01

Table of Contents

01 CREATIVE FOOD CYCLES AS DRIVER FOR URBAN RESILIENCE

17 **Circular Design for urban resilience**
Jörg Schröder

33 **Creative Food Cycles—Multiscalar challenges**
Manuel Gausa Navarro

47 **The role of food plans in the transition towards sustainable food systems in Italy**
Luca Lazzarini
Marco Mareggi

59 **Designing Food Cycles:**
Three pathways toward urban resilience
Sabrina Sposito

69 **Creative ecosystem services for new urban-rural communities: the VàZapp experience**
Maria Cerreta
Massimo Clemente
Gaia Daldanise
Giuliano Poli

83 **Socio-ecological connectivity for productive, circular and resilient territories**
Sara Favargiotti
Angelica Pianegonda
Alessandro Betta
Mattia Andreola
Francesca Forno
Marco Ciolli
Alessandro Gretter

97 From the global food system to the local dimension: the urban food strategies
Giorgia Tucci

107 Trueque based urbanism
Alissa Diesch

117 Approach for the analysis of self-cultivation as an expression of the resilient capacities of migrants in Barcelona during the twentieth century
Germán Guillén-Espallargas
Carles Llop i Torné

125 Food cycles and hydrogeological risk mitigation: the Kezersrande Natural Farm project
Mathilde Pitanti

02 CREATIVE FOOD CYCLES AS SOCIAL INNOVATION

137 **Food waste as a transitional key factor towards circular economy**
Silvia Pericu

149 **Be[e] the Creative Food of Social Innovation**
Raffaella Fagnoni

159 **Foodways: diasporic explorations at the age of (digital) discoveries**
Emanuele Sommariva

173 **Development of sustainable packaging based on agricultural residues and others**
Elizabeth Palomino Nolasco

185 **Remix El Barrio: a co-creation journey to foster innovative ecosystems crafting and micro-fabricating with food surplus and waste**
Anastasia Pistofidou
Marion Real
Milena Juarez Calvo

197 **The Uovo di Colombo Lab: designing against food waste**
Cristian Campagnaro
Raffaele Passaro
Barbara Stabellini

211 **Food Cycles: active engagement and new urban communities**
Federica Scaffidi

223 **Food Revolution. Services and Social Innovation as a reaction to lockdown**
Chiara Olivastri

235 Zitsa Wine Hub
Andreas Nikolovgenis

245 Design for Companion Species: developing collaborative multispecies Urban Environments
Chiara Farinea

253 German potatoe: analysis towards sustainability
Aldana Bouzas Mendoza

263 Designing at the service of rural territory
Daniela Cifuentes Avendaño
Iris Andrea Reyes Forero

273 Alimentar el barrio: farmers' market, a new opportunity to drive change
Giulia Damiani
Chiara Moretti

283 Eating with Type: designing a letterpress workshop based on typeful thinking approach for food education
Carlotta Belluzzi Mus
Alessio Caccamo
Andrea Venditti

291 Quarantined sobremesa
Gabriela Aquije Zegarra

301 Food design as a strategy for the global community
Ivo Caruso
Silvia Cosentino
Carlo Martino

03 CREATIVE FOOD CYCLES BASED ON DIGITAL TECHNOLOGIES

313 **Foodshift 2030: a citizen-driven transition of the European food system (EU Horizon Project)**
Kate Armstrong
Emily Whyman
Luke Schafer
Christian Bugge Henriksen
Dirk Wascher

323 **Cultivating social capital—resiliency against adversity**
Thiago Vasconcelos

335 **Food Reality Experience**
Kedy C. Cellamare

345 **Urban revolution at times of Creative Food Cycles**
Nicola Canessa

357 **Myco-scape**
Mohamed Elatab

367 **Strange is Better: an effort to biologically convert polystyrene into organic matter using mealworms**
Eve Nnaji
Madhavi Ojha

375 Pizza Toppings – Multiplayer Approach to Preparing a Pizza in Virtual Reality
Jan Philipp Drude
Victor Sardenberg

385 Waste-no-Taste: animated video recipes to prevent domestic food waste
Giulia Panadisi
Vincenzo Maselli

393 Rural studio farm
Elena Barthel

401 Platform Synthesis: the augmented domesticity
Melinda Bognar

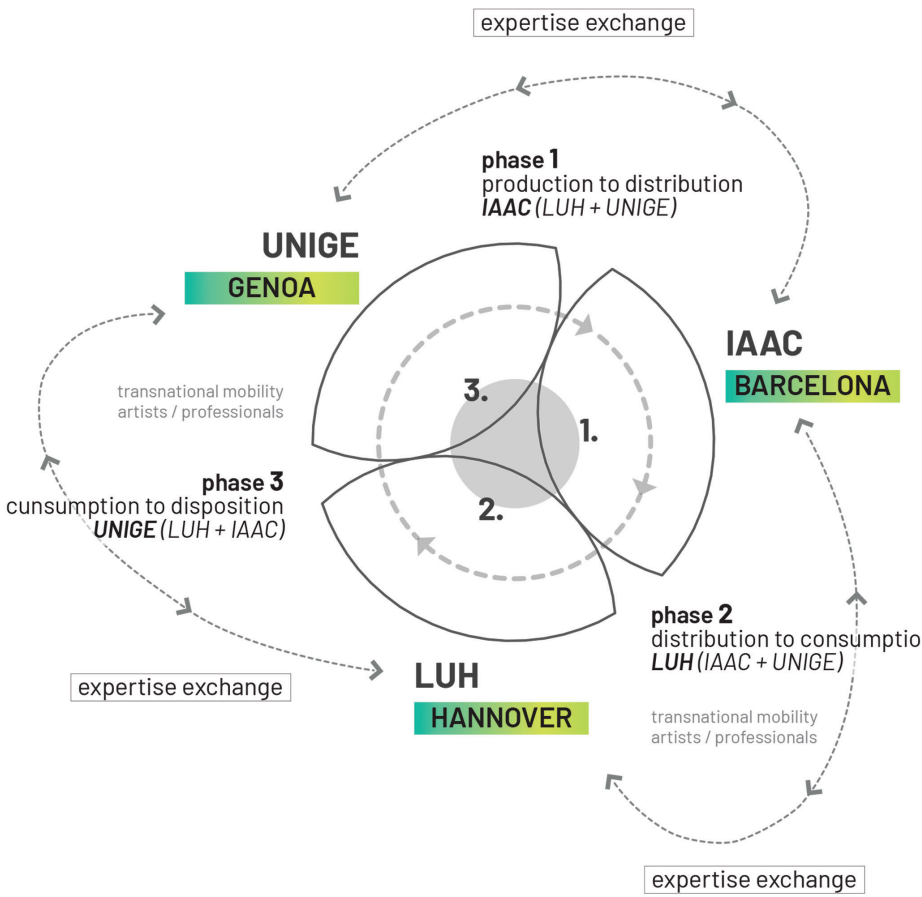


Figure 1. The Creative Food-Cycles Phases and partners: international exchanges. Image: LUH Regionales Bauen und Siedlungsplanung.

Introduction

by Jörg Schröder

Creative Food Cycles aims to enhance innovative and creative practices between food, architecture, and conviviality in a transnational and European perspective. Food systems as complex and rapidly changing constellations of economic activity, cultural exchange and social interaction influence Europe's long-term sustainability and living conditions. Resilient food cycles as part of the circular economy can be drivers for strategic change in urban development, urban qualities and cultural values. Creative Food Cycles works for new conviviality in the city as a creative factor for identities, innovation and social integration. The project develops a cultural and holistic approach that links all aspects of food cycles: from production to distribution (phase 1), from distribution to consumption (phase 2), and from consumption to utilization (phase 3). This open and inclusive approach will stimulate interactions between creative professionals, cultural operators, institutional actors and committed citizens with all those active in food cycles.

Creativity and culture are a major driving force in this current cultural and societal field. In the last years, the limits of sectorial policy programmes as well as sectorial academic reasearch have become quite obvious to address the topic of food cycles as a main field of change in Europe. Co-creation of change across food issues and values is as design- and creativity-related action that examines the increased attention for the space and place qualities, the regional scale and local product, their relationships among cultures and cultural experiences. It is placing food issues higher on both the political and urban agenda.

If green and local growth has become a major leitmotiv of contemporary society in terms of nutritional and health issues, with Creative Food Cycles we want to empower architects, product and communication designers and cultural actors to assume a more proactive attitude, regarding food and its expressive capacity, as a cultural vehicle of identity, innovation and social integration. Looking at identity as the product of continuing exchanges and transformations, means considering the positive and progressive interactions between food cultures, food spaces and places, creative performances, responsive digital technologies.

What is Creative Food Cycles?

Creative Food Cycles is funded by the European Union in the Creative Europe programme from 2018 to 2020. The project is coordinated by the Institute for Design and Urban Planning of the Leibniz University of Hannover and preformed with the project partners Institute for Advanced Architecture of Catalonia IAAC Barcelona/Spain and Department of Architecture and Design of the University of Genoa/Italy. Creative Food Cycles combines research with experimental prototyping, cultural actions and social dialogue. It has already developed a catalogue of good examples, carried out workshops and installations in the three cities of Hannover, Barcelona and Genoa. With the travelling Creative Food Cycles Exhibition and the associated events, a further exchange with initiatives and committed public is organised. Two major events promote the results of the project and launch their transfer: the Creative Food Cycles Symposium initiates a design-research platform contributing to the European Green Deal. The Creative Food Cycles Festival highlights the artistic-creative, social, and entrepreneurial force of the project.

Creative Food Cycles Symposium

How can Creative Food Cycles enhance urban resilience?
How can Creative Food Cycles become a major field for social innovation?
How can digital technologies foster Creative Food Cycles?

The Creative Food Cycles Symposium presents and discusses innovative and creative scientific contributions in the transformation of space and society for creating sustainable futures through food cultures, particularly connected to creative performances, responsive digital technologies, co-creation of change. The Symposium is aimed at an international academic audience, exploring novel ideas, knowledge and practices in addressing the manifold linkages of food-creativity-space together with project partners, representatives of international institutions, invited experts and key-note speakers. Hence, its target is to establish a common ground to contribute to the debate on circular economy and collaborative cities in Europe, to implement the objectives of the EU Urban Agenda and the United Nations Sustainable Development Goals.

Contributions are organized in three sessions:

1. CREATIVE FOOD CYCLES AS DRIVER FOR URBAN RESILIENCE

Fostering novel and adaptive Food Cycles as driver for resilience in cities, economy, society, and culture.

2. CREATIVE FOOD CYCLES AS SOCIAL INNOVATION

Extending civic participation in Food Cycles toward active engagement, new urban communities, and new models of social entrepreneurship.

3. CREATIVE FOOD CYCLES BASED ON DIGITAL TECHNOLOGIES

Experimenting with interactive devices and digital protocols with a strong cultural and social impact, as an empowering force of Food Cycles

01 Session

CREATIVE FOOD CYCLES AS DRIVER FOR URBAN RESILIENCE

This session discusses how *Creative Food Cycles* can be fostered as a driver for resilience in cities, economy, society, and culture. Food as urban element—this major shift in culture and politics in the last years is provoking major innovations in the concepts and modes of food culture and circular economy, of community and social inclusion, of new work opportunities, and it is also strongly affecting our vision of urban futures. *Creative Food Cycles* are targeting creativity for the transition to sustainability, to change effects provoking climate change. How to sustain initiatives for innovation? How to foster upscaling towards the city and resilience? How to position design and creativity for adaptive strategies of urban change? How to include enlarged actor-constellations into new forms of urban strategy building? Interventions present novel concepts, methods, and examples of the urban dimension of *Creative Food Cycles*.

Circular Design for the Regenerative City is put forward as a spatial-digital paradigm that can accelerate innovation through the "learning nature" of multi-scalar design processes. Responding to **Multiscalar Challenges**, Land-links, Agro-landscapes, Hyper-foods, Inno-fields promote a strategic and innovative integration, from the territorial and urban perspective to the creative-social dimension. An evaluation of **Food Plans** of cities argues their contribution to the set-up of sustainable food systems and their development opportunities in relation to urban and territorial planning. Practices, prototypes, and pathways in **Designing Food Cycles** are illustrate chances for urban resilience based on creative research.

A next step for urban **Food Strategies**—linked with potentials of patrimony and tourism and connecting actors, resources and tools—is promoted as a new kind of agro-urban integrated system. In the perspective of **Creative Ecosystem Services**, a model for a *Creative Food Cycles* value chain can be shown through the study of the social-creative enterprise "VàZapp'" in Apulia. **Trueque Based Urbanism** promotes the creative use of vernacular roots in exchange and interaction models for food flows as alternative benchmark for the expansion of the megacity Bogotá. Based on an analysis of landscape transformation and social dynamics in the Trento area, Food Cycles are put forward as a key for **Socio-ecological Connectivity** of city and countryside. The **Kezersrande Natural Farm** project is illustrated as a case study for the integration of hydrogeological risk managament with sustainable food production and a new design of territories. **Self-cultivation in Barcelona** is shown as an expression of the resilient capacities of migrants in the city during the twentieth century that influenced urban space well as urban biodiversity.

Figure 1. PorTable. Design: Julia Theis, Anna Pape, Josephine Arfsten, Michel Grändorf, 2019. Photo by Mohamed Hassan for LUH Regionales Bauen und Siedlungsplanung.

