DIPLOMARBEIT

URBAN FOOD MAPPING

FOOD ATLAS Wien: Making food-related urban structures and processes visible by using Citizen Science

KARTIERUNG URBANER ERNÄHRUNGSLANDSCHAFTEN

FOOD ATLAS Wien: Visualisierung lebensmittelbezogener urbaner Strukturen und Prozesse mithilfe von Citizen Science

ausgeführt zum Zwecke der Erlangung des
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Abstract

The concepts of urban agriculture, urban food production and ecosystem are challenging the discipline of urbanism. The growing interest has expressed itself on a spatial level mainly in the reintroduction of food production in urban areas, in forms of urban gardening, community gardening, or on a larger scale urban agriculture. Further activities involved in urban food provisioning are far from sufficiently researched in a coherent spatial context. However, the search for sustainable territorial strategies to (re-)connect urban areas with food supply has become inevitable for cities as climate change and geo-political crises or even pandemics become more prominent.

Visualising spaces relevant to the production, processing, distribution, consumption, and disposal of food (food cycle) promotes the understanding that the multifunctionality of the urban food network is not only a concern for the involved actors and spaces. Rather, the entire food cycle is linked to current challenges on several levels, such as health, biodiversity, climate change, poverty and social inequality, education, and awareness.

This Master thesis draws upon the intersection of direct engagement with citizens, a theoretical analysis of food concerning urban design, and official planning data in the Viennese context. The process of collective mapping and the resulting maps help to raise awareness, recognise complex interrelationships and provide knowledge that goes beyond the common understanding of food and the city.

Kurzfassung

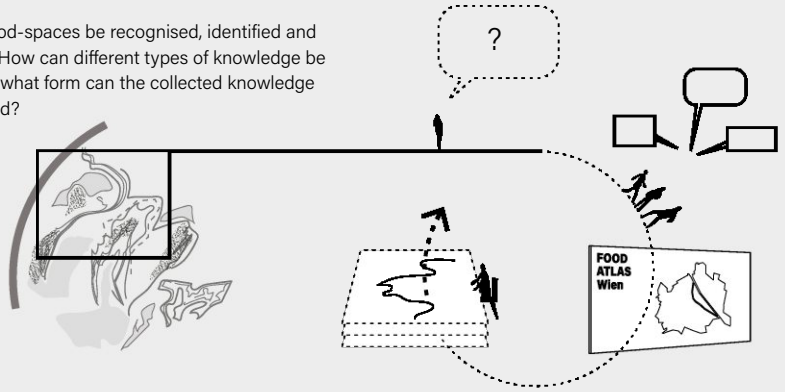
Konzepte der städtischen Landwirtschaft, der städtischen Lebensmittelproduktion und des Ökosystems fordern die Disziplin der Stadtplanung. Das wachsende Interesse äußert sich auf räumlicher Ebene vor allem in der Wiedereinführung der Lebensmittelproduktion in städtische Gebiete in Form von Urban Gardening, Community Gardening oder in größerem Maßstab urbaner Landwirtschaft. Weitere Aktivitäten im Zusammenhang mit der städtischen Lebensmittelversorgung sind in einem kohärenten, räumlichen Kontext noch längst nicht ausreichend erforscht. Die Suche nach nachhaltigen, territorialen Strategien, um städtische Gebiete (wieder) mit der Lebensmittelversorgung zu verbinden, ist für Städte jedoch unausweichlich geworden, da Klimawandel und geopolitische Krisen oder sogar Pandemien immer stärker in den Vordergrund treten.

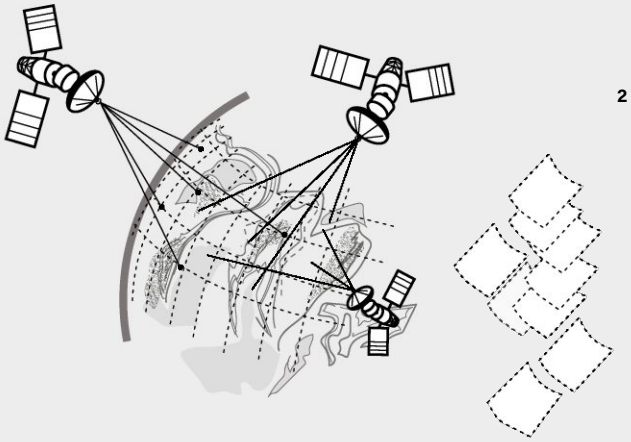
Die Visualisierung von Räumen, die für die Produktion, die Verarbeitung, den Vertrieb, den Konsum und die Entsorgung von Lebensmitteln (Lebensmittelkreislauf) relevant sind, fördert das Verständnis dafür, dass die Multifunktionalität des städtischen Lebensmittelnetzes nicht nur eine Angelegenheit der beteiligten Akteure und Räume ist. Vielmehr ist der gesamte Lebensmittelkreislauf mit aktuellen Herausforderungen auf mehreren Ebenen verknüpft, wie Gesundheit, Biodiversität, Klimawandel, Armut und soziale Ungleichheit, Bildung und Bewusstsein.

Diese Masterarbeit basiert auf der direkten Auseinandersetzung mit Stadtbewohnerinnen und Stadtbewohnern, einer theoretischen Analyse von Lebensmitteln in Bezug auf Stadtgestaltung und offiziellen Planungsdaten im Wiener Kontext. Der Prozess des kollektiven Kartierens und die daraus resultierenden Karten tragen dazu bei, Bewusstsein zu schärfen, komplexe Zusammenhänge zu erkennen und Wissen zu vermitteln, welches über das gängige Verständnis von Lebensmitteln und Stadt hinausgeht.

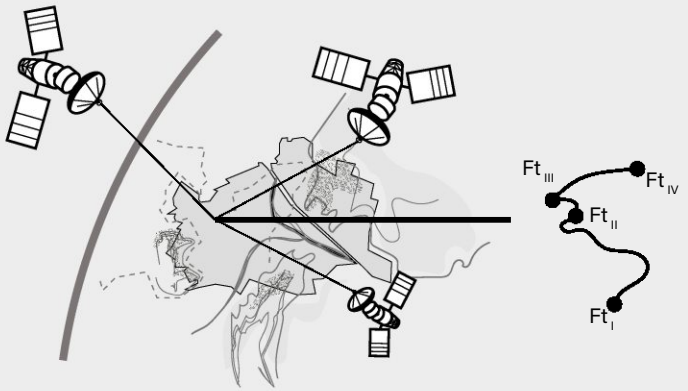
INTRODUCTION

1 How can food-spaces be recognised, identified and visualised? How can different types of knowledge be queried? In what form can the collected knowledge be presented?



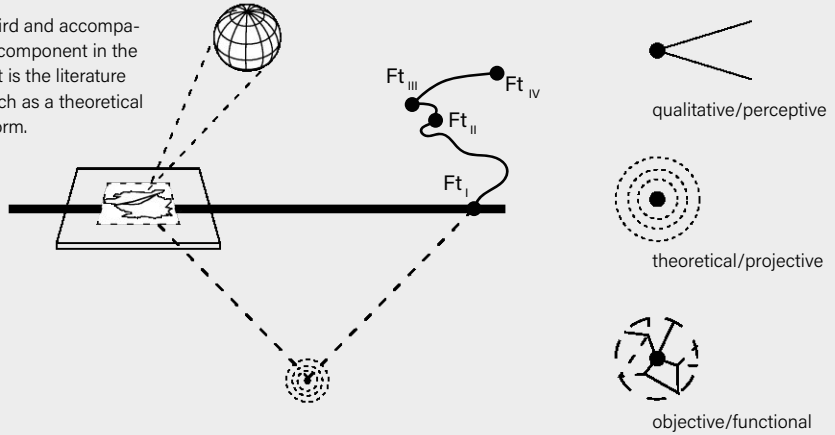


2 Cartographic sources are spatial representations such as maps, aerial photographs, but also geo-data. Maps are usually representations of the earth's surface based on a terrestrial or photogrammetric survey (City of Vienna n.d.).
The City of Vienna makes data sets freely available under the Open Government Data-initiative.



3 Georeferencing is used to create data sets with spatial information (City of Vienna n.d.). This project combines georeferenced data and so called qualitative data from participants in a joint mapping process at four different locations within the urban context of Vienna (Ft I - Ft IV).

4 The third and accompanying component in the project is the literature research as a theoretical data form.



5 Superposition:
The superposition of the three data sources results in a multi-layered understanding of the Viennese food system.

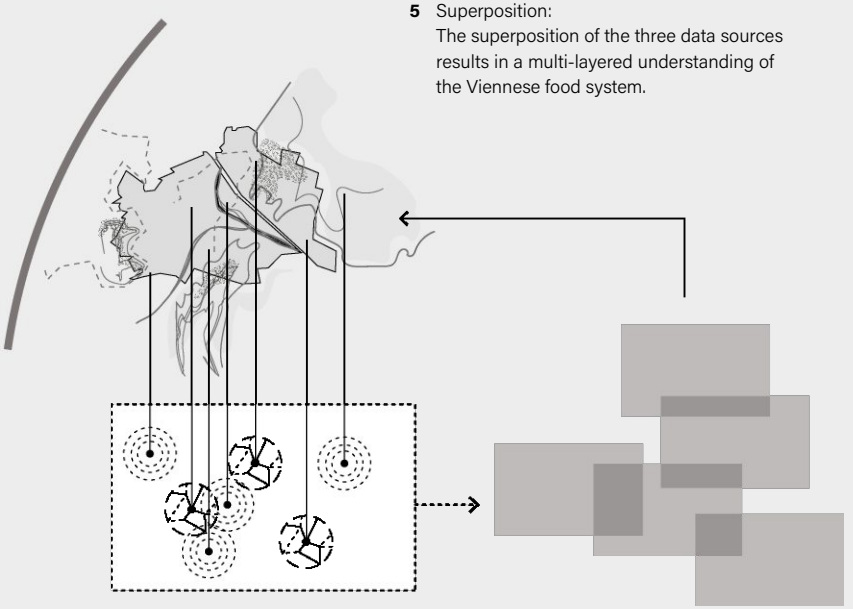


Fig. 1 Brief summary of the methodological approach of the project and map production.

State of the art

The complex relationships and interactions between cities and food, especially the infrastructure and logic beyond urban agriculture, are still far from well understood. The pioneers in urban food systems'[1] analysis and planning are Jerome L. Kaufman and Kameshwari Pothukuchi. As two innovative US planning academics, they concluded that the food system was "a stranger to the planning field" (Pothkuchi and Kaufman 2000 cited by Morgan in Bohn/Viljoen 2014:18). Meanwhile, a variety of terms associated with the emerging field of Food Urbanism can be found in the literature: (urban) foodscape, food landscape, food metabolism, food architecture, urban food system, food mapping, food system activities, edible city, food hub, and productive landscape (etc.). Each of these terms deals with aspects of the relationship between populated areas and their food supply. In this master's thesis, the term "Food Urbanism" is used as a generic term to describe these aspects and relationship between food systems and cities. Currently, there is no generally accepted definition of Food Urbanism. However, the term can be found among academics and practising architects and planners working in this field. The recently published book by Verzone and Woods Architects "Food Urbanism" defines the term as follows:

"Food Urbanism examines the complex relationship between food and the city, investigating how the thoughtful integration of food production into urban design and planning can achieve a form of new urban quality, measured by spatial character, community vitality, and ecological performance, all within a densifying city." (Verzone/Woods 2021:9)

The book presents typologies, tools, assessment methods and strategies and shows practical applications of urban agriculture. The focus is strongly on the production parts of the food system, which is also noticeable in the definition of Food Urbanism. The other parts of the food system, such as processing, distribution or the impact of disposal, are mentioned more in a peripheral way or in the context of case studies. Further publications, projects and researchers that deal with the connections between food and the city and served as a theoretical basis for this thesis are:

Bohn and Viljoen Architects, a London-based architectural practice founded in 1999, focuses on sustainable urban planning and low-energy architecture and specialises in integrating food into design. Katrin Bohn and Andre Viljoen presented an urban planning concept for the integration of urban agriculture in 2005 (CPUL[2]) and thereby entered the international urban design discourse. Ten years later, they published the book "2nd nature urban agriculture – Designing productive cities" (2014) which builds up on this concept with practical experiences and analyses of current developments. Kevin Morgan (Professor of Governance and Development in the School of Planning and Geography at Cardiff University) and Gillean Denny (expert for local resources and the integration of sustainable practices in modern society, Cambridge) are some of the contributing authors.

A first comprehensive work dealing primarily with policy and planning in both theoretical and practical contexts is the book "Sustainable Food Planning. Evolving Theory and Practice, edited by André Viljoen and Johannes S.C. Wiskerke (2012). It presents an anthology of contributions from practitioners and researchers in an international context.

The range of topics Carolyn Steel addresses in her two books, "Hungry City" (2008) and "Sitopia" (2020), support her thesis that food influences everything and is thus linked to deep existential problems in modern society.

1 A now widely used definition of urban food systems was proposed by the FAO (Food and Agriculture Organization of the United States) in 2013: "Food systems encompass the entire range of activities involved in the production, processing, marketing, consumption and disposal of goods that originate from agriculture, forestry or fisheries, including the inputs needed and the outputs generated at each of these steps. Food systems also involve the people and institutions that initiate or inhibit change in the systems as well as the socio-political, economic and technological environment in which these activities take place." (FAO, 2013 in Cabannes and Marocchino, 2018:23)

2 Bohn and Viljoen define the continuous productive urban landscape concept (CPUL) as a way of coherently integrating urban agriculture into urban spatial planning. "The term 'CPUL City' describes the vision for a resilient urban entity – containing CPULs – that enables sustainable urban food systems for the pleasure of its individual citizens and the benefits of environment, economy, culture and society as a whole." (http://bohnandviljoen.co.uk/theory/continuous-productive-urban-landscape-cpul-concept-2004/, last accessed 21.01.22 14:27)

In a detailed reappraisal of human history and its habitats, she shows connections between food and forms of life in an impressive way.

Philipp Stierand, a trained spatial planner, locates the problem of urban food supply and its spatial consequences in oversupply and irresponsibility on the part of city administrations and municipalities. In 2009, he started the blog speiseräume.de and began posting continuously about food and the city. This also resulted in the ebook "Stadtentwicklung mit dem Gartenspaten - Umrisse einer Stadternährungsplanung" (2012) (Urban Development with the Garden Spade - Outlines of Urban Food Planning) and the book "Speiseräume" (2014).

The authors Cabannes and Marocchino note that while the issue of Food Urbanism is becoming increasingly important in Western societies, far less attention is paid to the question of how cities need to be developed to promote food security for all and not just the wealthy. Published by UCL Press in 2018, "Integrating food into urban planning" seeks to fill this gap by reflecting on individual urban experiences and several international case studies on the topic.

Kata Fodor, a young researcher at Aalto University in Finland is working on "The Hybridisation of Food Spaces" as part of her PhD thesis. The main question she addresses is how new technologies and consumer behaviour affect the urban environment. In her last published article (June 2021), she explores the logics of modern food infrastructures, such as online ordering of food, and their impact on urban space.

The issue of food security has received little attention in urban planning so far. Several possible reasons are:

- From industrialisation onwards, food and its production were seen as a rural issue, which had no meaning in cities (cf. Pothukuchi and Kaufman 2000 in Cabannes and Marocchino 2018)
- Planners and politicians have been misled by the existing rural exodus into seeing food supply failure as a farm problem rather than a distribution failure (cf. Cabannes and Marocchino 2018:19)
- The lack of a holistic perspective and the predominantly sector-specific approach to planning and decision-making
- There are already some global and regional instruments that try to integrate food issues, but the concrete approach between food and urban planning is still missing.
- The increasing outsourcing of food supply to the private sector, and thus the weakening of food as a public issue, did not create a need to deal with the issue on the planning side (cf. Verhoeven/Wiskerke 2018)

Government level

The issue of nutrition has become increasingly prominent in strategy papers, policies and government programmes over the past years.

On a global level, the 17 UN Sustainable Development Goals (SDGs) aim to promote sustainable development on the environmental, social and economic levels. Nutrition is addressed in Goal 2 (Zero Hunger: End hunger, achieve food security and improved nutrition and promote agriculture).

The Milan Urban Food Policy Pact can be seen as a milestone on the international level in addressing challenges that affect the relationship between food and the urban environment. 170 cities have signed the declaration since 2018, including Vienna. Divided into 6 categories, it lists 37 recommendations on how cities can deal with the issue and better integrate food into their agenda. Regarding Vienna, a single coordinator of the department MA 22 (Environmental Protection) is responsible for the sustainable use of food for the city and therefore also the implementation of the pact (cf. City of Vienna 1 n.d.).

On the city level, there are some studies and actions by the City of Vienna to better integrate food into the urban agenda. With the strategy paper "Smart City Rahmenstrategie 2019-2050" as an overarching, citywide instrument the City of Vienna attempts to implement the Sustainable Development Goals.
On the municipal website, the City of Vienna refers to a couple of policy papers, projects and studies that stimulate rethinking nutrition issues and sustainable development. A distinctive project in this context is SUM FOOD (2017) by the Environmental Agency Austria, a study that examined regional food chains and the production areas around Vienna. For this purpose three subareas (Wiener Umland Nordteil, Wiener Umland Südteil und Wien) were defined as the urban-rural region. On this basis, the production and consumption of specific vegetable crops was studied in detail (Schwarzl et al. 2017).

Another study from 2016, conducted by Bioforschung Austria, is entitled "Green Public Food Procurement in Vienna". In this report, when compared with 18 other European cities, Vienna is seen as exemplary case study, but also as a city with much untapped potential and opportunities (cf. City of Vienna 1 n.d.). Other projects of the city are the food action plan "Wien isst G.U.T"[3] (Vienna eats G.U.T. (well)) (2020), developed by MA22, and Ökokauf - both aim for a sustainable approach to food.

3 G.U.T (Gesund und genussvoll – Umwelt und klimafreundlich – Tierfair) = Healthy and delightful - Environment and climate-friendly - Animal-friendly, further information: https://www.wien.gv.at/umweltschutz/nachhaltigkeit/wien-isst-gut.html

Research problem and question

In Vienna, urban food production is slowly developing from niche activism into a recognized and well-accepted business industry. However, conflicting interests especially in terms of current land use and land reserves for future development confronts authorities and civil society with difficult situations. The city touts thriving food production within the urban area, but parallel developments show that spaces and areas for food production and processing are disappearing from year to year, in many cases due to the conversion of agricultural land into residential areas. On a society level, public awareness of food has heightened significantly, not least due to experiences of disrupted supply chain performance as a result of the Corona pandemic 2020. City dwellers were confronted with empty supermarket shelves for the first time. In many cases, this was due to consumer buying behaviour rather than actual supply shortages. It did, however, put a new light on nutrition and created a long-absent awareness thereof.

However, the mentioned policy papers and municipal strategy papers show that the integration of food in urban planning is still urgently needed. The development strategy of the City of Vienna (STEP 2025), which primarily serve planning purposes, do address the topic of nutrition, but rather as a side-note via topics such as green and open space or health. Although the City of Vienna states that "agricultural and horticultural use in the city is of great importance in many different areas" (City of Vienna – STEP2025 2015:34), many of the urban expansions take place on former agricultural land. Even when innovative concepts are developed in these new areas through competitions and participatory processes, practical implementation seems to fail. Furthermore, there is a lack of generally understandable, basic knowledge about the topic of food and the city at the level of the planning community, city administration and civilians.

This thesis attempts to pick up on this point. One of the central questions takes a look at how the topic of Food Urbanism can be made visible in a spatial context. For this purpose, an interactive process that enabled exchange between city residents, experts and the scientific community was launched.

Following research questions accompanied the project:

How can urban structures and processes related to food be elaborated and what role can Citizen Science take in this process?

How can the importance and perception of food-related structures be harnessed for the city of the future?

The growing research field of Food Urbanism

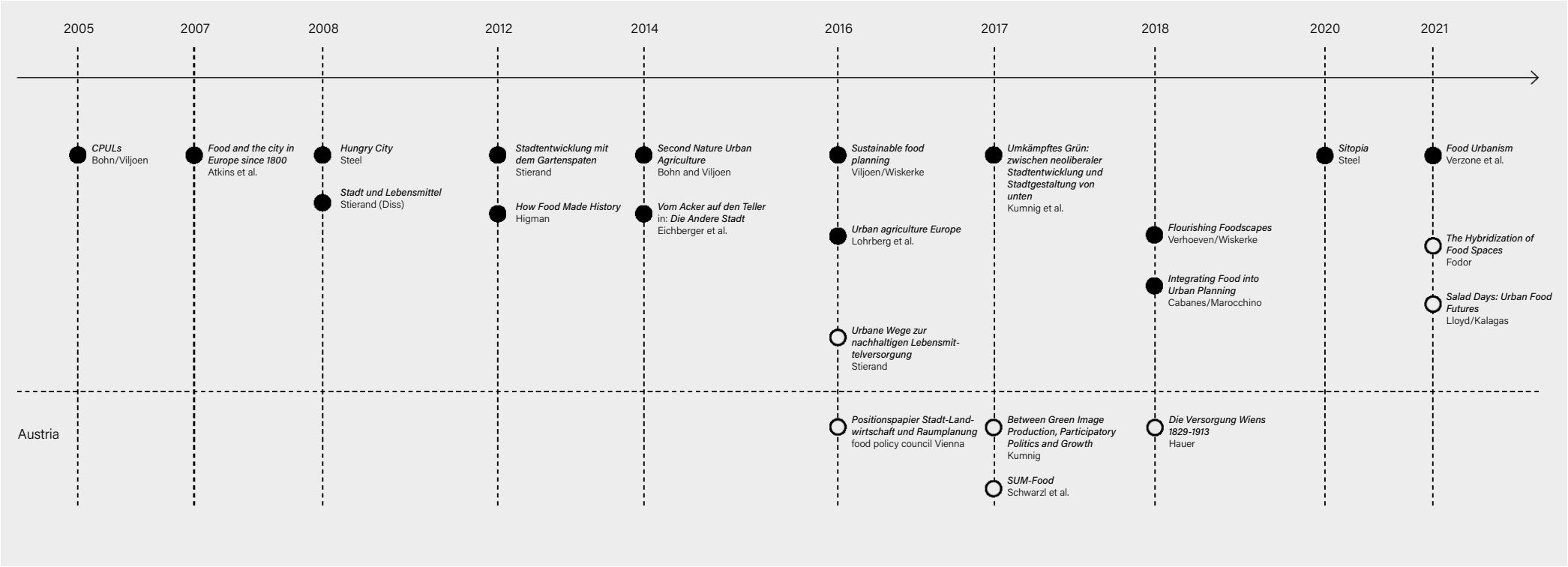


Fig. 2 The emerging field of urbanism and food. Literature and publications with focus on western cities over the last 20 years (no claim to completeness)

Graphical language & working method

In this thesis, visual representations serve two functions: As a medium for the collective sharing of information during the initial, interactive mapping phase and as an instrument to describe complex relationships between city and food. Representations include maps, plans, infographics, illustrations and isometrics. Continuous work at scales ranging from the building level (micro) to the citywide level and beyond (macro) allowed for moving between multiple dimensions, abstractness and reality, the detail and the whole, systemic and procedural.

Every representation is based primarily on subjective perception, as it represents a filtered image of reality. The simple graphic language, consisting of dots, lines and hatching, aimed to conceptualise essential content. Fig. 3 shows the basic principles and the visual language used to create the representations. In order to create readable content for laypersons as well as experts, essential visual components have been highlighted while others have been omitted. Only through this filtering of visual components do connections and information become legible. For the collective mapping process, a 4 by 1.7 metre map base at a scale of 1:25,000 was prepared. The chosen scale provided a good balance between building scale and a citywide scale, respectively the level of detail and overview. Finally, this map can be seen as the epitome of the collective communication medium, as it mixes newly acquired knowledge, the official data of the city and the filtered elements.

