Roadmaps to Foster Urban Food System Transitions: Multi-level Implementations in Nilüfer, Turkey

1 Assoc. Prof. Dr. Emel KARAKAYA AYALP, İzmir Democracy University, Department of City and Regional Planning, 0000-0001-9469-9657, emellkarakaya@gmail.com
2 Mehmet Can YILMAZ, Nilüfer Municipality, Healthy Cities Project Office, 0000-0002-6845-0994, mehmetcanyilmaz@nilüfer.bel.tr
3 Assist. Prof. Dr. Feral GEÇER SARGIN, İzmir Democracy University, Department of City and Regional Planning, 0000-0002-6701-3522, feralgecer@gmail.com
4 Baha KUBAN, PhD., Demir Energy, 0000-0001-6515-4359, bkuban@demirenerji.com
5 Gonca AKGÜL MAHREBEL, PhD Candidate, Demir Energy, 0000-0002-4728-4480, gakgul@demirenerji.com

*Correspondence: emellkarakaya@gmail.com; Tel.: (+902322601001)

(First received March 01, 2022 and in final form June 02, 2022)

Reference: Karakaya Ayalp, E., Yılmaz, M. C., Geçer Sargın, F., Kuban, B., & Akgül Mahrebel, G. Roadmaps to Foster Urban Food System Transitions: Multi-level Implementations in Nilüfer, Turkey. The European Journal of Research and Development, 2(2), 400–410.

Abstract
The ongoing crisis has shown that incumbent food system has been facing challenges. For a resilient and sustainable food system, transitions which shift towards sustainability, attention to public health and wellbeing as well as inclusiveness is compulsory. To overcome these challenges, driving a stepwise policy transformation, responsive and adaptive policy mixes and addressing citizens to drive sustainability are pivotal. This article represents two roadmaps which are designated for Nilüfer, Bursa. The roadmaps aim at including policy headlines/priorities as well as local needs and plural variations of collectivity to ensure a sustainable food system transition. The roadmaps are composed of two scalar levels one of which is macro-level; Nilüfer Food Policy Roadmap while the other is micro-level; Nilüfer Living Lab Roadmap.

Keywords: Urban Food System Transitions, Roadmaps for Food System Transitions, Technology Road Mapping (TRM), Urban Food Planning, Sustainable Urban Food System, Nilüfer

1. Introduction
The ongoing crisis has shown that the incumbent food system has been facing challenges such as climate change, ecological destruction, problems of nutrition and public health, biodiversity loss, soil degradation, hyper-urbanisation and de-ruralization recognised as
key components of resilient and sustainable development, food from nowhere, food safety, food security and food sovereignty, food waste and food poverty [11, 14]. These problems and challenges also contribute to lack of consumer trust for the food consumed and has caused civil society, local governments, and citizens to seek ways to achieve a more sustainable urban food system. For a resilient and sustainable food system, a food system transition which shift towards sustainability, increased attention to public health and wellbeing as well as inclusiveness is compulsory. The COVID-19 pandemic has also shed light on the ongoing crisis which has been triggered by human activities of which a noteworthy part is related to the agro-food system.

Although food and agriculture sector are mostly seen as a rural phenomenon, the demand for food and agricultural products are urban. Nowadays, 79% of all food produced is destined for consumption in cities and 90% of citizens in urban slums are food insecure [5]. Demand for food is expected to increase between 59 to 98 % by 2050 [6]. The global population is expected to grow to 10 billion by the year 2050. The expectations for population living in urban areas show an increase up to 60% by 2030 and 68% by 2050 [13]. In this respect, feeding the rapidly growing cities and their peri-urban interface in a sustainable manner is a key challenge and is dependent on the ability of our food systems to transform to a more resilient and adaptive mode. Rural linkages are also the key point that a city region approach to integrate urban, peri urban and rural with all processes of food production, processing, packaging, procurement, consumption, and waste are required. Many transnational organizations, supranational organizations and international organizations offer programmes to develop solutions for a more sustainable city-region food system.

To overcome these challenges, as recommended by European Council (EC) FOOD 2030 strategy and Farm to Fork Strategy, driving a stepwise policy for transformation, responsive and adaptive policy mixes and addressing citizens to drive sustainability are pivotal. This article represents a roadmap model which is designated for Nilüfer district of Bursa city in Turkey as a part of a H2020 project. The roadmaps aim at including recommended policy headlines by EC as well as including local needs, requirements, and plural variations of collectivity to ensure sustainable food system transitions. To do so, the roadmap is composed of two scalar level one of which is macro-level Nilüfer Food Policy Roadmap while the other is micro-level Nilüfer Living Lab Roadmap and are composed of five pillars which are governance, production, consumption, distribution, and waste. In this article, we present the process, strategy for a participatory design of the roadmaps as well as some participatory results from Nilüfer. Communicative methods are used during the roadmap formulation process and the final products, that is roadmaps, are developing ways for a multi-actor approach.

