The Future of Urban Food (FOOD) – Scenarios of urban agro-food systems and their eco-economic impacts for the case of Vienna

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Part I: Summary for the general public

I.1. Summary for the general public

The research project "The Future of Urban Food" started in 2018 and lasted four years. The main objective of this project was to investigate the impact of changes in the urban food system and urban food preferences on agriculture in the hinterland and thereby contribute to a social discourse on the future development of urban food systems. To this end, we used the city of Vienna as a case study to explore changes in three dietary patterns: reduced consumption of meat, increased consumption of organic food, and increased consumption of regional food.

We integrated perspectives and knowledge from different disciplines (socio-ecology, economy, and sociology) and worked together with actors from Vienna's urban food system. An advisory board (i.e., a group of representatives from the private sector, city administration, interest groups and civil society) critically accompanied the project steps with advice and specific information. This approach allowed us to create a deeper multi-perspective understanding of the structure and dynamics of Vienna's urban food system and to untangle the complex issue of sustainable food consumption patterns.

First, we identified the structure and key characteristics of Vienna's urban food system through literature analysis and interviews with experts, ending up in a food system model. We identified relevant leverage points for enabling change towards sustainability in VUFS. Some of these characteristics were predictable and widely researched like consumption practices but others were more context-specific and underexplored like the density of retailers, food markets or food governance dynamics. We also explored innovative Viennese food initiatives and selected three case studies for a more in-depth analysis through interviews (an insect farm, a zero-waste supermarket, and a community-supported agriculture initiative).

Second, we assessed how changes in food preferences would affect the land footprint and green-house gas (GHG) emissions related to the urban food system. We found that a shift in diets towards a lower consumption of animal products has the potentially largest effect. However, this is an option of limited popularity among Viennese urban consumers and regional farmers as the results from surveys have confirmed. In contrast, the regionalization of Vienna's urban food system, which is promoted by policy makers and retailers alike and popular among farmers and consumers according to our surveys' results, has only a moderate impact on GHG emissions. A shift towards products from organic farming, which is also promoted but less favoured by consumers, performs best in combination with a dietary change towards less animal-based food. This combination would help to avoid expanding the land footprint of organic farming while realizing its broad ecological benefits.

Finally, we used these insights to create future scenarios to illustrate the pros and cons of various bundles of measures and transition pathways. For example, locally adapted food supply, which would require consumption patterns adapted to local production, would need the targeted expansion of urban logistics structures for the storage and distribution of locally produced food. While urban food actors have only limited instruments at hand to directly

implement such measures, city governments are important economic actors which can support demand side changes, e.g. through public food procurement in schools, hospitals or public canteens.

I.2. Zusammenfassung für eine breitere Öffentlichkeit

Das Forschungsprojekt "The Future of Urban Food" dauerte von 2018 bis 2022. Das Hauptziel des Projekts war es, die Auswirkungen von Veränderungen im Wiener Ernährungssystem und in Konsummustern auf die Landwirtschaft im Hinterland zu untersuchen und damit einen gesellschaftlichen Diskurs über die zukünftige Entwicklung urbaner Ernährungssysteme anzustoßen. Der Fokus bei den veränderten Konsummustern lag auf einem reduzierten Fleischkonsum, erhöhtem Konsum von biologischen Lebensmitteln und erhöhtem Konsum von Lebensmitteln aus regionaler Produktion.

Das Projekt war interdisziplinär angelegt (Soziale Ökologie, Agrarökonomie und Soziologie) in enger Verbindung mit einem Beirat bestehend aus Akteur*innen des Lebensmittelsystems, u.a. mit Vertreter*innen von Stadtverwaltung, NGOs und Privatwirtschaft. Dieser Ansatz ermöglichte es, ein tieferes, multiperspektivisches Verständnis der Struktur und Dynamik des Wiener Ernährungssystems und der mit einer Veränderung in Richtung nachhaltiger Konsummustern verbundenen Herausforderungen zu gewinnen.