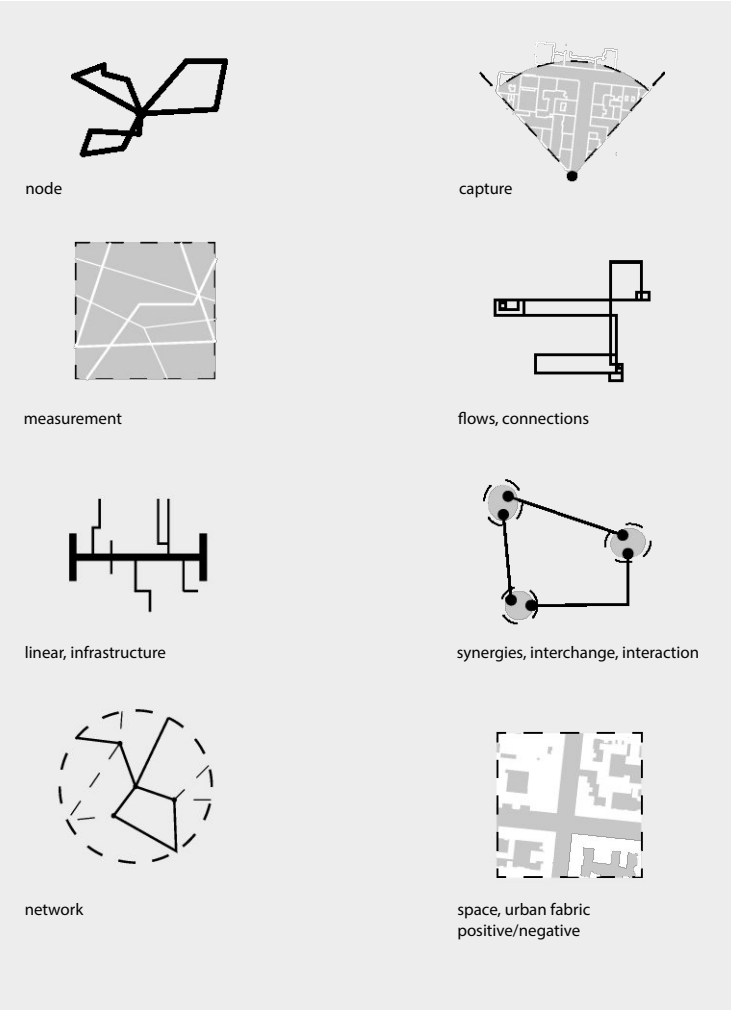


Fig. 3 Geometric and visual grammar to examinate and illustrate food-related structures within the urban

Structure of the master thesis

The master thesis is divided into three parts, starting with the introduction and the conceptual framework, the middle section comprises of the interactive project phase and crosscutting themes of Food Urbanism, and the final part a methodological background.

The middle section is divided into four main chapters, called Food Sphere, Resources, Policy, and Memoirs & Prospects, all following the same three-part structure:

- "*Field trip*" offers an excursion into theoretical reflections and analyses that intersect with being present in real space, in the urban fabric of Vienna talking to people, capturing different atmospheres, viewpoints and perspectives.
- "*Space*" shows a spatially reflection of the theoretical considerations and places them in the Viennese context.
- "*Map*" shows food-related elements on a citywide scale. In a superposition with the results of the interactive project phase (collective mapping), coherencies, subjective perceptions and individual aspects of specific locations become visible.

"*Food Sphere*" describes fundamental relations between the city and urban environments and, by extension the role food can play as part of the built environment.

"*Resource*", the second main chapter, provides an insight into environmental metrics related to food and questions the relations between humans, resources and nature.

"*Policy*" explains diverse considerations on how cities and municipalities can deal with food systems and the planning thereof, and the side effects neoliberal urban planning can cause in combination with food production.

CONCEPTUAL FRAMEWORK

Vienna Biennale for Change 2021

In the frame of the Vienna Biennale, the Food Atlas Vienna project was part of the EAT LOVE exhibition, a series of art events in public space curated by the Urban Think Tank Next and the Vienna Business Agency. The so-called "*studio mobil*", a city laboratory in form of a van and wooden pavilions, was the hub of the activities and events. The aim of this installation was to reach people who don't normally go to museums. In the context of the Food Atlas, four Open Studio events took place at different locations from June to October 2021 with the aim of involving urban residents in the project, getting in touch with them and addressing them directly. These four field trips in urban spaces are shown in fig. 5. Each of these events was preceded by a research phase to prepare content and create a basis for discussion with city residents as well as experts. The most elementary part of the public appearance was the food map - a metre-long map of Vienna and its surroundings (scale 1:25,000). The surface served as a medium to gather information, attract attention and directly confront visitors with the spatial structure of the city (see fig. 4).

"The Vienna Biennale is the first event of its kind to combine art, design, and architecture, with the aim of generating creative ideas and artistic projects to help improve the world." (MAK).

The Vienna Biennale is an art and design festival where exhibitions, events and projects take place at various locations in Vienna from May to October. Every two years artists, architects and designers are invited to deal with the focal theme. Under the motto Planet Love, the Vienna Biennale for Change 2021 was dedicated to climate care. Planet Love means questioning a fundamentally new relationship between humans and the earth (MAK).

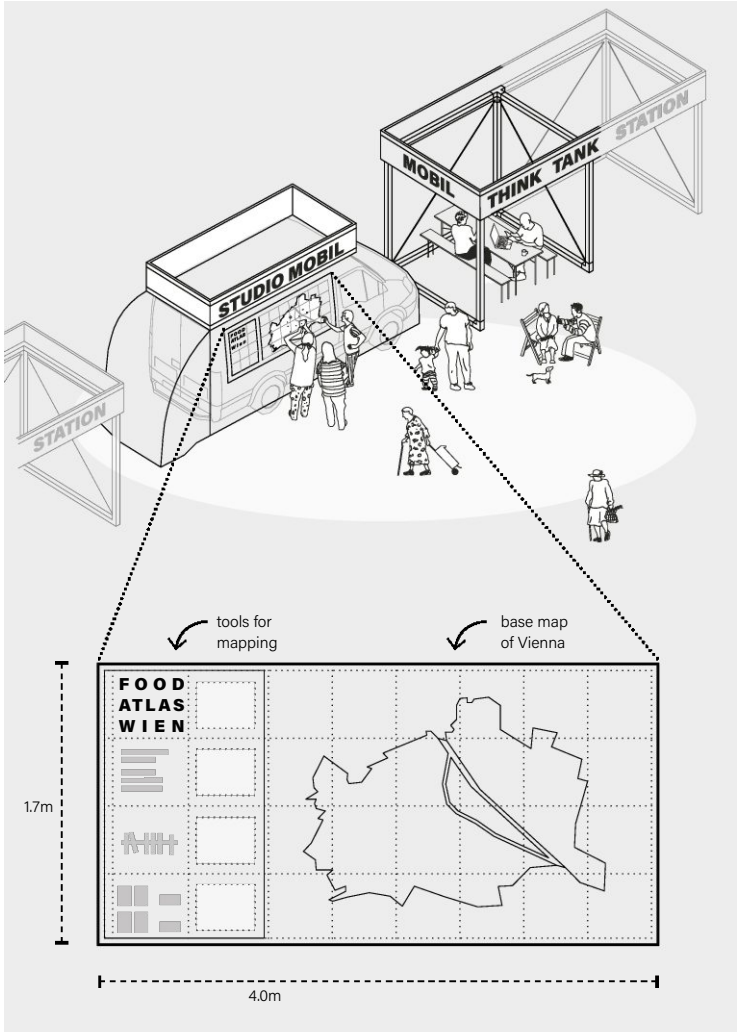


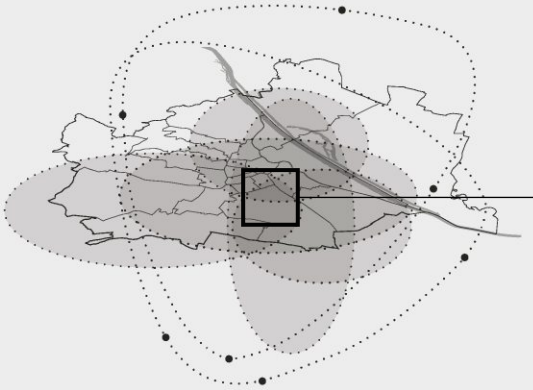
Fig. 4 Conceptual drawing: the analogue map of Vienna and its surroundings (food map) offered the opportunity to identify places and collect information in a collective and public process. The ***studio mobil*** by urban think thank next was a hub for bringing different people together. More details on the mapping process can be found in the chapter "Methodological background".

Food mapping & Citizen Science

The reason Citizen Science approaches were part of the project is due to the complex political, ecological, economic and social contexts as well as the lack of data and the general (urgent) relevance of the topic. It seemed helpful to step outwards with the project, involving the broad population and thus initiating a dialogue between science and society that would not otherwise be achieved. New insights and different forms of knowledge were gained during the Open Studio events and the collaborative mapping workshops. According to the Citizen Science Platform "Österreich forscht", the project could be assigned to level 3 of "participatory science", in which "Amateur*s perceive environmental changes in their environment very quickly and can pass this data on to scientists through citizen science projects, where it is processed and published accordingly, or passed on to responsible authorities after analysis and interpretation." (Heigl/Dörler n.d.)

In this thesis, the mapping process that took place is based on the common method of community mapping, as "a group-based process in which members of a community visualise certain aspects of their community in the form of a drawing or map in order to identify resources, problems and possible solutions for strengthening the community and improving its situation in a participatory process." (Gangarova et al. 2020) In the context of the research field Food Urbanism, the method can be inscribed as food mapping and is defined as follows: *Food mapping describes the mapping of places spatially related to the production, processing, distribution, purchase, consumption and disposal of food. The group-based process, in which participants visualise aspects and subjective perceptions of their supply infrastructure on a map, is intended to help identify the food system at the local level.*

Exemplary illustration of different data in the context of Vienna and their overlay at one location



superposition of collected data

qualitative/perceptive

theoretical/projective

objective/functional

Spatial contextualisation

At the following locations, the **Field trips (Ft)** for collective data collection took place in the form of interactive mapping, interviews, dialogues and discussions at the mobile urban laboratory, called studio mobil (Klumpner et al.), in public space:

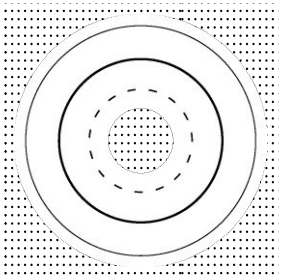
Ft I - Viktor Adler Markt
Ft II - Naschmarkt
Ft III - Platz der Menschenrechte
Ft IV - Sachsenplatz (Final exhibition)

Fig. 5 Dealing with the collecting data in the spatial context of Vienna.

SUMMARY OF CONTENT

Fig. 6 Built environment in the south of Vienna with the highlighted Viktor Adler Markt (Ft I).
(Data basis: City of Vienna)

Viktor-Adler-Markt



FOOD SPHERE

p.31

Field Trip I

It is 25 June 2021; since 6am, the Viktor-Adler-Markt, one of Vienna's markets in the 10th district, Favoriten has been filled with hustle and bustle. Market criers roar across the square where food has been sold and consumed every day since 1877 (cf. City of Vienna n.d.). It takes the average pedestrian about 50 minutes to walk from St. Stephen's Cathedral, Vienna's landmark and the anchor from which the city's concentric urbanisation originated, to the southern district of Favoriten. Winding through the narrow alleys of the historically grown first district, the eye lingering on the Viennese *Gründerzeit* houses and prominent buildings, the walker finally emerges from the urban interior. One step further, as if strung together, restaurants, shops and supermarkets can be found along the Favoritenstraße. It is a busy street which leads directly through the fourth district and further on to the Viktor Adler Markt. The street transforms into a pedestrian zone and finally brushes the square on its eastern slant. Between a coffee shop and "Elektro Oswald", an electronics shop, at the edge of the densely packed market stalls, space has been transformed into a city laboratory. Two wooden pavilions and a mobile measuring station for urban data in the form of a small truck, the so-called "studio mobil" or "mobile tank station", frame the eastern edge. The truck is wrapped in white tarpaulins disguising the functionality of the scientific measurements. The flashy neon sign on top of the truck and the people whizzing around, who don't quite fit into the local scheme, attract attention. Pedestrians on their way to the underground station inevitably have to walk through the setting of the studio mobil or give it a wide berth. A cluster of people starts to form in the narrow passageway between the truck and the first pavilion, alternately looking at their shopping bags and a meter-long map of Vienna and its surrounding areas.

Can we link the food we eat with the city we live in? How are people, place and food connected?

View of the pedestrian zone at the Viktor-Adler-Markt

The food map between market visitors and passers-by

The lost urbanism of food and space

Food has always been the existential basis of human life. The connection between food and the city is first and foremost a historically grown, symbiotic link. Urban food systems represent one of the most important infrastructures of human settlements and, at the same time, the prerequisite for urban growth (cf. Held 2017) (a graphical definition of the urban food system can be seen in fig. 7, p.42). In the history of European cities, the city's food supply was a local task and, due to the lack of possibilities for preservation and transport, dependent on the immediate surrounding hinterland. Agriculture was necessarily urban (cf. Stierand 2012) and determined the form and size of the settlement supplied. In this respect, agriculture was the sole and immediate parameter for urban development and thus responsible for the archetypal form of the western city.

Excavations at Uruk, near present-day Baghdad, tell of the first elements of urbanisation and related food provisioning (cf. Imbert 2015). Food was produced in the city area and in the immediate surrounding countryside, organised in concentric circles around the urban core, which evokes parallels to Johann Heinrich von Thünen's image of an ideal-typical region of agricultural land use (see fig. 9, p.44). It presupposes a growing urban structure with dwindling productive land for self-sufficiency, making the transport of food from outside and regional relations the decisive components (cf. Teuteberg, Atkins, and Steel in Stierand 2012).

Equipped with technological gadgets, spacious flats in multi-storey houses, a secure job sitting in an office, we perceive ourselves as urban but the fact that human nutrition relies on natural products shows the vital connection to the producing, rural area. This paradoxical approach to "urban life" Carolyn Steel describes in her book "Hungry City". As long as people feed themselves relying on natural resources, as our early ancient ancestors did, we will never be truly urban. Using the famous painting "Allegory of the Good Government", a series of three fresco panels painted by Ambrogio Lorenzetti between February 1338 and May 1339, Steel explains the symbiosis between the two differing environments. The image of the compact medieval city, separated by walls from the surrounding landscape, characterised by a disparity between poverty and wealth, repressive government and hunger, reflects the time of the archetypal supply infrastructure. The city wall draws a sharp dividing line between the two worlds, where the protection of the cultural is paramount. This former typological clarity contrasts with modern, western cities. Highly industrialised and structured by spatial logics that

have left an indistinct and blurred state due to the effects of changing scales and the alienation of local users of space, the spaces can hardly be described typologically. The industrial city has irreparably disrupted this once strong link between the city and its hinterland. Turning to global supply structures, automatization and the standardisation of production and distribution processes led to a dissolution of the local context of diet (cf. Stierand 2012). Space, time and season no longer play a role in today's diet. Not only is this reflected in the personal diet, but also in spatial logics, types of organisation and building typologies. In his blog "*speiseräume*", Philipp Stierand writes about the delocalisation and dissolution of spatial links of food provisioning for the urban population. With overcoming the spatial limitations that once tied the peasant as well as the city population to geographical conditions and the local market, the feeling of hunger has been replaced by abundance. He also notes that local growing conditions and seasons no longer matter in today's food supply (cf. Stierand 2012). This phenomena one can retrieve not only in automated, technologized consumption and distribution processes but also in the very production of existential foods of daily needs. Hence, "not only has consumption become detached from space, but also the production of food is no longer embedded in space. In the modern food system, the places of production for almost all kinds of food are interchangeable. Space no longer has any influence on the characteristics of the vast majority of products." (Wiskerke 2009 in Stierand 2012:4).

In Stierand's analyses, it becomes clear that the urban food system has become redundant. At the local level, it operates mainly as an offshoot of global market structures. The individual city dweller is a passive participant and, with increasing tendency, places his or her diet in the hands of national and global corporations (cf. Stierand 2012). We have reached the point where "today's relation between urbanization and food production is now stretched to a maximum: the cultivation of land in Africa supports the expansion of megacities in China, with few benefits for the locals." (Imbert 2015:6)

Interviewing people at the market

An elderly lady with slightly greying hair breaks away from the group and takes a step towards the map. She starts talking about former market places, spread all over the city. She runs her thin, wrinkled finger over the map and looks for the places. Her gaze jumps back and forth between us and the map as she tells us stories of the vanished places and her daily life some 50 years back. The map fulfils its purpose of being a point of attraction around the mobile laboratory in public space and at the same time a basis for discussion and work with passers-by. "Each is capable of revealing an aspect of our collective imaginary. The details of their subjective itineraries take on more significance when confronted with others, and together with many other details, unique stories, and ordinary trips, they form a new entity – a dynamic whole that is greater than the sum of its parts." (O'Rourke 2016:xiv)

It is our goal to draw a picture of the perceived Viennese food landscape of the population by means of questions, suggestions, coincidental conversations that are to be located in the urban fabric. To map signifies to draw a representation of a place, following the map is a drawing that gives a particular type of information about a particular area (Cambridge Dictionary). Our analogue map, printed on PVC, serves as documentary tool where commentary, feedback, food-related locations and other resulting from the discussions are captured. Mapping, as a general tool for studying urban environments, interwoven with a psychogeographic approach aims to explore the food landscape as perceived by residents. Psychogeography can be defined as the intersection of psychology and geography, the term coined by the French theorist Guy Debord in 1955 (cf. O'Rourke 2016) who aimed for a "revolutionary approach to architecture that was less functional and more open to exploration." (Tate n.d.). The Greek *graphein* linked to the syllable *graphy* means to write, a seemingly ambiguous notion. The question arises, when geographers already write the earth (eos) what do psychogeographers do? (cf. O'Rourke 2016)

Adding the Latin prefix psyché "adds a zest of soul to the mix, linking earth, mind and hand." (O'Rourke 2016:7). Decoding urban space through the contribution of citizens, their individual behaviour and emotions reveals the specific elements of Vienna's unique and general food patterns.

The lost connection between food and its urban dwellers acts on various levels, from simple food shopping to forgotten food processing and production, and finally to the loss of confidence in natural products. Food wrapped in plastic, marked with numbers and codes, becomes objects. For Carolyn Steel, industrialisation and the accompanying social and structural changes was probably the most significant point in the history of human nutrition, which continues to have an impact in various forms today. The archetypal city, supplied with grain as the fundamental basis of the western diet, became extended in its metabolic function through machine-friendly spaces and steam-powered transport. The decoupling of manpower and industrialising agricultural processes radically ended ancient life based on closed cycles and local resources. Also Steel discerns that the once strong connection between the city and its surrounding countryside has been broken and dissolved in many ways. "Eating processed and packaged food is part of the price we pay for living far from where it is produced." (Steel 2020:55). Human nutrition is based on natural resources that are transformed into food through means, tools and processes. The image of cows munching on grass in lush, green meadows and pastures was, from a traditional perspective, the transformation of substances indigestible by humans into nutritious, edible foods such as milk and meat. Moreover, grazing cows cultivated the landscape and were part of the local, biological system. Now that many cows are grain-fed, for maximum output, this closed cycle has been broken. Steel describes this as the modern "fast food-diet" (Steel 2020:55) of farm animals and annotates that this leads to negative effects on the cows' biological system and consequently to less nutritious milk and meat, which ultimately affects human health. If one considers at this point which spaces and places today's (global) production and food patterns occupy, and how transnational material flows are influenced by hierarchical positions of power, the imbalance of the broken system becomes more tangible.

Delimiting an urban food system and reducing it only on the scale of the city or the local context does not prove effective. Since the beginning of human history the city region has not existed in isolation, but rather it highly interacts with its rural surroundings. In this sense, there is a need for hybrid systems that take advantage of global connections and modern technologies while being strongly linked to the local context. "The better these interactions are, the better the available food will be." (Bohn/Viljoen 2014:7) In recent years, widespread terms and phenomena such as "urban agriculture", "urban farming" and "urban gardening" are evidence of a growing awareness about bringing food back (in)to the city. Aiming to further strengthen these links between the urban region and food, some researchers no longer speak only of "'urban' but of 'metropolitan agriculture'." (REOS 2011 cited in Bohn/Viljoen 2014:7)

Disembodiment of space

While the spatial changes were mainly related to industrialisation, today they "have been augmented by a digital disembodiment that renders power and influence all but invisible." (Steel 2020:126) Whereas the historical marketplace was still comprehensible through the physical presence of activities in the urban space and the responsibility of the authority, in the digital age we are facing opaque and subtle exchanges (cf. Steel 2020). Today, we are confronted with an increasingly blurred perception of traditional food venues, such as marketplaces or supermarkets, accompanied by online services and digital opportunities for action in the food sector. Here, the question arises as to how these blurred relationships can be broken down spatially and consequently translated into workable approaches for the planning community?

Kata Fodor considers cyberspace as one of the key spatial consequences. Digital food "avatars" (Fodor 2021:107), in other words digital representatives of food in virtual space, enable digital platforms to take on and fulfil many food-related functions that formerly were located in physical space (cf. Fodor 2021). While Steel describes the disappearance of traditional trade structures of food in urban space, Fodor sees a new, necessary approach to adapt the spatial logic to that of the digital, particularly with regard to logistical tasks, such as storage and delivery (cf. Fodor 2021). Where are the virtual interfaces linked to the new logics of food space located? In this regard, online farmers' markets have emerged in recent years and several online delivery services for ready meals have popped up (cf. Fodor 2021), both of which are also developments that can be observed in Vienna. A key factor is the separation of display and the location where the food items actually are in physical space. Meal delivery services, box schemes, and farmers' deliveries have been an integral part of western cities for a number of years now, creating new links between the city, the provisioning of its residents and its fertile land. This raises not only logistical issues in terms of distribution and storage, but also questions about consumer's changing behaviour in inhabiting and using physical space, and not least, their valuation of food. As a result, the physical perception of food in the urban environment is fading with the consequence that people are becoming increasingly alienated from nature, origin, and culture; a phenomenon of Western society that Carolyn Steel also notes (cf. Steel 2020).

Physical-digital merging

An example describing the physical-digital convergence is shown in the film "*Auslaufmodell Supermarkt?*" (Supermarkets: a model to be phased out?) by Rémi Delescluse (2021). It examines the systems and strategies behind one of the largest online platforms, Amazon. Tracking the coffee ordered online in Paris and returning it, as Amazon's customer philosophy allows, disguises the end of the coffee's mile-long journey in a landfill next to the European return centre. Located among Slovakian agricultural fields, fenced in with a steel fence, the centre has been in Sered since 2017, sending, receiving and repurchasing goods to Europeans. As the geographical heart of Europe and with the lowest minimum wage of five euros per hour in a European context, Slovakia is an ideal location for companies to transport goods across the continent (cf. Delescluse/stp productions 2021). Spatial impact and coherence are almost impossible for the individual consumer to grasp. This modern way of using digital technology

combined with economical profitability caused a "series of new hidden and precarious work opportunities and conditions. Examples of this include gig economy workers, as well as dark kitchen and warehouse staffs" (Cheng 2018 cited in Fodor 2021:108).

The Amazon Go Store, opened in 2020 in Seattle, can be described as one of the first hybrid typologies, where consumers have the alternate experience of walking through physical space and shopping for groceries (and non-food) online. In terms of its spatial dimension, the supermarket consists of shelves, corridors, and bright neon tubes, all enclosed by a hall-like building structure. Overall the individual components do not differ greatly from the configuration of a conventional supermarket. "In this setup the whole physical construct works precisely because it gets virtually modelled in real-time. That is, the store is primarily operated online with the avatars of both customers and of products." (Fodor 2021:108) According to Fodor, the distinctiveness, in this case, lies only in the digital sphere and its new connection to (conventional) physical space. This digital-physical merging is characterised less by the spatial impact than by the shopping philosophy and the way people move through the space. Britain Ladd, a former business development manager of Amazon (2015-2017) describes Amazon as the largest future grocery retailer. What will happen to traditional shopping typologies should these hyper-connected shops with tailored concepts of food consumption dominate our cities one day? This dichotomy, "the dual phenomenon of contemporary urban food spaces that diversify their functional offerings physically, while also merging their operations with virtual platforms." (Fodor 2021:112) Fodor describes as the "Hybridization of food spaces".

The fact that food-related functions which used to take place in physical space are now physically detached and independent could open up new and enriching possibilities when discussed critically under spatial, economic, social and environmental conditions. Stierand's observation of the urban food system as a "global offshoot" must be understood as the overarching framework that has to be restructured and prioritised according to the philosophy of "think global – act local". The simple formula of – "the less the transport and logistic challenges are, and ultimately the shorter the food supply chain will be" (Fodor 2021:112) - needs local knowledge, rethinking and a conscious reconstruction of the spatial logics of our cities. The lost urbanism of food and space is a result of shifted relations between production, processing, preservation, storage, retail, preparation, consumption, and waste management due to new lifestyles and innovative corporations. The built reality of the 21st century is not able to

accommodate the blurring division of our familiar sequencing of individual functions along the food chain. The way this spatial accommodation is solved and designed seems to be a key factor in addressing the challenges of the 21st century. New spatial structures may be uncovered when this phenomena is not just left to "devices of business and property developers" (Fodor 2021:113).