CIRCULAR DESIGN FOR THE REGENERATIVE CITY: A SPATIAL-DIGITAL PARADIGM

Jörg Schröder

This conceptual outline is based on findings from the *Creative Food Cycles* project with the specific focus to enhance innovative and creative cultural practices between food, architecture, and conviviality in a transnational and European perspective. It refers in a double perspective to the EU *Farm to Fork* strategy: to embed and extend innovation in *Food Cycles* into urban contexts and to create benefits for all citizens and actors along *Food Cycles* and and thus a main stage for circular economy, contributing to a just transition and to enhance urban transformation to sustainability and resilience. The *Regenerative City* scenario serves to evaluate findings from the creative and cultural activities of the *Creative Food Cycles* project that have been carried out as design-based research. Circular Design embodies the need of the *Regenerative City* for the effectiveness and adaptivity of strategies, tools, and processes of change. In particular, the "spatial-digital nature" of *Circular Design* and the "learning nature" of multiscalar design processes are put forward as accelerators for transformation.

urban resilience / circular economy / just transition / food Nodes / PorTable

During the Corona crisis, the fragility of supply and social divisions—both seen through the lens of food—became evident. But the role of food got also highlighted for triggering social bonds, carrying community activities and public space, and connecting to digitisation in organising our lives, expanded to every and all angle of society and economy. At the same time, the topic of food has arrived in a new perspective in European policies. The Farm to Fork strategy is a part of the agenda for the next years and is meant to contribute to Europe's sustainable transition: to reduce the environmental and climate footprint of the food system, to strengthen food security and public health, to prevent biodiversity loss, and to open up new economic opportunities (European Commission 2020).
Thus, the background from which the *Creative Food Cycles* project started two years ago has been confirmed. Its focus to enhance innovative and creative cultural practices between food, architecture, and conviviality in a transnational and European perspective can refer in to Farm to Fork in two ways: to embed and extend innovation in Food Cycles into urban contexts and urban change as well as to create benefits, social, economic, cultural, for all citizens and actors across food chains turned into Food Cycles as part of *circular economy*, contributing to a *just transition* and the liveability of Europe's cities.

FROM RESILIENCE TO THE REGENERATIVE CITY

An important result of the *Creative Food Cycles* project are detailed insights into creative mechanisms to enhance sustainability in each part of the cycle—not at least through transversality not only along the cycle, but in interdependency with urban contexts, culture, and actors. The project started from some basic figures that describe specific aspects and show also the high global relevance of the topic food, e. g. that one third of food produced globally is lost or wasted;[1] that 180 kg food waste generated per capita in Europe each year,[2] mainly in processing (39%) and in households (42%); that over half of the adult population in the EU are overweight;[3] and that 33 million people in Europe cannot afford a quality meal every second day, with food assistance essential for even larger groups.[4]

Already these figures show the societal impact and contextualisation of food issues that are deeply rooted in cultural beliefs and practices and social dynamics. Even the share of agriculture in Europe's greenhouse gas emissions of 10.3% includes the observation that 70% of it come from the animal sector,[5] clearly a cultural factor. As a major energy consumer, but also producer of renewable energies, the food sector can be seen an important field for decarbonisation. The mission

of *Creative Food Cycles* to bridge—with a material-creative approach—separated sectoral fields in order to concretise and spatialise closed loops of the food system, necessarily linked with other metabolisms, actors, and urban structures, corresponds to a holistic approach for urban resilience: defined as comprehensive adaption to climate change (Rockefeller Foundation, ARUP 2016).
Even more, *Creative Food Cycles* aim at contributing to mitigate climate change by supporting and even enhancing the transformation of cities into a sustainable living space that has positive environmental impacts. Not only to react to stress and shock, but to transform proactively towards an adaptive city calls for the regenerative design of pathways to sustainability. *Regenerative City Design* (Schröder 2018), thus, cannot be just a destination, but needs to become a process- and capacity-oriented approach to the city that constantly renews and reinvents itself meaningfully, "in a new responsive and sensory condition, sensorized and sensitive at the same time" (Gausa 2019). Cities as a complex entity of streams, activities, influences, and beliefs—as lived space that is all about regeneration—are not only increasingly fragmented, spatially and socially, but also expanded in a view on diverse constellations between metropolis and peripheries in a broad range of different—and emerging—habitats (Schröder, Carta, Ferretti, Lino 2018). This complex urban and territorial condition demands differentiated and pro-active concepts to effectively install sustainability as evolving pathway—necessarily transcending limits of scales and systems to become sustainable, as adaptive bodies energised by people, space, ideas, and nature.

A SPATIAL-CREATIVE APPROACH: FOOD CYCLES AS A LENS AND ACCELERATOR FOR URBAN CHANGE

The *Regenerative City* scenario serves to evaluate findings from the creative and cultural activities of the *Creative Food Cycles* project that have been carried out as design-based research (Schröder 2019A). Design, in this context, evidently addresses a range from product and communication design to architecture and urban design—a spectrum of thinking and work as a creative methodology deployed to a specific end, to shape ideas to become a practical and attractive part of life (Design Council 2015). In this sense, design can be defined as "what links creativity and innovation". Food as transversal topic in different scales and contexts in the city, and as a relevant field for sustainability, can be seen as a lens to observe social and urban conditions and at the same time as potential accelerator for change. *Creative Food Cycles* have proved their tendency for specific innovation as well as for conceptual and methodological novelty. In particular, the aim to close the cycle

Figure 2. Manifesto Market. Design: reSITE, Radka Ondrackova. Prague, Czech Republic, 2018. Cultural events in the evening at the Manifesto Market. Photo by Jakub Červenka. Layout plan of Manifesto Market. Graphic by reSITE, Elvira Islas.

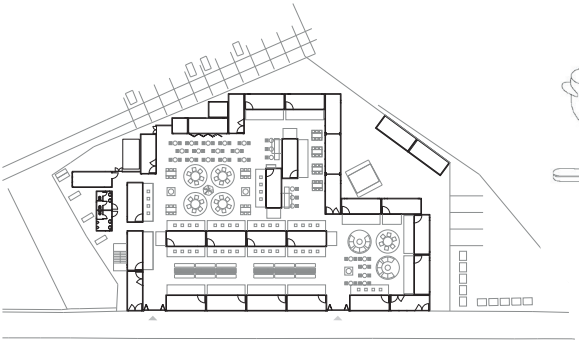
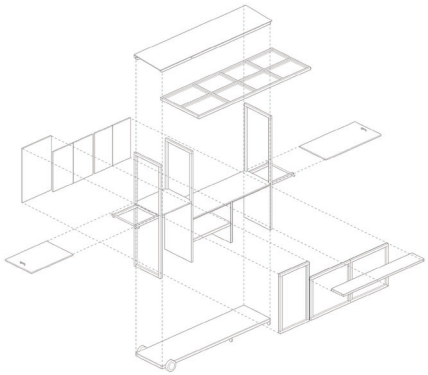


Figure 3. Firekitchen. Design: Johanna Dehio. São Paulo, Brazil, 2017. Johanna Dehio cooking during the Firekitchen Workshop. Photo by David Moritz.Drawings of cooking utilities. Graphic by Johanna Dehio.

Figure 4. Fish market. Design: Eder Biesel Arkitekter. Bergen, Norway, 2012. The fish market as public space between the old town and the harbour. Photo by Norbert Miguletz. The Fish Market upgrading the historic harbour of Bergen. Graphic by Eder Biesel Arkitekter.



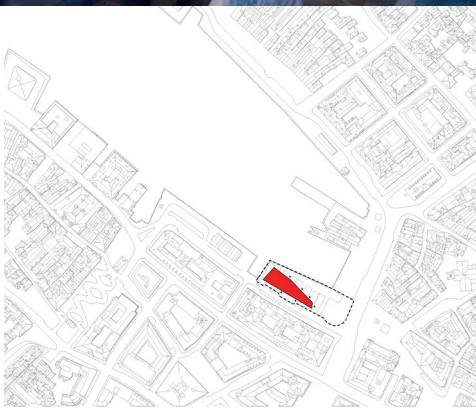
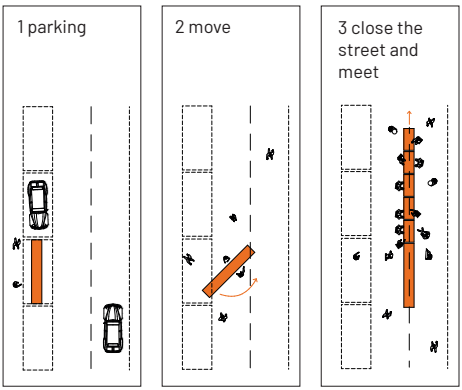
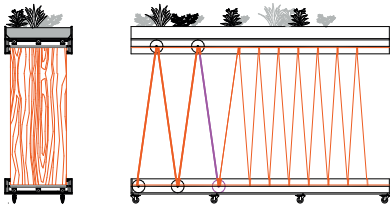


Figure 5. Yatai Cart. Design: Note Architects (Ryo Kamamatsu). Fukuoka, Japan, 2018. Yatai Cart in the renovated alley. Photo by Maki Hayashida. Exploded axonometric plan of the Yatai Cart. Graphic by Note Architects

Figure 6. PorTable. Design: Julia Theis, Anna Pape, Josephine Arfsten, Michel Grändorf, 2019. Photo by Mohamed Hassan for LUH Regionales Bauen und Siedlungsplanung.





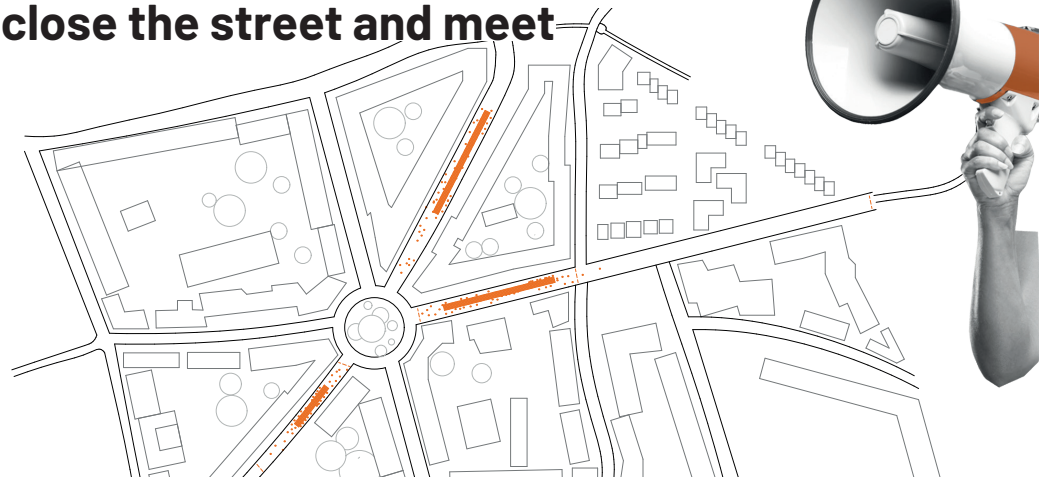
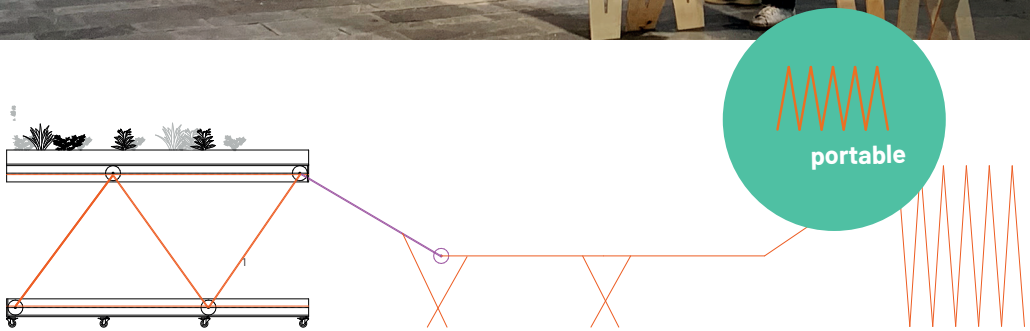


Figure 7. PorTable. Design: Julia Theis, Anna Pape, Josephine Arfsten, Michel Grändorf, 2019. Photo by Mohamed Hassan for LUH Regionales Bauen und Siedlungsplanung.



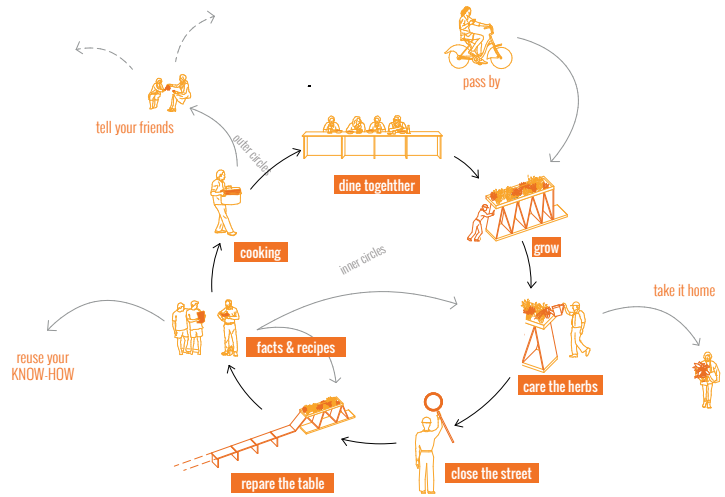


Figure 8. PorTable. Design: Julia Theis, Anna Pape, Josephine Arfsten, Michel Grändorf, 2019.

Food Nodes: typological categories	Cyclical charging / polyvalence	Digital charging / aggregation values	Spatial expression / aggregation values
A. Weekly / daily markets	Distribution + consumption, recycling, linkages to production, manufacturing	Pre-ordering, community networks, financing models	Renewed/new centralities, public space
B. Food stores / groceries	Distribution + conservation tools, without packaging, manufacturing	Pre-ordering, community networks, financing models	Neighbourhood aggregation
C. Bakeries etc.	Distribution + manufacturing, recycling	Pre-ordering, community networks,	Neighbourhood aggregation
D. Supermarkets	Distribution + fair trade, recycling, linkages to production, manufacturing	Community orientation, financing models	Renewed/new centralities, public space
E. Restaurants	Consumption + manufacturing, conviviality	Community networks, sharing / financing models	Renewed/new centralities, public space
F. Farms / mircofarms	Production + manufacturing, distribution, recycling, consumption	Deep chains, sharing / financing / co-harvesting, working models	Agricultural space aggregation
G. Shared kitchens / dining rooms / workshop rooms	Production + conviviality, consumption, centres for self-production,recycling	Sharing / community networks, link to FabLabs	Neighbourhood aggregation
H. Collection / storage points	Distribution + recycling, linkages to production, manufacturing	Sharing / community networks	Neighbourhood aggregation
I. Social kitchens / collection points	Production + distribution, recycling, self-production, conviviality	Basic digital access, new financing models	Neighbourhood aggregation
J. Mobile kitchens / streetfood stands	Consumption, linkages to manufacturing and production, conviviality	"Food ambassadors", instant communities	Renewed/new centralities, public space
K. Picnic baskets / blankets	Consumption + linkages to production, recycling, conviviality	Instant communities	Open / agricultural space aggregation
L. Mobile tables	Conviviality + production, manufacturing, recycling	Instant communities	Neighbourhood / public space aggregation

Figure 9. Food Nodes: typological categories.

between production, distribution, consumption, and disposal led to a sharpened focus on cultural modes, from perception to performance, that connect inventions along the cycle: e. g. through the creative use of waste, collected from different points of the cycle, into new products; or through new linkages between consumption and production, e. g. in prosumer models. Along the cycle, products, not only material flows, connected to social demands and urban contexts, embody experience and capability of closed cycles. In terms of architecture and urban design innovation, urban space, its elements, networks, and strategies for its change become the stage for closing the cycle in the sense of resilience and sustainability, and at the same time enable new conviviality and social inclusiveness in the city. Based on experiences from the *Creative Food Cycles* project, innovations of interaction between food and regenerative cities can be identified in different spheres: common, private, and urban.