Zunächst haben wir die Struktur und die wichtigsten Merkmale des Ernährungssystems durch eine Literaturanalyse und Interviews mit Expert*innen ermittelt und ein Systemmodell erstellt. Wir identifizierten vielversprechende Ansatzpunkte für einen Wandel in Richtung Nachhaltigkeit. Einige dieser Merkmale waren vorhersehbar und gut erforscht während andere kontextspezifisch waren und bisher noch weniger Beachtung fanden. So untersuchten wir die sich ändernden Rahmenbedingungen für drei Wiener Lebensmittelinitiativen: eine Insektenfarm, ein Zero-Waste-Supermarkt und eine Solidarische Landwirtschaft.

In weiterer Folge analysierten wir, wie sich Veränderungen in den Ernährungspräferenzen auf Flächenverbrauch und Treibhausgasemissionen des Wiener Ernährungssystems auswirken würden. Die Modellrechnungen zeigen, dass eine Reduktion des Konsums von tierischen Lebensmittel das größte Potential hat, den Ressourcenverbrauch und die Treibhausgasemissionen zu reduzieren. Allerdings findet diese Option unter Wiener Konsument*innen und Landwirt*innen laut unseren Umfrageergebnissen am wenigsten Zuspruch. Eine Regionalisierung der Lebensmittelversorgung, die von politischen Entscheidungsträgern und Lebensmittelhändler propagiert wird und laut durchgeführten Befragungen bei Konsument*innen und Landwirt*innen großen Zuspruch findet, hat dagegen nur mäßiges Potential die Treibhausgasemissionen zu reduzieren. Eine Erhöhung des Konsums biologischer Lebensmittel, die ebenfalls propagiert wird, aber bei Konsument*innen mäßig beliebt ist, erzielt vor allem in Kombination mit einer Reduktion des Konsums tierischer Lebensmittel sehr positive Effekte. Damit könnte eine Ausweitung des Flächenbedarfs vermieden werden und gleichzeitig könnten die weitreichenden ökologischen Vorteile der ökologischen Landwirtschaft realisiert werden.

Die Erkenntnisse aus diesen Untersuchungen sind in die Entwicklung von Zukunftsszenarien geflossen, die die Vor- und Nachteile verschiedener Maßnahmenbündel und Transformationspfade aufzeigen. Eine stärker regionalisierte Lebensmittelversorgung, in der die Konsummuster an die Produktionsbedingungen im regionalen Hinterland angepasst sind, würde u.a. den gezielten Ausbau städtischer Logistikstrukturen für die Lagerung und Verteilung regionaler Lebensmittel erfordern. Während die städtischen Entscheidungsträger begrenzt über Instrumente verfügen, um solche Maßnahmen direkt umzusetzen, sind die Möglichkeiten der Stadtverwaltung größer, z.B. indem sie Nachfrageveränderungen unterstützen können.

Part II: Scientific report

II.1. Ex-post scientific abstract

This project applies an inter- and transdisciplinary approach to investigate options for a more sustainable urban food system in Vienna. We aimed to unpack the synergies and trade-offs of changes in three aspects of food consumption (reduced meat consumption and increased consumption of organic and regional food) through a scenario process that integrates results from multiple disciplines and the perspectives of different food actors. This combination of approaches enabled us to create a deeper understanding of the structure and dynamics of Vienna's urban food system and to untangle the complexities of sustainable food systems. The development of scenarios allowed us to deal with the trade-offs of different consumption patterns by creating diverse futures that illustrate the pros and cons of various decisions. Our results indicate that demand side strategies targeting food consumption patterns are essential to effectively reduce GHG emissions from urban food systems and save resources.

II.2. Scientific challenges and development of the research project

The five aims defined in the research proposal of this project could be met:

1) Creation of a deeper understanding of Vienna's urban food system (VUFS) by identifying its main structures and driving factors, biophysical foundations, its agronomic conditions and consequences for food costs.
2) Identification of main ecological and economic impacts and the societal acceptance of different urban food habits in the wider VUFS, by modelling biophysical flows, farm economics and assessing the societal acceptance of changes.
3) Analysis of past transitions and the current situation of VUFS to identify and critically assess the potential for change.
4) Demonstrate room for manoeuvre for the future development of VUFS by the development of concrete transition pathways and connected policy recommendations.
5) Foster the societal discourse and social learning about the complex relationships between agriculture, ecology and food habits in the city through engagement of stakeholders and sounding out the viability of a Viennese food policy council (VFPC).