We hear a deep, smoky voice complaining about the whole situation and us. The voice belongs to an obese woman sitting in an electric wheelchair. Her right hand rests on a joystick, which she uses to control the direction and speed of the wheelchair. People loaded with full shopping baskets and plastic bags look curiously from afar as they pass by. An elderly gentleman stops and shakes his head in confusion, mumbling words like „It's all useless anyway". A bearded man with a walking stick joins the conversation, asking which political party all this belongs to? Surely the right-wing, it can't be the SPÖ, although the wooden construct would stand in the place of the socialists, here at the Viktor-Adler-Markt. As a group of architects, designers, filmmakers, planners and photographers, we strive to interact and create in this place in the midst of the hustle and bustle.

Excited voices can be heard behind the urban laboratory. Wildly gesticulating, a corpulent woman in a flowered, long dress bustles back and forth ranting with an eastern accent. A carriage full of handbags stands in front of her. Normally she stands on this very spot, where today this thing made of wood with odd posters and a strange audience is standing. It is her place, every day, where she offers (fake) leather bags for sale. The mobile laboratory is clearly a foreign object in this place. Nevertheless, people are very eager to talk and the map is

Bag sales stall at the market

The end of a turbulent market day

continuously filling up with content. At the end of the stay, we leave with the first marked points, new knowledge about places of food production in Vienna and the memory of the experience: At the Viktor-Adler-Markt unspoken rules prevail, aside from official permits. Our gaze wanders one last time across the square, the rolled-up map under the arm, hearing snippets of German, Austrian-German, Turkish, Serbian and English, as the dynamic of the market fully seizes us. Watching people shopping for food, trying samples of apricots and strawberries, we also have to confess that the vibrant place masks the hidden structures of food provisioning.

SPACE I

What are urban food systems?

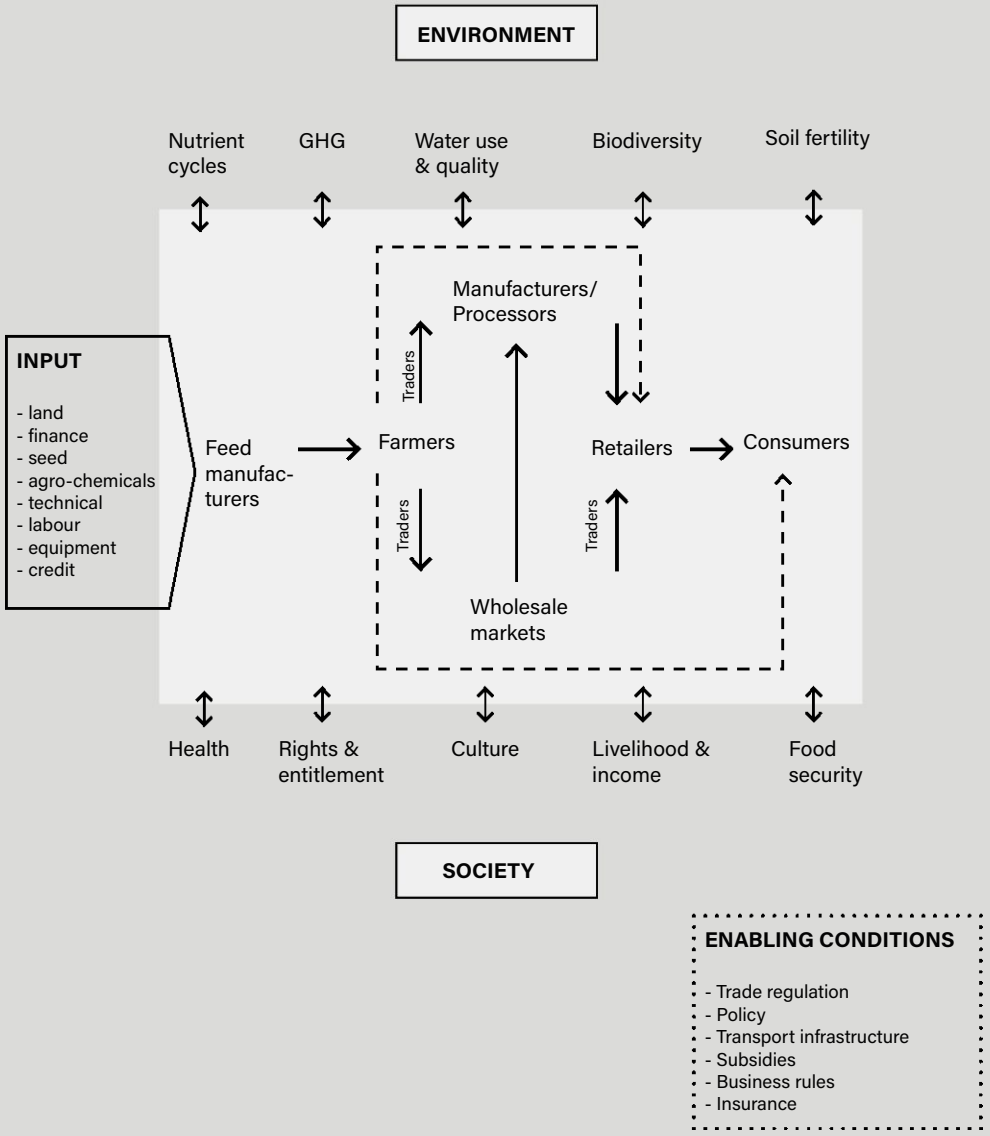
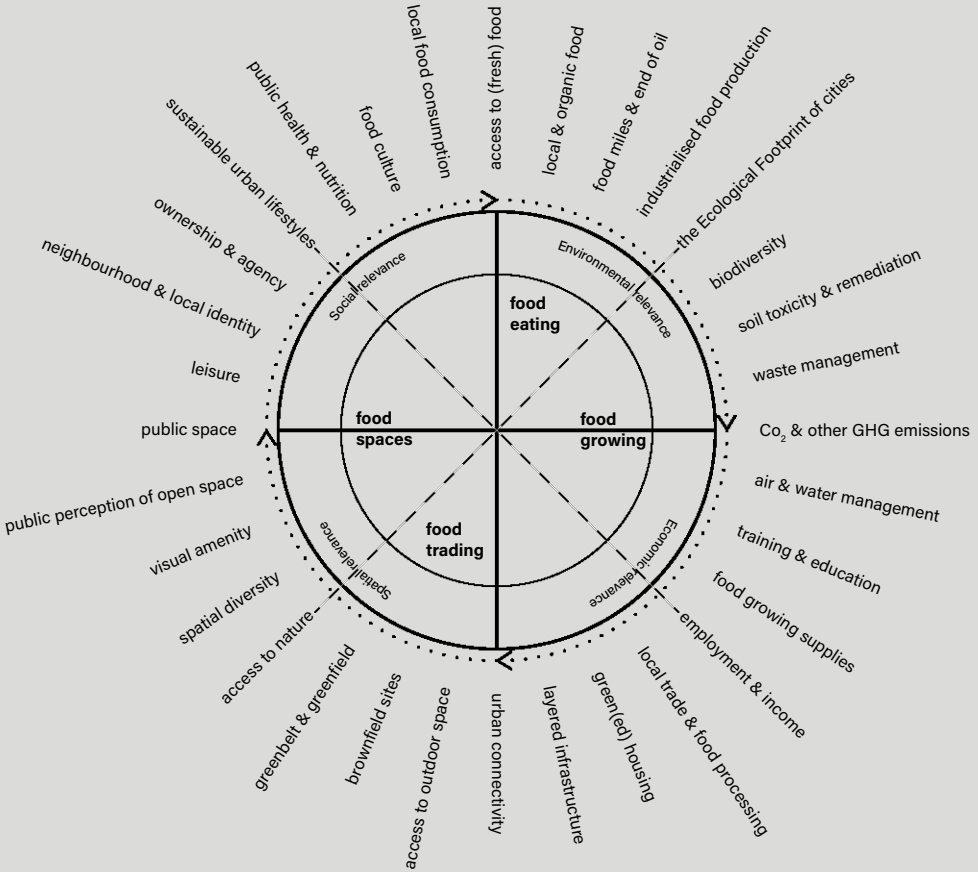


Fig. 7 Simply conceptionalisation of the urban food system (following FAO 2015)



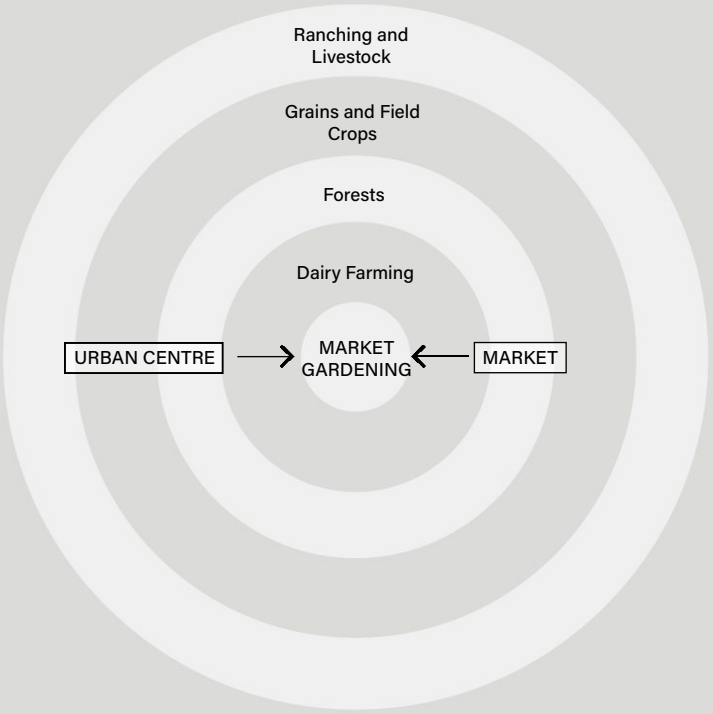
The urban food systems star by Bohn & Viljoen architects shows that food permeates almost all aspects of urban life. Cities and their inhabitants are involved in all parts of the food cycle, which illustrates the enormous importance in social, economic, political and economic terms. (cf. Bohn/Viljoen 2014)

Fig. 8 The urban food systems star (following Bohn/Viljoen 2014:9, fig.2)

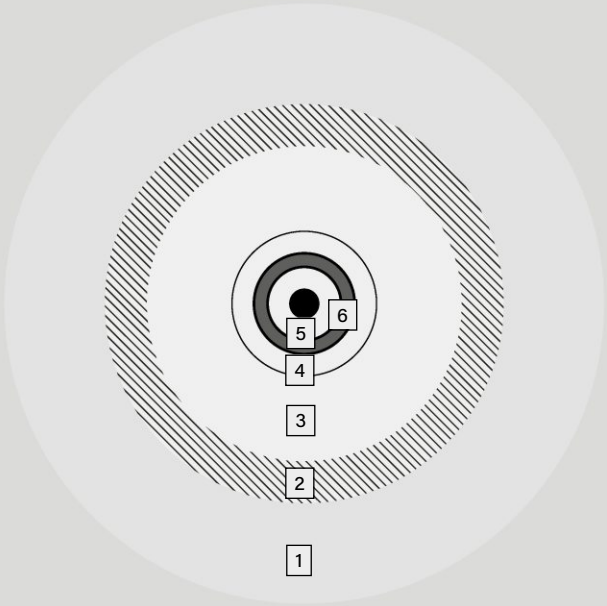
SPACE I

The urban supply model of Johann Heinrich von Thünen 1826,
from his book *Der isolierte Staat* (The isolated state)
The model was one of the first to illustrate the spatial relationship of the city to its hinterland.

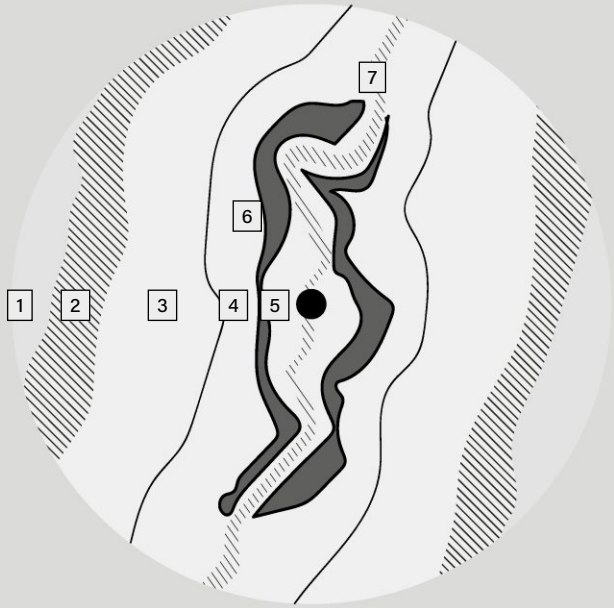
Von Thünen model: isolated state



Von Thünen model (isolated state)



Model modified by river

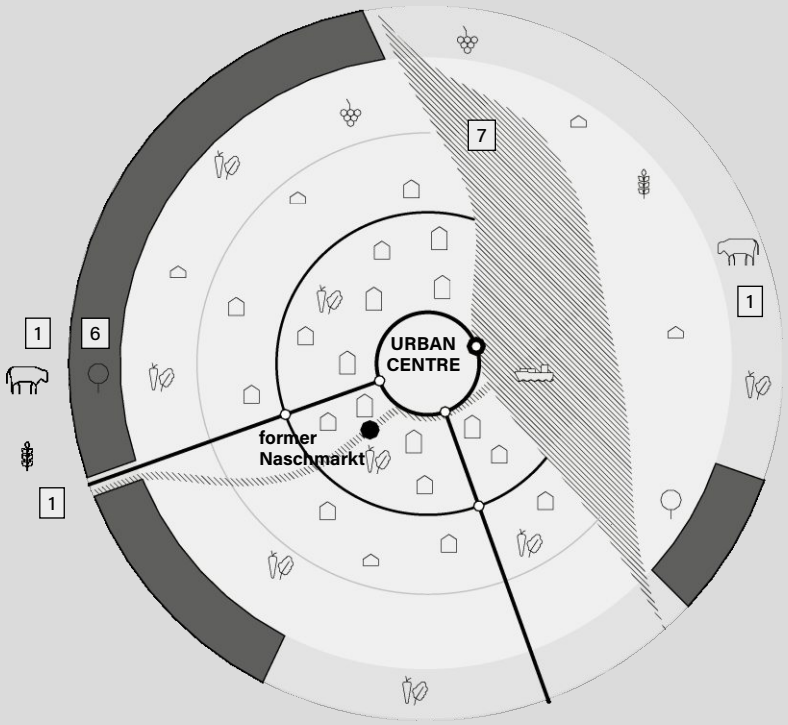


1 Ranching and Livestock
2 Three-field
3 Crop and pasture alternate use
4 Crop rotation
5 Horticulture and dairy
6 Forestry
7 Navigable River
City

Fig. 9-11 The Von Thünen model 1826 (following Verhoeven/Wiskerke 2018:16)

SPACE I

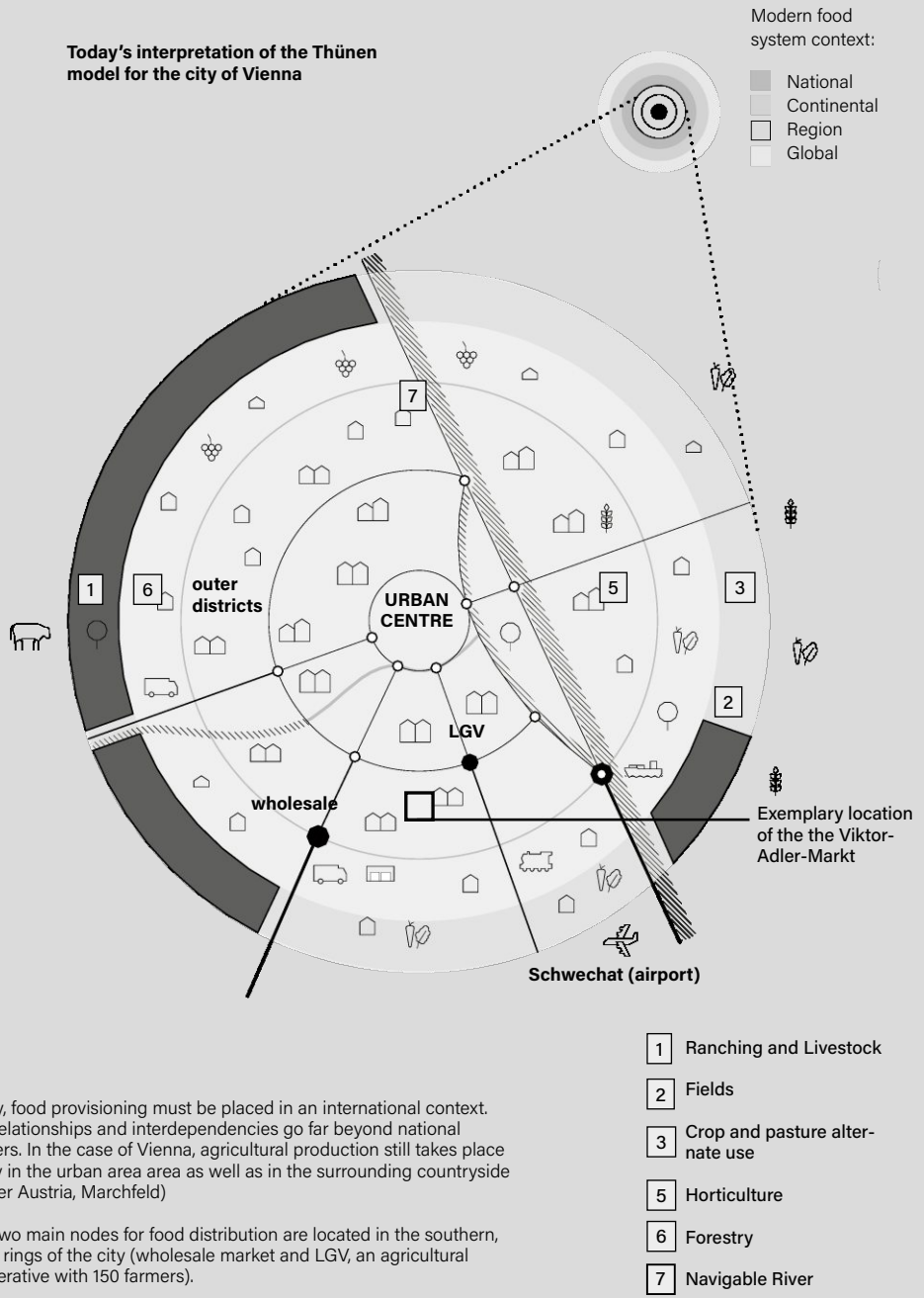
Historical interpretation of the Thünen model for the city of Vienna



Pre-industrial age: The Danube is still unregulated. The main transport of food to the city takes place by water and two main routes by land. Depending on the type of food (fish, meat, fruit and vegetables, milk), the products arrive at different places in the city.

Fig. 12 Historical food supply system, before the regulation of the Danube (around 1875). (Following the Von Thünen model of 1826)

Today's interpretation of the Thünen model for the city of Vienna



Today, food provisioning must be placed in an international context. The relationships and interdependencies go far beyond national borders. In the case of Vienna, agricultural production still takes place partly in the urban area area as well as in the surrounding countryside (Lower Austria, Marchfeld)

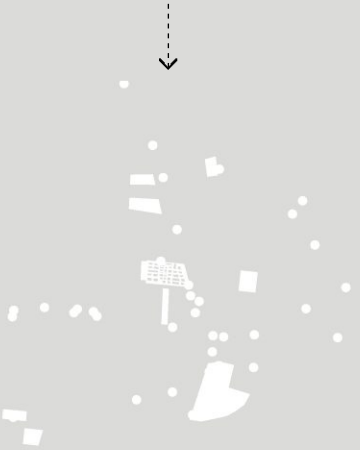
The two main nodes for food distribution are located in the southern, outer rings of the city (wholesale market and LGV, an agricultural cooperative with 150 farmers).

Fig. 13 Today's food supply model for Vienna. (Following the Von Thünen model of 1826)

SPACE I

Building blocks
Building blocks (blocks) are a statistical counting unit usually enclosed by traffic areas or road sections. (City of Vienna)
The Gründerzeit grid of the city becomes visible. Deviations are immediately recognisable in this plan, such as the bevelling of building corners or to the north-east, the start of the newly developed "Sonnwendviertel" quarter.

Public space
Coherent space that is available to all users. The majority of the areas shown here consist of streets. Although they are public space, they can only be used secondarily due to occupation by stationary and moving traffic.



Public food space
highlighted locations: places to eat, share, and consume food in public space (such as pocket parks, parks, squares, benches, kiosks).

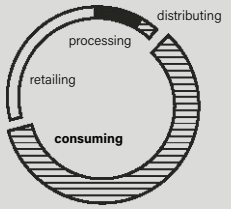
Built environment
the two-dimensionality of the built space. The outlines of the buildings mark the footprint of the built structure.

Built food environment
highlighted locations: buildings that contain a food-related use (such as shops, market stalls, restaurants, grocery shops, cafés, supermarkets, mini-markets)

Zoning
The zoning and development plan of the City of Vienna is adopted by ordinances of the municipal council in the form of "plan documents". In these plan documents, which consist of a plan and a text part, all future uses and the type of development of an area are laid down in a binding manner. (City of Vienna)

23,18%

of the buildings involve a food-related use.



0	producing
14	processing
6	distributing
1	storing
103	**consuming**
50	retailing
1	disposing of
175	**total food uses**

Fig. 14 Urban analysis Viktor-Adler-Markt: Urban parameters and their connection to food, exemplary city extract of 1km². (Data basis: City of Vienna)

MAP I
FOOD SPHERE – EXCURSUS
VIENNA MARKETS

Vienna has **17 markets** at permanent locations and **5 temporary weekly markets**.
(Source: City of Vienna)

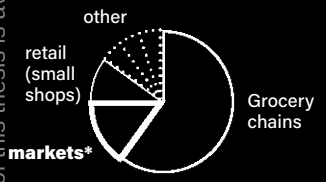
How many people have access to food from a market in their neighbourhood? Within a radius of 1km (or a 15-minute walk), the Vienna market landscape covers approx. 13% of the city area.

The wholesale market (Großmarkt Wien)

Since 1972: hub and competence centre for **fruit, vegetables, meat, fish, egg products** and flowers.

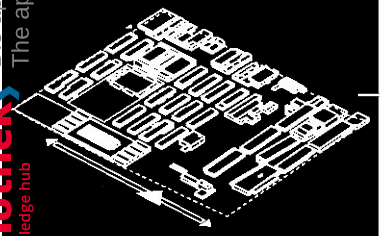
Around **400,000 tonnes of food** are traded annually (City of Vienna).

