2018; Feola et al., 2020; Jehlička et al., 2019; Jehlička & Smith, 2011; Pinto-Correia et al., 2021) and hence improved social resilience.

Some have noted that FSP may enhance personal pride and recognition within the community, and hence relate to individual's social wellbeing (Ivanova et al., 2021). FSP may be deep-rooted in family traditions (Kirkpatrick & Davison, 2018) and strengthen ties between generations (Ivanova et al., 2021). The importance of FSP education in enhancing vulnerable communities' diet and community health (Colby & Kennedy, 2017) or passing on traditional ecological knowledge and care-taking skills to children at community gardens (Harper & Afonso,

2016) are also discussed. FSP may be part of the preservation of a shared local culture related to cuisine and local edible plant species (Ivanova et al., 2021) and has significance in terms of local cultural wellbeing.

3.2.3 City/region

At the city scale, studies specifically focus on the potential outcome of urban food security through FSP across a variety of geographic contexts, including Europe, North America, Australia, and East Asia, by calculating the self-provisioning capacity or level of self-sufficiency in commercial farms (Porter et al., 2014), home gardens (CoDyre et al., 2015), allotment gardens (Edmondson et al., 2020; Sovová, 2015), or a combination of many forms of urban agriculture (Pulighe & Lupia, 2019). Securing land in urban environments for FSP activities is seen as important for local food security. At a cross-regional scale, in both South America and Europe, it has been noted that food and required resources flow through informal (mostly family-) networks between rural and urban localities (Piras, 2020; WinklerPrins & de Souza, 2005), hence potentially affecting food security and health at a regional scale and beyond.

3.3 Meanings related to the environment at different scales

3.3.1 Household

Vávra et al. (2018a) evaluated the climate change mitigation potential of FSP in the Czech Republic in terms of its carbon footprint and use of fertilisers and pesticides. They found that the greenhouse gas emission reduction potential is relatively low when compared to overall household emissions (0.6–1.4%) or the country's total emissions (0.4–0.8%). Sixty-one per cent of respondents used either no fertilisers or only organic, while a very small fraction relied on industrial fertilisers. Most people walked, cycled, or used public transportation to reach their gardening plots (Vávra et al., 2018a). A few other studies have also looked at the fertiliser and pesticide-use among FSP practitioners in Eastern Europe. While some found that the use of industrial fertilisers and pesticides is quite low (Pungas, 2019; Šiftová, 2021; Smith et al., 2015; Vávra et al., 2018a, 2021), others found that a significant share of people use agrochemicals, including synthetic ones (Ivanova et al., 2021; Smith & Jehlička, 2013). The latter also relates to a paradox observed by Sovová (2015); namely that while own produce is seen as healthy and natural, industrial fertilisers and pesticides might still be used. Sovová et al. (2021) also found that younger generations tend to use fewer industrial agrochemicals than older generations, which indicates that for the young, FSP practices do not aim at maximum yields, but at the balance between efficiency and long-term sustainability.

FSP may have a role in agrobiodiversity conservation, which in turn can improve resilience of the food system and have implications in terms of food security and adaptation to climate change. Hernández et al. (2022, p. 9) link FSP, agrobiodiversity, and household food security in a rural context in Colombia, and point out that the expansion of agricultural monocultures at the expense of home FSP may decrease agricultural biodiversity and further threaten household food security. They found that a high number of women in the household, a higher level of education among young people and heads of household, and a high level of technology (i.e. tools) used, positively correlate with the number and diversity of species grown. Šiftová (2021) studied water conservation practices of cultivating households in the

Czech Republic and found that most households (83% of the sample) use rainwater for irrigating their home gardens.

Whether environmental motivations drive FSP practices has been of interest to many researchers. This topic was studied in the contexts of Europe, North America, and Australia. It seems that environmental reasons are not in a big role in motivating FSP at least in many central and eastern European households (Ančić et al., 2019; Smith & Jehlička, 2013; Sovová, 2015; Sovová & Krylová, 2019; Vávra et al., 2018a, 2021) which is why it has been labelled as ‘quiet sustainability’ by some scholars (Petridis & Huber, 2017; Smith & Jehlička, 2013) due to its assumed environmentally and socially sustainable nature and different aspects of care (Sovová et al., 2021). In fact, across a range of options, environmental concerns were found to be the least important motivator for FSP in the Czech Republic (Sovová et al., 2021; Vávra et al., 2018a).