FOOD NODES: NEW COMMONS, NEW ROLES

As spatial manifestation of food in the city, *Food Nodes* in the form of markets have been the origin of cities. Today, on the one hand, advanced forms of Food Nodes can be described as places of exchange in the city, that re-invent existing structures and are part of a revival of community cooperation (Sennett 2012). They are energised with a new role for sustainability, also by means of an added digital dimension—not only in information, but particularly in interaction, e. g. participation in organisation of distribution, or in manufacturing and harvest. On the other hand, digitally co-created initiatives as *new commons* are observed to setting up on site spaces of material encounter.

This spatial-digital interaction, driven by civic engagement, entrepreneurial vocation, and idealistic spirit, can be seen as characteristic for the new role of food in the city, with its material value of nutrition and its sensual value charged by cultural, social, and economic meaning. As manifest and experienceable spaces, *Food Nodes* offer new forms of social encounter, education, culture, experience, delight, and draw their mission and their added values from a polyvalence of roles and functions, within the *Food Cycles* but at the same time within the *Regenerative City*. Based on the research for the *Food Interaction Catalogue* (Schröder 2019B) and the capacity building workshops and accompanying research within the *Creative Food Cycles* project, some typological categories for *Food Nodes* can be detailed: specifying the cyclical charging towards polyvalent roles and spatial-digital aggregation values (Fig. 9).

Digitally driven interactive organisation and financing models target sharing, but also in new forms of crowd-funding and part-ownership, investment, shared ownership, civic associations. A desired share of organic production, set with the objective 25% by 2030 in the *Farm to Fork* strategy, evidently is bound in many ways to questions of distribution and consumption. Even in its social criticalities, the food topic seems a lens for larger questions and trends in society and space, just to mention social fragmentation and living costs; that food can become a tool for spatial and social separation (élitist or middle-class "food zones"); or social standards and working conditions, all along the cycles.

PORTABLE: PROTOTYPE OF A MOBILE SOCIAL TABLE

The typology of the mobile table has been chosen for inventing and testing a prototype, realised and presented in a public installation within the *Creative Food Cycles project*. *PorTable*[6] (Fig. 7–10) is a prototype for street furniture on the theme of food and sustainability. It is designed as a foldable table for transformative actions in urban space, combining creativity with climate change, food production, inclusion.

The shift to sustainable forms of mobility offers the possibility to transform parking areas in the city into experimental spaces, that can host and enable a wide range of urban micro-actions. The table creates a space for eating together as cultural exchange, starting a new urban ritual. Through the initiative of residents and guests, urban space becomes a new community place, temporary and short-term, but with impact on urban space and visions for urban futures.

The mobile table is conceived as a modular system of 15 folding panels with a herb garden as roof on top. When closed (1.6 x 4.0 m), *PorTable* fits into a parking lot. The panels can be partially or fully unfolded, then the table has a maximum length of 26.0 m. If you want to be part of the table, you bring food and a chair, and contribute to create a "public dining room", a place of eating as social interaction. The table propagates the idea of public space created by the attention and commitment of citizens.

PorTable can be used in various situations and in different spatial configurations: the table becomes a multi-purpose stage for showing, sharing, distributing, and communicating creative events on food and culture that strengthen social life in neighbourhoods; it serves a material side of digital interaction, as has been experimented in the *Creative Food Cycles* installation.

FOOD STAGES: PRIVATE-COMMON INTERFACES

In private space, critical viewpoints on current trends, such as that one fifth of British households no longer features a dining table,[7] in the Corona crisis have been turned into the discovery that four fifth do have the table. Everywhere dining and kitchen tables were entertained as stage for "self-production" not only of meals, but of a whole material culture in manufacturing and recycling connected with food raw materials. A long-running trend of shifting cultural borders between private and public (Castells 1996, Madanipour 2003), further accelerated by diversified household constellations and by digitisation, is leading to new interaction between private kitchens and dining tables and public or common spaces of production, distribution, consumption, and disposal of food.
Today, the rediscovery of cooking and food manufacturing as self-production and of cooking and dining as social practice is mirrored in direct broadcasting, showcasing, instagramming, networking, and digital interaction: practices that are shaping a new vision of spatial programming for private living space and its connectivity. Disengaged from modernist paradigms—of the minimum and of industrial standards—the concept of the "kitchen for cooking" as stage of a new living culture and community spirit, as Aicher (1982) put it, provokes a deep change not of its dimension or technical tools, but of the spatial and conceptual design of its material-digital interaction.

FOOD STRUCTURES: URBAN SPACES, NETWORKS, STRATEGIES

As part of ongoing strategies and projects for urban resilience and sustainability, food issues are shown to be able to play a role of avantgarde (Schröder, Haid 2015). Still, challenges are remarkable towards a substantial transition, not so much in managing flows, but in changing their substance and dynamic, depending from immaterial, cultural, and behavioural patterns. The two most interesting fields for an impact of innovations in *Food Cycles* on urban change and its governance can be seen as bound to all phases along the cycle, production, distribution, consumption, disposal.

First, in terms of networks: to modify a modernist understanding of heavy and hierarchical networks towards more flexible and adaptive networks driven by new forms of platforms, hubs, abilities, and cultural spirit; recognising the influence of points of spatial and programmatic densification of networks in Food Nodes to sustain several levels of connection; and not at least, valorising micro-networks

and alternative forms of transport and its organisation, bound to new sustainable mobility and its expression in space. Second, in terms of manifest space: the possible role of Food Nodes for the revival of public and community space and for the future of centralities, not only in the sense of supply (to prevent food deserts), but also in a cultural and social sense, and in a sustainable recycling approach for existing town, neighbourhood, and village centres; in the new role of production in the city in terms of functional mix, increased autonomy, and a broader set-up of economic bases; and in extension to a new awareness for city-countryside co-operation (Schröder 2015), *regional foodsheds* (Schröder, Hartmann 2017), agriculture in relation to the city (Sommariva 2015), and *Agro-Cities* as a territorial vision (Gausa, Canessa 2018).

CIRCULAR DESIGN

The contribution of the *Creative Food Cycles* project to evolve a paradigm of *Circular Design* (Schröder 2019C) is based on the understanding of food as cross-cutting field of innovation for circularity—crucial for transition (Marin, de Meulder 2018)—and for the *Regenerative City*: to design out waste and pollution, to make products, architecture, and cities regenerative by design, and to enhance natural capital (MacArthur Foundation 2019); as well as to support a renewal of community aggregation and new economic opportunities, triggering creativity, technologies, knowledge, and abilities towards a "performance economy" (Stahel 2006).

Thus, *Circular Design* embodies the need of the *Regenerative City* for effectiveness and adaptivity of strategies, tools, and processes of change. Linked with the understanding of design as mode of research and of research as part of design, *Circular Design* can lead to promote design itself, not is products, as culture in being for the age of climate change. Through methodological innovation, it responds to the need to bridge between the traditional fields of product and communication design, architecture, and urban design, to connect between scales, and to offer a new setup for cooperation with other disciplines. Planning, strategy, governance, and communication—essential for transition to resilience (Rockefeller Foundation, ARUP 2019)—are increasingly caught between the challenge to sustain and extend bottom-up initiatives and to produce visible and experienceable change in the city with the aim to set-up long-term perspectives. Designerly methods oriented in a circular approach can respond to the need for creative innovation, for narratives, and new forms to organise co-creative processes that lead to enabling frameworks for upscaling and to earlier impact and more adaptive setups of urban strategies.

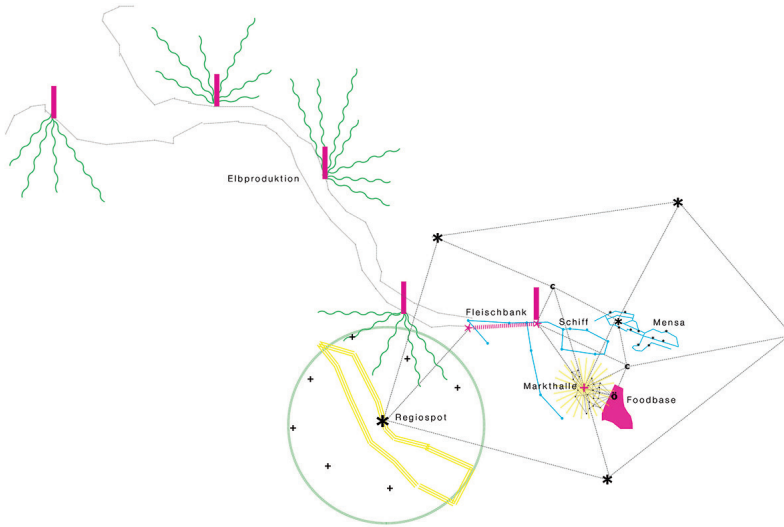


Figure 10. Foodscape Map for the metropolis Hamburg. Graphic by Jörg Schröder, 2017.

The "spatial-digital nature", at the very core of *Circular Design*, enables this new mission and role of design—and contributes to the *Augmented City* as "an expansion of urban space" (Carta 2017). A "learning nature" of multiscalar design processes, from the city to products, is shown in the three main ingredients for the *Creative Food Cycles*' menu: a creative interpretation of urban contexts and spatial potential in order to change spatial structures, actors networks, and urban mechanisms; co-production and co-creation to involve and extend to society and to dig social capital and local knowledge for transition; the understanding of digital technologies as multidimensional tools: for design, production, interaction, and for new spatial-digital qualities in the city.

FOOTNOTES

1 FAO (2011) *Global food losses and food waste*. Online at: http://www.fao.org/3/mb060e/mb060e00.pdf (01.08.2020). Following UNSDG's differentiation in food loss (during refinement and distribution) and food waste (occurs from retail to final consumption/demand), FAO developed a more precise measurement processes, leading to a FLI Food Loss Index and a FWI Food Waste Index for different food types, regions, and supply chain stages. FAO (2019) The State of Food and Agriculture 2019. Moving forward on food loss and waste reduction. Online at: http://www.fao.org/3/ca6030en/ca6030en.pdf (01.08.2020).

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3 Eurostat (2017) "Obesity rate by body mass index". Online at: http://ec.europa.eu/eurostat/databrowser/view/sdg_02_10/default/table?lang=en (01.08.2020).

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5 EEA (2020) *Annual European Union greenhouse gas inventory 1990–2018 and inventory report 2020*. Online at: https://www.eea.europa.eu/publications/european-union-greenhouse-gas-inventory-2020 (01.08.2020).

6 *PorTable* was designed in 2019 by Julia Theis, Anna Pape, Josephine Arfsten, and Michel Grändorf and prototyped with a group of students and with support of the digital labs and workshops of the Faculty of Architecture and Landscape of Leibniz University Hannover, as part of the *Creative Food Cycles* project; supervised by Jörg Schröder, Emanuele Sommariva, and Sabrina Sposito.

7 http://www.express.co.uk/news/uk/907364/dinner-table-sofa-Social-Issues-Research-Centre-family-eating-research-Co-op (01.08.2020).

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Figure 1. Yves LYON- Jerome [illegible] MARD, Le Triangle Vert, Essonne, Ile de France, 2009

CFC–MULTISCALAR CHALLENGES : LAND-LINKS: MULTI-CITIES, AGRO LANDSCAPES, HYPER-FOODS, INNO-FIELDS. 5 FACTORS FOR A BALANCED GEO-URBANITY

Manuel Navarro Gausa

The new contemporary multi-city, the fractal, irregular and networked poly-polis (Gausa 2018), needs the landscape, as a eco-systemic and proactive infrastructure, conceived not only as a network of 'green open spaces'. The in-between transversal landscape of the new city needs agriculture to ensure its positive and relational conservation. Agriculture, especially if developed in low or medium intensity contexts, requires programmatic innovative mixture and diversity—associated with its uses and crops, but also with an agro-tourism based on zero kilometre hospitality, gastronomy, energy production, digital manufacturing, technical research—to ensure its own resilient livelihood capacity. Creative Food Cycles (CFC) covers all these scales and levels of action—with a socio-cultural activism approach—promoting a strategic and innovative integration, from the territorial and urban perspective to the creative-social dimension and to the scale of product design. The food factor, from a mere productive indicator, becomes an agent inducing new sustainable and innovative processes.

geo-urbanity / multi-Cities / landscape links / new agriculture / innovation / proactive sustainability

LAND-LINKS:
FRACTAL MULTI-CITY, MESHED TERRITORIES, AND OPERATIONAL LANDSCAPES

The last decades experimented the emergence of a double territorial equation. On the one hand, the increasing anthropisation and the competitive positioning of cities in a global economic framework, associated with the growing increase in mobility and internationalisation of the housing market (Muñoz 2008). On the other hand, the appearance of a new cultural and environmental sensitivity, responding to the need of reflecting on the current urban reformulation processes, fostered by 'significant', innovative and qualitative interventions in open space design, more interconnected on a social scale, and more democratic in their accessibilities and uses.