Shares where the products of the wholesale market are further delivered:



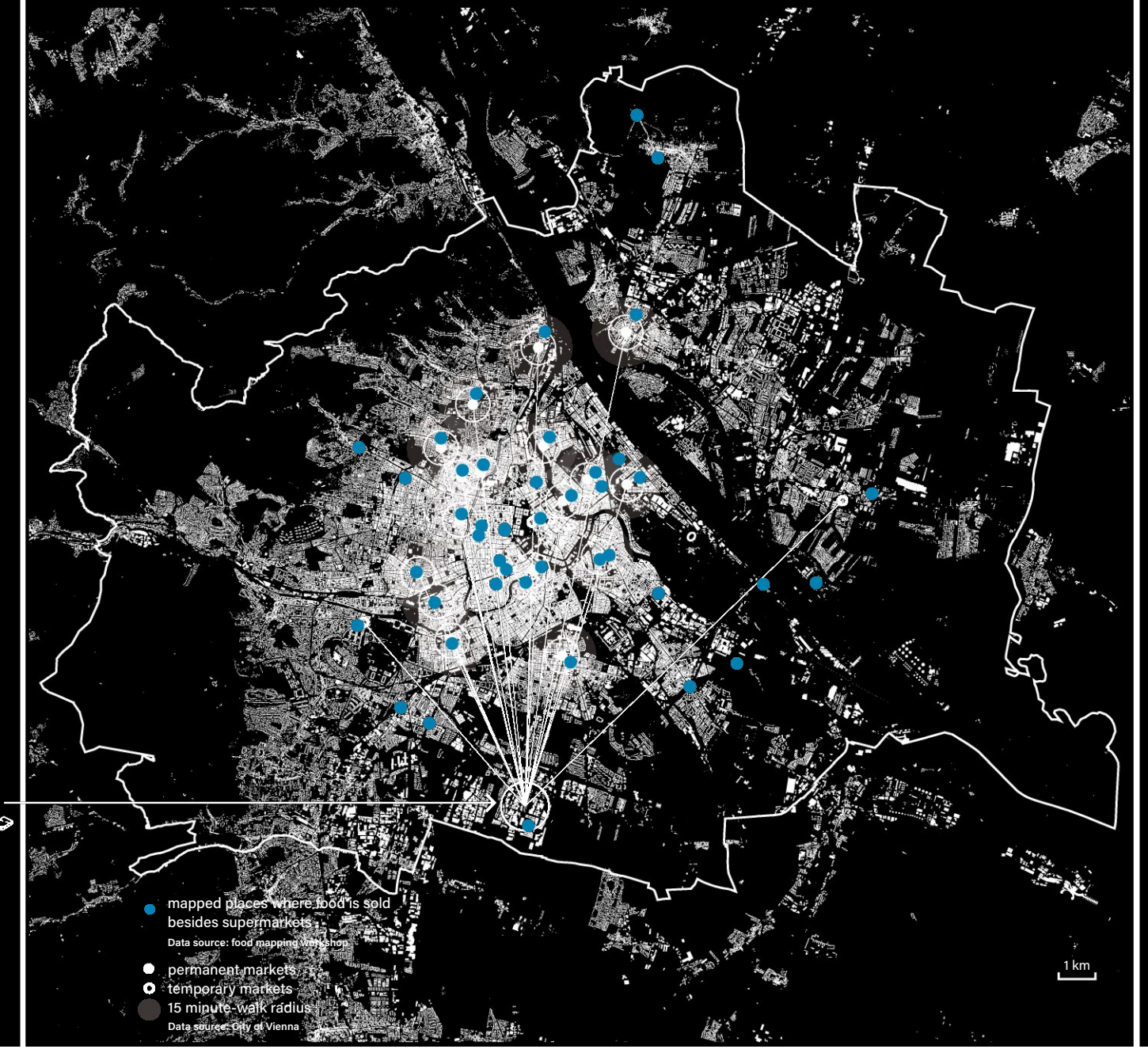
(Source: Schwarzl et al. 2017)

*** More than three quarters** of the goods of the Viennese markets come from the wholesale market, said the then market office spokesman in an interview with *die Presse* (the Press). (cf. Winroither 2018)



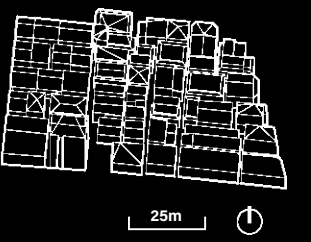
Product origin 70-80% from:

Poland	Turkey
Hungary	Spain
Czech Republic	Netherlands
Slovakia	Italy



Viktor-Adler-Markt

3D representation of the Viktor-Adler-Markt



In spatial terms, the Viktor Adler Markt is integrated into the *Gründerzeit* grid and occupies exactly one block.
The market buildings are pavilion-like structures with hinged fronts.
In addition, there is usually an open, adjacent area for a temporary farmers' market.

Supermarkets

In terms of everyday food supply, the Viennese markets appear secondary. More than half of the participants indicated that they do their shopping in supermarkets.
At this point, it is to mention that Vienna has **one of the highest supermarket densities** in Europe. Their dominance could be the cause of the absence and disappearance of small-structured, local trade.

Distribution of supermarkets in Vienna (own data collection):

in total: 801

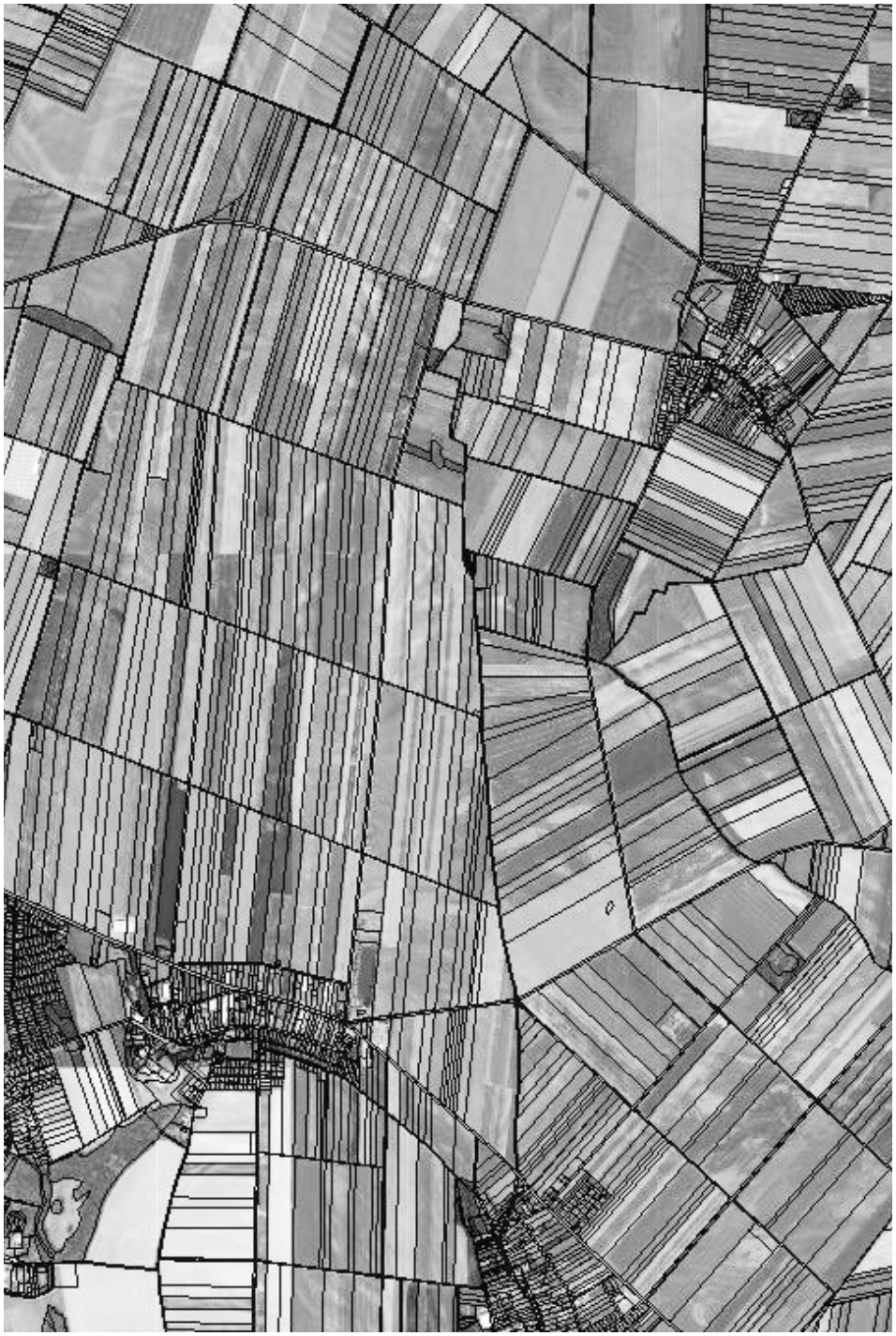


Fig. 16 Marchfeld aerial view, productive fabric between Vienna and Bratislava, parcel delineation.
(Source: Land Niederösterreich)

Naschmarkt

RESOURCE

p.53

It is 31 July 2021, a hot and stuffy day. Underneath the Naschmarkt, where the urban laboratory is setting up today, the Wienfluss (Vienna River), flows under layers of concrete and earth until it meets the Donaukanal (Danube Canal) at the north-western end of the Ringstraße (ring road). A man in red striped trousers crosses the square on a clattering bicycle. The studio mobil, set up at the far end of the Naschmarkt, seems lost and too small for the vastness of this urban space between the Linke and Rechte Wienzeile. Unimaginable in the 19th century, when all fruit and vegetables brought in on carts had to be sold at the Naschmarkt (cf. City of Vienna 2021).

This space, as it is today, was only made possible by urban development measures such as the regulation of the Vienna River and the covering of the Wiental in this area. The rear part of the former market, squeezed between rows of houses, growing traffic arteries and the river, was relocated to the southern outer edge of Vienna in 1972 due to insufficient space. It is the site of today's wholesale market (cf. GMW Großmarkt Wien Betrieb GmbH n.d.). What remains in this place is a vast, concrete parking area of 12,000m² on which we are currently standing. Last year, a heated discussion was triggered by the City of Vienna when they communicated plans for the redevelopment of this area. A lively neighbourhood centre is to be created with a covered market hall. The Green Party oppose the proposal and call for its transformation into a park (cf. Scherer 2021) in order to take action against the heat in the city and for a healthier living environment.

As we prepare for the coming food mapping workshops and hang up the map, we notice the many yellow banners and posters on the facades of the houses. In conversations with passers-by we learn that they belong to the citizens' initiative that is positioning itself against the market hall. At this moment, the Naschmarkt presents itself as an emotionally charged space. Diverse interests face multiple urban challenges. How should a city deal with its existing resources? Does it help to establish a link between urban resources, food and climate change adaptation?

Asphalt surface above the Wienfluss

Food, city and resources

Two parallel phenomena - pressure on natural resources and the inevitable growth of cities - represent key challenges of the 21st century. Fertile land plays the most central role here, as it is directly in the area of tension between food production and settlement expansion. The Federal Ministry of Food and Agriculture (Bundesministerium für Ernährung und Landwirtschaft n.d.) defines soil as a "non-renewable resource that is becoming increasingly scarce". Over 90 % of global food production depends on this resource. The Oxford Languages dictionary even defines resource as "naturally existing stock of something especially needed to feed people." In Austria, the threat posed by the loss of autonomous food supply is even rated higher than the threat posed by terrorism, cyberattacks or migration (cf. Commenda 2018 in Fitz et al. 2020:140). "In the past 20 years, the amount of arable land available per capita worldwide has halved. It will halve again by 2050. Food is becoming scarce, prices are rising. In 2009 alone, 100 million additional people became hungry." (Brüsler 2011 in Fitz et al. 2020) Soil is the most essential component for food security (cf. Bundesministerium für Ernährung und Landwirtschaft n.d.) and should, therefore be the regulating factor for building land growth and land use.

In addition, soil plays an essential role in global warming and climate change adaptation issues. After the oceans, soil is the most important reservoir of greenhouse gas emissions. Building up not only destroys this function, but also increases the GHG emitters (cf. Weber in Fitz et al. 2020). Food production, climate protection and settlement growth are inevitably linked and should be considered interrelated. What role do cities play within the interdependence of resource consumption and food supply? Addressing soil as a resource in the context of food production has the advantage of translating abstract issues into concrete spaces and tangible facts.

Resource-related awareness

Cities depend on the import of large quantities of resources and the removal and disposal of substances in different aggregate states (solid, liquid, gaseous) (cf. Bott/ Siedentop in Bott et al. 2018). As populations increase and living standards rise, meeting resource consumption and disposal space needs is increasingly becoming a challenge. Already today, the majority of the world's population lives in cities (cf. Statista 2022) and is partly responsible for three-quarters of global resource consumption and 80 per cent of greenhouse gas emissions (cf. Giradet 1996, OECD 2010, UN 2007 in Bott et al. 2018). In this sense, Mario Schneider addresses the phenomenon of distinct lifestyles and behaviours of city dwellers by analysing them in relation to the ecological footprint. In his explanations, he points out the metrics to put the interdependent relationships between human behaviour, environment and climate into comparable values. These become measurable in the ecological footprint and can be compared within a spatial area via the biocapacity in global hectare (gha) (cf. Schneider in Bott et al. 2018). The value indicates how much biologically productive area is available for resource extraction and for the decomposition of waste materials and CO2. He also points out that the consumer's behaviour plays a major role. While Western societies have a high level of environmental awareness, actual behaviour is lagging far behind. Ingrained behaviour patterns, habits and situational reasons subordinate environmental behaviour to other factors (cf. Schneider in Bott et al. 2018). What are the fundamental prerequisites for changing behaviour? Schneider points out two elementary types of measures: spatial-infrastructural and person-oriented measures. While the first type of structural measures aims at changing behaviour by redesigning the external, physical framework conditions, person-oriented measures intend to achieve an intrinsic change (cf. Schneider in Bott et al. 2018). Self-driven change is only possible if the individual is aware of his or her responsibility and has up-to-date knowledge about the state of the environment and ecological interrelationships (cf. Schneider in Bott et al. 2018). Both measures correlate strongly and thus have far-reaching interconnections in all levels of western civilised life, from the organisation of the personal living environment to collective circumstances at the macro-level.

In historic observations of domesticated life, the presence of the above mentioned consciousness and knowledge is the basis of survival. For over 3000 years humans have been settling and cultivating land. Domesticated life associated with civilisation marks a new relationship between people, plants and animals (cf. Higman 2012).

With the initial colonisation of land, people primarily found new locations, still unsettled, where they could exploit the available resources. In contrast to the very first form of colonisation by hunter-gatherers, whose main goal was to exploit the available resources, domesticating life entailed manipulating the ecosystem and natural aspects to ensure food production (cf. Higman 2012). Unlike today's global food system, where the world is subject to a certain system of resource exploitation, our ancestors had to make decisions based on their perception of the environment and their relationships with other living beings (cf. Higman 2012). These choices were also based on local knowledge and observations in the dichotomous relationship between farmers and city dwellers that consequently developed (cf. Higman 2012).

Regarding nutrition and its interactions, it is necessary to note that this knowledge and awareness is currently (re)emerging, at the societal level and among professionals.

Saturday flea market

On our second mapping day, the sun burns undisturbed from the sky. However, strong winds make the heat tolerable. Surprisingly, the vastness of the square has vanished amid mobile flea market vendors and eager shoppers strolling between the stalls. Our first input of the day comes from a hydroponics expert who metaphorically explains how a city should manage its resources. The food map is already filled with several places, subjective impressions and comments. We are slowly realising that the map is more than a medium with the sole utility value of collecting data. There is no doubt that its value lies in the fact that it attracts people, stimulates their creativity and gives impulses for communication. We observe some people scanning our printed QR code on the map with their smartphone, which automatically directs them to the digital map. The physical presence in public space does have an impact on the number of visitors in our digital space. However, there was no evidence of a significant increase in digital mapping activity, which leads back to initial questions of motivation and strategies for engagement.

A woman with a brunette girl holding her hand looks perplexed when asked which places she associates with food. How or what would she perceive concerning food production in general? Thinking about her meals that end up on her plate every day seems to reach her for the very first time. Yet documentaries, headlines and articles fill the media almost daily at least since the beginning of the Corona Crisis 2020 and the first shutdown of public life. How is it possible to get people interested in these issues? While talking to her, we realise that the conversation on food has enormous potential at this interface. Creating an emotional connection or addressing personal experiences with food makes abstract issues (more) tangible and understandable.

Food in relation to GHG

The analysis of greenhouse gas emissions (GHG) related to food can be very complex as there is no standardised measurement method. Bohn and Viljoen point to several studies related to food consumption in the UK that are based on different methodologies, such as for example "consumption figures" that include gases produced outside the country, and others that only include emissions that actually occur within the country, called "production figures". This disparity in the methodology artificially inflates the statistics and makes comparative analysis difficult. With further outsourcing of food production, the GHG emissions also increase (Druckman/Jackson 2010 in Bohn/Viljoen 2014:61).

One possible all-encompassing method is the life cycle analysis of food products. It describes an overall balance of the greenhouse gases contained in the product along the entire value chain. In this sense, food consumption is ranked as "one of the most polluting everyday activities" (Carlsson-Kanyama et al. 2003:293). When looking at the entire process of a food product's journey, GHG emissions differ greatly depending on the type of product. Animal products account for the largest share of all global GHG emissions in the food sector, as well as in global agriculture (Schlatzer, 2011; FAO, 2006, FAO, 2013 cited in Schlatzer/Lindenthal 2020:6), while vegetables and fruits account for the smallest share, even with a high degree of processing and extensive transport. Transport by air is the exception to this trend, as similar values are achieved as for meat products (cf. Carlsson-Kanyama/González 2009). Consequently, it can be deduced that nutrition and dietary behaviour have a strong influence on climate change and thus on resources and land use. A study by Schlatzer and Lindenthal (University of Natural Resources and Life Science, Vienna) shows the correlation between nutrition type, land use and GHG emissions in Austria. The results show clear differences in land use and greenhouse gas emissions between average diets, vegetarian diets and vegan diets. The biggest difference is between the average and vegan diet. Here, a savings potential of more than two thirds of GHG emissions becomes clear. Further considerations of what this means for Vienna in a spatial context are illustrated in chapter Space II, p.63.

The potential of integrating agricultural uses in urban environments with regard to climate impacts must be questioned in a differentiated manner. The climatic impact of urban agriculture at the urban scale is strongly influenced by the density of the urban environment and the type of farming (cf. Denny in Bohn/Viljoen 2014). When it comes to the targeted reduction of greenhouse gas emissions through urban food production, above all the scale and management plays a decisive role. For example, it is possible that products from a private or community garden produce higher emissions than a commercial product from the farmers' market. This is partly due to the behaviour and habits of private households, such as the households' car-use, or inefficient forms of maintenance due to lack of expertise and size (cf. Denny in Bohn/Viljoen 2014). The situation is different for urban agriculture, which is geared towards greater commercial activity, such as local urban farmers or market or vegetable box schemes (cf. Denny in Bohn/Viljoen 2014:76). However, the decisive factor related to GHG emissions is the respective cultivation method. A beneficial scenario is cultivation via traditional farming (avoiding heated glass houses and foil tunnels), maximising local and seasonal consumption and minimising dependence on travelling distances for individual supply by car (cf. Bohn/Viljoen 2014:62).

The preceding considerations show that changes in nutrition, adaptation of farming methods and spatial connectivity can have significant impacts on land use, land use patterns and resource requirements. The evaluation of urban agriculture solely on the basis of its potential to reduce GHG is enormously complex and involves interrelationships that go beyond its direct sphere of impact. Urban planning can contribute to these changes by considering space that allows local opportunities for food

procurement and incline citizens as well as actors involved in the food system to deal with the conditions, consequences and preconditions of their food supply (cf. Bohn/ Viljoen 2014).

We hear people talking behind us in low voices and catch some interesting words. Two women stand next to each other and use our map to discuss their current living situation in the 10th district. We learn about the “city farm”, the “WeltTellerFeld” (world plate field), and some opportunities for kids to engage with farm animals, plants, and seed processes. The “WeltTellerFeld” is located in the 22nd district, between the “Schillerwasser” in the south and the “Mühlwasser” in the north, two gently curved distributaries of the former, unregulated Danube. From the aerial view, the field appears as a forgotten area between lined-up single-family houses, row by row, each one with a pool in the garden, constructed on former fertile land. Tall trees line the field, shielding it from the road that creates access to the surrounding homes. Raised beds and small patches on some 4 hectares of land grow tomatoes, pumpkins, corn, cereals, salad, cucumbers, courgettes, melons, potatoes, and many more. It is open to the public and belongs to the LobauerInnen, a collective farming initiative that seeks to take back control over its diet. The project combines social value-added, educational aspects, and the alternative use of land. Insofar as areas in this type of management are overlaid with other supply infrastructures of the city, a positive measurable effect can certainly be achieved here that goes beyond neighbourhood effectiveness.

The second field trip is coming to an end. We roll up the map and leave richer in information and contributions from visitors about the Viennese food landscape.

SPACE II

What role does food play in the metabolic context of a city?

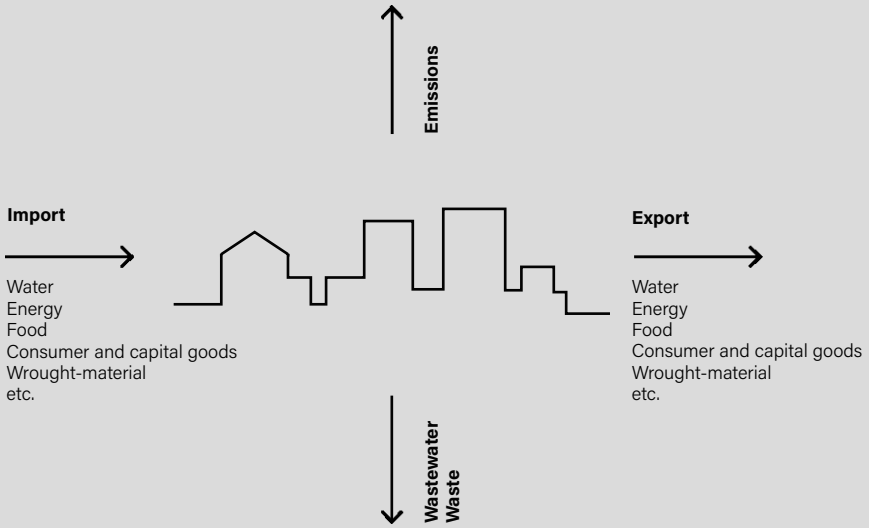


Fig. 17 Exemplary material flows in the city
(Following Bott et al. 2018, 109, Abb. 1)

What resources do humans consume?

Our dietary behaviour has a major impact on land consumption and, as a result, on food security (cf. Schlatzer 2020).

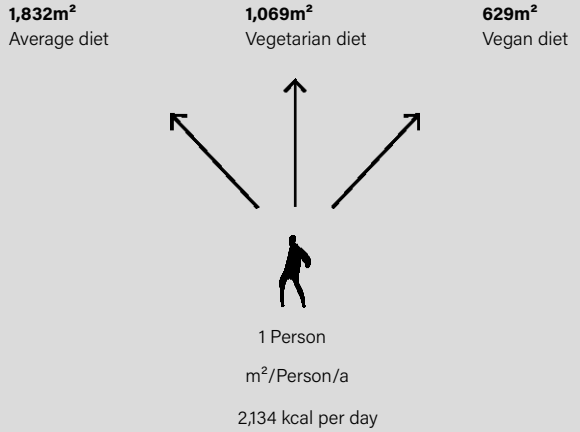
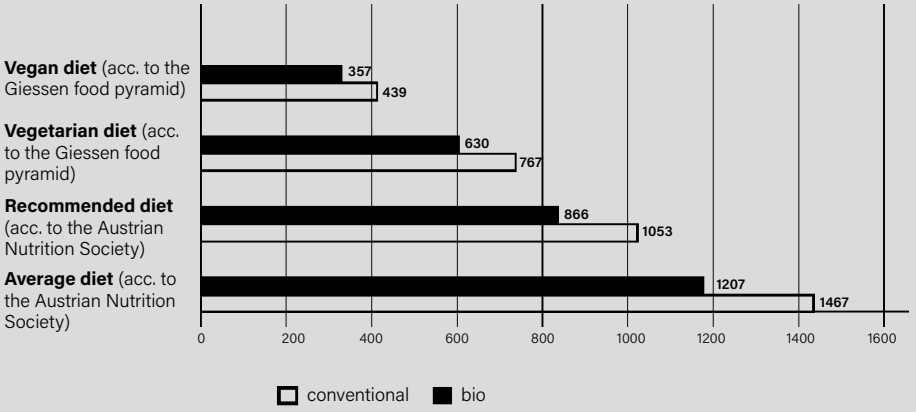
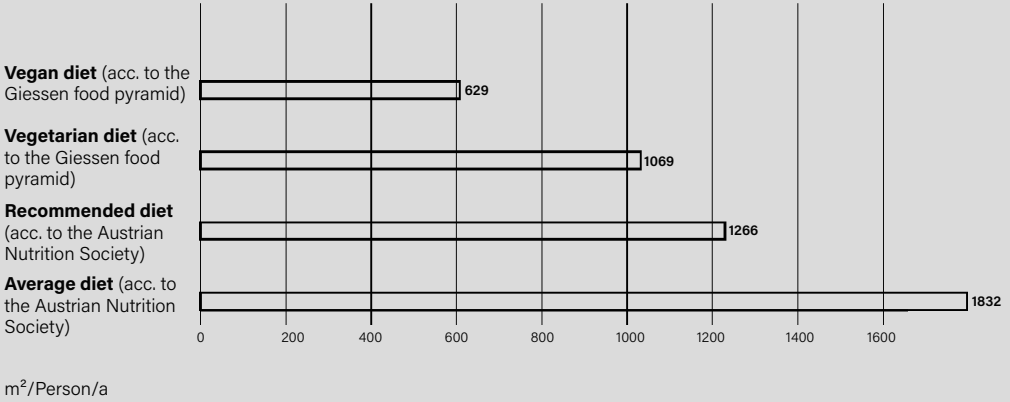


Fig. 18 Area required per person for different types of diet
(Source: Schlatzer/Lindenthal 2020)

SPACE II

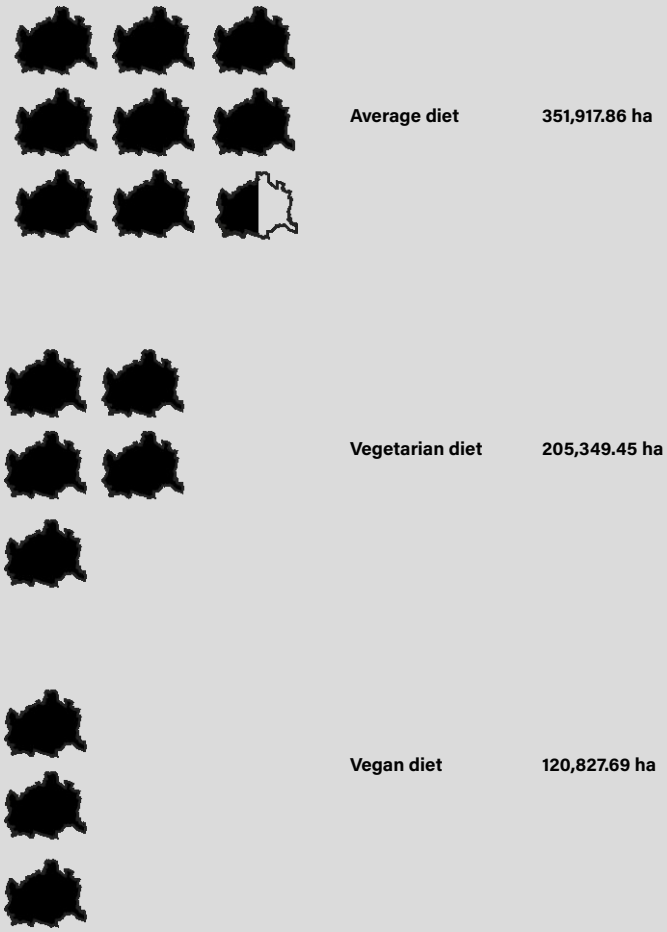




The current average diet in Austria causes a total of 1,467 kg CO_2 eq emissions/person and year. Switching to the recommended, significantly healthier diet (i.e. 66% less meat) can save 28.2% of GHG emissions.