On the contrary, especially in North America, Australia, and in some European households, scholars have found pro-environmental values to increase the likelihood of FSP or to be linked to the motivating factors of taking part in FSP (Kirkpatrick & Davison, 2018; Pungas, 2019; Schupp & Sharp, 2012; Vávra et al., 2018b). Pungas (2019) studied allotment gardeners in Estonia and found that most gardeners had clear environmental concerns, which affected their gardening practices. As an example, most used manure or compost sourced locally to fertilise the soil, and almost none had used industrial pesticides in their gardening plots. Schupp and Sharp (2012) studied home gardening in Ohio (the USA) and found that gardening is more prevalent among higher income households with pro-environmental values and behaviour, and stronger participation in alternative and local food systems in general (i.e. buying locally produced foods, visiting farms, farmers’ markets, and roadside stands). All in all, the roles of environmental values and motivations in FSP vary greatly between contexts.

3.3.2 Community

Environmental issues were less discussed at the community level. Themes that emerged had to do with the support (or the lack of it) from environmental organisations to FSP, as well as the conservation and renewal of local agrobiodiversity. Some environmental organisations in the Czech Republic are sceptical about the sustainability of households’ FSP practices and are unlikely to advocate for these practices. De Hoop and Jehlička (2017) found that environmental non-governmental organisations in the Czech Republic were more likely to campaign on market-based alternative food networks than informal FSP. While activists preferred the consumption of local and seasonal foods, they also feared that FSP is not sustainable and most people participating in FSP are not environmentally conscious. With regards to conserving agrobiodiversity at the community level in Bulgaria, Ivanova et al. (2021) noted that while local gardeners were hardly interested in conservation of local landraces, local cultural centres had some interest in maintaining small seed banks for local villagers.

3.3.3 Region/country

Discussion relevant at the scale of countries and regions (and globally) are related to how FSP may offer an alternative framing of sustainability rooted in existing practices. Jehlička et al. (2021, p. 156) argue that in ‘overdeveloped’ societies, FSP may to some extent replace dominant ways of food provisioning and offer ‘a counter-narrative’ to the supposed ‘immutability of the hegemonic economic organization’. In other words, it may offer an alternative social imaginary to the current, largely unsustainable

modes of food production and consumption. They (2021, p. 156) continue that ‘FSP is thus associated with quiet sustainability, conviviality, degrowth, autonomy and de-alienation from nature and products of one’s own labour’. Others (Córdoba et al., 2021; Šiftová, 2021; Sovová et al., 2021) share this view and, for example, Sovová et al. (2021, pp. 1–3) propose that, even though the intentional political and activist forms of gardening have so far been marginal in the wider context of FSP, the already widespread and socially embedded place-based East European ‘practices of food production, consumption, and care’, have the potential to become more active agents in informing and altering ‘the very processes of the global itself’ towards a different, ‘a more beautiful Anthropocene’.

4. Discussion

In this section, we discuss, based on the findings, how FSP is conceptualised in relation to health and to the environment (especially climate change), and what are the (potential) implications of FSP to human/non-human health. At the end of the section, we also consider the limitations of the review.

4.1 FSP and health conceptions

Three most prevalent health-related conceptions of FSP in the literature frame (1) FSP as a recreational activity with health benefits, (2) FSP as a source of community wellbeing, and (3) FSP as a source of food security. FSP is seen primarily as a source of fresh and healthy food from the perspective of households across a variety of contexts. Therefore, FSP is conceptualised through its implications for household dietary needs. Similarly, for individuals and households, FSP may act as a meaningful hobby through which health benefits such as reduced stress can be acquired because of the physical exercise involved in gardening practice, and due to time spent outside interacting with the surrounding environment. FSP is also depicted to have a role in community resilience, as it may strengthen or improve social relations and trust among community members who share surplus of food. Agency, adaptive capacity, and self-organisation, concepts important for community resilience (Berkes & Ross, 2013) are also prevalent in FSP.

The health-related meanings arising from the literature appear somewhat anthropocentric (cf. Heikkurinen et al., 2019b; Ruuska et al., 2020), as the discussion revolves around humans’ access to food, and individualistic notions of wellbeing benefits from the self-centred practice (such as stress reduction, exercise, or access to food that is perceived healthy). However, the framework of care used in some of the studies (i.e. Pungas, 2020; Sovová et al., 2021) interestingly highlights the interconnected nature of human and non-human health. Continuing the line of thinking by Kortetmäki et al. (2021) who introduce the concept of ‘planetary wellbeing’, care emphasises responsibilities in caring for the environment not only to sustain our own existence but also in securing the possibility for other organisms to do the same. Studying FSP through the framework of ethics of care at least makes it possible to understand that caring for the environment and caring for the ‘loved ones’ are interrelated (see Sovová et al., 2021, p. 12). As argued by Kortetmäki et al. (2021, p. 5), ‘the idea of needs and needs satisfiers is integral to the concept of planetary wellbeing’. In the light of this review, it seems FSP may have the ability to satisfy both material and non-material

human needs by the provision of food, but also by enabling meaningful leisure, relationships, and social participation.