The definition of possible *Multinter* strategies—*multi-levelled* and *inter-networked*—applied to *multi-urban* or *inter-territorial* scales (Gausa 2009) to tackle the great challenges that arose in the global scenario, obliges to contemplate cross-cutting topics associated with the so-called 're'-factors (re-naturalisation, re-environmentalisation, re-cycle, re-structuring, re-activation and re-information) which today tend to mark the new urban-territorial agendas in the beginning of this century (Ricci 2012, Carta et al. 2017, Schröder et al. 2018). The debate on urban and territorial challenges, in other terms, appeals today to a new mutable evolution of the system theory approach. The *systematiCity* embodies relational (transversal), intelligent (holistic), and imaginative (creative) needs to be implemented into a new conceptual logic, more strategic and informational; a logic where the ancient 'urban-swing' or 'urban-needlework' would not be only based on the continuity of the building plot(s) but on the capacity of new integrating and interweaving network models (Gausa et al. 2003). These models are associated with the active importance—programmatically intense in the exchanges—of natural and semi-natural (agro-productive) landscapes capable of promoting different territorial land-uses, ecosystem services and interlaced development patterns of large meta-politan areas (Asher 1995) through urban reinforcements and interurban conjugations. This type of new multi-urban governance (Puig Ventosa 2011, Gausa 2011) obviously requires a qualitative (re)definition of its main territorial assets and policies towards the reuse and recycling of urban pre-existences by implementing strategies of spatial, programmatic, and social diversity. It requires a more effective relationship with the landscape: an in-between condition, giving new values and meanings to the natural-artificial dimensions.

We have used, in several occasions, the terms *Land-Links, Land-Grids*, or *ReCitying* (Gausa 2014) associated with these new dynamics. Terms that are predisposed

to defining possible strategies—integrated and interdependent, compared to local and global development trends, And able to create a dialogue among different scales of interventions. Developments, in which the new *multi-city* (Gausa 2019) would no longer interpret specific interventions on 'building extension' linked to a single mono-central, mono-referential, or pseudo-radial expansion programme, but as a possible multi-central (or polycentric) structure (Nel.lo 2011); strategically adjusted, properly recycled, sensibly reoriented, and intelligently re-informed.
Three main strategic research lines in an agri-urban development debate can be identified as:

- Connecting the landscape(s) and consolidating the city(ies).
- Articulating and coordinating the different infrastructural (and programming) links.
- Meshing the various knitting and knotting 'patch-matrices' of our existing territories in new planning models of integrated, multi-dense kaleidoscopic mosaics (Llop 2008).

Today, the question of interpreting landscapes as infrastructures—or even infrastructures as landscapes—becomes crucial according to the level of the ecological performances produced in the territory: *eco-structures* of which we have to explore the infra-, intra-, info-, and trans-scalar operability. The territorial city can therefore be proposed as a 'non-linear' structure of places and in-between-spaces; a complex set of conditions, situations, solicitations, and information combined in *agenced* (*agencés*) spaces (Deleuze-Guattari 1980) related to effective inter- and eco-qualities.
We are talking about a combinatorial system built on territorial evidences, conflicts, risks, stresses, and threats, that is nevertheless capable of promoting new series of development scenarios and offering also possible multi-leveled strategic projects based on potentials, capacities, latencies, and operative strategies. It is no longer a matter of compact models, neither of 'poly-diffuse' models, but of possible 'interlace' systems, focused and articulated; intensive and extensive; capable of combining, within new territorial networks, density structures (urban centres, nodal fabrics), interweaving structures (connective links), and relationship structures (active landscapes) able to establish new urban-geographies or geo-urbanities (Gausa et al. 2003, Gausa 2009). They are discontinuous multi-networked structures, aimed at spatial, functional, and social mixtures (local and global), associated with a differential ways of organisation.

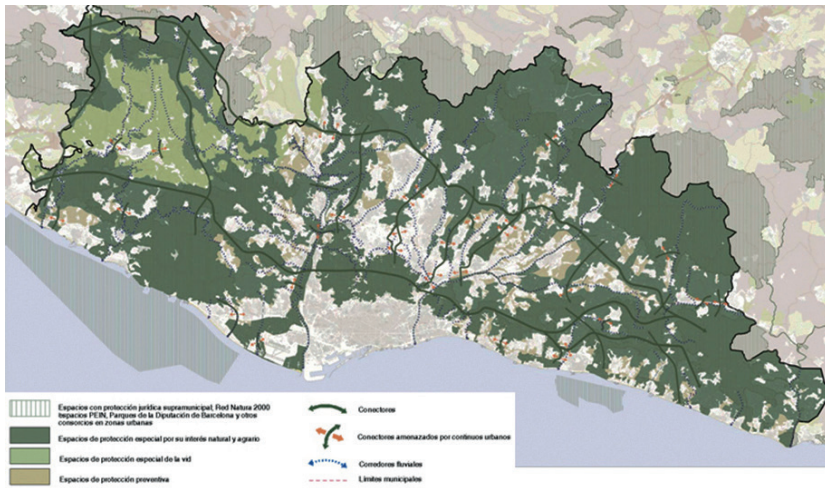

Figure 2. Barcelona, Strategic Director Plan, 2011. Green agro-corridors. Ajuntament de Barcelona (Barcelona City Council)

AC+. AGRO-CULTURES, AGRI-CITIES
THE POTENTIAL FOR A NEW RURBAN PROACTIVE DEVELOPMENT

The evolution of the urban-territorial city together with the mutation of our natural environments due to climate change has produced, in Europe—and, in particular, in the Mediterranean areas—a complex set of questions and research interests going beyond the traditional relationships City/Landscape, Landscape/Nature and Nature/City. To the growth of the informal and informational city corresponded, paradoxically, the diffusion of urban sprawl, more or less tending towards a dense and intense but discontinuous fractal geometry.
Therefore, the necessary articulation, planning and design of resilient landscapes become crucial in the articulation of coastal areas, where agricultural and woodlands can be interpreted as a fundamental (and possibly founding) element of a new sustainable form of dis-dense (discontinuously dense) multi-city model (Gausa et al. 2003, Gausa 2009). Consistent parts of the reflection of urban disciplines and territorial sciences have been dedicated in these years to the reinterpretation of the role of open spaces (free spaces, semi-natural spaces, in-between spaces), closely related to agricultural production (active and/or in decline), and how they can become (re)generative elements for defining new paradigms in the construc-

Figure 3. Agricola Sud Milano, 47.000 ha, 61 comune, 2005.

tion of the new urban forms and formulations (Ricci 2012, Carta et al. 2017). Going beyond the traditional dichotomy of city and countryside towards an integrated and intertwined reading of peri- and para-urban territories it means to assume a wider interpretative logic of the n-productive functions associated to creative of complex added-values.

It is a new holistic approach to land-use governance in a geo-urban condition (Gausa et al. 2003, Gausa 2009); questions that arose together with new ways of planning and that recommend policies for inter-urban or rurban (Guallart 2014) realities; challenges that require the definition of new land-spaces necessarily designed to combine primary and tertiary activities; agricultural production and technological production; environmental sensitivity and tourist attraction; private spaces and public functions. The role of agriculture, in this interpretative framework, is hence fundamental, being one of the most decisive and transcendent uses of the soil—linked to the concept of 'landscape' transforming conservation and efficiency—in a multi-meshed integrated systematicity (Gausa et al. 2017). In most of the productive areas of the Mediterranean Latin Arch, agriculture generally represents an average of 35% to 65% of the available fertile lands, occupying only 1% to 5% of the working active population (Ministerio de Agricultura, Pesca y

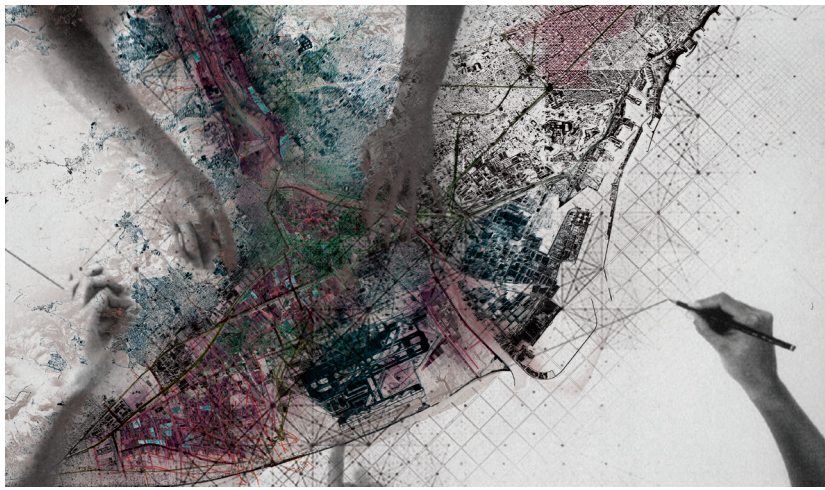

Figure 4. PABLL-BCN+, Agricultural Park of the Baix Llobregat, Barcelona: a park of park (Actar Arquitectura-Gic-Lab, 2014). Smart Agro-Parc. Network Activations and App Cycles.

Alimentación 2006).
The importance of understanding agricultural spaces as operational landscapes, not only as productive landscapes but as multi-productive landscapes, supposes a new urban-rural vision of the contemporary city-mosaic. The multifunctional and multi-programmatic condition of these agricultural spaces implies to no longer conceive them as 'primary' spaces but as 'complex spaces' (green infrastructures, ecological corridors, natural patterns, wellness environments, innovative productive programmes, agro-touristic attractors, etc.); spaces that are able to understand the landscape as a "system of eco-systems, in plural interaction" (Buonanno 2012). A condition linked to its basic agricultural-food component (Sommariva, 2015) but also connected to the social well-being, to the economic development, to the environmental and resilient urban quality, and to a (new) technological and operational dimension: the *smart-landscapes* (Carrabba et al, 2013) or *advanced landscapes paradigm* (Gausa 2012). The conveyance of the 'smart planning' concept alludes to a set of integrated systems and subsystems (safety, resilience, water, health, infrastructure, economy, environment, food, etc.) called to guide the sustainable growth of these new *multi-* and *inter-urban* scenarios (Ratti 2016).

In this 'smart' framework, urban and interurban agriculture can contribute to en-

Figure 5. Any figure of Albenga or MedNet Coast AgroCities with all Med cities

suring not only healthier and more efficient nutrition processes—related with algorithmic data-optimization of environmental and economic parameters—but also linked and shared dynamics associated to the energy and waste cycles, water and material consumption, as well as with a better management of environmental resilience factors. In parallel, new playful-social interactions promote the consolidation of local identities, by integrating cross-cutting topics such as food safety, food security, and food creativity. These aspects are linked to the implementation of diversified and plural strategies, oriented towards the creation not only of productive spaces, but also of recreational, restorative, and agro-touristic developments based on pre-existing environmental and socio-cultural values (Gausa et al. 2016, Tucci 2016).
In this sense, several research questions can be formulated around this new perspective of smart agri-landscapes and their ability to adapt to the current transformation trends according to a glocal and rurban development model.

1. Which can be the roles (and new identities) of the large agricultural landscapes (and land-spaces) according to their different definitions, characteristics, and structures in these new meta-metropolitan contexts? How could they be better linked with the territorial natural assets and how could they be

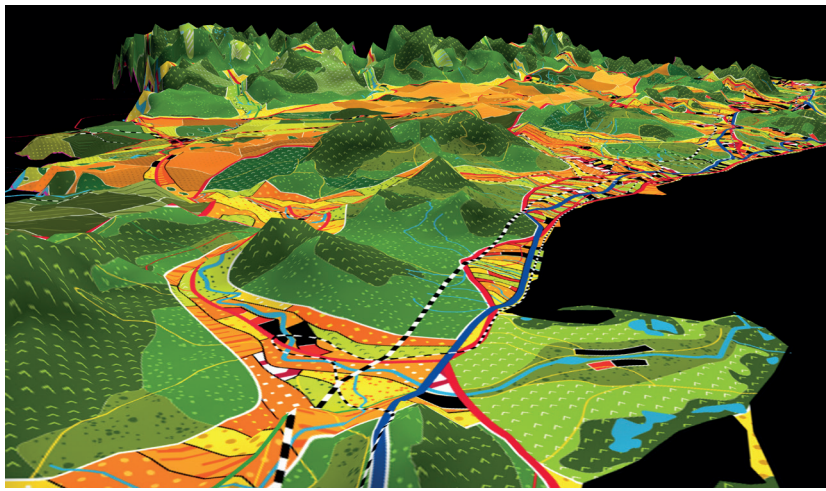

Figure 6. BCN.CAT, Catalunya Land Grid. Barcelona / Catalonia, an integrated model of urban and territorial development((Hicat-Actar Arquitectura, 2003). General view and detail of the big agricultural central plane.

designed according to their definition as key elements of intra-, eco-, info-, and trans-territorial articulations?

2. In which way can mono-functional specialised areas (logistic-industrial, residential, commercial, eco-recreational, and touristic) be rethought to encourage new positive interactions with productive landscapes, social recreation, leisure, and innovative mixed operations and users?

3. How can the different volumes of flows related to the large and middle-scale infrastructures—which delimit, cross, or surround these spaces—be exploited, by channelling and configuring slow mobility lines able to configure new strategic eco-circuits and qualitative interventions?

4. How can these areas, together with their heritage and values, be declined in the diverse equations among *interactive* scenarios (environmental, social, and cultural), active scenarios (economical, material, and industrial) and *attractive* scenarios (touristic, recreational, experiential)?

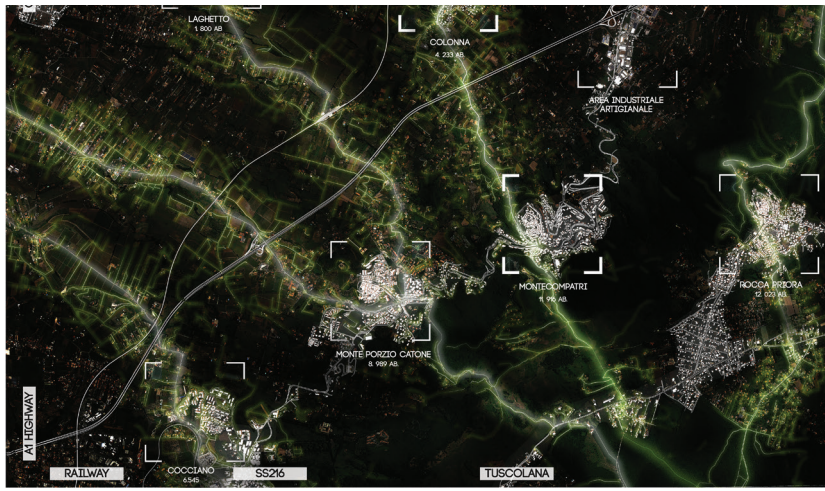

Figure 7. AGROMA – ROMA 2025 (IAAC, 2016). Prospective diagrams of structuring sharing network strategies.