1.1. The Background: FUSILLI Project and Nilüfer’s Agro- Food System Transitions
The roadmaps, in which we focus on in this article, are designed and prepared as a task in the scope of FUSILLI (Fostering Urban Food System Transformation through Innovative Living Labs) Project which is funded by European Council Horizon 2020 program.

FUSILLI puts together 12 European cities to address the challenges of the food system transformation. The main objective of the project is to empower cities to create innovation ecosystems that strengthen their capacities to develop and deploy integrated and holistic policies and actions. As an urban food planning project, FUSILLI intends to reach a transition towards healthy, sustainable, secure, inclusive, equitable and cost-efficient city region food systems, through urban food policies. The local specificities and strengthening urban-rural linkages in line with FOOD 2030 priorities, making use of urban living labs.
Figure 2 FUSILLI Cities’ actions in five pillars. Actions to be implemented in each city (Green already experienced, Yellow on course and Grey foreseen to be implemented during FUSILLI, (Source: FUSILLI, 2021)
There are five groups of actions to be implemented in the project as follows (see figure 2);

1. Governance Innovative Actions (GIA): 
2. Production and Processing Innovative Actions (PIA)
3. Distribution Innovation Actions (DIA)
4. Consumer Innovative Actions (CIA)
5. Food Waste Innovative Actions (WIA)

The macro- level Nilüfer Food Policy Roadmap is a part of GIA, while the micro- level Nilüfer Living Lab Road Map is linked to all actions as a coordination unit, testbed, and niche provider.

2. Materials and Methods

The technology road mapping (TRM) is identified as a flexible planning and assessment tool to support strategic settings, which Berner et al. [1] propose to utilize for developing strategic and long-term planning in organizational settings in which both small scale enterprises, large-scale government policy projects and all initiative projects included. Departing from TRM methodology, we designed the method of Nilüfer’s road mapping in this manner.

We based our methodologic approach on technology road mapping (TRM). TRM is a flexible planning and assessment method that has been used to support strategic and long-term planning in organizational settings reaching from small-scale enterprises to large-scale government policy projects.

The material of this article is twofold. The designation of roadmaps depend primarily on the FUSILLI projects deliverables. On the other hand, roadmap formulation is unique in each of the cities, so, Nilüfer’s roadmaps are designed in a participatory way the researchers of this study are also a part of. Therefore, the process itself offers quantitative data which has tacit knowledge and in-depth information.

Consequently, the method for roadmap preparation process depends on the methodology designated in the scope of FUSILLI project. The data used for the evaluation primarily depends on qualitative data gathered during roadmap formulation. The specific methodologies used in FUSILLI Project are;

- Food 2030 Living Labs: the framework for open and responsible innovation, intrinsically participatory and established to define and put in practice experimental governance to adopt innovative solutions and make cities the agents of food system transformation.
- Knowledge Community: method by which to do organizational or process innovation, suitable to introduce change in the food system identifying, creating, representing, and distributing data, information, and knowledge in and via a community of cities and stakeholders.
- Policies and actions planning
- Policies and actions implementation and validation
- Upscaling and replication strategy
- Participatory processes

The macro-level roadmap formulation is based on this framework. The micro-level roadmap formulation for Nilüfer Living Lab consists of:

1. Establishment of the citizen engagement strategy at local level, ensuring strong participation of producers, consumers, civic associations, and any other relevant social collectives
2. Roadmap development for Food 2030 Living Lab activities mainly focused on stakeholders and citizens participation by means of workshops, information events, surveys, etc.
3. Identification of suitable scenarios for piloting innovative policies and actions and the procedure for impact assessment of potential actions early deployed
4. Creation of the European network of Food 2030 Living Labs and coordination with other similar networks already existing or created in the framework of similar projects.

3. The Roadmaps of Nilüfer: Process, Progress and Participation

This part represents two roadmaps prepared for macro-level and micro-level urban food system actions with which aim at a transition for sustainability in Nilüfer’s urban food system. The macro-level Food Policy Roadmap formulation primarily depends on a set of analysis, vision and strategies building, establishment of new organs for urban food system governance and creating higher scale policy. In this four-step process, each process change is publicized for open discussion of all local stakeholders with an emphasis on citizens.