Switching to a **vegan diet** offers the greatest potential. Here, **a saving of 70.1% of GHG emissions** can be achieved.

Fig. 19 Different diets and their climatic context
(Source: Schlatzer/Lindenthal 2020)



How much land is needed to feed Vienna's population? (1,920,949 inhabitants per 01.01.2021 source: City of Vienna)

The area of the Marchfeld (approx. 100,000ha) could supply three quarters of the city's inhabitants if a vegan diet was adopted.

Fig. 20 Comparison of different types of nutrition in relation to the necessary land area
(Based on the values of Schlatzer/Lindenthal 2020)

SPACE II

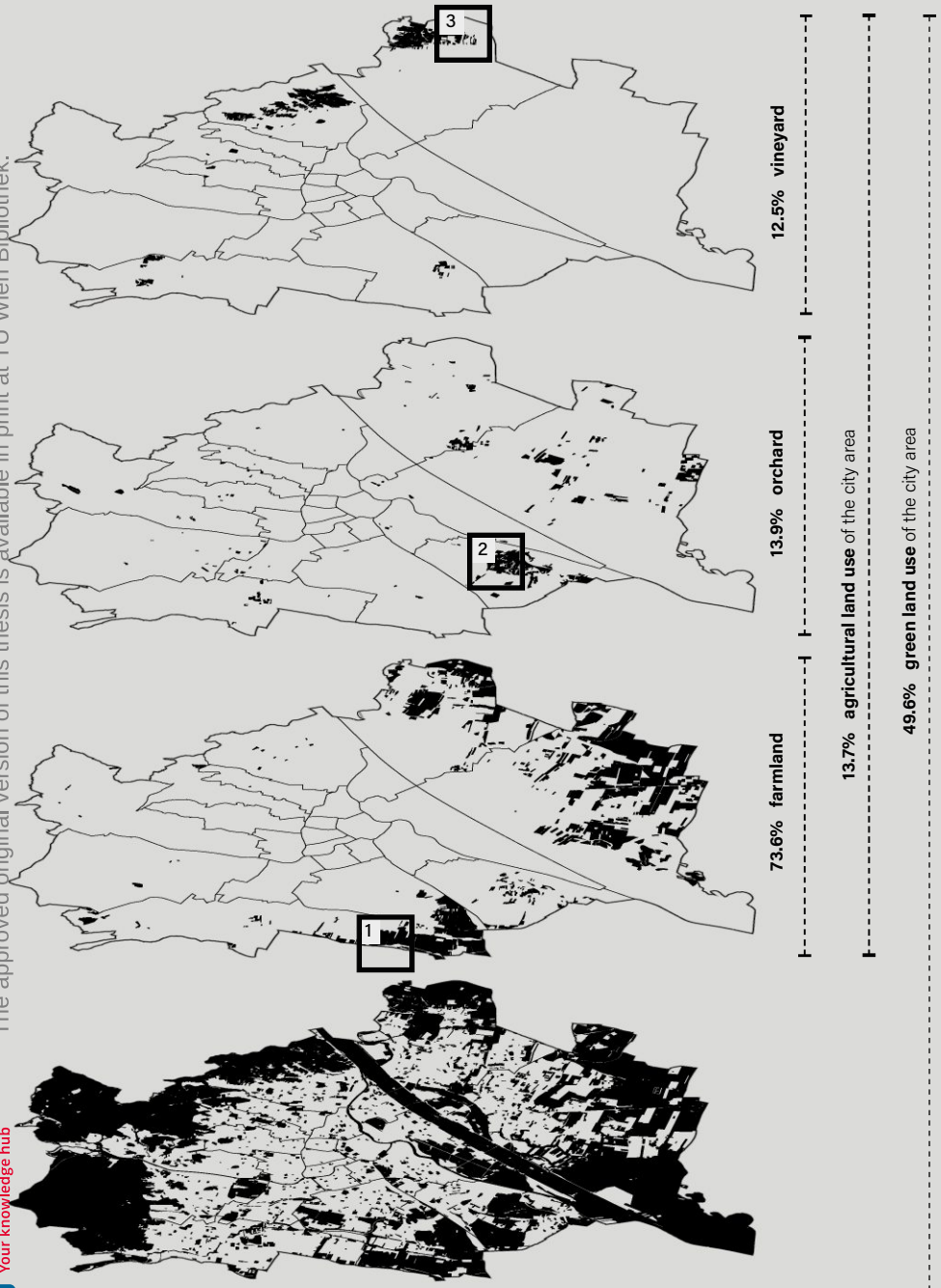


Fig. 21 Land use in Vienna: The agricultural area within the city limits is above average compared to other European cities. (Data source: City of Vienna)

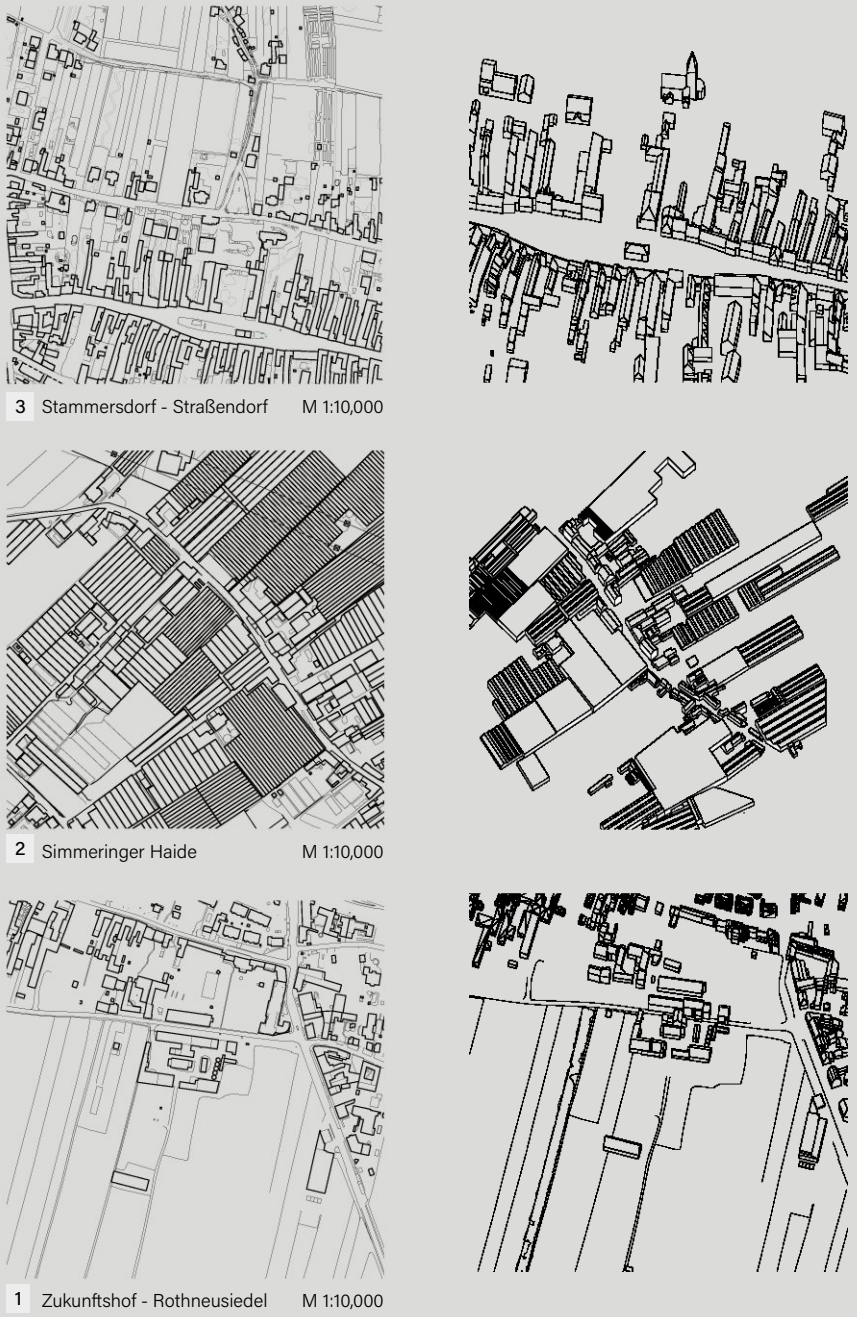


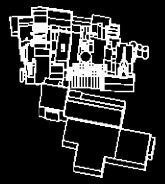
Fig. 22 Exemplary extracts of the land uses and their different spatial contexts (Data basis: City of Vienna)

MAP II
RESOURCE - EXCURSUS
TRANSFORMING RESOURCES

The resources of a city are manifold - processing places, producing places and preparing places. Resources are consumed (land, raw materials) and also produced (waste heat, by-products).
The **food processing places** most frequently mentioned by the mapping participants and their **sensual perception** are shown below:

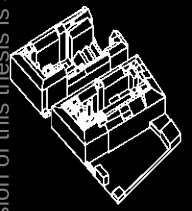
Space - Sensual perception

Ottakringer Brauerei (Ottakringer brewery)
Poducts: Beer



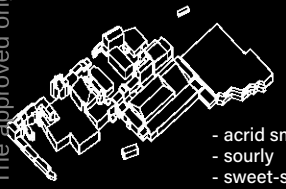
- beery
- malty
- heavy scent

Manner - Fabrik
Products: sweets (Mannerschnitte)



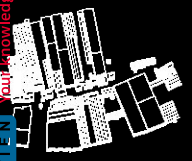
- chocolate
- sweet-smelling
- buttery

Mautner Markhof
Products: Vinegar, mustard, syrup, delicacies



- acrid smell
- sourly
- sweet-sour

Simmeringer Haide
Products: vegetables (e.g. cucumber, tomatoe, paprika...)



- manure
- dung
- grassy
- country air

Places where food is produced
Places where food is processed
Data source: food mapping workshop

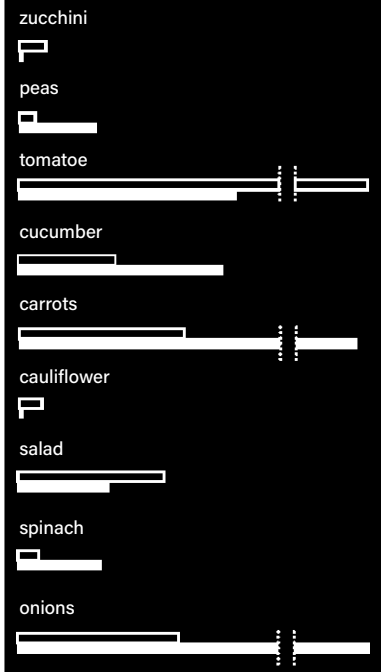
Green spaces secured by dedication
Food producing areas/agricultural area
Data source: City of Vienna

1 km

Production vs. Consumption

How much food is produced in Vienna and the surrounding area?

Comparison by type of vegetable:
Consumption and production in the **urban-rural region** (catchment area including: Korneuburg district, Tulln district, partly Gänserndorf district, Mistelbach, Wien-Umgebung, Bruck an der Leitha district, Baden district, Mödling district, and the city area of Vienna).
(Schwarzl et al. 2017:12)



(Source: Schwarzl et al. 2017)

consumption
production

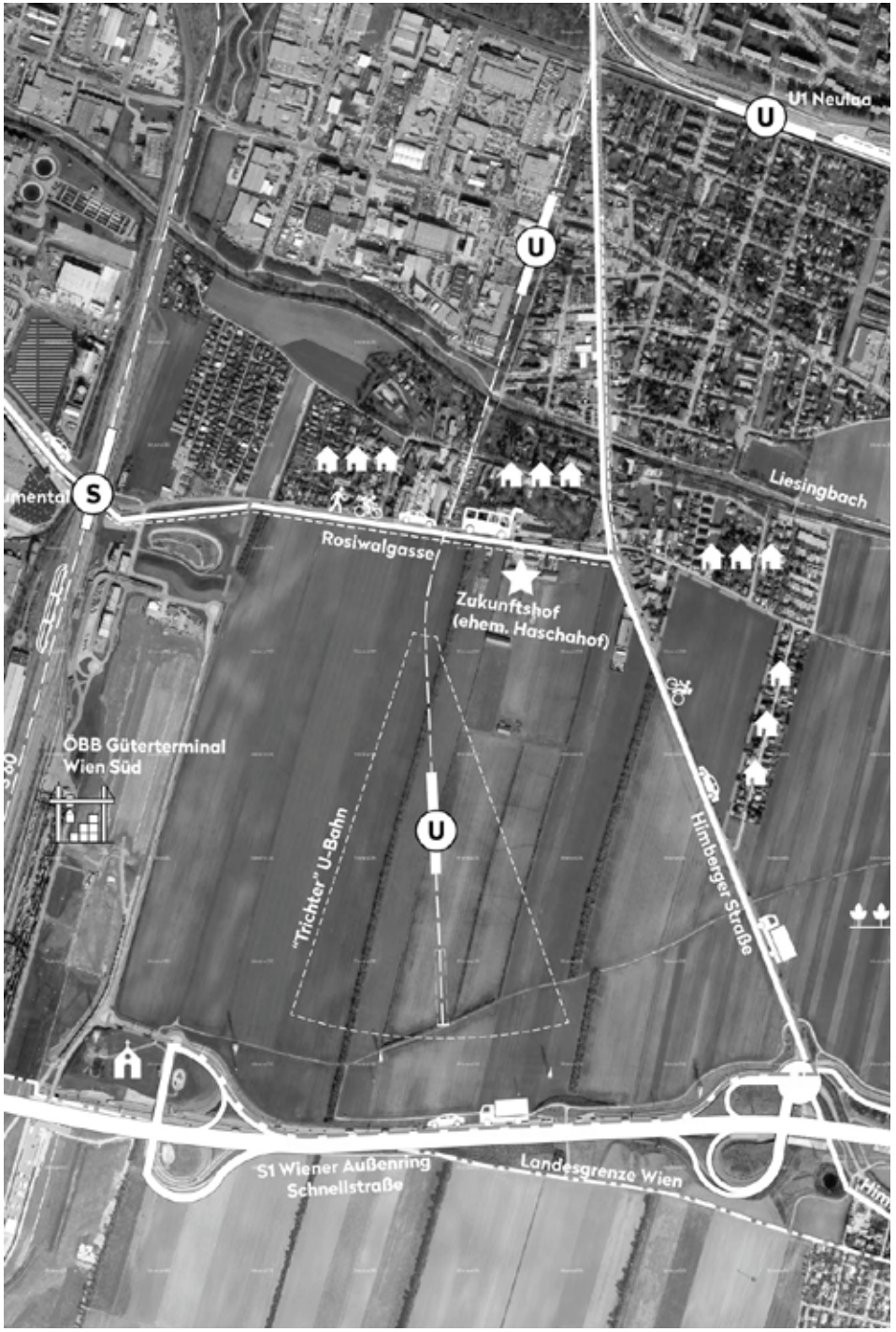
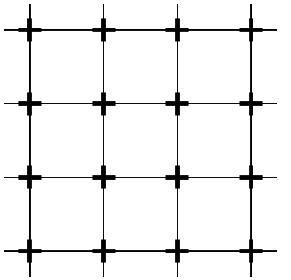


Fig. 24 Aerial photograph of the Rothneusiedl urban development area. (City of Vienna 2021:8, © Raumposition)

Platz der
Menschenrechte



POLICY

p.71

Field Trip III

Only on closer inspection does one notice that the swinging and curved red line on the sandstone-coloured paving of the square forms a giant, oversized question mark. Today, Friday, 1 September, the studio mobil stands alone, with no wooden pavilions. It is situated next to the busy road that disrupts the spatial flow of the intersecting cross-axis that then leads to the ring road and finally merges into the city centre. The enormous punctuation character marks the end of Vienna's most popular shopping street, Mariahilferstraße. It is the business part of the city with shops full of fashions and flamboyant imported food on congested supermarket shelves. In the middle of the question mark, a 10-meter long table invites people to meet, talk and explore the articles of human rights, written on painted plates on the white surface of the table. The blue and white street signs typical of Vienna have only recently begun to show the formerly nameless square its name: "Platz der Menschenrechte" (Place of human rights). The stone monument Omufuma, situated at the narrowing point between the Museum Quarter and the street, commemorates an asylum seeker who was killed by police violence in a negligent manner. The square seems spatially bizarre with its almost randomly distributed elements and the urban lab as part of it.

View of the Platz der Menschenrechte and the studio mobil

While at the Viktor-Adler-Markt we were visited by a large number of very different people, people at this place are more reserved. Nevertheless, the Platz der Menschenrechte is a popular place for rallies and gatherings for demonstrations. Watching people lethargically moving from the opposite side of the street towards shops lined up next to each other, we ask ourselves: Can architects play an active role in making conflicts between people and places more visible and resolving them? Where are parallels to food-related issues in spatial terms? How does the political framework affect food spaces?

View of the studio mobil and the food map; in the foreground: the 10-meter long table

Policy links between food and urban planning

The demands on urban development processes have gradually increased with the current challenges of climate protection, conflicting interests in the functionality of the land and the need for innovative mobility concepts. The planning service stands between politically determined framework conditions and legalities on the one hand and civil society on the other. High complexity due to socio-cultural developments, changing participation methods, and consideration of local and global material flows pose new challenges for urban policy and urban planning. "The organisation of the planning always determines the quality of the result." (Messerschmidt et al. in Bott et al. 2018:51). Food as a cross-cutting theme has the unique potential of tackling several issues at the same time. As introduced in the previous chapters and reflections, the food supply of a city includes activities such as producing, processing, distributing, consuming, retail and disposing of. Viewed in chronological order, they pass through certain ecological, institutional, social, economic, and political dimensions in turn. Each of these processes is bound to spatial dimensions and territorial preconditions that have been completely underestimated so far (cf. Tendall et al. 2015 in Cabannes/Marocchino 2018:25). The localisation of these spaces is in turn tied to different political frameworks. The topic of nutrition was seen as a rural issue until a few years ago and therefore only appeared on the political agenda of urban settlements recently. Due to growing attention in recent years, nutrition is gradually becoming understood as a reciprocal urban-rural issue and being included in urban politics (cf. Verhoeven/Wiskerke 2018).

The rediscovery of food as a field of political action

In the intersection between local and global movements, Stierand poses thoughts on food systems and their political relation. He believes the reason for the missing local level in the food system is the fact that today's supply is (paradoxically) not dependent on the existence of local production and the exchange of local goods. Food supply is not organised locally, but operates in national to global contexts, which is the most fundamental threat of municipal food policy (cf. Stierand 2018). Stierand identifies the development of instruments, the attribution of responsibility and the definition of fields of action as the greatest challenge in order to bring food policy back to the local level (cf. Stierand 2018b). He defines two crucial paradoxes; firstly, even though

regionality seems to be the decisive purchasing characteristic for food in consumer surveys, regional food is an absolutely marginal phenomenon in purchasing behaviour and on the food market. Secondly: Consumers (and often also the political discussion) see ecological advantages in buying regional food. Scientific studies refute this. Thus, there is a lack of starting points and contact persons/stakeholders within municipal nutrition policy. It is necessary to state here that a complete regionalisation of the food system is not expedient, or even disadvantageous, but rather that a holistic approach must be developed that makes regional food one of the instruments of integrated municipal food policy (Stierand 2018a).

At a leisurely pace, two men approach. Both are experts in the field of social change and new technologies. Our attempt to discuss what role food can play in the field of tension between population, politics and change leads to an intense debate until our heads are spinning. Even though we live in a time of multiple crises, simply acknowledging this state of affairs is not enough to bring about change. What is needed is a clear political understanding, which means that there must be a broad consensus in politics as well as among the general population. With the map hanging in public spaces and actively confronting people with the topic of food, we see ourselves as contributing to the first fundamental stage of change.

From an urban policy perspective, according to Stierand, there is a need for appropriate instruments, such as municipal food policy and urban food planning, as well as the associated urgent need for accountability, so that cities can once again take on nutrition-related tasks. He formulates two essential goals that cities should pursue: firstly, in order to connect the different actors, a hub is necessary, and secondly, a think tank is needed for the strategic development of nutrition policy in the municipality. Using the “ladder of nutrition policy” (see fig. 28, p. 83), designed for consumption-oriented nutrition policy by Spiller et al. 2017, Stierand defines the various measures and starting points in a hierarchical order. Their arrangement symbolises the degree of influence of the respective measure and the guided, facilitated, or restricted choice of food (cf. Stierand 2018c and Spiller et al. 2017). Stierand argues that even the lowest level of non-regulated action (doing nothing) can have an impact by leaving developments to their own devices. The multitude of projects that have emerged from civil society and initiatives underline this impact.

Kevin Morgan, Professor of Governance and Development in the School of Planning and Geography at Cardiff University, is one of the leading researcher in public food provisioning. He questions how it is possible that the planning community addressed all essentials of human life from land, shelter, air, and water - with the conspicuous exception of food? He justifies the need for the planning community to address this issue through the concatenation of phenomena underlying ongoing urbanisation and population growth. To demonstrate the political dimension of food and reasons for the growing attention, he points out the following points:

- Food security is now perceived as a national security issue following the urban riots that erupted in many countries after the food price hikes of 2007/2008
- The food chain accounts for some 31% greenhouse gas emissions in the European Union, making the food system a crucial target of policies to counter climate change.
- The epidemic of obesity and other diet-related diseases makes the food system a prime target of campaigners who want to transform the National Health System from a treatment service to a health-promoting and prevention service.
- Food poverty is increasingly visible in the cities of the Global North, as we can see from the explosive growth of food banks, making food a social justice issue as well as a human health issue.
- The food system is now perceived as a prism through which planners seek to promote more sustainable natural resource management and ecosystem services.
- A quality food revolution is underway as people rediscover the pleasures of good food and its associations with place and provenance (Morgan and Sonnino 2010).

(Morgan in Bohn/Viljoen 2014:18f)

With the result that food has become a major topic of political discussion, the question also arises as to where such a multifaceted issue should be institutionally placed (cf. Morgan in Bohn/Viljoen 2014). This difficulty is also addressed by Stierand insofar as no institution feels responsible (cf. Stierand 2018b). Morgan refers to experience

data of Europe, North America and Africa where the framework in policymakers and civil society interlocutors evaluate and view the issue of urban food is crucial. In this sense, food councils take a leading role in networking different actors, activating civil society and connecting them with political institutions.