4.2 FSP and climate change conceptions

It seems like the FSP literature is yet to fully engage in discussions about climate change. While ‘climate change’ as a concept was mentioned in about 20% of the studied literature, only two articles specifically focus in their empirical work on FSP in relation to either climate change mitigation or adaptation (i.e. Hernández et al., 2022; Vávra et al., 2018a). We find that FSP is conceptualised in the literature as a strategy for both climate change mitigation and adaptation, but with a lot of uncertainty as to what extent it has actual potential in responding to the problems of conventional modes of food production. With regards to mitigation, it seems households differ in terms of the quality and quantity of used agrochemicals and means of commute to their gardening plots. Regarding adaptation, it is noted that the more diverse the gardens are in relation to cultivated species, the more resilient households are in adapting to change.

Transforming the unsustainable global food systems is central in achieving climate change mitigation targets (Clark et al., 2020). While agriculture is a major contributor to climate change, it is also highly vulnerable to its effects, threatening for example future food availability due to changes in crop productivity (Wheeler & von Braun, 2013) and the productivity of farm workers due to hotter average temperatures (Sauerborn, 2016). As climate change is already advancing, the question of adaptation also becomes of central importance. It might be possible that the global industrial food system with its monoculture plantations is not very adaptable to change (see Nyström et al., 2019). Therefore, questions such as conservation and renewal of agrobiodiversity are of high importance in terms of climate change adaptation (Gonzalez, 2011). Gardens also serve as green spaces that help in both mitigation and adaptation to climate change (Clarke et al., 2019; Okvat & Zautra, 2011), hence providing ecosystem services and relevant for discussions regarding nature-based solutions.

While the potential environmental sustainability of local food systems is highlighted in many studies, it is interesting that for most households it is the perceived healthiness of self-grown foods that is more important as a driver of FSP than the environmental friendliness of the practice. To this end, it is interesting to note that health is also seen as ‘the driving force [...] an argument that drives change, which generates energy to do something about climate change’ as argued from the public health side of climate change research (Sauerborn, 2016, p. 1). Moreover, it is argued that similar actions, such as ‘enhancing personal mobility or eating less red meat’, lead to both health and climate benefits (Sauerborn, 2016, p. 2). Through positive changes in diet, such as an increase in consumption of fruits and vegetables, and the fact that FSP entails physical work, FSP as a practice seems to embody these potential co-benefits.

4.3 Potential implications of FSP to health and climate change

Based on the findings we can argue that the implications of FSP to health and climate are manifold. Some of these implications have already been actualised, such as acquiring fresh and healthy food, but many of them remain underutilised and underdeveloped on multiple scales. This is particularly true in the case of communal organising of food self-provisioning. In the existing research, FSP is considered to provide especially positive individual health

benefits, for instance because of healthier eating habits and meaningful social interaction. We argue that there is potential for wider involvement of individuals, households, and communities in FSP.

At the same time, there exists somewhat a paradox in the FSP literature. Based on our interpretation, it seems to be the case that many environmental implications in FSP research have been rather assumed than found. In other words, researchers seem to look for or expect to find certain things *ex ante*, or head to the ‘field’ with certain mindset about the research topic and phenomenon. In the case of FSP, this may be due to the logic of research approaches that have been applied, which have in many cases sought to uncover and identify the motivations and aims of self-provisioners. While there is nothing wrong in this type of approach or research design *per se*, we would argue that this type of approach does not reveal or inform the *potential* of food self-provisioning for sustainability, or for instance, the mitigation/adaptation of climate change (see e.g. Bradford, 2019; Shiva, 2009; Smaje, 2020).

As Georgescu-Roegen (1975, p. 373) remarked, the industrialisation of agriculture goes against ‘the most elementary bioeconomic interest of the human species’. This is because complex, specialised, and differentiated systems dissipate and erode due to the second law of thermodynamics. Thus, we propose that FSP could be considered as a ‘counter strategy’ to the unsustainable industrial food system, because it indeed has the potential to be sustainable. This is because in FSP there is an opportunity to localise the food production and to involve individuals, households, and communities to meet their basic needs in a way that is not possible within the current industrial food system. Furthermore, and while providing for the self, FSP immediately addresses important societal and political questions, such as, prospects of food security and food sovereignty, and for example, the adaptation and mitigation of various socio-ecological crises.