However, we had to adapt the project phases (figure 1) to different challenges as well as to the new circumstances imposed by the Covid-19 restrictions in the last two years.

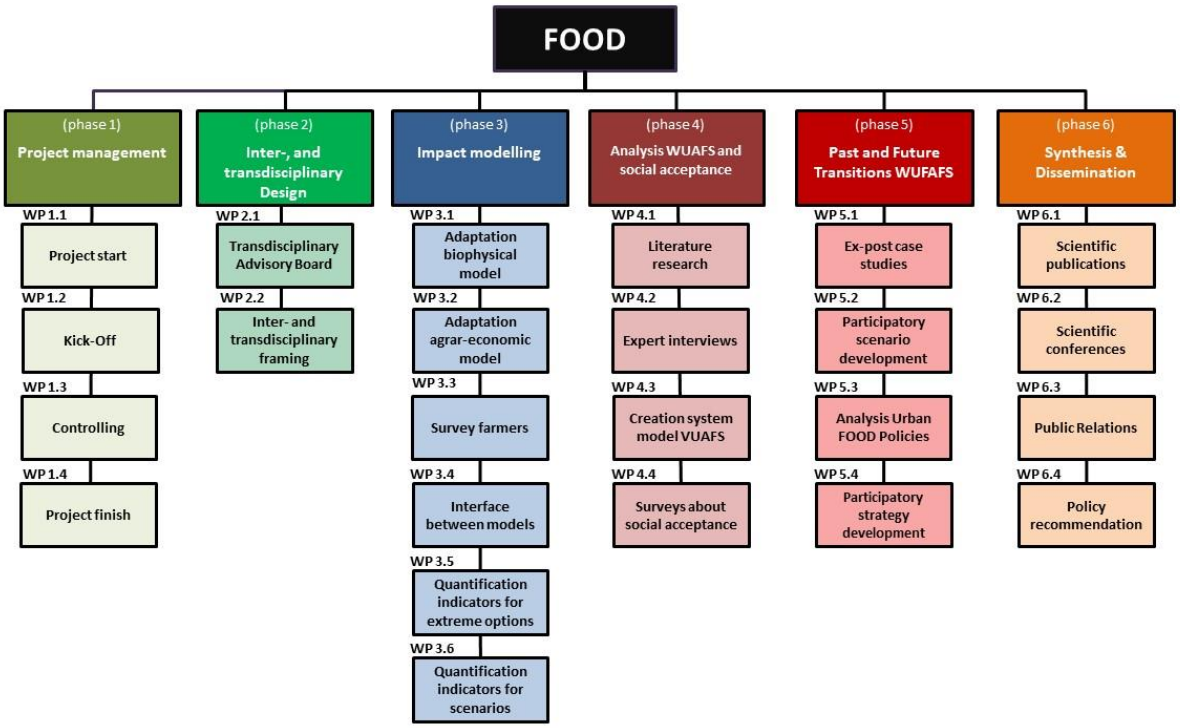

Figure 1 Project structure with its phases and individual work packages.

The transdisciplinary design of the project (**phase 2**, figure 1) was especially impaired by Covid-19. We were forced to change the format of the interactions with the advisory board to online meetings. Although the online format limited our tools to organize participatory activities, it allowed for a high participation rate of the members of the advisory board.

The transdisciplinary as well as interdisciplinary design of the project also posed challenges beyond the pandemic. The participatory scenario and strategy development (**phase 5**) was initially planned in close collaboration with representatives of the city of Vienna and the VFPC. A series of externally moderated workshops, involving VUFS stakeholders, was intended. Finally, the city of Vienna opted for a less participatory approach for developing a food strategy. For this reason, we decided to change the transdisciplinary process we had planned for the development of future scenarios and transition pathways (**aim 2**, **phase 5**, figure 1). Instead of developing the scenarios with a broader participation of stakeholders from VUFS, we developed them in an interdisciplinary process within the research team. To include stakeholder viewpoints in the process, we organized an online workshop with the advisory board to get feedback on the scenarios and conduct a consistency and robustness check with them. The transition pathways (i.e., recommendations for action, implementation approaches) were also developed by the project team, yet to integrate different perspectives, we used all collected data from the project.