Entangled relationships between food, politics and planning

The link between political agendas and urban planning projects proves to be exceedingly difficult. Even though food has become a recognised issue, it is not enough to simply include, for example, food-producing components (such as community gardens) on top of the initial agenda (Bohn/Viljoen in Verzone/Woods 2021:39). Unclear power relations and weak integrity of governance risk that, for example, urban agriculture is used more as a marketing tool than for adequate integration of food production (cf. Bohn/Viljoen in Verzone/Woods 2021). This difficult situation between politics, urban planning and the planning community is to be shown in the following example.

Sarah Kumnig, a social scientist, examines Vienna in the light of neoliberal urban development and its effects on agricultural spaces and highlights, among other things, concrete actions of governance at the local level. For her „the neoliberalization of the urban is characterized by increasingly entrepreneurial city politics and an intensification and transfer of a market-based logic to all societal areas." (Kumnig 2017a:234) Kumnig describes the strong conflict between urban growth and agriculturally used areas using the example of the Donaufeld in the 21st district, Floridsdorf. The 60ha area was largely used for agriculture. However, vegetable farms have already and will in the coming years have to give way to 6000 new flats. Kumnig's fundamental argument is that urban gardens and agriculture serve as a strategy for building a green image of project areas. She bases this statement on the observation that accompanying participatory processes act as a democratic regulator without having any effect. Incorporated into profit-oriented strategies, they became a useful instrument of upgrading and value enhancement (cf. Rosol in Kumnig 2017a). Regarding the urban development area Donaufeld, "the aim of the participation process was not to involve the population in decision-making processes, but only to provide information about the planned developments and to collect suggestions for the site." (Kumnig 2017b) Instead of searching for common perspectives and solutions, the parties of interest go against one another and reinforce the already conflictual character.

The dynamics of power are unbalanced and make political participation methods questionable. In the case of the Donaufeld, a seemingly logical, unchanging framework was created that justified the planned building project for implementation (cf. Kumnig 2017a). The existing housing vacancy as well as the possibility of converting other sites, such as already sealed areas for the construction of new housing, were not considered or mentioned in the process. The participation process itself was not primarily led by the city, but by a private planning office (cf. Kumnig 2017a). Often, such an agency is used in general participation procedures as a mediator to create and promote a broader exchange between the participants than in legally prescribed procedures (cf. Messerschmidt et al. in Bott et al. 2018). However, according to Kumnig, this outsourcing acts as a buffer to cushion critical reactions from the population and other decision-makers. Criticism therefore, hits an empty target, as the office has no real decision-making power in the urban development process in its function as an organiser and contact point (Kumnig in 2017b:15). In other words, this conclusion means that the experts, specialist planners and the mediating planning office brought in must also be competently represented and actively involved on the side of the decision-makers, which was not the case in this instance. The chances of the population to seriously participate in processes are incredibly small. In this sense, the meaning of urban gardens and urban food production is highly ambiguous: On the one hand, city dwellers are reclaiming public space through collectively planted gardens; on the other hand, urban vegetable production is being used specifically as a marketing tool to make neighbourhoods more attractive and expensive. The production of food is therefore replaced by romanticising images of gardens (Kumnig 2017a:14).

The example of the Donaufeld illustrates a clash of multiple actors and the discrepancy between different values of land. High value inner city land cannot be left unattended in the future development of the city. Consequently, low-value uses, such as agriculture must give way. In the interdependence of use and land value, "urban agriculture is productive but not self-sufficient on inner-city lands carrying high real estate value." (Verzone/Woods 2021:19) Although such uses can increase the value of urban quality, which the city has also taken advantage of as mentioned above, they would have to be given a long-term perspective and a secure position.

Dusk is already falling when we spot a group of people gently approaching us, some of them with a glass of wine and a bite to eat in their hands. It must indicate the end of the today's symposium of the Vienna Biennale, in which speakers, discussants and participants have racked their brains about our future world and exchanged opinions reflecting the current state of affairs. After spending nearly 12 hours in this place, watching the traffic lights change from green to orange to red and reverse, discussing socio-political questions, and chinking glasses with the chess-playing group at the long table for an after-work beer, we finally roll up the map, collect our scattered pins, pens and markers and leave.

SPACE III

Instruments
Spatial regulating factors, governmental as well as recommendations of initiatives. Urban development instruments that directly influence the urban food system. 3 levels of impact are shown, from the neighbourhood (micro), to the whole city (meso), to the international level (macro).

* AgStep (2014): The data situation has changed enormously in the last 8 (!) years. An updated agri-structural development plan does not seem to be planned at present.

*Step 2035: This urban development plan should be developed soon (subsequent to the STEP 2025)

*ÖPUL 2015: The programme has been extended until 2022 and is currently in the transition phase for ÖPUL 2023

*food strategy plan (MA22): A nutrition strategy is currently being prepared by MA22.

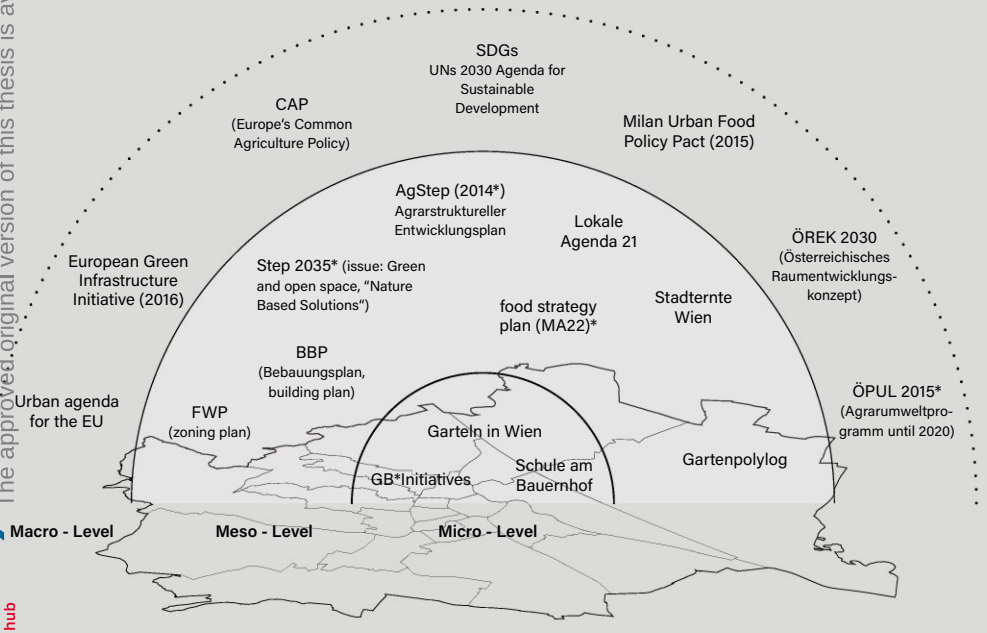


Fig. 25 Urban development instruments in the context of Vienna (following Viljoen 2018:93, Fig. 7)

Stakeholder
Actors in the urban food system from the neighbourhood level to transnational relations in Vienna.

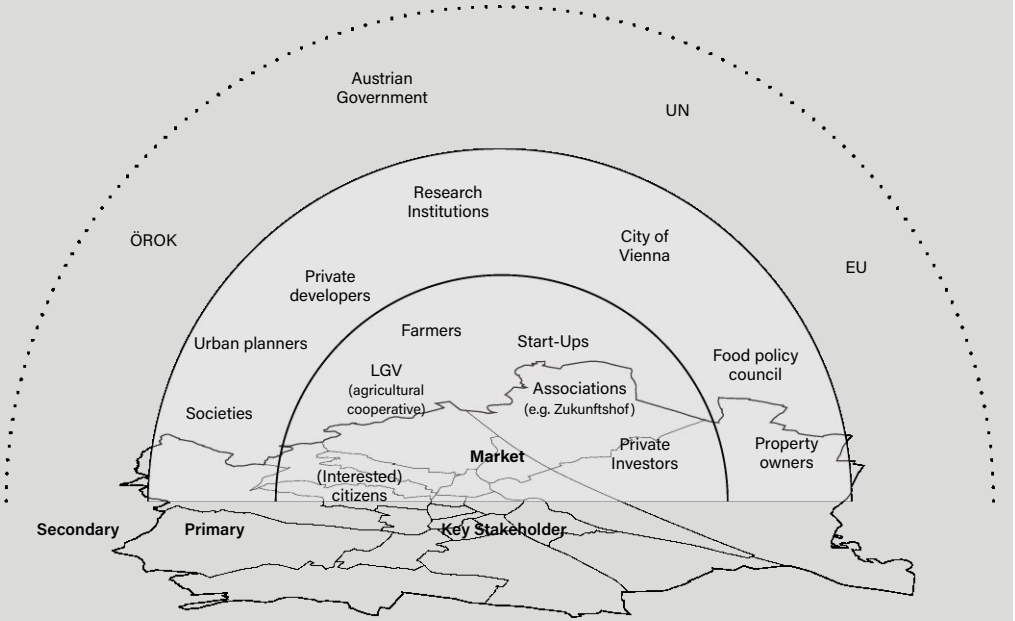


Fig. 26 Stakeholder in the context of Vienna (following Viljoen 2018:111, Fig. 8)

SPACE III

Urban development and agriculture in Vienna

target area for urban development
current urban development area on agricultural land
green spaces secured by dedication
agricultural land use
citizens' initiatives in connection with urban development projects

Ladder of nutrition policy interventions according to Spiller et al. 2017
A possible instrument of nutrition policy to influence consumer behaviour. The ladder visualises the sequence of increasing influence on individual choice behaviour. The impact of the instrument is based on the one hand on the argumentation of scientific findings and on the other hand on the acceptance of the citizens.

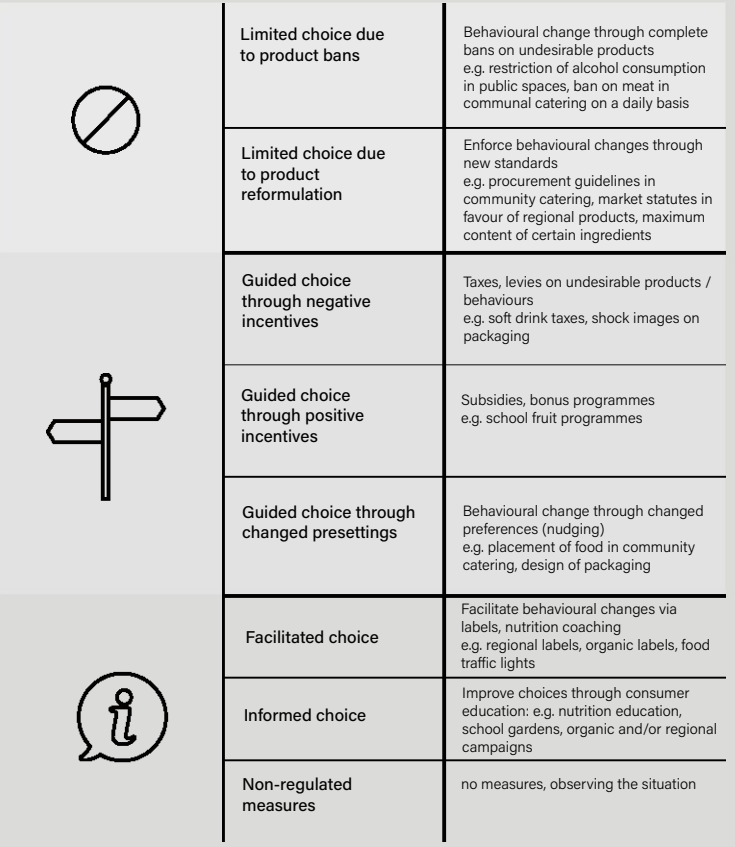


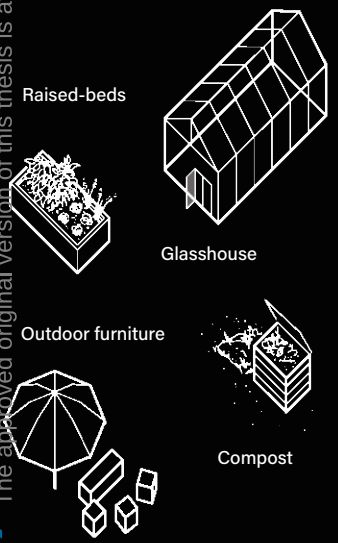
Fig. 27 Urban development and agriculture in Vienna

Fig. 28 Leiter der Ernährungspolitik (Ladder of nutrition policy) according to Spiller et al. 2017

Community gardens as a hybrid of top down and bottom up

Community gardens are gardens that are run by a group of people. However, it is not only gardening that plays a role here, but also working together, helping to shape the neighbourhood, the possibility of participation within a community, the development of a sense of community in doing things together and ultimately the communicative togetherness in the garden.
The community garden is a space en miniature for political action. Decisions are made on an open-democratic basis.
Guerilla Gardening = gardening in public space without official permission. The intentions and goals blur with those of community gardens. (cf. Gartenpolylog n.d.)

Spatial elements



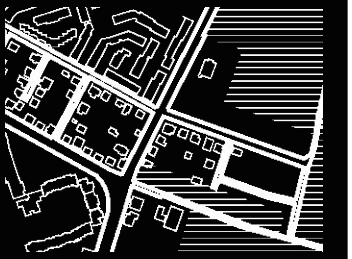
MAP III
POLICY - EXCURSUS
POLITICAL-SPATIAL IMPACT

- food producing locations (urban gardens, self-harvesting, , farms)
  Data source: food mapping workshop
- Gebietsbetreuungen (area management)
- Collection of projects with participation with focus on gardens
  Data source: City of Vienna
- Target areas for urban development
- Construction ban §8 (Bausperre nach §8)
- Building blocks
  Data source: City of Vienna

1 km

Spatial regulators

Building blocks (blocks) are a statistical counting unit usually enclosed by traffic areas or road sections. (City of Vienna)



Plan extract: Blocks, buildings and highlighted agricultural fields.

Construction ban §8

A building ban is imposed on urban areas not yet covered by the development plan until these plans are determined. In addition, a construction ban is imposed if the City of Vienna intends to make changes to the existing plan.

§8 (1): Comes into effect for urban area not yet covered by the development plan. Permits for new buildings, conversions and extensions may be issued under certain conditions.

§8 (2): Comes into effect when the municipal council makes changes to the development plan (limited in time). Permits for new buildings, conversions and extensions may be issued under certain conditions.

§8 (6): Comes into into effect automatically with the announcement of the public display of the draft land use and development plan. For construction projects, the provisions as §8 (2) apply.

cf. wko and RIS Bauordnung für Wien §8 - Landesrecht konsolidiert Wien)

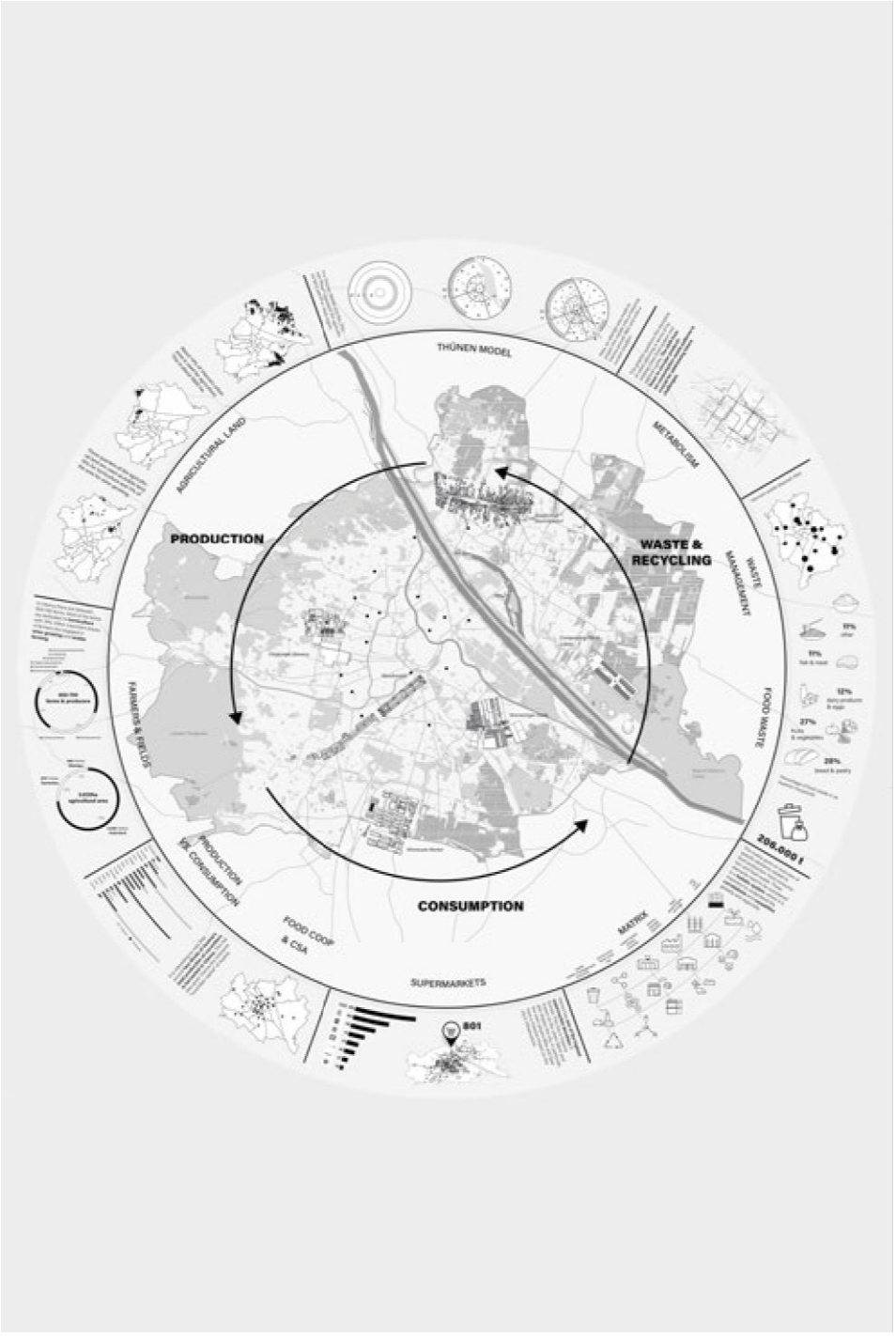
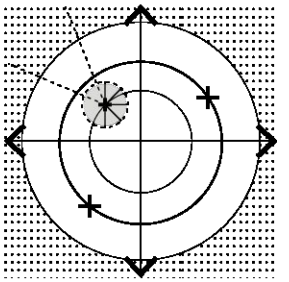


Fig. 30 Food cycle Vienna (Vanessa Braun, Daniel Löschenbrand)

Sachsenplatz



MEMOIRS & PROSPECTS

p.87

Field Trip IV

1 October, Friday morning. The studio mobil is lined up with cars and motorbikes on the parking strip along the square. Three parking spaces are occupied by the van and the pavilions. Benches, a playground and a sports field in the middle of the square are wrapped in the shade of hundred-year-old trees. The neon coloured banner of the studio mobil shines through their overhanging branches. The square is quiet and peaceful, awaiting hundreds of visitors of the Vienna Design Week 2021.

Autumn foliage covers the ground around the studio mobil. Crispy wind brings a flustered look to our cheeks, while we unpack the map and position it on the side of the truck just opposite the entry to the exhibition of the Vienna Design Week. It is a place full of design and art installations questioning contemporary challenges and ways of life. First visitors approach, curiously looking at our map with its various layers of written commentary, associative sketches, analytical drawings, connecting lines, green, yellow and blue dots and pictogram-type stickers. The map has filled up steadily over the last few months with new layers, points, places, impressions and perceptions added at each appointment.

Sachsenplatz, view towards the Wallensteinstraße

Entrance to the Vienna Design Week exhibition

Detailed view of the food map

Reflection of the Field trips

The perspective on city, food and landscape has changed. The map now is a living sign of civic expression. Each added element shows the narrative of food, space and people that would not have been obtainable by other means. The graphic and narrative possibilities of georeferenced data in combination with food open up a new documentary approach. The value-added, challenges, positive effects and impact of building a sustainable food network are anchored in people's minds and reflected in urban fabrics/civil societal movements.

After spending so much time viewing the city through the lens of food, the familiar urban perspective was swapped with food related anecdotes that have not been perceivable before. "The stumbling block for people who are familiar with an area is a selective gaze that ignores everything but what is necessary for the task at hand. We see only what we expect to see. It takes a certain detachment to be able to look for one thing and find another fortuitously." (O'Rourke 2013:5) Any attempt to understand the systematics behind food chains, from production, processing consumption models and disposal, requires a thorough consideration of overarching patterns of resources, human perceptions and changing patterns of availability and seasonality. The combined method between the work with citizens, being on site and spatial analysis leads to a changed dynamic of dialogue and practice. Spatial configurations at all scales, from one's home over the scale of neighbourhood to larger configurations, become tangible and can be placed in the correlation of food and space.

The graphical documentation of the process and digital synchronisation of the data have made the collected knowledge from different levels visible. MAP I to MAP IV in the previous chapters have identified several partial aspects of food supply into the spatial context of Vienna. Based on the experience gained and the literary analysis, three main results are obvious:

Conclusion 1 – heightened perception

» The combined method of the work with citizens, being on-site and spatial analysis leads to a multi-layered understanding of food-related spaces and processes in the city.

Visualising spaces relevant to the production, processing, distribution, consumption and disposal of food promotes the understanding that the multifunctionality of food not only affects the different actors and spaces involved in the food cycle, but is also related to current challenges at multiple dimensions, such as health, biodiversity, climate change, social inequality, education and awareness. The goal of creating a broader understanding of this issue cannot only be achieved by reducing the physical distance of food production and reintegrating food into urban areas. Rather this must be done primarily through social actions such as raising awareness and strengthening ties to place and culture. The Field Trips as part of the interactive process between academics and residents have shown that food is a key element, as it permeates human life on different levels, giving it a unique potential to shape and change. Local initiatives in this field and urban community gardens show the power that these projects can develop (e. g.: Zukunftshof in Rothneusiedl, Zukunftsküche, CSA Ochsenherz, City farm Augarten, Kleine Stadtfarm, Landgut Cobenzl, WeltTellerFeld, Mundraub, Gartenpolylog, MILA Mitmachsupermarkt, FoodCoops, ...).

Conclusion 2 – spatiality of food

» The city as an experimental space offers the ideal opportunity for a detailed analysis and visualisation of spaces permeated by food in a multi-scale way and in different dimensions.

The growing interest in the topic of food in the planning context has so far expressed itself on a spatial level mainly in forms of reintegrating food production in urban areas, such as urban gardening, community gardening or on a larger scale urban agriculture. The further phases of the food cycle, consisting of procurement, processing and preservation, distribution and exchange as well as preparation and consumption up to disposal, are far from being sufficiently researched in a coherent spatial context. However, they manifest themselves spatially with highly varying effects on their immediate environment. The city is an ideal place for the direct engagement with food-related activities, their interactions and the spaces associated with them. The spatial elaboration of these food-related impacts holds potentials ranging from urban circular economy approaches to climate improvements and social integrity. In this work, a cross-section of food-related aspects was shown to represent the different spatial aspects with the associated potential to view space through the lens of food.

Conclusion 3 – holistic view

» The multi-scale understanding of spaces along the food cycle and their impact on the local level is necessary to identify and establish missing links, capture potentials, and close loops. The search for holistic territorial strategies to (re)connect urban areas and food is imperative for cities.

The times are long gone when the production volume of the hinterland was the decisive factor for the growth of a city. In order to be able to analyse the spaces, areas and built structures of today's urban food system, the consideration must go from the

building scale (micro), to the city scale, through to the global scale (macro). These scales are strongly intertwined and express themselves spatially in different ways. For example, the tomato in the supermarket is tied to glass-greenhouse landscapes in Spain and distribution centres on the outskirts of the city, which are as much a part of the city's metabolism as vegetables from more local agriculture. The planning community has a key role to play here, as they are able to act at different spatial scales, both two- and three-dimensionally. At the same time, they have the opportunity to identify and create missing links between the different actors and sectors involved in the food system, ranging from the political level to civil society.

Prospects

In order to secure the knowledge, make it publicly accessible and be able to process it further the transfer of analogue data into the digital world is of central importance. Decoding urban space through the contributions of citizens, their individual behaviour, thoughts and emotions reveal the specific elements of Vienna's general and unique food patterns. The use of public knowledge and intelligence, combined with new technologies, identifies opportunities and actions to deal with current challenges. The digital food map as a multidisciplinary platform that brings together laypersons and experts and provides processed knowledge has the potential to open up spaces for action, shape a level of dialogue and promote the vision of a shared future for multiple actors.