5. How can these territories maintain their agricultural vocation and, at the same time, reinforce their functionality toward a new, innovative, and operational condition: eco-industrial, eco-touristic and eco-resilient?

6. How can the old notion of 'food' be reformulated as a primary product, combining it with other secondary and even tertiary levels of definition, and how can it be related to the recycling of waste and discarded products? How can we reorient the research in pharmaceutical applications, cosmetics, chemistry, new bio-materials, to design new objects and materials with wasted food? How can we implement three-dimensional manufacturing and new technologies according to the eco-design paradigm for the food industry, able to implement new bio-temporary facilities?

7. What can be, in conclusion, the evolutionary horizon of these different in and in-between agri-cultural and agro-territorial (semi-natural and semi-artificial, fragmented or extensive, highly productive or socially oriented) dynamic fields? How can these practices be implemented in their different socio-cultural mixed contexts, by evaluating potentialities, capacities, and identities in the framework of the new *multi-city* and *geo-urban* dimension?

Figure 8. PABLL-BCN+, Agricultural Park of the Baix Llobregat, Barcelona: a park of parks (Actar Arquitectura-Gic-Lab, 2014). Territorial relations with the Big Natural Parks of the Pre-Coast.

PERSPECTIVE AND INNOVATION: CREATIVITY IN THE CENTRE OF (PRO)ACTIVE RESEARCH

In the last years, many of these questions have guided research activities related to a strategic planning approach and social design laboratories at UNIGE-DAD, such as *AC +, Agri-culture, Agro-cities, BCN Llobregat multi- Agro Park, Albenga Glass City, or Med.Ned Agro.Coast.Cities* (Gausa et al. 2017; Canessa 2020; Tucci 2016; Tucci 2020), and recently the innovative actions linked to the *Creative Food Cycles* project (Creative Europe, 2018-20), framing a set of urban-to-product design educational activities based on the assumption of the relevance of food in the contemporary multi-city and its relationship to the new urban food equation. It is a seach for factors which bring together cross-cutting topics such as food-art-design, but also food-landscapes-architecture and ecological resilience as framing condition of a new inter-city relationships.

It is the transition from a strictly taxonomic reading between city and countryside to a more integrated understanding of polycentric territorial development scenarios (multi-dense, or in-between fractal growth), questioning the traditional interpretation of 2D planning theory towards new participated 3D actions. These

Figure 9. Albacete, Spain. Patterns with agricultural

vibrancies are necessary to combine not only the socio-cultural background of the territory, but also the site-specific knowledge and maker communities, based on primary skills and activities. Agricultural production, eco-industrial production, and technological production still represent the crucial assets on which the quality of our living spaces and leisure interspaces can be formulated; dynamics of relationship and dynamics of growth: environmental sensitivities, and socio-cultural sensibilities, etc. A condition that is linked to the digital turn and the operational emerging ICT dimension able to reformulate traditional urban/agricultural spaces into new *Resili(g)ent-landscapes,* which are 'resilient' in their shapes and 'intelligent' in their performances (Gausa 2020) to face exponentially stressed land-use and increasing climatic threats.

The conveyance of the concepts 'Intelligent Cities', 'Resilient landscapes'm or 'Smart Contexts' is, hence, combined with the terms 'Trans-productive Lands' and/or 'Advanced Planning', alluding to the ability to make sets of integrated informational systems and subsystems interacting among them—in terms of security, safety, closed cycles of energy, water, material, waste management, health, infrastructures, economy, environment, food, etc.—called to guide the development and sustainable growth of these new multi- and inter-urban scenarios. The main

case studies presented in the *Creative Food Cycles* (CFC) project have shown new logics and interpretations for food topics, by exploring their inter-operability and the creative re-information of hyper-agricultural contexts as well as their spatial effects (urban, natural, cultural, economic, social) connected to our "living-working-resting...leisure and celebration" habitats.

These 'in-between' transversal landscapes need agriculture to ensure its positive and relational conservation. Agriculture requires programmatic diversity, associated with new uses, functions and programs, to ensure its own resilient livelihood capacity. This new intelligent resilience requires, above all, technological empowerment of social community to diversify production generated beyond pure food, ensuring a second or third level of definition, aiming at social inclusion. New socio-ecological systems need to be animated to implement holistic solutions to societal challenges that we are currently facing, putting food higher on urban, environmental, and public health agendas. In this regard, the transition towards a new democratic and circular economic model, empowered by new creative tools and research actions, represents the paradigm on which we re-imagine the future of our cities, from the design of our public spaces to the domestic spaces, for new needs and new opportunities.

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Figure 1. The weekly market in via Osoppo, Milan. Source: Luca Lazzarini.

THE ROLE OF FOOD PLANS AND STRATEGIES IN SHAPING CREATIVE FOOD SPACES IN ITALY

Luca Lazzarini
Marco Mareggi

The article aims at improving the understanding of the contribution of food plans in the transition towards more sustainable food systems. The research presents the results of a survey of all the food plans developed until today in Italy. The methodology is based on a documentary analysis according to which an analytical framework was built to investigate geographies, visions, and objectives of the plans; the governance mechanisms, policies, and actions to achieve these objectives; the actors involved in the decision-making process; and the relations with statutory planning policies. A specific focus is oriented to investigate if and how the plans interpret food as a resource able to produce positive impacts on the economic and environmental sustainability of the food system. Although food plans have triggered a process of cultural and institutional enhancement allowing to coordinate and integrate different policies, the research has shown that most of them have not found effective applications and created good performance results.

food planning / food plan / food strategy / sustainability / local authority

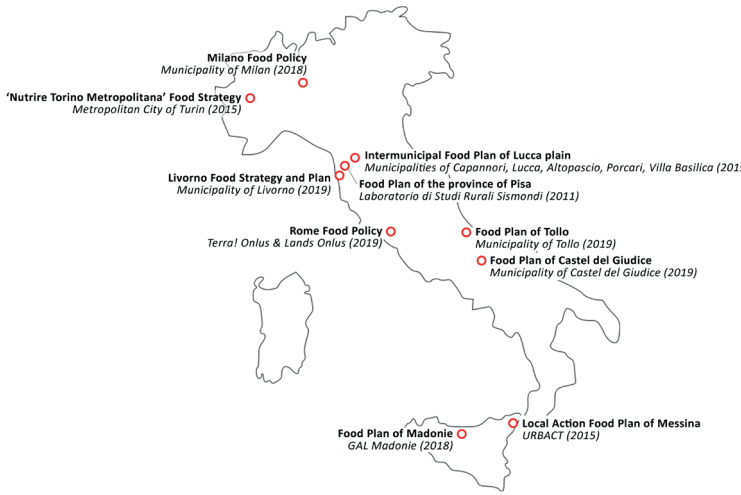

Figure 2. Food plans in Italy with promoters and dates. Source: Elaboration by the authors.

Feeding people with healthy, sustainably produced, and ethically sound food has become a global challenge. Central to the debate on food systems is the contribution of local governments in promoting policies and actions for improving the sustainability of the relationship between food and territory (Dansero et al. 2017). Despite the increasing awareness that a multiscale reflection able to grasp vertical and horizontal interactions between territorial systems appears crucial to successfully incorporate food into sustainable urban development, according to many authors the local scale remains the key in responding effectively to food systems' vulnerabilities (Mount 2012; Pothukuchi & Kaufman 1999). Moreover, in recent decades, the commitment of local institutions towards sustainable food systems has gradually increased and, although discounting a number of structural and operational weaknesses (Lazzarini 2020), it has achieved some significant results (Morgan 2009; Marsden & Franklin 2015).

In this context, in August 2019, for responding to the growing demands for support expressed by local institutions in the field of sustainable food systems' planning, FAO (2019a) released its Framework for the Urban Food Agenda, a document that defines the organisation's commitment to support local institutions for responding to the growing challenges disclosed by the interaction between food cycles and urbanisation processes.[1] The interest of the document lies in disseminating

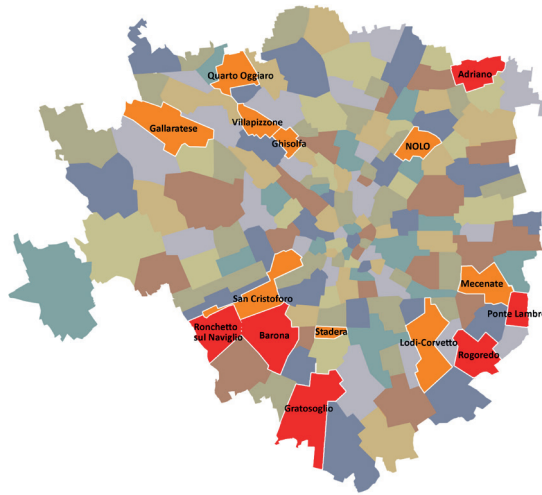

Figure 3. Neighbourhoods identified as food deserts (red) and food mirages (orange) in Milan. Source: Re-elaboration by the authors from Comune di Milano & Fondazione Cariplo (2018).

the results of a twenty-year long period of experimentations in the field of food policies. The majority of experiences of local food planning and design, although emerging in different geographical and institutional contexts, have faced the same social, economic, and environmental vulnerabilities and have produced a specific response, whose distinctive elements are outlined in the document.

An equally important role is played by the *Farm to Fork Strategy. For a fair, healthy and environmentally-friendly food system*, promoted by the European Commission (2020) as part of the European Green Deal. The strategy develops a legislative framework to promote the transition towards sustainable food systems by 2023, a need that has become urgent after the diffusion of the Covid-19 global pandemic. According to the strategy, this transition implies "a collective approach involving public authorities at all levels of governance (including cities, rural, and coastal communities), private sector actors across the food chain, non-governmental organisations, social partners, academics, and citizens" (Ibid., p. 20).

Starting from these assumptions, this contribution investigates a specific type of food policies, the food plans, a strategic food planning document that presents guidelines and concrete actions necessary to guarantee sustainable nutrition for all citizens. The aim is to understand the contribution of food plans in the transition towards more sustainable food systems. The choice to analyse these tools relates

to the specific attention that food policies have encountered in the field of urban planning over the past decade (APA 2007; Morgan 2009; Cinà 2016).

The analysis takes the Italian domestic context into consideration, on the basis of the willingness to measure the impacts on food planning triggered by the EXPO "Feeding the Planet, Energy for Life" held in Milan in 2015. In fact, among the over 250 cities that have currently signed the Milan Urban Food Policy Pact,[2] which collects the EXPO legacy and systematises local administrators' commitment to develop sustainable food systems, 26 are Italian local authorities. This demonstrates a certain vibrancy of local governments in Italy to set up policies, programmes, actions oriented to tackle the food sector (Marino & Mazzocchi 2019).

Concerning the methodology, the research employed a documentary analysis of all the food plans developed until today in Italy through an analytical framework aimed at investigating geographies, visions, and objectives of the plans; the governance mechanisms, policies, and actions to achieve these objectives; the actors involved in the decision-making process; the relations with statutory planning policies (see section 2). Specific attention is paid to the exploration of the environmental and economic implications of the food plans, which, as demonstrated in section 3, reports no significant contributions and innovations. This anticipates the final critical remarks related to food plans as a form of policy and not as a new planning tool (see section 4).

A SURVEY ON FOOD PLANS IN ITALY

The first element emerging from the analysis lies in the catalytic role of the Milan 2015 EXPO with respect to the emergence of food plans in Italy. Ten plans are analysed in the survey (Fig. 2). All of them have been elaborated during the past five years, except one, the food plan of the Province of Pisa, that was developed in 2011. A food strategy—Nutrire Torino Metropolitana (2015)—and two policy documents—the Food Policies of Milan (2018) and Rome (2019)—have also been included in the survey because, although exemplifying a different policy formation and involving a different range of actors, they represent important experiences of food planning, in many ways comparable to the other investigated cases (Marino and Mazzocchi 2019).
Promoters of the food plans refer mainly to two typologies of organisations: public administrations and public-private partnerships. The first group comprises local authorities and, sometimes, provincial and metropolitan institutions, often sup-

ported by other public-private organisations (business associations, universities and research centres, civil society groups). The second category includes public-private interest groups, but also ad hoc committees (as in the case of Rome) which activate and support the planning process. In some cases, public-private partnerships originate alongside specific policy programmes and tools, such as the Local Action Group (LAG) (for example, the LAG of Madonie, in Sicily). In others (Livorno), food plans are conveyed by specific regulations, such as the regional law 46/2013 of Tuscany Region about participatory and deliberative democracy.

The geographical distribution of food plans is fairly balanced between Northern, Central and Southern Italy. Rather different territorial contexts are involved, including metropolitan areas (Milan, Turin and Rome), medium-sized cities (Livorno and Messina), small municipalities located in inland Apennine areas (Castel del Giudice and Tollo), and, finally, provincial and inter-municipal areas (Province of Pisa, the Lucca plain in Tuscany and the Madonie in Sicily).

Five objectives are recurrent in the analysed Food Plans. The first is the reduction and/or elimination of food waste, which is an objective stated in the food plans of Livorno, Castel del Giudice, Pisa, Milan, and Rome. In Livorno, the issue of food waste implies achieving ethical goals, such as social justice, to be guaranteed also with the recovery and donation of surplus food as a social aid measure. In Castel del Giudice and Rome this goal is expressed within a vision of circular economy. Access to food is instead a goal in the documents of Lucca, Pisa and Milan. Initiatives are thus promoted to break down the barriers that prevent the qualitative and quantitative access to food, sometimes trying to reach the more vulnerable sections of population (in Pisa), and often looking at how access occurs on a daily basis in different places where food is purchased and consumed (Lucca). Only in Milan, this issue is framed in relation to the spatial distribution of socio-economic indicators of population and the identification of very critical areas in terms of access to food resources (e.g. the Gratosoglio, Ponte Lambro, and Adriano districts), defined as *food deserts* (Fig. 3).