Communication also proved to be challenging at times due to the differences among the involved disciplines (i.e., concepts, methods) and between the research team and the advisory board (i.e., vocabulary, complexity). We tried to overcome this barrier by creating spaces for exchange and finding a common language throughout the project. Furthermore, there were different expectations from the project and the collaborations. Although not all could be met,

we identified them at the beginning of the project and tried to tackle the different needs. Finally, it has also been challenging to combine the different disciplines to really work together instead of next to each other. From the beginning, the two teams working on social aspects and the two focusing on the modelling worked closely together in a process of ongoing communication. The interactions between these two groups, however, were limited to punctual meetings and the Covid-19 situation further complicated the interdisciplinary communication process. Through the implementation of a scenario process we were able to bring together heterogeneous knowledge, ideas, and data from the different disciplines. Furthermore, the research groups collaborated in lectures and workshops which also supported finding a common language and the integration of their results and approaches.

At the end, if not quite in the way as initially intended, we were able to complete **aims 4 and 5** through an inter- and transdisciplinary approach. It is also important to mention that the establishment of a VFPC was already in motion by the time this project started. Thus, the last part of **aim 5** was not relevant anymore. We did, however, work closely with the VFPC during the whole project and fostered the societal discourse and social learning by participating in different activities, by closely collaborating with the different stakeholders, by presenting at conferences and by giving lectures and workshops in different settings (**aim 5**, **phase 6**).

For **phase 3**, we investigated farm adaptations in the metropolitan region of Vienna in response to the assumed changes in consumption patterns. The challenge in this process was to transfer the behavioural intentions articulated in the survey to adaptation paths of farmers that can be used for modelling production systems and their output of food products. For this purpose, responses of the survey were analysed with a customized and flexible algorithm to derive farm type specific preferential weights for adaptation decisions. This allowed to better account for transformative adaptations in the decision-making process and to determine practical adaptations paths for the agro-economic model. Overcoming this challenge helped to deal with larger amounts of data and also eased a comparison between supply and demand of food within the 100km region around Vienna at an aggregated level of food categories.

We also encountered challenges in the development, advancement and coupling of the biophysical (FoodClim) and the agro-economic models, which took more resources than initially planned due to inconsistencies of applied models and problems with the collection and harmonization of required input data for the models. We encountered these challenges in an iterative process of aligning and fine tuning the models. Despite these challenges, **aim 2** was also satisfactory completed.

Phase 4 was also completed without major challenges (**aims 1 and 3**). Conducting a representative survey with Viennese consumers proved challenging due to the large number of respondents needed. To address this issue, we collaborated with a master student from the Vienna University of Economics and Business who was able to get a grant for his master thesis that covered the expenses of distributing the survey through the panel provider Respondi. Furthermore, the length of the survey made it necessary to divide it in three parts, one per each consumption pattern, and send out three surveys. Although the sample had to be divided, we could collect data about each consumption pattern in more detail and still have some

representative data with a larger sample for general questions. This approach allowed assessing the societal acceptance of changes (**aim 2**).

Finally, during **phase 4**, a new research objective was developed based on the first experiences with stakeholders through interviews, focus groups and workshops. The analysis of VUFS highlighted the relevance of participation and power dynamics. Thus, two doctoral students from the project decided to include the concept of food democracy as an aim of their work and theses. This new research aim was then incorporated to the transition pathways and policy recommendations (**aim 4**) and further developed in two articles.

II.3. Most significant results of the research project

This inter- and transdisciplinary project combined and integrated different approaches and methods that enabled us to create a deeper understanding of the structure and dynamics of VUFS. By combining different disciplines and actors' perspectives this innovative approach has revealed that the popularity and the biophysical effectiveness of the analysed consumption patterns are diametrically opposed. To the best of our knowledge, this has not yet been shown so specifically for a specific case in an empirical study and is the result of this kind of knowledge generation and integration.

Understanding VUFS from a multi-actor and multi-level perspective

At the beginning of the project, a conceptual model was created to analyse VUFS based on literature and further refined by different actors using a soft-systems approach (figure 2). This approach allowed us to learn about a situation in the real-world context of Vienna, make models of relevant activities and use these models to initiate a debate on the Viennese contemporary phenomena to improve the definition of the problem situation[1].