As a next step, questions need to be answered about how food can play a unifying role in the planning process; How food-related data can be translated into parameters and indicators for the planning community; How the value-added and benefits of food-related activities can be made visible in a spatial context; How to deal with the city's resources (consuming and emerging). How new partnerships between civil society and administrations can be encouraged.

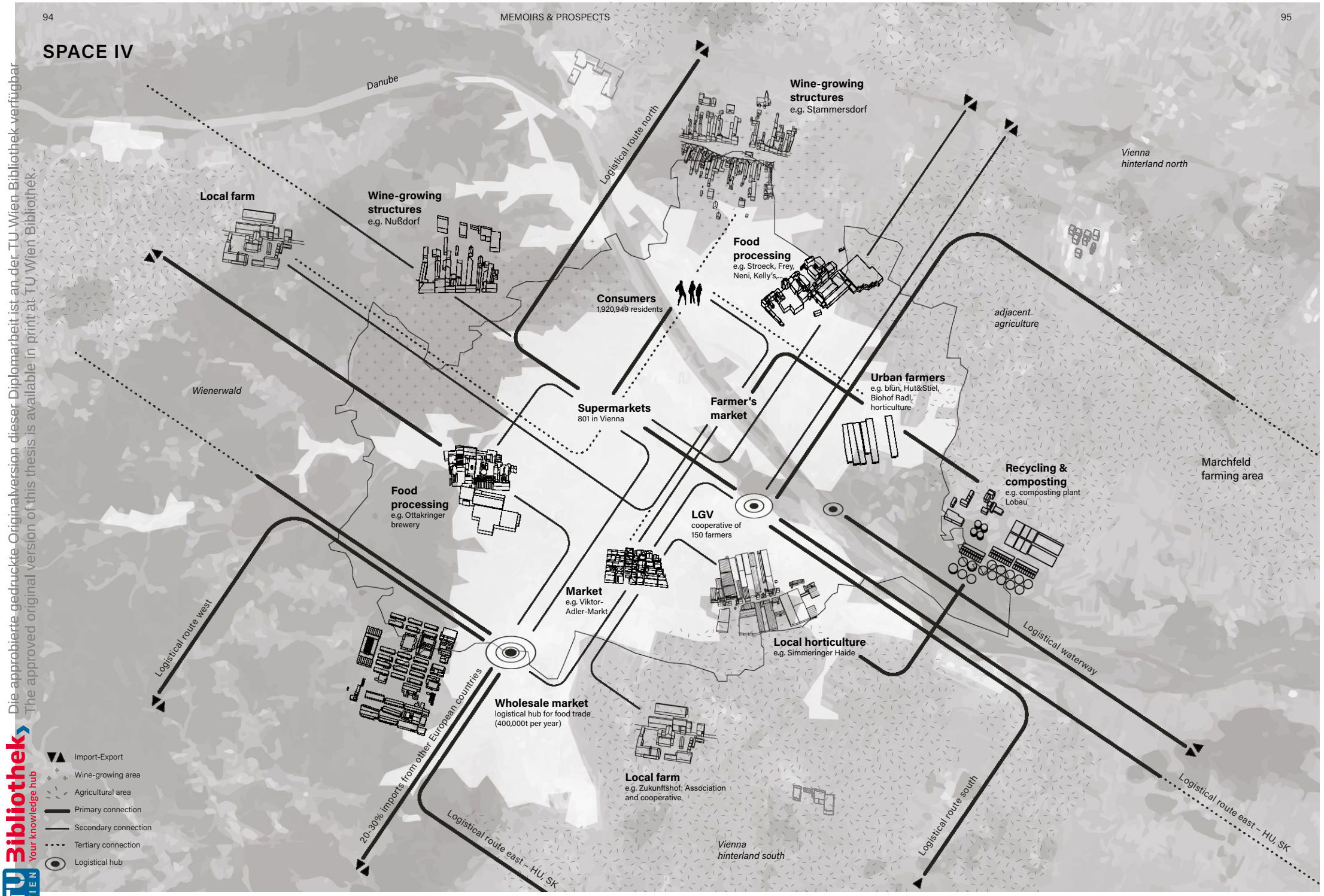


Fig. 31 Exemplary interrelationships of the Viennese food system following the food cycle

MAP IV
MEMOIRS – EXCURSUS
PERCEPTIONS

„The driving forces of agriculture cannot keep up with the driving forces of urban development. Certain areas of land, especially those that are well equipped with infrastructure, are considered too valuable for food production. Creating visibility for those areas can help to bring them on eyelevel with other development interests and show their benefit for the city.“

"Pläne die man mit am feuchten Fetzn abwischen kann, sind gute Pläne."

"There is a small permaculture farm here. The types of vegetables and fruits are not available in normal shops. For example, these peaches. They also taste very different, much more intense!"

"The odours that mingle here are unique in the city. You immediately know which district you are in. "

"Manner heats surrounding households with the waste heat from their ovens!"

"Compared to other cities, Vienna has very little undeveloped land. Land reserves are simply grassland, much of which is agricultural. A story that is often told: The paused farmer is sitting on millions in Donaustadt and is waiting for the highest sales option."

"We currently have local honey producers as guests, there are beehives on the Küniglberg."

"Really good beer is brewed in a former piano factory, (100 Blumen). You can buy it directly there, or simply go to the Avalon Beisl in the 8th district."

"A quite unknown to the Viennese population, but vital place for the maintenance of the city's food supply."

food production (gardens, farms, self-harvesting)
food processing (manufactories, factories)
consumption (except supermarkets, such as Greißler, farm-gate sale, market)
waste and recycling (compost, initiatives, food rescue)

Data source: food mapping workshop

1 km

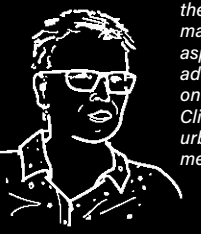
"Eating is political."

"This is a farmer where my mother often picks up fresh vegetables and occasionally a rabbit for a tasty roast."

"Vienna has enormous potential in terms of agricultural land. More than a hundred years old fertile soil, what a valuable resource!"

"The algae from the old Danube are currently only used for animal feed. But you could make a lot of nutritious and tasty things for humans out of it!"

"What makes it so exciting are the unbelievably many partial aspects that are addressed with one question. Climate aspects, urban development, soil,..."



"Here, on the 'WeltTellerFeld' you can really experience nutrition!"

Simmeringer Haide: *"Actually, everything here is full of glass houses, foil tunnels and horticulture farms."*

"Somewhere here, the City of Vienna has bought up land that the Business Agency is marketing for new production sites. So that the land does not become deserted, it is leased to farmers. They are actually intended for development and are used temporarily so as not to degenerate into wasteland."

Zukunftshof: *"We are trying to develop a pilot project in this place. How can urban development and food production work together? How can urban agriculture work in the future? The biggest problem, however, is the dedication problematic. The legal framework is not ready yet."*

METHODICAL BACKGROUND

Digital concept of food-related data generation

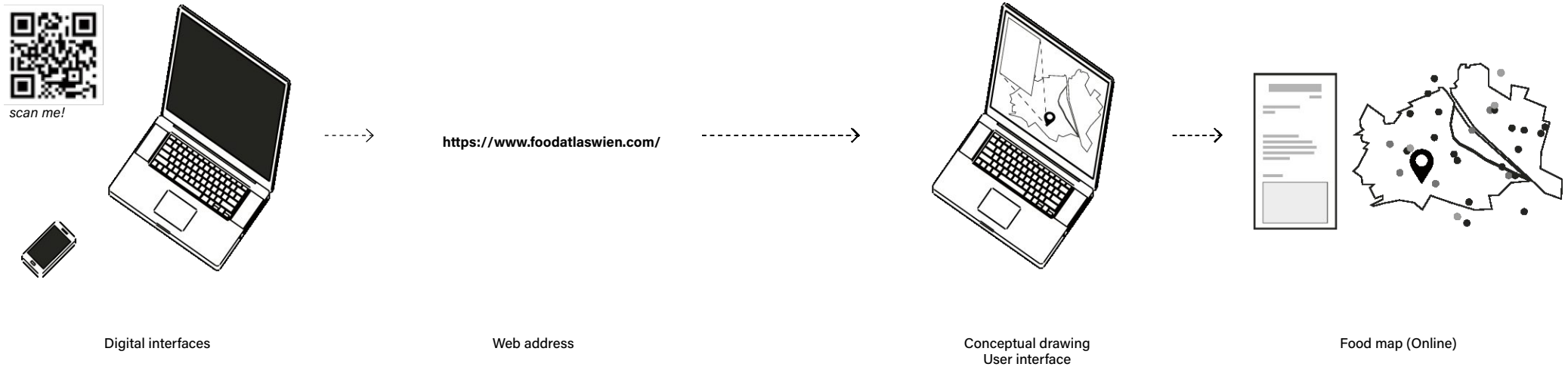


Fig. 33 Concept of digital food mapping

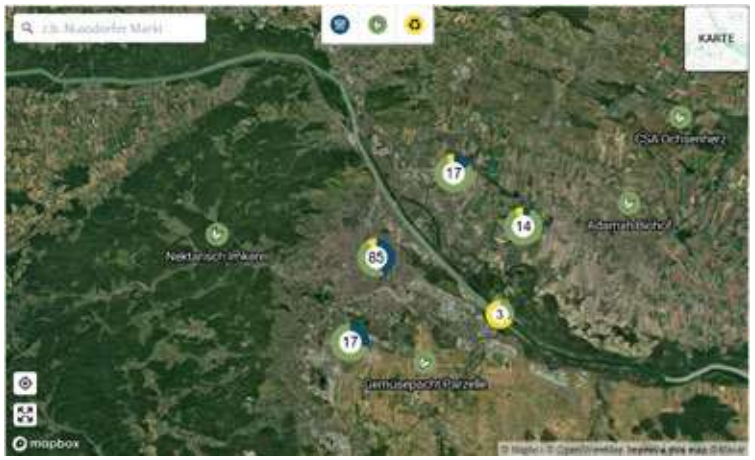


Fig. 34 and fig. 35 Digital map and analogue map with data status per 10.02.2022

Food mapping – analogue & digital

"In Western culture, it is in fact not uncommon to feel, in the face of major changes and transformations in the surrounding world, a need to step outside of libraries in order to experience forms of knowledge that lie not in books but elsewhere." (Blumenberg 1989 cited in: Grulois/Tosi/Crosas 2018:105).

Being aware of the existing structures, contexts and places related to food is a fundamental step in addressing local and global food system challenges. Being present on the streets, working publicly on food and nutrition issues and interacting directly with people has led to insights that go beyond general information and knowledge obtained from literature. Two main features can be distinguished: The mapping process itself as a tool for visualising subjective perceptions and provoking the debate between different actors, and the map as a representative of the collected knowledge and medium of communication.

In the preparatory phase of the interactive process, the following points/questions were of central importance:

- How can people be activated?
- What tools are needed to collectively map the food landscape?
- What questions do people need to be asked in order to establish spatial relations with regard to food?
- How do the different places and their audiences react to food-related issues?
- In what form can the subjective data be recorded (perception)?
- What data is needed to retrieve spatial characteristics?
- How can the data and information be organised?

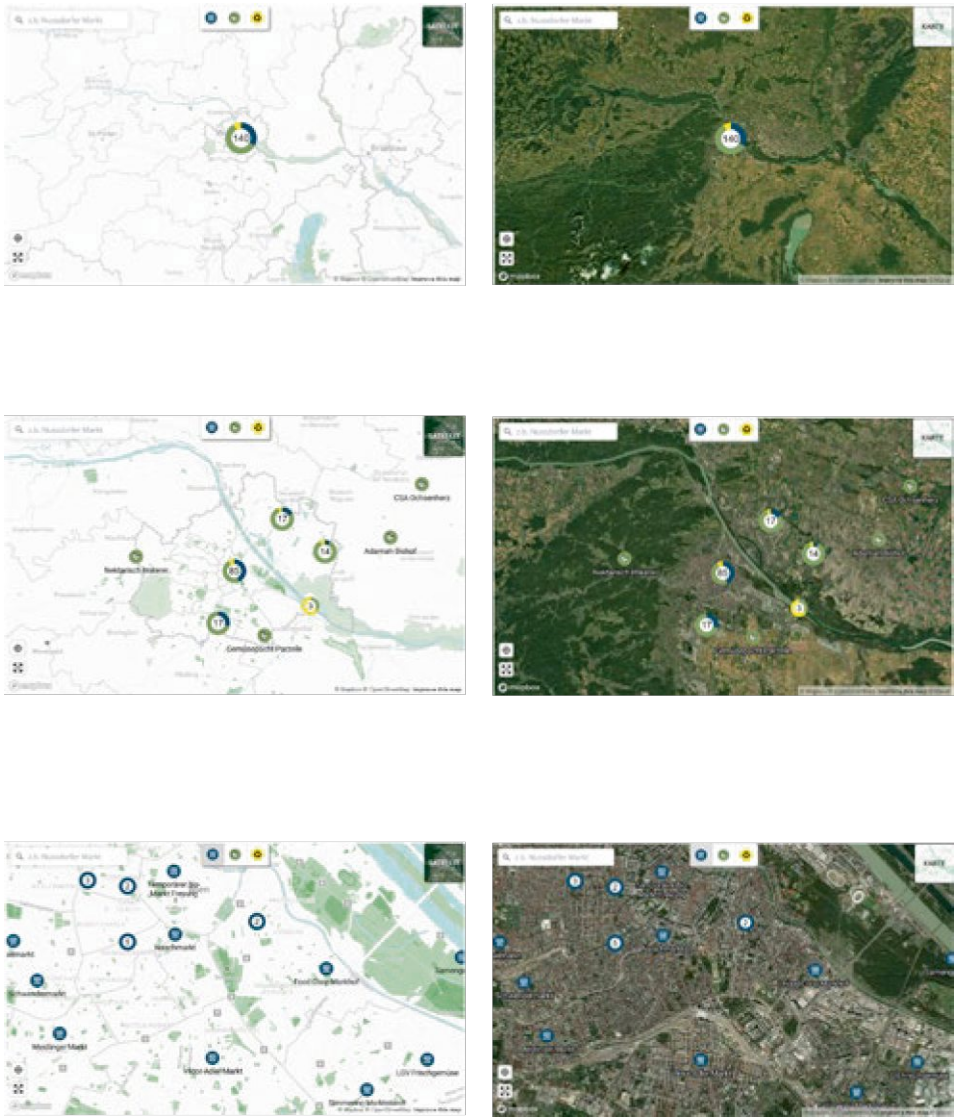


Fig. 36 - 41 Zoom levels of the digital map in the two different settings map view and satellite view (coding: © David Kirchsteiger)

Cross-media approach

Accompanying the analogue food mapping workshops, a digital mapping tool was programmed. The digital map enabled precise documentation and systematisation of the analogue mapped data. At the same time, it offered the possibility to access citizen's knowledge via the digital way. The digital map was developed in parallel to the analogue mapping workshops in order to directly incorporate conclusions and findings regarding categorisation and systematisation of food-related data. The use of cross-media methods opens up new possibilities of data collection for participants as well as for those involved in the project. The online food map provides different users to share information and data about food localities in Vienna.

Evaluation

The digital map serves as an interface between collective data collection and subsequent data evaluation. As an exchange tool, data sets can be exported and imported in different combinations. This becomes particularly important in further processing and evaluating the collected information. Using the subjective data of the participants, interesting superpositions can be made with official planning bases of the city.

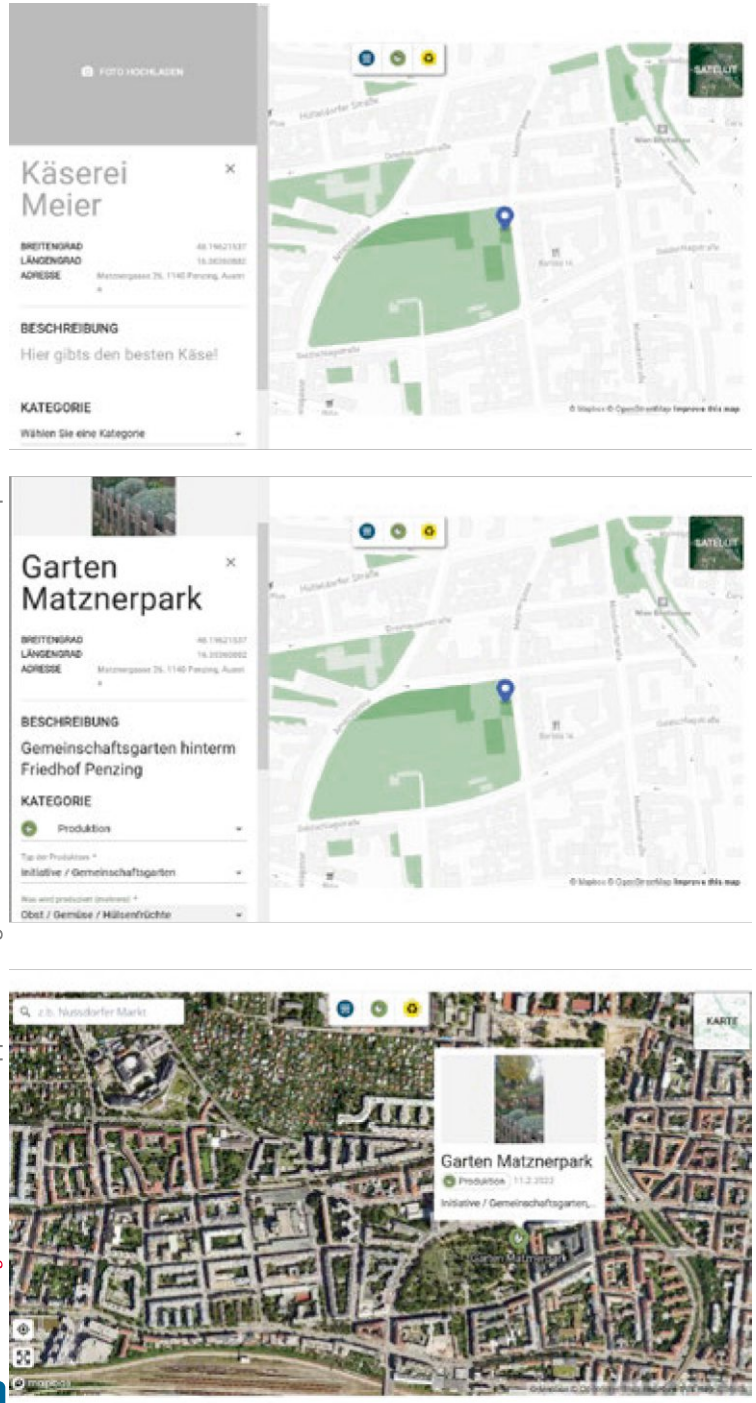


Fig. 42 Setting a new food pin on the digital map (coding: © David Kirchsteiger)

Challenges and difficulties

In terms of Citizen Science and the continuation of the project, the online map is the essential interface between the citizens and the scientific project. The analogue events have made an important contribution to activating citizens and bringing the issue to the outside world. As an overarching tool, however, digital resources (website/platform/app) are necessary to further process the results.

In the context of this Master's thesis, Citizen Science approaches could be tested and linked to the topic of Food Urbanism. The exchange with different people and their diverse backgrounds has given the project an enormous multidimensionality. At the same time, however, some challenges and difficulties have arisen, which are briefly explained below:

- Comprehensible categorisation of different types of food along the food cycle
- Delineate and define food-related content
- Finding a common vocabulary between urban planning, experts and lay-persons; Difficulties in dealing with ambiguity
- Time-consuming communication and organisation in addition to the actual research
- Simple handling of the online map (User interface)
- Promoting online activity; Building an active online community
- Definition of (standardising) spatial parameters

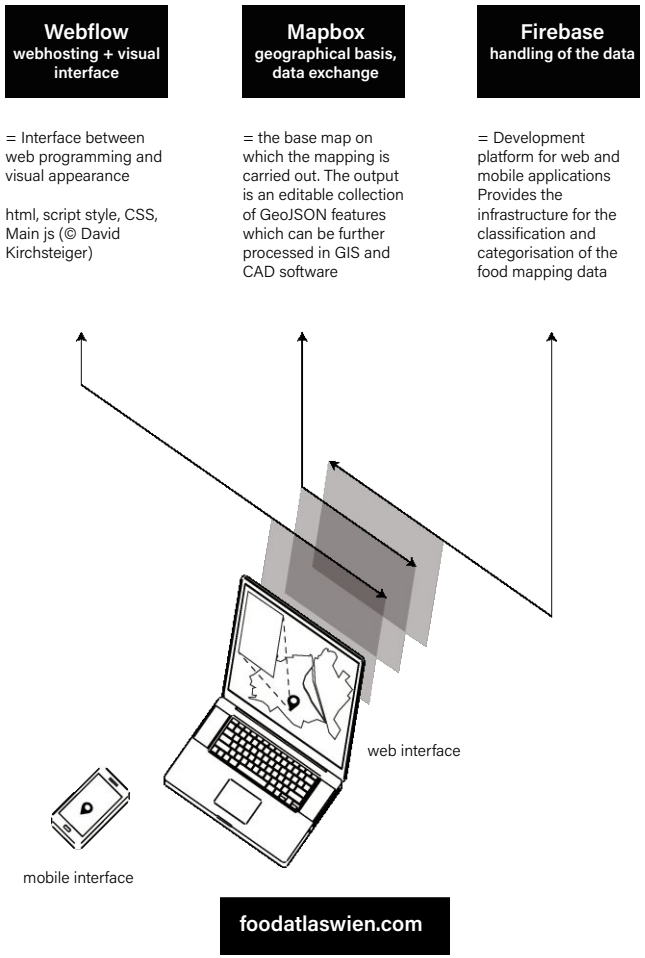


Fig. 43 Technical aspects of the digital food map

Technical aspects

The online map contains the following functions for the *project participant*:

- Search and research of locations
- Search suggestions regarding food locations
- Mapping of a food location and allocation within its activity in the food cycle
- Sharing comments or other advice
- Evaluation of food locations
- Viewing the personal location (especially effective by mobile use and spontaneous mapping)
- Switch between aerial view and map view

The online map contains the following additional functions for *project members*:

- Design of the map interface
- Exchange of data
- Import and export, download
- Evaluation of food locations based on urban parameters (beta)

Photo documentation

of the Field trips I - IV with the studio mobil
(Viktor-Adler-Markt, Naschmarkt, Platz der
Menschenrechte and Sachsenplatz)

and

further impressions from Food Field Trips
(FFT) of Viennese food spaces

The studio mobil (Klumpner et al.) at the Viktor-Adler-Markt, first Field trip, 10th district Favoriten, Vienna (© Christoph Kleinsasser)