A further objective is food education, shared by the documents of Livorno, Rome, Milan, Turin, and Lucca. Compared to the existing national programmes taking place only in primary schools (and applied successfully in many areas of Italy, for example in Emilia-Romagna), these food plans recall the need to establish pedagogical nutrition programmes in all education levels (Turin), jointly developed together with schools, families, trade associations (Lucca), and public procurement companies (Milan). Another objective presented in the documents of Lucca, Tollo, Castel del Giudice, Madonie, and Rome concerns the development of short supply chains and the strengthening of urban-rural relations within the food systems.

Figure 4. food gardens in via Goito, Livorno. Source: Luisanna Carleo

Specific actions relate the organisation of forms of cooperation and agreements between urban consumers and rural producers (Castel del Giudice, Madonie), the provision of a higher amount of local food in retails, restaurants, school and company canteens (Lucca), and the strengthening of the presence of farmers within local markets (Rome, Milan, Fig. 1). A final objective concerns the sustainable management of natural resources and ecosystems (Livorno, Castel del Giudice, Madonie, and Lucca) for promoting a type of agriculture that protects environment and landscape and generates ecosystem services. In some cases, agricultural production is sustained for reducing—or eliminating completely, as in Castel del Giudice—the use of pesticides (Livorno).

One element of interest concerns the link among food plans and statutory planning tools. The survey highlights that none of the food plans weaves a direct relationship with local plans. Only seven out of ten food plans identify objectives and possible interventions to be introduced in planning policies. Here, three aspects need to be highlighted. First of all, the conservation of agricultural land for reorienting planning policies is supported in Livorno and Pisa. In the first case, the food-planning linkage is strong because in the food plan's operational part and strategic axis "Strengthening the sustainable short supply chain as a tool for local development"

Figure 5. Agrarian landscape in Madonie. Source: Andrea D'Amore

there is the intention to block urban sprawl, sustain agricultural land-uses through local tax levers, encourage the purchase and rental of farmland, and discourage land abandonment. In Pisa, this is achieved by implementing territorial planning policies oriented to originate relations with other policy areas (e.g. rural, commercial, infrastructure policies). In addition, the survey highlights a number of requests for planning new areas to be used for urban agriculture (Fig. 4), on public or private land, also as a resource to offer economic support to low-income families and promote social integration (Messina).

Lastly, the Turin food strategy intends to influence the drafting of the new metropolitan territorial plan, towards critically revising the land regime and attempting to overcome territorial inequalities.

An important component of most of the investigated food plans lies in the creation of governance mechanisms to ensure inclusive learning, participation, and coordination of social and institutional actors, but also to monitor and implement the plan itself. In this context, the Food Council is the most recurrent form of governance, also due to many successful international examples (Aa.Vv. 2019). Here, the interesting aspect lies in the different weight attributed by the food plan to this instrument. For example, in Messina, the Food Council is conceived as an instrument of governance and food democracy, capable of organising and orienting the

agri-food sector, enhancing its contribution to integrate various socio-economic actors towards a shared interest. In Livorno, in addition to coordinating and managing participation, it has the function of developing, implementing, and updating the food plan and supporting the local authority to develop an integrated food policy. More limited to the implementation of the food plan and to convey participation is the function of the Castel del Giudice Food Council. In the analysed plans, also other more traditional governance tools and mechanisms emerge, such as the memoranda of understanding (Turin and Milan), programme agreements (Pisa), thematic and inter-councillor's boards (Milan), mayors' assemblies (Livorno), working groups within the administration (Livorno), and local support groups (Messina). Hence, with the exception of the Food Council, all these governance mechanisms are already known and used in collaborative action of local governments.

SOME IMPLICATIONS OF FOOD PLANS ON ECONOMY AND ENVIRONMENT

The purpose of this section is to investigate if and how the food plans interpret food as a resource capable of producing positive impacts on the economic and environmental sustainability of the food system. The decision to focus on economic and environmental areas lies in the desire to study two areas in which food policies have been deeply analysed in the past decade.

On the economic level, the analysis reveals a certain diversity of responses from the food plans. A first significant group of experiences aims to create physical or digital places for the exchange and interaction between producers and consumers, the so-called food-hubs. In Turin, the traditional logistic platform has been transformed into a meeting place for the supply and demand of food, which is functional for consumers but also for small producers. In this way they can generate consortia to access also large-scale distribution centres. In the Livorno and Messina plans, the food hub is a digital space, which develops short supply chains and allows local producers to reach consumers and public canteens. Furthermore, in Tollo it facilitates the re-entry of uncultivated soils and abandoned rural buildings on the market, for new uses and cultivations. The development of new business models, the creation of new agri-food enterprises, and the consolidation of existing ones are central to a number of food plans. Especially in Messina and in the Madonie, this fosters short supply chains and the specialisation towards typical local products, sustaining biodiversity (Fig. 5).

Unlike the Messina case, however, even these new simple business models rarely provide entrepreneurial training that goes beyond the ineffectiveness of traditional start-up programmes. Another response emerges in Castel del Giudice and in

the Madonie, it lies in enhancing local production through the introduction of protocols to certify origin on voluntary basis.
Lastly, with respect to the purchase and sale of food, measures are oriented to introduce reduced taxation for organic and natural products and increase the VAT for the more processed ones (Turin), set a minimum level of organic products in public procurement, and reduce taxes for the stores that redistribute surplus food (Milan).
Responses on the environmental level seem to have a very limited weight in the plans and refer to two main types of actions. In relation to agricultural production, mechanisms for protecting productive farmland from urban development (Livorno) and the transition to organic farming (Castel del Giudice) are conceived. Lastly, food education is proposed especially in schools, but also in public places such as municipal gardens, urban parks, and protected areas. In essence, the findings related to the contribution of plans to the economic and environmental sustainability of food systems report no significant innovation since most of them refer to policies and actions already put in place by local authorities.

CONCLUSIONS

The investigated food plans represent the first experiments in the field of food planning in Italy. The conducted survey revealed a certain diversity of the promoters of the plans and of its governance mechanisms. A convergence in the stated objectives is recognised, despite some differences. Most of them contribute to import good practices and apply solutions deemed effective, rather than originating innovation in the food system, shaping new relationships between public health, quality of life, and environmental protection (Morgan 2009). In spite of this, these plans reveal good results in the objective of transposing the post EXPO 2015 legacy into policy tools.
In fact, they neither invoke nor activate new planning tools, which would have been added to the many already requested by Italian legislation. Rather, they try to trigger a process of cultural and institutional enhancement that allows to coordinate and integrate different policies, with the aim of supporting the transition towards more sustainable food systems and promoting a development model capable of protecting the environment and the well-being of future generations. However, most of the contents of the food plans still seems to be expressed in general objectives rather than finding effective applications and creating significant results in performance.

FOOTNOTES

1 The Framework for the Urban Food Agenda is the result of a multi-year research carried out by the Department for Economic and Social Development directed by Costas Stamoulis, nourished by a preliminary work elaborated by a team of researchers from the University of Cardiff coordinated by Roberta Sonnino (in which also also Helen Coulson, Terry Marsden, and Kevin Morgan took part). The document identifies four so-called cross-cutting principles that give substance to the holistic vision of FAO focused on the contribution of food systems to sustainable urban development: i) urban/rural synergies, following the awareness that food-related strategies contribute to promoting balanced development policies between city and countryside, ii) inclusion and social equity, for recognising the challenges related to food access and promoting an inclusive agri-food economy, iii) resilience and sustainability, for promoting the conservation and sustainable use of natural resources and ecosystem services, and iv) food systems' interconnections, for emphasizing the relationship between the different social, economic and environmental dimensions of food (FAO, 2019a).

2 The Milan Urban Food Policy Pact (MUFPP, 2015) is an international pact signed by 250 cities from all over the world aimed at interpreting food as a trigger for sustainable urban development. It represents the main framework for local governments and international organisations working on food policies for developing and shaping the governance of sustainable food systems.

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Figure 1. Firekitchen. Design: Johanna Dehio. São Paulo, Brazil, 2017. Different cookware in use ©Johanna Dehio

DESIGNING FOOD CYCLES: THREE PATHWAYS TOWARD URBAN RESILIENCE

Sabrina Sposito

This contribution refers to the creative actions led by the Leibniz University Hannover (LUH) in the framework of the Creative Food Cycles project. It gives an overview of current speculations and testing in designing food cycles, based on the notions of urban metabolism and resilient food systems. A selection of best practices contained in the Food Interaction Catalogue is presented to enlighten spatial qualities, societal benefits, and actors' constellations being boosted creatively in the market, kitchen, and table setups. The nine prototypes conceived during the workshop 'Food Cycles Pop-Up" are illustrated, as explorations and potential inventions for "urban food hotspots". Finally, three pathways towards urban resilience are briefly traced towards a regional and local development based on food cycles.

food cycles / food flow / practices / prototypes / pathways

Figure 2. Yatai Cart. Design: Note Architect, Fukuoka, Japan, 2018. The Yatai cart as movable coffee stand ©Note Architects

Food cycles provide design disciplines with opportunities of speculations and testing, as circularity builds on the capacity of single segments to interact with and feed each other. Time is an inherent logic of cycles, which complements that of space. Thus, the natural substratum supplying food to territories and societies has been recently examined through the lens of processes that can help regenerate and restore it. It was back in the sixties that the importance of material flows within the urban ecosystem emerged (Kennedy et al. 2010), as Wolman (1965, p. 180) demonstrated that the "metabolism of a city involves countless input-output transaction." Wolman enlightened on the necessity of completing a "metabolic cycle" to avoid imbalances in the system determined by waste overload. Applied to food provisioning, the observation of material flows has intercepted consistent research across natural and urban studies, architecture, and arts. Emphasis has been given to connecting cities and the countryside in terms of exchanges—of assets, actors, and semantics: within a defined geographical region, or foodshed (Hedden 1929); through agro-ecological principles (Vaarst et al. 2018), regenerative approaches (Girardet 2010), and agro-urban models (Donadieu 2013); by linking food to urbanism, to the public and private realms of cities (Parham 2015); in addressing peripheries as catalyst of sustainable urban-rural dynamics (Schröder et al. 2018).

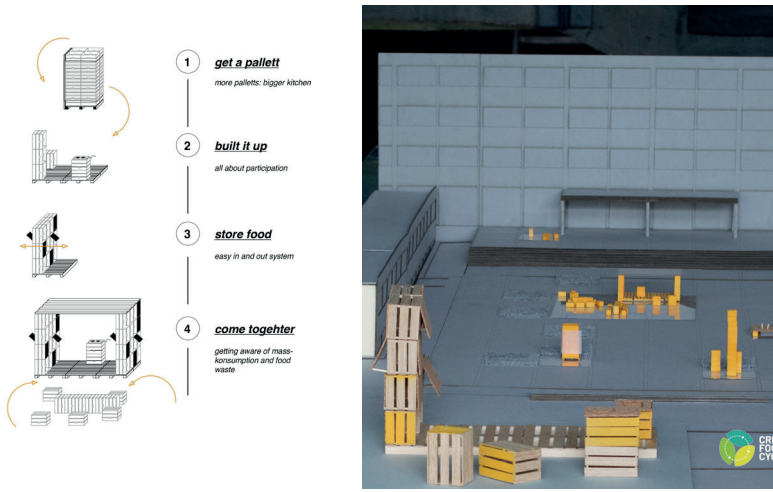

Figure 3.Leftover Performance. Design: Julia Theis and Marsha Dinse.2019

Beside it, a trend can be recognised in that alternative food networks create commons as "a reaction to a placeless and unjust corporate food system" (Borčić 2020, p. 4). However, gaps in-between strategic efforts and spontaneous reactions towards resilient food cycles still exist, making it necessary to envision new roles of architects and designers as daily agents of urban futures. How food flows can be traced out and re-shaped in everyday life? How creative food cycles can be established as a new domain of design? What pioneering actions can be fostered towards empowering urban communities?

PRACTICES

Innovations in food cycles have been occurring in the Global North and South. A collection of best practices in the Creative Food Cycles project, indeed, gives evidence of a double condition: on the one side, it can be recognised the broad geographical presence of creative inventions, at each latitude; on the other, a vast diversity of solutions arise in response to the peculiarities of regional climates, technological readiness, raw materials and resource streams, community needs, and vernacular knowledge. (Markoupoulou et al. 2019)
With regard to distribution and consumption phases, focused by the research

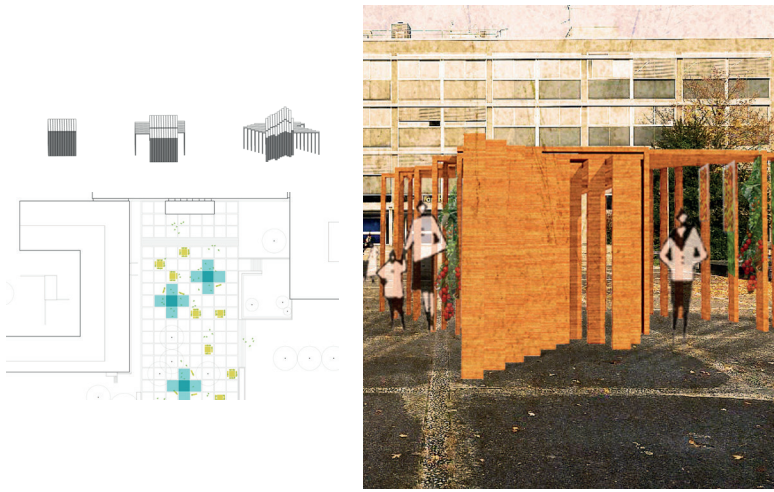

Figure 4. Food Machine. Design: Leona Schubert and Michel Grändorf.2019

unit of Leibniz University Hannover (LUH), the categories of "market", "kitchen", and "table" have been identified to interpret the role of food cycles in daily urban actions, with clear cultural and civic scopes. Hence, the supply of foodstuffs through multi-functional food nodes, the socio-cultural transformation of ingredients in the acts of cooking and eating, the shaping of new urban communities through conviviality rituals and sharing habits have been investigated. In this contribution, each category is analysed through a selected practice, to enlighten spatial qualities, societal benefits, and actors' constellations being boosted creatively through food: a) Fish Market in Bergen, Norway (Eder Biesel Arkitekter); 2) FireKitchen (Johanna Dehio); c) Yatai Food Carts (Note Architects).[1]

Market

The Fish Market in Bergen accelerates ecological food cycles in the harbour area of the old town, located at the core of the UNESCO protected site of Bryggen. It offers a place for interactions between fishery and trade, port and city, which refers to the membership the Hanseatic League since late medieval times. The architecture enhances the urban space hosting new experiences linked to food tasting, goods distribution, and preservation of heritage.