[1] López Cifuentes, M., Freyer, B., Sonnino, R., Fiala, V. (2021): Embedding sustainable diets into urban food strategies: A Conceptual Model. Geoforum, 122, 11-21

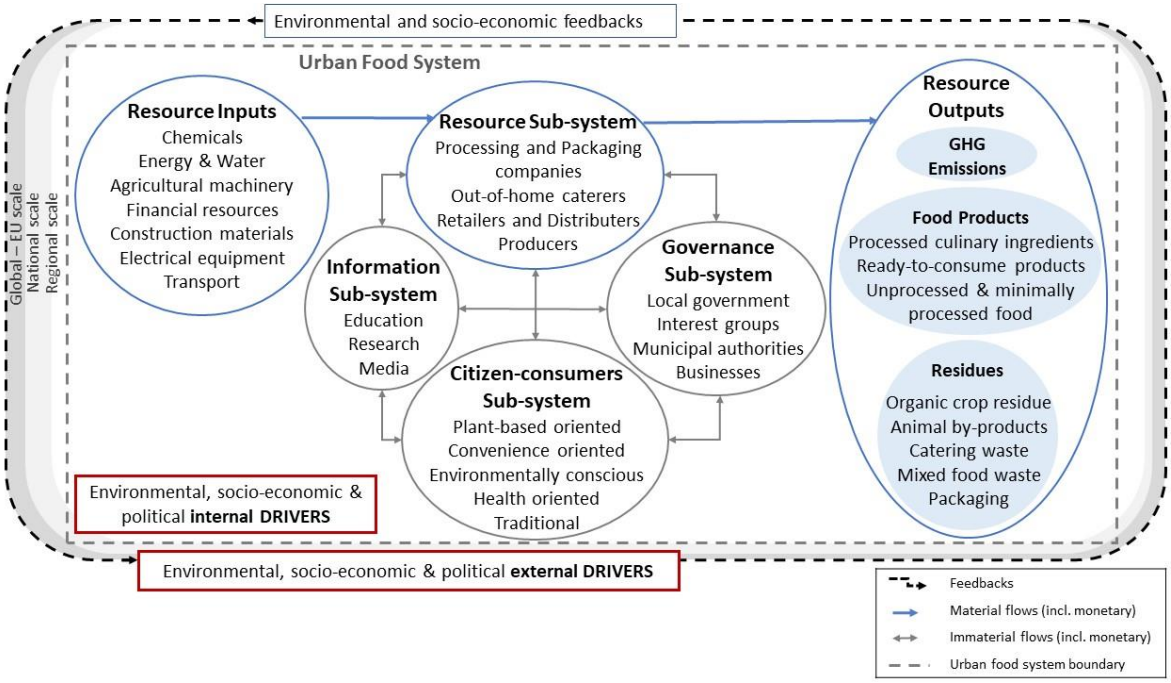

Figure 2 Urban Food System conceptual model. Source: own based on empirical findings and literature

At the heart of the conceptual model is VUFS, which includes four interrelated sub-systems and their relations. VUFS is represented as cutting across different geographical scales, each of which has environmental, socio-economic, and political drivers (figure 2). Based on empirical research, we identified different drivers of change for VUFS that may enable change towards sustainability – some predictable and widely researched drivers like consumption practices but also more context-specific and underexplored ones like the density of retailers, food markets or food governance dynamics.

The model developed through the multi-actor approach provided an important support in uncovering key geographical features and cultural dimension of an urban food system. It is an innovative approach that integrates the perspectives of a manifold of actors to link abstract conceptualizations of global food systems with the processes and relationships at the micro-scale.

Furthermore, we also took a multi-level perspective on food system actors to understand better the development of actors on the niche level (i.e., "protected spaces", where radical innovations with the potential capacity to change the regime emerge) and the regime level (i.e., conventional food sector and its associated mainstream rules and practices), as well as their potential contributions and barriers towards a sustainable and democratic VUFS.