As it is seen in figure 3, the first step aims at understanding the current situation. Starting with a SWOT analysis which documents strengths, weaknesses, opportunities, and threats for current situation of Nilüfer’s agro-food system. The analysis is developed with
in-depth information gathering through focus group meetings in which a variety of stakeholders are included (see figure 6). Further, this step has a critical attribute both for being a niche for local governments in Turkey and for the stepwise FUSILLI actions. Establishment of the Food Council within the Citizens’ Council has the importance for forming a new governance model, a novel sub-council as a consultative organ for the Municipality and has the function for supporting participatory processes. Similarly, the establishment of the Food Commission as another organ of City Council (Municipal Parliament in Turkey context), supports the niche triggered with the establishment of Food Council.

The general structure of Nilüfer Food Policy depends primarily on developing an action and receiving feedback from a variety of stakeholders. All phases of stakeholder participation also contribute to the next step. The food policy document preparation, which is the last step in the process, has a vital role for transitioning the urban food system and for the formulation of a participatory model.

According to Bilali [2], policies are crucial in sustainable food system transitions by shaping food practices and the system as well. The role of cities in sustainability transitions of agro-food systems is also vital [4] that pioneer cities lay down a path for other cities to follow [3]. There is growing evidence that cities provide protected spaces where niche experiments have been able to emerge for changing agro-food system [11]. In the perspective of city actors, the role of policymakers can play indirect roles by mobilizing their locality and incorporating them into developing visions to address sustainability transitions [15]. Also, Paddock [12] declares that policy makers are key actors to promote change towards sustainability transitions. Taking the Nilüfer urban food policy into consideration, it triggers sustainability transitions as a city-level policy innovation, lays down a path for Turkish city actors that are concerned with the urban agro-food system and creates a niche and a sheltered space in the context of its direct relation with Nilüfer Living Lab implementation. As it can be seen in figure 3, the roadmap process itself creates novel organs and mobilizes these organs in the same process for formulation of the food policy.

Innovation in the agro-food system and in agriculture requires the involvement of multi-actor approaches, multi-task programming and multi-scalar policy formulation [8]. To do so, the emergent literature gives evidence for the importance and evolving attention of living labs, for a sustainable agro-food system [10]. As a public sector agro-food living lab, Nilüfer Living Lab has a pre-determined actions and implementations programme which has been formulated within the application process to H2020 programme for FUSILLI Project. Within multi-scalar policy formulation, Nilüfer Living Lab plays different roles in different implementation programmes. It has functions for coordinating, driving participation, transitioning production, consumption, distribution,
and waste management. For such a multi-functional structure, the micro-level roadmap for Nilüfer Living Lab has a flexible structure although it has predetermined actions.

Figure 4 clearly shows that, there are action groups such as PIA1- School Food Gardens, which is not predetermined in terms of space, size, the model, etc. On the other hand, Nilüfer Living Lab actions are more actionized strategies for transitioning the urban food system. One of the greatest functions of the Living Lab is being spaces for direct participation, which brings together citizens and regime actors.

![Nilüfer micro level roadmap: Living Lab Roadmap](Source: Produced by the authors)

The timeline shows actions implemented in Nilüfer living lab (in green) as well actions which are expected to be implemented (in red). The percentages of progress can be seen in the figure 5 and figure 7 as well.

![Nilüfer Living Lab Timeline](Source: Produced by the authors)

As a key function and character of Nilüfer Living Lab, participatory approach and new ways of driving participation has been established with the aim to be inclusive. The
participatory model includes both regime actors and initiatives which have confrontational character, exist together in a horizontal organizational structure. It has character of a collaborative governance [9] includes civic food initiatives and alternative food networks at national scale [7].

![Figure 6 Participant Map for Nilüfer Living Lab Project (Source: Produced by the authors)](image1)

![Figure 7 Nilüfer Living Lab Progress in Actions in the first year of FUSILLI Project (Source: Produced by the authors)](image2)

4. Discussion and Conclusion

The paper has focused on the interim results and processes in one of the demo sites of the FUSILLI Project; Nilüfer in Bursa, Turkey, pertaining to the road mapping of policy processes at macro-level; Food Policy and micro-level; Food Living Lab.

A great diversity of approaches marks the FUSILLI cities policy processes and the Nilüfer case stands out through the centrality of local government ownership of the urban food
transition processes. The municipality had a head start with many activities by declaring 2021 as the year of food. Starting with the Mayor, all relevant decision makers prioritized food in their policy agenda, brought together the citizens and local food system actors with activities that foster food system transformation in the city.

The already existing consultatory and participative local governance approaches in Nilüfer, the existence of the widely accepted, trusted and active Citizens Council; as a consultative organ of the local government, that came into being as an extension of Agenda 21 strategies, and its critical role in the bringing together local stakeholders of the urban food transition. Identified stakeholders, action by action, consist of people already involved in many participatory processes of the Municipality that facilitates stakeholder engagement strategies for the action implementation.