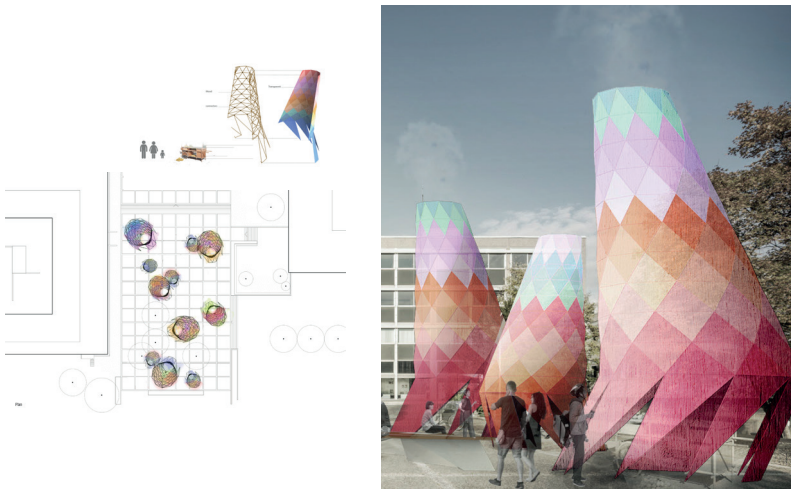

Figure 5.Pneumatic Towers. Design: M.Adel Alatassi and Elvin Demiri.2019

Kitchen

Firekitchen arises as a collaborative design project based on shared intents, offering artistic means for new inventions. It builds on the particularities of cultural environment, vernacular techniques, and renewable materials to originate a common kitchen, a dinner table, and a shelter. Clay is sourced and employed locally in the neighbourhood of Beiza in São Paulo to design ecological pottery, placed at the centre of an open feast around a fireplace.

Table

The Yatai Food Cart in Fukuoka combines DIY approach and fabrication with the traditional micro-scale architecture of Japanese food carts deriving from the Edo period. It consists in a modular and movable coffee stand, built with square timber and plywood, which can be located in abandoned interstitial spaces to support urban life and regional food cultures through a simple, effective, and replicable design.

PROTOTYPES

Taking inspiration from the international inventory of creative practices, nine prototypes2 have been conceived in the forms of social tables, cooking utensils, market multi-settings, and urban kitchens with a novel performative, experiential, and experimental character. The three-day workshop "Food Cycles Pop-up" coordinated by LUH has offered a framework to systematic testing in the food settings of Hannover (Lower Saxony, Germany) giving impulses to crucial nodes and drivers in the system. The five analytical lines of food culture, conviviality, digitisation, circular economy, and sustainability mark and enlighten the most compelling fields in which design-driven actions should step and contribute.

1. Food culture. It relates to the idea of multiplying public living theatres in the city based on performing activities and art-based experiences. The prototype SensFest stimulates senses through a discovery pathway gradually driven by rotating furniture, which additionally encloses tasting and gathering hubs. The other prototype in this field DIY Box focuses on the micro-mobility of food, building colourful and replicable boxes to transport cooking utensils for the set-up of community kitchens.

2. Conviviality. It engages with the emerging ritual of sharing tables. Plate Revolution confronts with the demand of healthy diets and proper dining, by conceiving a space for social workshops in which to self-build plates and other utensils. Convivi-Island offers new urban furniture that moves according to the desired orientation, atmosphere, and company.

3. Digitisation. It concerns the ability to crafting and developing advanced devises as an enabling factor of food cycles. The project Food Machine manufactures an advanced light architecture made of wooden panels: by pressing them, various ingredients are supplied to users for creating a personalised meal. Pneumatic Towers consists in a pavilion, built through parametric design, which aims at stimulating different perspectives and perceptions about food by the use of colours and by creating surprisingly events and opportunities of interactions.

4. Circular economy. It merges recycling practices and co-design along the food chains. The proposal Leftover Performance creates a public kitchen from recycled materials based on the creative re-use of leftovers, thus giving a collective contribution to food-waste reduction. No Walls fosters multiculturalism through playful 'totems' that facilitate social integration and urban cohesion based on public crafting and dining.

5. Sustainability. It relates to connecting regional markets and bio-production to the city life and responsible behaviours. The prototype Portable, selected to be scaled up as a 1:1 installation, considers the European transition toward low carbon societies by designing an unfolding movable table in the scale of unused parking lots, which contains a green raised bed, for community use and implementation.

Through the nine prototypes, modular, pop-up, and flexible inventions for an "urban food hotspots" have been proposed: they represent alternative living stages capable of activating ecological food cycles (Sommariva, Sposito 2019).

PATHWAYS

As a result, three pathways for urban resilience can be briefly distilled.
Food can represent a "medium", involving the cultural, urban, and geographical spheres of everyday life and forging the inter-linkages between new aesthetics, flavours, and habits. Food can be strongly driven by design to engage communities differently, by multiplying "food stages" in the cities for a direct connection with food and food practices. Food can serve as a "strategic asset" for shaping urban-rural economies, resilient foodsheds, and sustainable food chains

FOOTNOTES

1. A complete description of the projects is contained in the Food Interactions Catalogue: Collection of Best Practices: https://creativefoodcycles.org/food-interactions-catalogue/. [Accessed: 01.09.2020].

2. Prototypes have been developed as follows: (1) "SensFest" by Fabiana Cerutti Rossetti and Selin Karamanoglu; (2) "DIY Box" by Janine Philipp and Nadina Jurat; (3) "Plate revolution" by Kit Wing Virginia Siu and Blanca Mendez Rebollo; (4) "Convivi-Island" by Deiby Betancur, Jorge Fuentes, and Jiajing Sun; (5) "Food Machine" by Michel Grändorf and Leona Schubert; (6) "Pneumatic Towers" by M.Adel Alatassi and Elvin Demiri; (7) "Leftover Performance" by Marsha Dinse and Julia Theis; (8) "No Walls" by Isabella Sanches Previti and Fabrice Rutikanga; (9) "PorTable" by Anna Pape and Josephine Arfsten.

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Figure 1. VàZapp' practice (source: VàZapp' team).

CREATIVE ECOSYSTEM SERVICES FOR NEW URBAN-RURAL COMMUNITIES: THE "VÀZAPP"' EXPERIENCE

Maria Cerreta
Massimo Clemente
Gaia Daldanise
Giuliano Poli

Food cycles, as dynamic and ever-changing systems, need flexible solutions to be co-designed and co-evaluated to generate benefits for people and the environment. Regenerating capital stocks of ecosystem services through urban-rural co-operation requires a "creative capital" which can continuously innovate the use of resources, skills, knowledge, and impact monitoring. Moreover, cultural creative enterprises generate a new value chain in which tangible and intangible assets join the "shared value" perspective to enable a new supply chain as a pillar of the circular economy paradigm. In this perspective, a model for a creative food cycles value chain has been designed, using a Stated Preference (SP) method. A social/creative enterprise—called "VàZapp"' (Foggia, Apulia region)—has been selected as a case study for the testing of the proposed model. The research results allow preliminary reflections about the definition of "creative ecosystem services" as tools for overcoming some critical issues concerning urban-rural cooperation.

creative ecosystem services / capital stocks / creative capital / circular economy / urban resilience

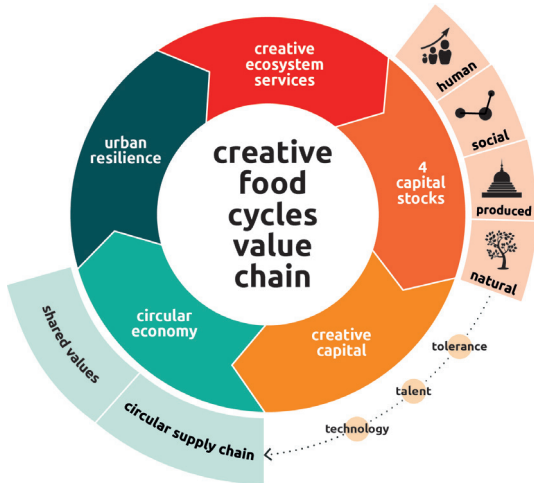


Figure 2. Creative food cycles value chain (authors elaboration)

Food cycles, as dynamic and ever-changing systems, need flexible solutions to be co-designed and co-evaluated to generate multidimensional benefits for people and the environment. Regenerating socio-cultural ecosystem services through the monitoring and management of urban-rural cooperation requires a "creative capital" which can continuously innovate the use of resources, skills, knowledge, and impact monitoring.

The broadest definition of Cultural Ecosystem Services (CES) provided by the Millennium Ecosystem Assessment concerns "the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience" (MEA 2005, p. 600). Nevertheless, defining the concept of Ecosystem Services as a "boundary object" for sustainability (Abson et al. 2014, p. 29) means setting the relationship among some key-terms linked to the role of an integrated assessment.

In this study, two critical terms have to be considered: "ecosystem service" and "benefit from ecosystem". In 2010, The Economics of Ecosystem and Biodiversity (TEEB) organisation stated that receiving a benefit from an ecosystem means improving the well-being of final users of services. Therefore, it is not possible to define ecosystem services without considering the existence of one or more beneficiaries (Haines-Young, Potschin 2012). As a specification of the MEA definition,

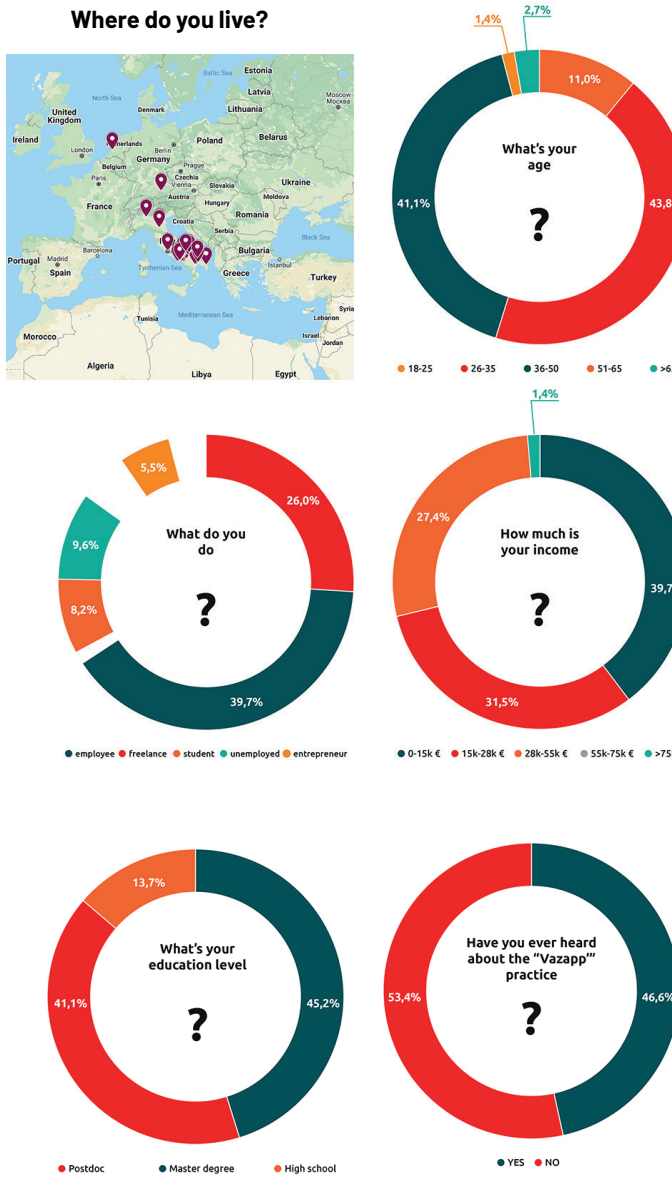


Figure 3. Social profile and statistics of respondents (authors elaboration)

Which are the most important ecosystem services linked to these practices?

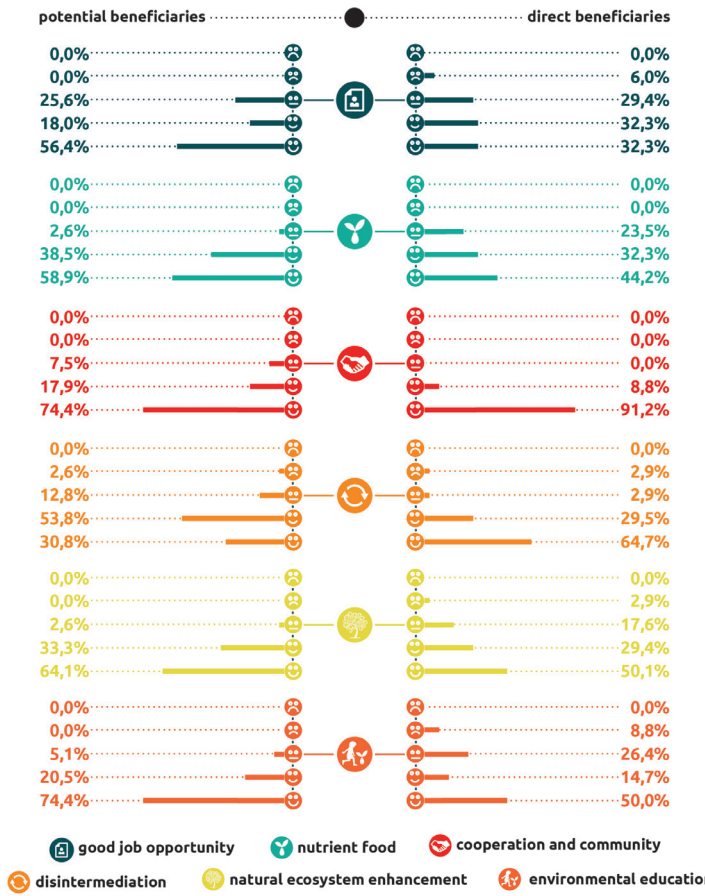


Figure 4. Ecosystem services elicitation and preferences through the qualitative Likert scale (authors elaboration)

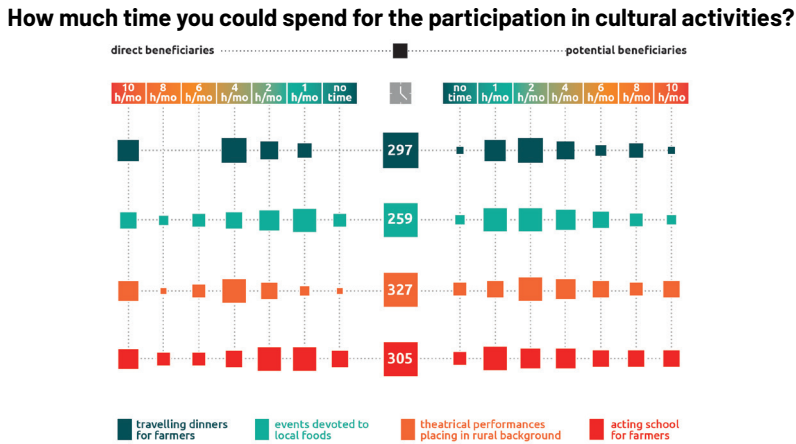


Figure 5. Stated preference about people interesting to be involved in creative agri-food practices activities (authors elaboration).

we use the concept of TEEB—which defines the ES as "the direct and indirect contributions of ecosystems to human well-being"—highlighting four capital stocks referring to "human capital", "social capital", "produced capital", and "natural capital" (TEEB 2010, p. 19). According to the TEEB agri-food framework (2018), these capital stocks represent the foundations of an eco-agri-food value chain in terms of material/immaterial flows, by varying from production to manufacturing, to distribution, and to consumption (TEEB 2018).