An exemplary qualitative study on food niches with sustainability-oriented innovations (a zero-waste supermarket, an edible insect company, and a community-supported agriculture) in VUFS resulted in the identification of spatial-relational proximities and pathways of food niches towards sustainability transitions of urban food systems. Findings highlight the potential of diverse small-scale niches experimenting with (more or less radical) innovations and

interacting in new formats of democratic food governance[2]. The introduction of spatial-relational proximity dimensions to sustainable change processes in urban food systems enabled us to add a new perspective to the sustainability transition literature. Results highlight the importance of relational proximity and thus on increased trust, collaboration, and knowledge and value sharing within and across organizations in the food system.

Finally, qualitative interviews with niche and regime actors served as a basis to analyse the contributions to and barriers for food democracy. Findings demonstrate that food actors at the niche and, to some extent, at the regime level may contribute to a process of on-going changes that fosters a transformation of established structures within the food system. Yet this transformation is still limited by the embeddedness of VUFS in wider socio-economic and political systems[3].

The land requirements and the GHG footprint of VUFS in perspective

For the comparative assessment of the most important demand-side strategies to reduce land requirements and GHG emissions associated with food consumption we have developed a novel mass-balanced accounting model (FoodClim) that uses a systems (rather than an LCA based) approach to quantify biomass flows in the food system, land requirements at three spatial scales and the GHG emissions linked to different production, processing and transport steps.

Applying the FoodClim model we find that VUFS is currently drawing on 639,000 ha of agricultural land to provide food for its 1.9 million inhabitants, which represents an area 15 times of the city itself and two orders of magnitude larger than the agricultural land still available within city limits. From another angle, Vienna's land footprint of 0.35 ha/cap is only slightly larger than the agricultural land available per capita in Austria (0.32 ha/cap) and amounts to only two thirds of the agricultural land available per capita in the immediate regional hinterland (within a radius 100 km in Austria). While these relations seem favourable, we estimate that only 8% of Vienna's land footprint is currently located in the regional hinterland and 24% in the rest of Austria.

[2] Gugerell, C., & Penker, M. (2020): Change Agents' Perspective on Spatial-Relational Proximities and Urban Food Niches. Sustainability, 12(6), 2333.
[3] López Cifuentes, M., Gugerell, C. (2021): Food Democracy: Possibilities under the frame of the current food system. Agriculture and Human Values 2021, 38, 1061–1078.

VUFS causes GHG emissions amounting to 2.22 Mt of CO_2e/yr., with roughly 60% from agricultural production (incl. aquaculture and fisheries) and the remainder from processing and transport. Most of the agricultural emissions do not stem from the use of fossil fuels but from soil management and enteric fermentation. They can, thus, not be mitigated by a substitution of carbon-free energy for fossil fuels but require other strategies including demand-side changes. Overall the GHG emissions from VUFS are substantial and correspond to 12% of Austria's total territorial GHG emissions in 2015, excluding emissions from land conversion.