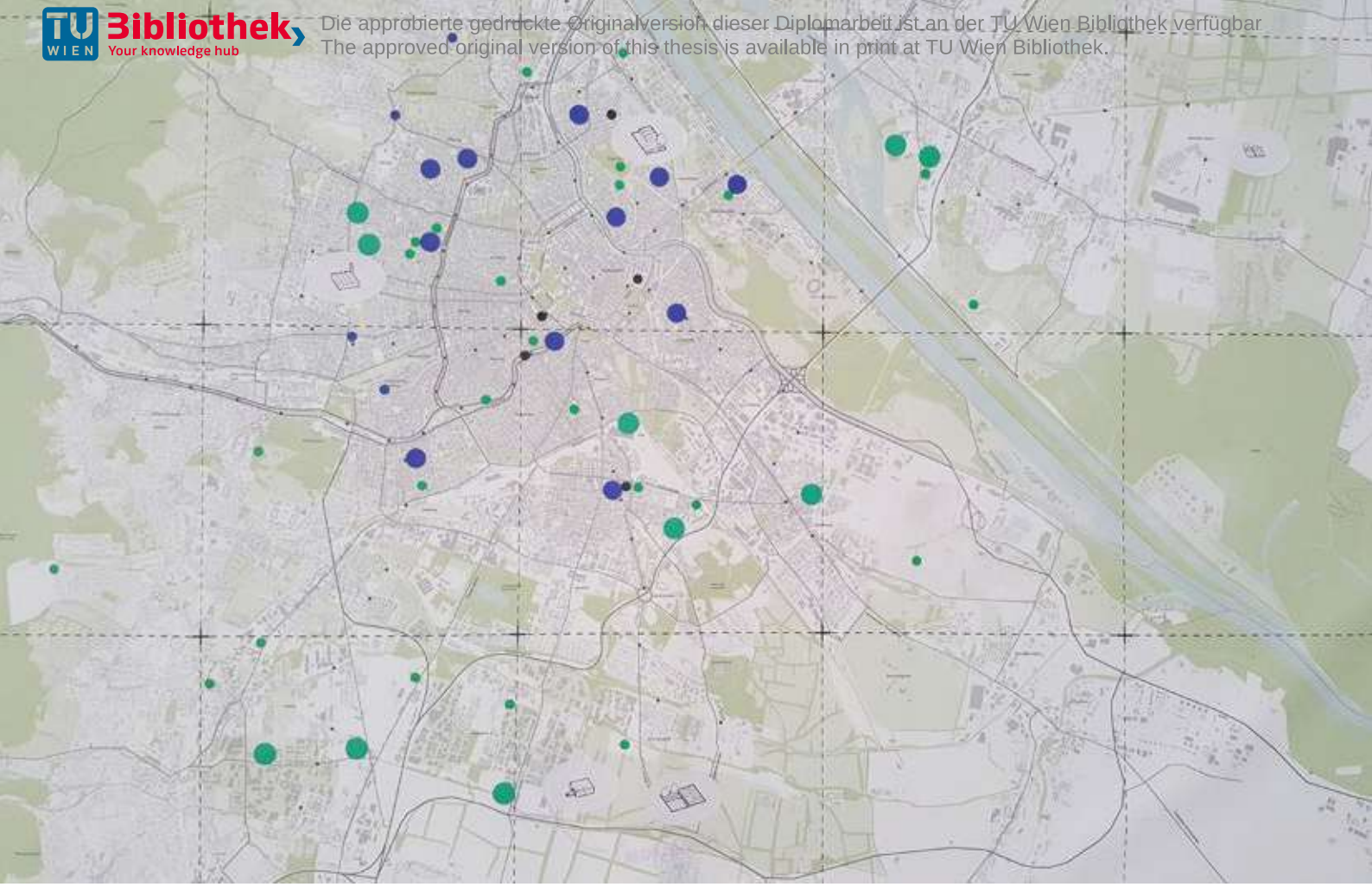
Best tomatoe sale - Market sale at the Viktor-Adler-Markt in Vienna (© Christoph Kleinsasser)

The studio mobil at the Viktor-Adler-Markt (© Christoph Kleinsasser)

Conversation with passers-by at the Viktor-Adler-Markt (© Christoph Kleinsasser)

View of the food map and the studio mobil through the bags sales stall at the market, see Field trip I (© Christoph Kleinsasser)

Market sales at the Viktor-Adler-Markt (© Christoph Kleinsasser)



First food-related locations mapped by participants (© Vanessa Braun)

Food mapping (in the background), expert interview and disussions (© Christoph Kleinsasser)

Hanging up the food map, Field trip II, Naschmarkt (© Daniel Löschenbrand)

The food map faces the endless concrete surface between Linke and Rechte Wienzeile, Field trip II (© Vanessa Braun)

Saturday flea market at the Naschmarkt (© Vanessa Braun)

Expert interview at the Naschmarkt (© Vanessa Braun)

Platz der Menschenrechte, Field trip III; In the foreground: Installation of human rights (artist: Françoise Schein) (© Christoph Kleinsasser)

Analogue food mapping at the Platz der Menschenrechte (Field trip III) (© Christoph Kleinsasser)

Field trip III at the Platz der Menschenrechte (© Christoph Kleinsasser)

Food mapping with passers-by (© Christoph Kleinsasser)

Discussing food topics with local people (© Christoph Kleinsasser)

The studio mobil between the facade of the Museumsquartier (right) and Gründerzeit facades of the Mariahilferstraße (left) (© Christoph Kleinsasser)

Possible interface between the map in public space and the digital map (© Christoph Kleinsasser)

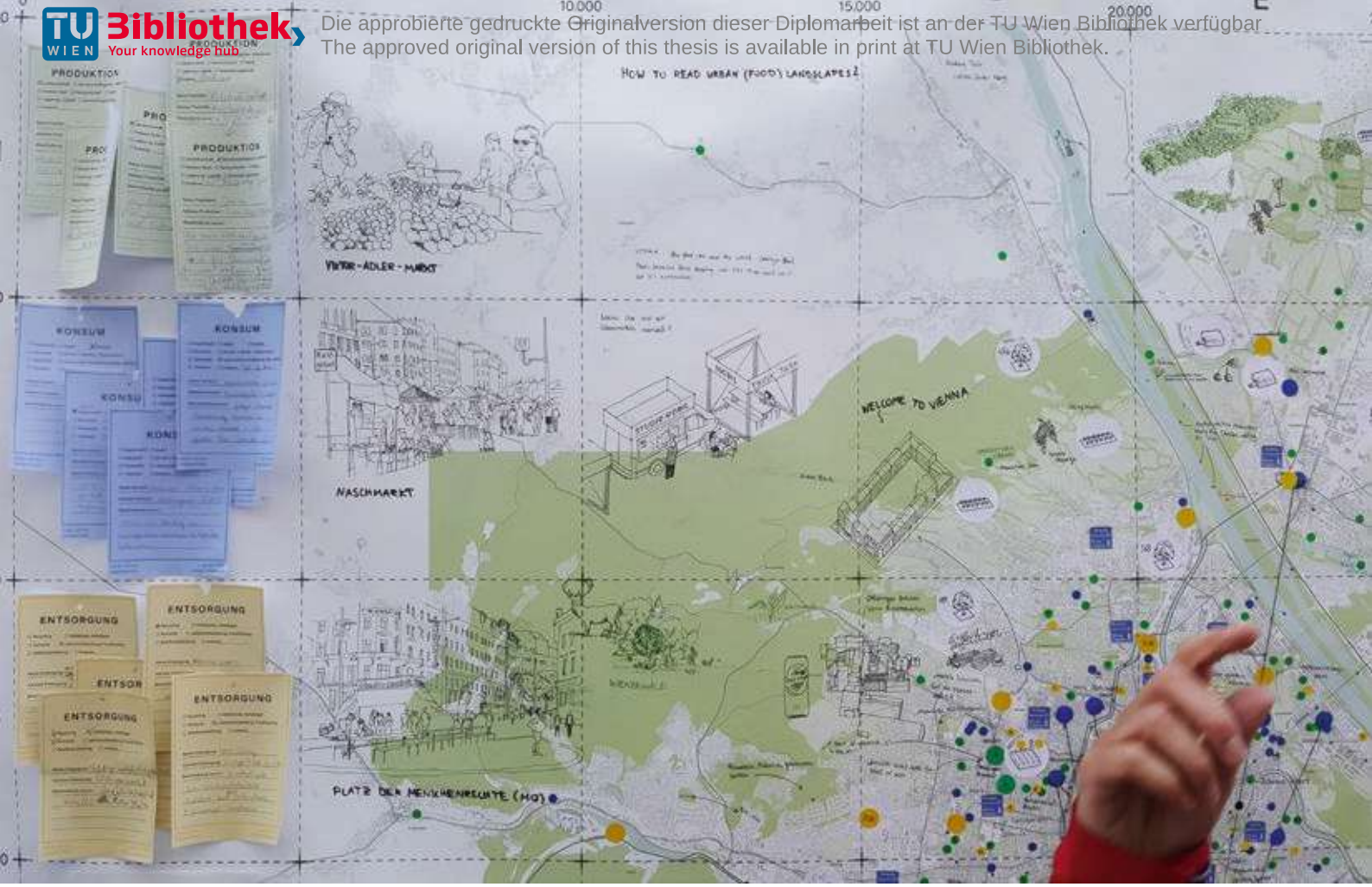
Parallel synchronisation of analogue and digital data (© Christoph Kleinsasser)

The studio mobil at the final Field trip IV at the Vienna Design Week 2021, Sachsenplatz, Brigittenau (© Vanessa Braun)

Entrance to the exhibition of the Vienna Design Week (© Vanessa Braun)

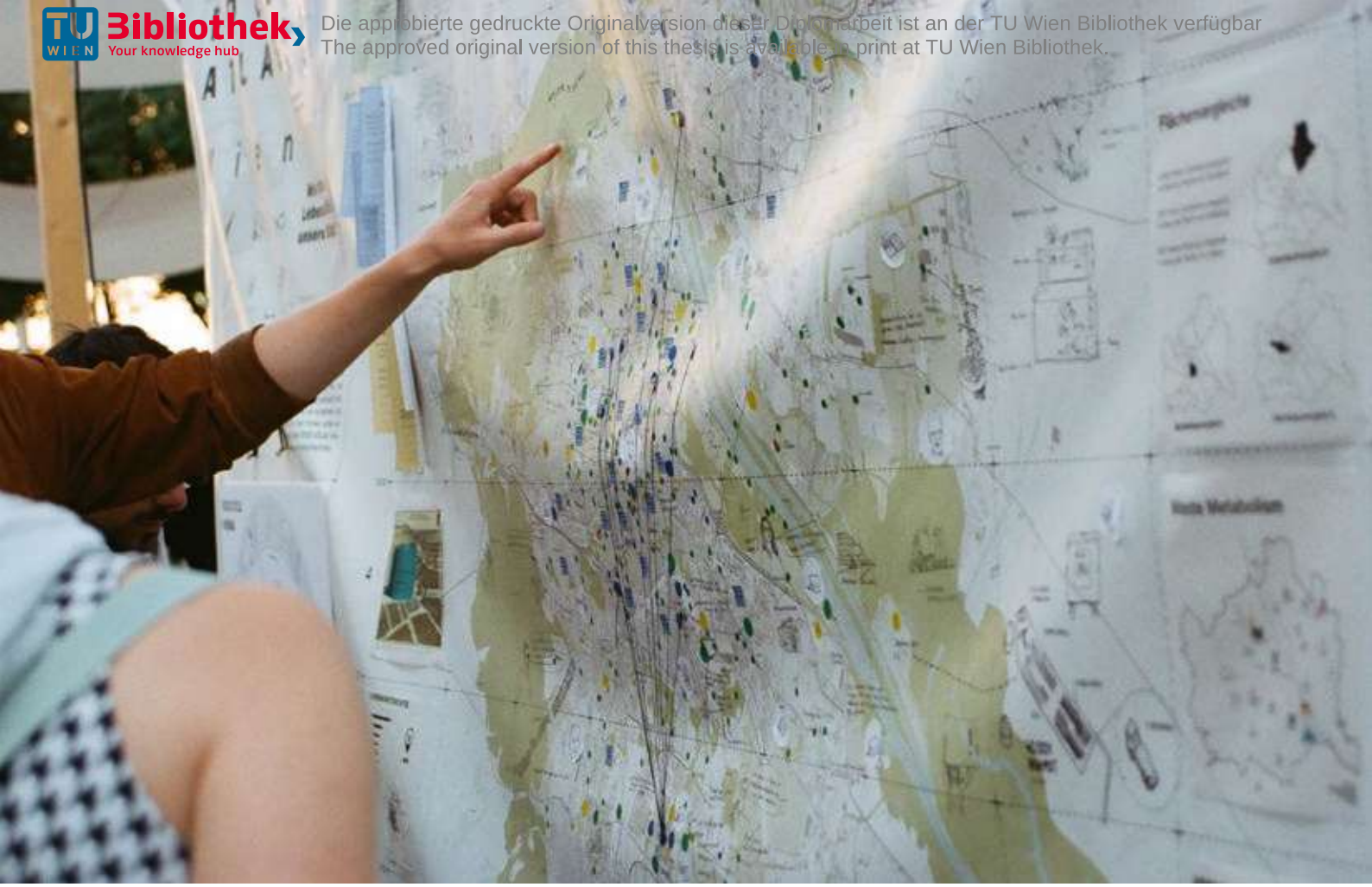
The studio mobil at the Sachsenplatz (© Vanessa Braun)

Discussing in front of the final food map (© Vanessa Braun)

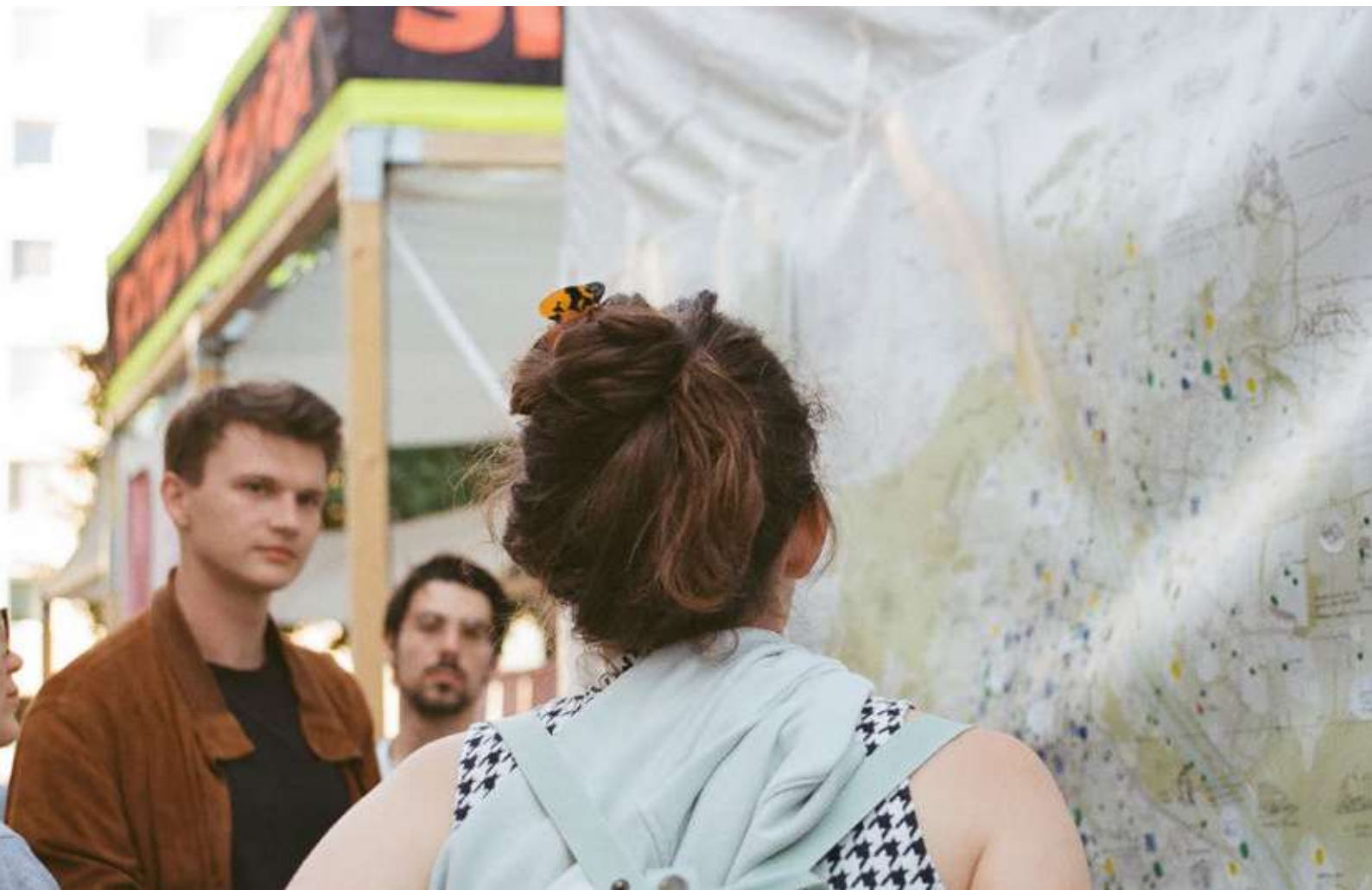


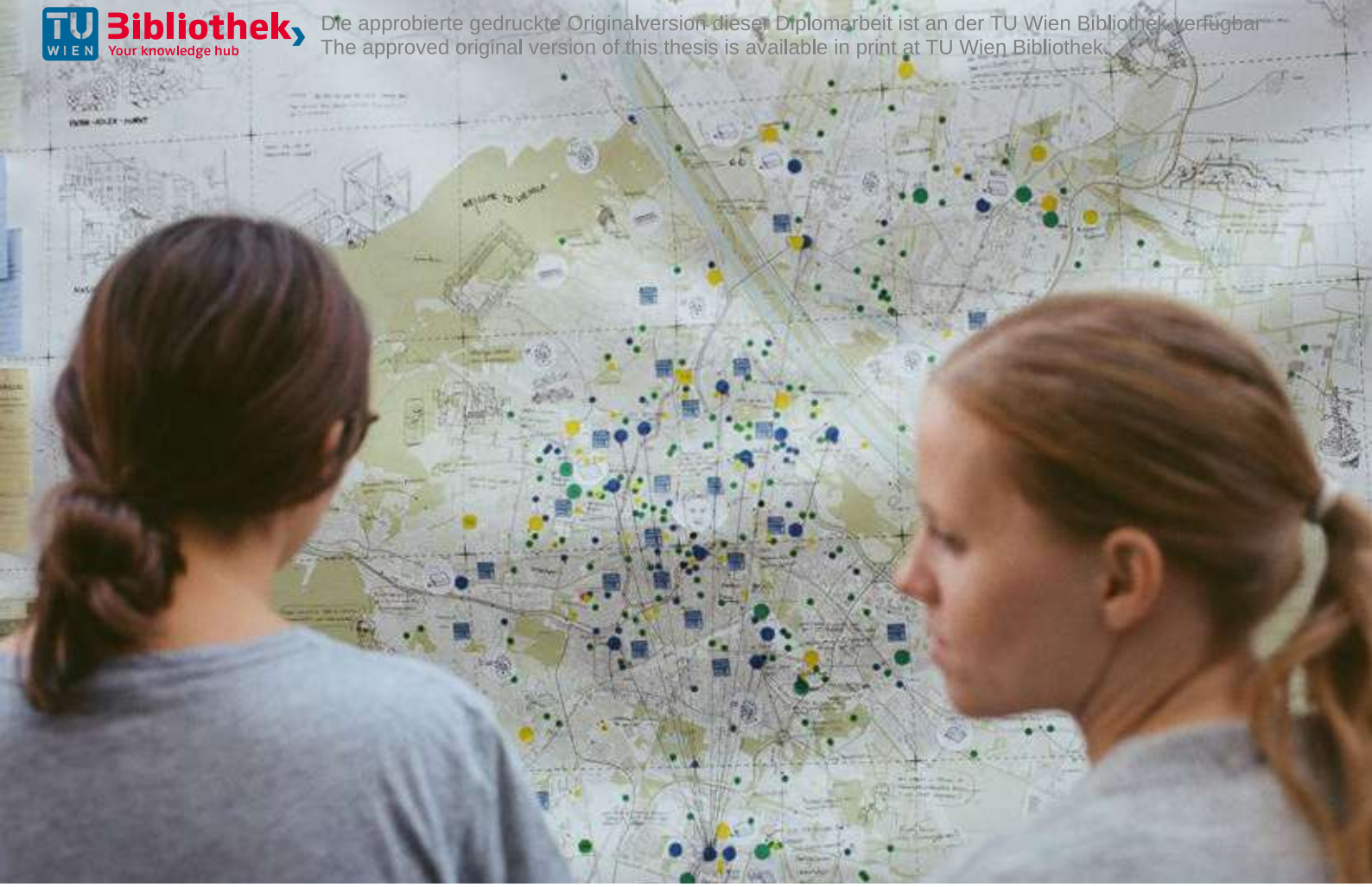
Details of the final food map: sketches, comments, documentation cards of the mapped points (green, blue, yellow) (© Vanessa Braun)

Notes from expert interviews (© Vanessa Braun)



Discussing food-related topics with visitors of the Vienna Design Week 2021 (© Vanessa Braun, both)





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Local residents at the Sachsenplatz (© Vanessa Braun)

Viewers of the final food map (© Vanessa Braun)

The base map before field trip I and the mapping workshops (© Daniel Löschenbrand)

The final food map after four field trips, intensive discussions and several mapping workshops (© Vanessa Braun)

Food Field Trip (FFT) to Seestadt Aspern, November 2021 (© Vanessa Braun)

Food Field Trip (FFT) to Seestadt Aspern, project "essbare Seestadt - winegrowing", November 2021 (© Vanessa Braun)

Community garden (© Vanessa Braun)

FFT to the ***Kleine Stadtfarm***, 22nd district, November 2021 (© Vanessa Braun)

FFT to the *WeltTellerFeld*, 22nd district of Vienna, November 2021 (© Vanessa Braun)

FFT 15th district of Vienna, allotment gardens next to the railways, December 2021 (© Vanessa Braun)

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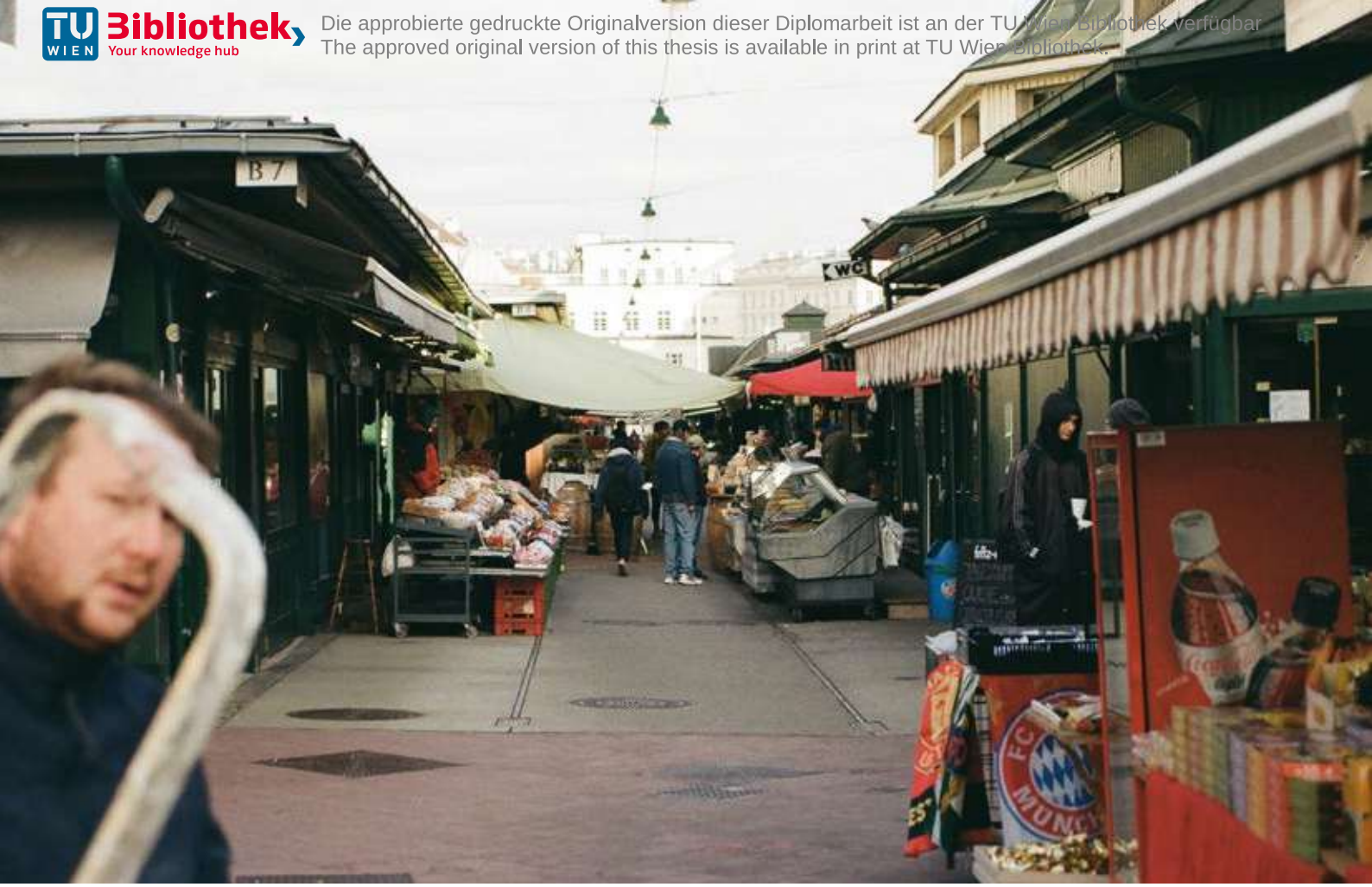
View beyond the city limits heading south, 23rd district, urban development area Rothneusiedel, December 2021 (© Vanessa Braun)



FFT to the Naschmarkt, January 2022 (© Vanessa Braun)

Cheese sale at the Naschmarkt (© Vanessa Braun)

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Food growing in glass houses on the outskirts of the city, November 2021 (© Vanessa Braun)

ANNEX

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