To our understanding FSP has a significant potential to contribute to food security, and to food self-sufficiency, which can be defined as ‘the ratio of food produced to food consumed’ and is most often monitored on a country or a regional level (Clapp, 2017, p. 89), but can also be applied to, for example, individual households (e.g. Houtbeckers, 2018). As noted in previous literature and policy, skills and capacity for FSP as well as a high rate of food self-sufficiency enhance socio-ecological resilience of households and communities, and safeguards food security in times of disruptions in international or national food supply, for example, due to political conflicts, production shortfalls, or sudden rises in food prices (FAO, 1996; Heim, 2020; Lehmann-Uchner & Kraehnert, 2017).

Regarding climate change in particular, the implications or actual benefits of FSP are currently similarly limited in scope. However, FSP indeed has a significant *potential* for climate change mitigation and adaptation. From the perspective of mitigation, FSP has the potential to decrease the use of fossil fuels, and to increase the use of renewable inputs due to its local organisation and the use of muscular labour. In addition to these mitigation strategies, FSP can help communities to adapt to climate change and other socio-ecological crises, as it relies on, and nurtures, personal ties, local communal economies, and conservation and renewing of agroecology and biodiversity (see e.g. Gonzalez, 2011; Shiva, 2009; Smaje, 2020). Moreover, gardens may serve as green infrastructure in cities that help in both adapting to and mitigating climate change through, for example, carbon sequestration and lowering of ambient temperatures (Okvat & Zautra, 2011).

4.4 Limitations

The coverage of our review is obviously limited by the semi-systematic approach and the fact that the literature search focused only on 'food self-provisioning'. We recognise that there is a variety of studies focusing on FSP-related practices that use other terms, such as 'home food production', 'home gardening', 'home-stead vegetable production', 'informal food production', 'home-steading', 'home food gardening', 'backyard food gardening', 'community gardening', 'community supported agriculture', 'subsistence farming', 'people's farming', 'quiet food sovereignty', 'peasant farming', and 'food exchange networks'. Including some or all of the other key words in the search could have altered the findings of this review. At the very least it would have diversified the geographic scope of the review, which is biased towards Europe, particularly central and eastern Europe. As was found, academic discussion on FSP seems to be fairly new, whereas subsistence farming and home gardening, for example, have been studied over a longer period of time, especially in countries of Global South. Hence including these could have potentially provided more comprehensive findings regarding health and climate implications of FSP. However, by limiting the scope to 'self-provisioning', the literature search yielded a more reasonable number of articles compared to a search with all the potentially relevant terms. In addition, the use of 'food self-provisioning' better guaranteed that the focus of the studies was on the practice and process of 'food self-provisioning' rather than on some other aspect of related activities. The notion of 'health' in this paper is not strictly pre-defined but determined by how it emerges from the literature. As can be interpreted from the results, a wider conception of health arose from the literature, encompassing both individual mental and physical health as well as social and community wellbeing and care.

5. Conclusions

Due to unsustainable human activities, the Earth system integrity, and consequently, planetary wellbeing, is in danger. Large-scale industrial agriculture is to a great extent responsible for crossing multiple planetary boundaries, and at the same time vulnerable for the consequences of those actions. In this paper, we set out to bridge the gap between human and non-human health by discussing the health- and environment-related meanings in parallel, as they arise from the food self-provisioning literature. The purpose of the review was to investigate the meanings of food self-provisioning in relation to environmental problems, particularly climate change, and to issues of health across multiple scales.

The semi-systematic review of 44 texts, including articles and book chapters, showed where the emphasis in the food self-provisioning literature lies, and where there might exist research gaps. We found that food self-provisioning is mainly addressed as a source of fresh and healthy food and a source of social wellbeing at large. Environmental issues, including climate change, were less frequently discussed in the literature, and directly addressed in only a few articles. Nevertheless, we conclude that food self-provisioning holds potential for both climate change mitigation and adaptation. We argue that food self-provisioning, as a strategy for local food system sustainability, has been largely undeveloped and underutilised. In particular, it may hold potential for moving towards planetary wellbeing; as a local and small-scale activity, it helps in caring for basic needs and in experimenting with both traditional and novel ecological

techniques and practices while respecting the integrity of Earth and ecosystem processes.

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Data. The list of reviewed literature is available in the Supplementary materials (Table S1).

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