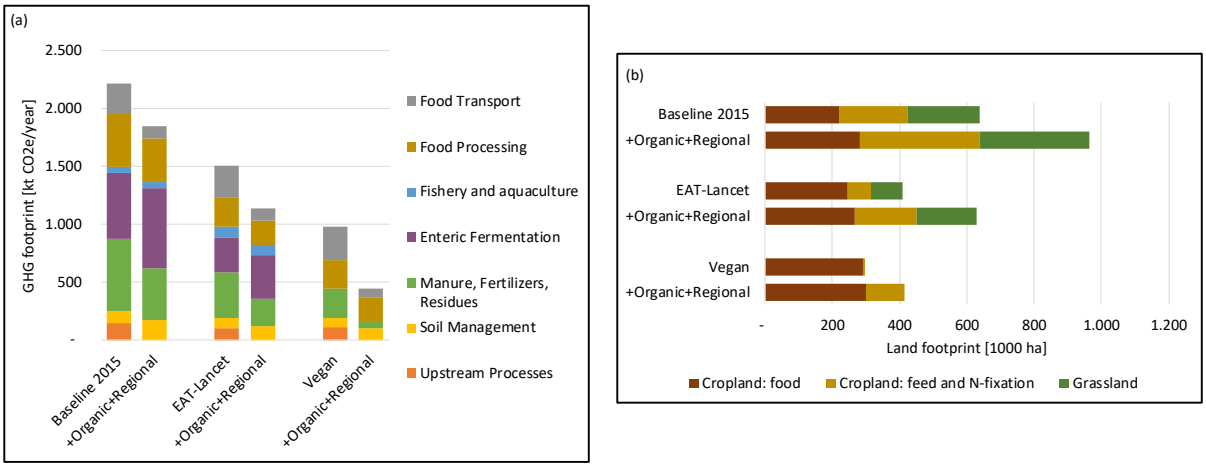

Figure 3 Greenhouse gas (GHG) emissions (3a) and land footprint (3b) related to food consumption in Vienna for the situation in 2015 (Baseline) and selected scenarios combining different diets low in animal products, regionalization and preference for organic products. Note: The effect of carbon sequestration in organic cropland soils (SOC effect) is not shown.

Figure 3 shows selected results from the scenario calculations[4]. We find that combined with a reduction of avoidable food wastes by 50% and a regionalization of the food system but without a change in diet (Baseline+OrganicLSE+Vienna Region), GHG emissions under organic agriculture could be reduced by 17% (-28% including carbon sequestration in organic cropland soils). The land footprint, however, would increase by 51%, mainly due to less efficient feed conversion rates and lower crop yields in organic agriculture. Combining organic agriculture with a diet low in animal products (EAT-Lancet) and a regionalized food supply, however, would roughly half GHG emissions from the food system (-49% or -56% including SOC effects) without increasing the land footprint (-2%). This indicates that it is possible to switch to organic agriculture with lower yields and higher animal welfare standards and still considerably cut emissions while reducing the land footprint of agriculture. The Vegan variant of this scenario family would even reduce emissions by approx. 80% compared to the Baseline and would set about one third (-35%) of the agricultural land (mainly grassland) free for other purposes.

To our knowledge, this is the first systemic environmental impact modelling exercise investigating an urban food system and using two complementing footprint indicators. With FoodClim we have developed a flexible tool, which allows capturing the global heterogeneity of agricultural production practices and the involved value chains in a systematic and

[4] Lauk, C., Kaufman, L., Theurl, M.C., Wittmann, F., Eder, M., Hörtenhuber, S., Freyer, B., Krausmann, F., 2022. Demand side options to reduce greenhouse gas emissions and the land footprint of urban food systems: A scenario analysis for the City of Vienna. Submitted to Journal of Cleaner Production

consistent way as well as the interrelations between the different measures to reduce environmental impacts of food consumption.

Preferences towards changes in food consumption patterns

Actors along Vienna's food value chain show a strong preference towards a higher regional food consumption. Not surprisingly, this is the most attractive dimension of food system change for farmers in the region and also most preferred by consumers. Farmers can best cope with increased demand for regional food, as farm adaptations in this case would be incremental rather than transformative – i.e., production systems would mostly need minor adaptations. From a consumers' perspective, the majority of respondents consider the consumption of regional food as beneficial for the environment (80%), while between 40% and 50% seem not to be aware of the implications of organic food and meat production for the environment, respectively. The availability of regional food at the point of sale and visiting farmers' markets positive interrelate with the intention to mainly consume regional food.

Answers to the intention to consume mainly organic food do not show a specific preference. No more than 23% of respondents, who do not already consume mainly organic food, show a high intention to do so. This seems to be correlated to consumers' trust in labelling. Whether organic farm conversion is acceptable to farmers, considering higher gross margins but also higher workload, must be evaluated on a farm-by-farm basis, as farmers may face difficulties with skills and organizing the work load. In general, 43% of conventional farmers would convert to organic farming if the demand for organic food increased, with approximately half of the farmers in the region would produce organically (including farmers who already produce organically). This would affect production quantity and types of crops grown because conversion to organic farming results in lower yields and structural changes in crop rotations. Furthermore, imported nitrogen at farm level would decline by 37%, due to more balanced nitrogen flows, resulting in a decrease in the agricultural reliance on external nitrogen inputs. Such a decline would also be in line with the farm to fork strategy of the EU and would be accompanied by falling demand for external nitrogen in the agricultural inputs sector.