The strong supportive bonds that the local government has established with its rural hinterland (which is under constant pressure of an unplanned urban sprawl, pauperizing small farmers), attempting to stabilize farmer incomes and information gaps. Socio-economic development in rural neighborhoods and continuity of agricultural activities supports conservation of agricultural lands, rural identity, cultural landscape, and natural resources while generating a buffer zone for urban sprawl. It is crucial for enabling local food supply and establishing short supply chains which gain better understanding in shocks such as Covid-19 pandemics.

The numerous economic and social solidarity actions generated by the Project Living Lab actions in diverse categories that introduce trust and stability for more transformative Policy actions.

5. Acknowledgement

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 101000717.

References

[1] Berner, S., Derler, H., Rehorska, R., Pabst, S., Seebacher, U. (2019). Roadmapping to Enhance Local Food Supply: Case Study of a City-Region in Austria. *Sustainability, 11* (14).

[2] Bilali, H. (2019). Research on agro-food sustainability transitions: a systematic review of research themes and an analysis of research gaps. *Journal of Cleaner Production*. 221, 353–364.

[3] Burch, S. (2017). The governance of transformative change: tracing the pathway of sustainability transition in Vancouver, Canada. In: Frantzeskaki, N., Broto, V.C., Coenen, L., Loorbach, D. (Eds.), *Urban Sustainability Transitions*, NY and London, pp. 50–64.
[4] Cohen, N., Ilieva, R., T. (2015). Transitioning the food system: a strategic practice management approach for cities. *Environmental Innovation and Societal Transitions, 17*, 199–217.

[5] FAO, IFAD, UNICEF, WFP and WHO. 2018. The State of Food Security and Nutrition in the World 2018. Building climate resilience for food security and nutrition. Rome, FAO. Licence: CC BY-NC-SA 3.0 IGO.

[6] FUSILLI (2021). Fostering Urban Food System Transformation Through Innovative Living Labs Project. Horizon 2020 Programme, grant agreement No 101000717. Available at [https://fusilli-project.eu/](https://fusilli-project.eu/)

[7] Karakaya Ayalp, E. (2021) Alternatif Gıda Ağları ve Türkiye'de Yurttaş Temelli Gıda İnisiyatifi, İdealkent, 12(33), 965-1005. [https://doi.org/10.31198/idealkent.976618](https://doi.org/10.31198/idealkent.976618)

[8] Karakaya Ayalp, E. (2020). Tarımsal Gıda Sistemleri Dönüşüyor mu? İzmir'de Alternatif Tarımsal Gıda İnisiyatifi, *Toplum ve Bilim*, 153, 49-81. [https://iletisim.com.tr/dergiler/toplum-ve-bilim/3/sayi-153-2020-tarimda-guncel-sorunlar-tartismalar-ve-alternatifler/10050](https://iletisim.com.tr/dergiler/toplum-ve-bilim/3/sayi-153-2020-tarimda-guncel-sorunlar-tartismalar-ve-alternatifler/10050)

[9] Kurtsal, Y., Karakaya Ayalp, E., Viaggi, D. (2020). Exploring Governance Mechanisms, Collaborative Processes and Main Challenges in Short Food Supply Chains: the case of Turkey, *Bio-based and Applied Economics*, 9 (2), 201-221.

[10] McPhee, C., Bancerz, M., Mambrini-Doudet, M., Chrétien, F., Huyghe, C., Gracia-Garza, J. (2021). The defining characteristics of Agroecosystem Living Labs. *Sustainability, 13* (4).

[11] Özatağan, G., Karakaya Ayalp, E. (2021). Sustainable futures of agro-food? İzmir's sustainable agro-food transitions in the making, *Environmental Innovation and Societal Transitions, 40*, 283-295.

[12] Paddock, J. (2017). Household consumption and environmental change: Rethinking the policy problem through narratives of food practice. *Journal of Consumer Culture, 17* (1), 122-139.

[13] UN-DESA (2019). Highlights 2019-2020. Towards sustainable development for all. USA: New York. Available at [https://cdn.un.org/unyearbook/un2/desa/desa-highlights-report-2019-2020-final.pdf](https://cdn.un.org/unyearbook/un2/desa/desa-highlights-report-2019-2020-final.pdf)

[14] UN-FAO (2017). The future of food and agriculture. Trends and challenges. Italy: Rome. Available at [https://www.fao.org/3/i6583e/i6583e.pdf](https://www.fao.org/3/i6583e/i6583e.pdf)

[15] Wittmayer, J.M., van Steenbergen, F., Rok, A., Roorda, C. (2016). Governing sustainability: a dialogue between Local Agenda 21 and transition management. *Local Environment, 21* (8), 939–955.