Finally, a reduction of meat consumption is the least popular adaptation among consumers. While half of respondents agree on the relevance of reducing meat consumption for the environment, there is also a considerable share (17%) who completely disagree. Cultural values, gender and the perceived lower price of meat compared to its alternatives are factors that seem to affect consumers' attitude towards a reduction in meat consumption. On the agricultural side, reduced meat consumption is an impediment for livestock farmers to continue their operational focus without adaptation. According to farmers' intended adaptations, meat production in the region would decline by 26% if meat demand declines.

Knowledge integration through a scenario process

The application of a scenario process enabled the integration of the project's various types of results in a meaningful way. The scenario process served as a helpful planning tool for exploring the urban scope for action in the context of agricultural and food issues in Vienna. The idea of the scenarios was to develop combinations of extreme but still plausible expressions of VUFS characteristics and drivers of change. It brought together different

sectors, involved different disciplines and stakeholders, heterogeneous knowledge, qualitative and quantitative data, and also very different ideas about the future of VUFS[5]. Scenario A gives priority to organic products and promotes transparency in food systems and education of consumers. In contrast, in scenario B, civil society plays a crucial role in decision-making and supporting disadvantaged groups. There is a focus on the regionalization and diversification of VUFS. Finally, scenario C focuses on technological solutions to improve the ecological and economic performance of food systems based on the current Austrian diet.

Based on the findings of the project, we developed different transition pathways for the three scenarios. For example, according to scenarios A and C, local food production could only play a minor role in the future Vienna. These two scenarios confront urban governance with the challenge of how the agricultural areas that become available can be preserved as, e.g. recreational areas or carbon sinks despite settlement pressure. In addition, measures to secure the food supply would probably be needed – e.g. diversification of supply regions. In contrast, scenario B assumes a possible expansion of food production and processing activities. In terms of planning, the aim here is to expand priority areas for agricultural production and to gain additional areas for micro-gardening, but also to secure areas for food processing and markets. In addition, more attractive framework conditions would be needed for all those who might be interested in a profession in the food supply sector in the future, or social measures to support disadvantaged groups in the face of rising food prices.

Further activities and career developments

This project contributed to the profiling of two post docs (Christian Lauk and Michaela Theurl) and to four dissertations – two already completed (Christina Gugerell and Marta López Cifuentes) and another two still in progress (Fritz Wittmann and Lisa Kaufmann).

In the near future we plan to submit another article about the research process and knowledge integration in this project to the Journal GAIA and further publications to field specific journals. The results from the project will be presented in future lectures and conferences. The FoodClim model developed in this project can be used in future projects to assess food and also bio-economy scenarios for Vienna and also for Austria and it can be adapted to be applied for other European cities or regions. A cooperation for a comparative study with colleagues from Instituto de Ciências, Tecnologias e Agroambiente da Universidade do Porto is planned.

II.4. (Potential) impact on and benefits for society

The results and scenarios developed and the exchange across disciplinary and sectoral boundaries have already been used to inform the first Vienna Food Strategy, which representatives of the City of Vienna and the VFPC are currently discussing with numerous stakeholders. They are using these inputs to support their aims and measures with scientific data in order to produce a more robust and science-based food strategy. In addition to a common vision and very concrete and time-bound measures, this strategy also contains indicators for monitoring the achievement of objectives. The collaboration with the VFPC

[5] Gugerell, C., López Cifuentes, M., and Penker, M. (2021): Wie isst Wien in Zukunft? Erfahrungen aus einem Szenarioprozess. Vereinigung für Stadt-, Regional- und Landesplanung e.V. Berlin, Germany.

continues beyond the project, as synergies for future projects and collaborations have been built and two researchers became members of it. The future will show to what extent this food strategy can activate urban actors for the realization of the vision of sustainable food in Vienna.

The systems approach of this project challenges silo-based thinking and established ways of working that often lead food policy-makers to address single-issue problems – which neglects the complexity of food systems. The conceptual model for urban food systems and the analysis of the drivers of change aimed to uncover this complexity through a multi-actor approach. The methodology followed in this first part of the project facilitates the integration of local actors' perspectives in understanding UFSs. It, therefore, may be used to adapt the suggested model for other local food systems to identify place-based peculiarities, dynamics, and drivers of change.