All these capitals need to be assessed through qualitative and quantitative indicators; e. g. the "human capital" can be measured through the indicator "good job opportunity"; the "social capital" can be assessed through the observation of "cooperation and community activities".

Despite that the culture and cultural ecosystem services are multifaceted concepts, the "creative capital" becomes an essential catalyst in which Technology, Talent, and Tolerance (Carta 2007; 2009; Florida 2002; 2005) are key-issues referred to the quality and innovation with substantial impacts on the competitiveness of organisations and on local attractiveness.

The creative capital is the engine of "creative industries" which have been defined by the UK Government's Department for Culture, Media, and Sport as "those industries which have their origin in individual creativity, skill and talent and which have

a potential for wealth and job creation through the generation and exploitation of intellectual property" (DCMS 1998, p. 4). The creative capital represents the starting point for a culture-led regeneration (Miles, Paddison 2005) in which Cultural and Creative Enterprises (CCEs) have a crucial role. CCEs are oriented to a synergic and symbiotic relationship among community, business, and landscape (Pratt, Jeffcutt 2009; Valentino 2013), highlighting the talents and the convergent interests of citizens, private organisations, and public institutions to transform them into original products and services. In this perspective, creativity, quality, and innovation of CCEs are crucial for the sustainable competitive advantage of urban-rural systems (Troilo 2014; Vorhies, Morgan 2005). Moreover, CCEs generate a new value chain of resources in which tangible and intangible assets join the "shared value" perspective to enable a new supply chain as a pillar of the circular economy paradigm. Within the international debate about Circular Economy (CE) models (Ellen MacArthur Foundation 2013), the need for a new value chain for the „product-as-a-service" lifecycle has been highlighted. A „circular value chain" (ARUP 2017) engages all stakeholders in contributing to generate best value for all of them, to build long-term resilience, and to produce cultural, environmental, and social benefits.
In the Italian CE Story Atlas (CDCA 2017), urban resilience practices have a significant role in implementing the enabling factors recognised by the European Environment Agency (2016): eco-design, repair, refurbishment and remanufacturing, recycling, economic incentives and finance, business models, eco-innovation, governance, skills, and knowledge. These factors enable the Creation of Shared Value (CSV) that is directly functional to the organisations' competitive advantage and profitability. By optimising and using specific resources and skills, CSV builds economic value through the creation of the social value (Porter, Kramer 2011), generating job opportunities and innovation through an advanced form of shared responsibility, which DelBaldo and Demartini (2016) refer to as "Territorial Social Responsibility". According to Mehmood (2016, p. 413) urban resilience can be defined as "[…] a proactive rather than reactive view to planning, policy-making and strategic steering in which communities play a vital role for resilient place shaping through their capacity for active learning, robustness, ability to innovate and adaptability to change". The paper's perspective highlights urban resilience as the capability of innovative micro-networks of creative practices to co-create enabling factors (e.g. social bonds, shared values, cultural co-operation, etc.), responding to urban-rural changes and conflicts.
The contribution explores the this research field considering the following main issues: How do beneficiaries of ESs perceive creative food cycles initiatives? How do creative and collaborative processes facilitate to generate new urban/rural

communities focused on the exchange of skills and knowledge which improve urban resilience? In this perspective, a model for a creative food cycles (CFC) value chain has been designed, using a Stated Preference (SP) method. Section 2 introduces the elaborated methodological approach, while section 3 shows results and conclusions.

A METHODOLOGICAL APPROACH FOR A CREATIVE FOOD CYCLES VALUE CHAIN: THE "VAZAPP"' BEST PRACTICE.

Within urban-rural innovative productive cycles, the consumer has become more and more a "prod-user" (Rifkin 2014) of cultural contents and services, through technologies, evaluations (Cerreta, Poli 2017; Mele, Poli 2015), and collaborative processes (Clemente et al. 2015; Daldanise et al. 2020) addressing the creation of shared value (Porter, Kramer 2011; 2019). Based on the objectives of the Circular Economy Story Atlas (CDCA, 2017), a proposal for the resilience of urban-rural systems should comprehend a new enterprise model based on a circular supply chain applied to a "cultural ecosystem" and to creative services, which can generate social, cultural, economic, and environmental values and opportunities, as well as continuous forms of innovation.

A social/creative enterprise—called "VàZapp"' (Foggia, Apulia region)—has been selected as a case study for the testing of the proposed model. It is a network of people who have been trying to transform the short food supply chain into a cultural food supply chain. „VàZapp"' (Figure 1) offers services and events that promote the exchange of skills and knowledge among the actors of the agricultural supply chain, sharing ideas and problems related to these activities. Each member of the network brings an added value which translates into professional collaboration and social innovation through creative solutions oriented to the agro-food sector (Lombardi et al. 2020). Different spatial contexts have been hosting „VàZapp""s four creative events for six years: e.g.: in Cascina Savino (Foggia), "We are in Paglia" and "Meloday" has been performed; Elda Cantine (Troia), Teatro Lucio Dalla (Manfredonia), Ente Fiera di Foggia hosted "Teatri del Gargano"; while "Contadinner" spread throughout 18 municipalities of Apulia. Through its methodological approach, which roots in the different backgrounds of this hybrid enterprise, the research aims at defining and evaluating "creative ecosystem services" within a "circular value chain" to investigate the opportunities of food cycles and urban-rural systems that CCEs, such as the good practice VàZapp', have been facing in economic, social, environmental dimensions.

The proposed model for understanding and assessing a value chain of creative food cycles proceeds as follows (Figure 2):

1. Identifying the four capital stocks for socio-cultural ES in terms of human, social, produced, and natural benefits. Within these capitals, the following six ecosystem services have been selected, or integrated, according to the priorities of the "VàZapp'" practice: "good job opportunity" (GJO), "nutrient food" (NF), "cooperation and community" (CC), "disintermediation" (D), "natural ecosystem enhancement" (NEE), and "environmental education" (EE). The criteria for selecting the six ES can be defined as follows: Exploring GJO means understanding how "VàZapp'", or a similar practice, can contribute to generate an enabling context that promotes employment through funding and formal/informal partnership. NF should be at the foundations of an agri-food value chain that arises as an alternative to mass agricultural production, and, therefore, it has been selected. CC is consistent with the purpose of "VàZapp'" aiming at improving the feel of belonging to a community and the cooperation among stakeholders. Moreover, "VàZapp'" guarantees D as the most relevant service reducing steps within a supply chain (e.g., a virtual market delivering agri-food to the neighbourhood), enhancing the benefits in environmental terms. NEE and EE have been chosen since the cultural activities of this practice focus on the preservation of local traditions and bequeathed agricultural techniques, the education of new generations in respecting nature and understanding its processes, and the comprehension of the rural "genius loci".

2. Determining the creative capital as the fifth ES capital stock in terms of Technology innovation, Talent exploitation and Tolerance implementation for generating cultural and creative services—elicited by the "VàZapp'" team—to boost urban resilience;

3. Investigating the circular economy relationship in terms of the creation of shared value for a novel food supply chain;

4. Evaluating resilience according to ability of practices to generate adaptive food cycles enabling relationship within the local community and promoting innovative services;

5. Generating creative ecosystem services that boost local regeneration processes.

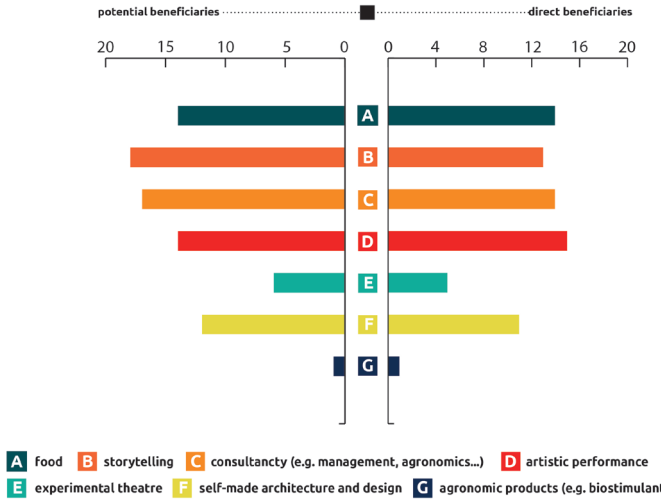
The research steps have been addressed through the Stated Preference (SP) method (Adamowicz, Deshazo 2006) which has been operationalised by the "VàZapp' survey" (https://bit.ly/2O55BEG).
The SP methods are particularly useful for assessing the demand of individuals for non-market goods. They have been employed to understand how the beneficiaries' preferences concerning cultural ecosystem services can improve the agri-food value chain through the creative capital and CE criteria which define „creative ecosystem services". The SP survey has been addressed to direct users and providers of VàZapp' services (direct beneficiaries) and people interested in the CFC at the foundations of similar agri-food practices (potential beneficiaries).
The purposes of the survey proceeds as follows: 1) Scoring the six selected ES, according to preferences which can be expressed through the Likert scale in 5 points; 2) Assessing how much time a person is going to spend to cooperate at the functioning of the experiences in order to highlight the "creative capital" potentials; 3) Detecting typologies of relationships among involved stakeholders (e.g. working partnerships, consultancy, sponsorships, etc.) in terms of the creation of shared value for the "circular supply chain"; 4) Understanding what people are going to share in terms of products, skills, experiences, or services for getting the potentials of local community relationship to emerge in order to boost urban-rural resilience. In the next section, the preliminary results of the SP survey are shown.

RESULTS AND CONCLUSIONS

The overall number of respondents are 73 people, among which 46,6% (34 persons) include "direct beneficiaries" of the "Vazapp'" practice, while 53,4% (39 persons) refers to people that never heard about this practice; nevertheless, they can be considered as „potential beneficiaries" (Figure 3). The "potential beneficiaries" have been sampled according to their interest to be involved in rural experiences, urban resilience strategies and cultural activities linked to agri-food chain discovery and knowledge. The representative sample, indeed, is composed of people with a high education level (45,2% hold a master-degree, while 41,1% are involved in Post-doc) and with job positions as employee (39,7%) and freelance (26,0%).

The first question of the survey relates to the priorities of six ecosystem services which "Vazapp'" or similar practices can spark. The results highlight that "cooperation and community" and "environmental education" score at the top of the ranking both for potential beneficiaries and direct beneficiaries. About the first issue, the services linked to the practice aim to enhance relationship among people engaged

What do you like to share for a creative performace of "VáZapp"?



Which types of creative collaboration with other Stakeholders can you spark?

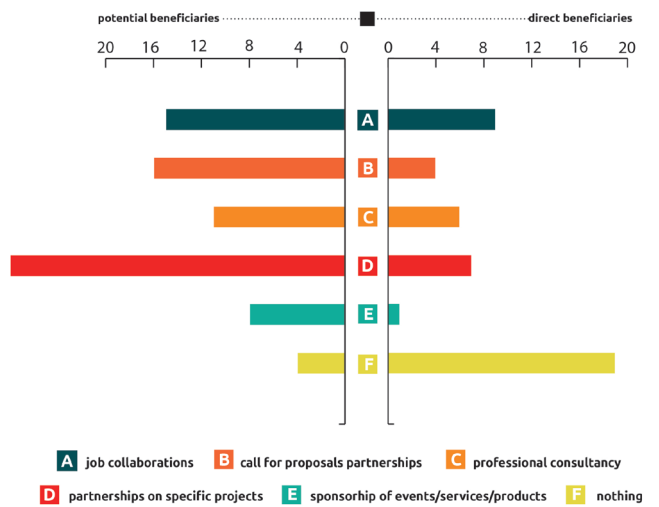


Figure 6. Stated preference about people's willingness to share products, skills, and services (top figure) and creative collaboration among Stakeholders (bottom figure) (authors elaboration).

in socio-cultural activities, strengthening the sense of belonging to a community that shares ideas, skills, knowledge, and problems about agriculture and food chains. 74,4% of potential beneficiaries and 91,2% of direct beneficiaries attribute extreme importance to this service. Nevertheless, there are some discrepancies between potential and direct beneficiaries about the second position in the ranking, since the first class of beneficiaries (74,4% of interviewed people) place the „environmental education" at the top. In comparison, 64,7% of direct beneficiaries rank the „disintermediation" as the second relevant service provided by the "Vazapp'" practice (Figure 4).
The second observation aims to understand how much time a person could spend enjoying the cultural and social activities provided by creative agri-food practices. The overall time amounts to 1188 hours per month which 73 people are willing to spend to be directly engaged in the provided activities. Art performances and acting schools emerge as the most interesting activities in which people have stated to spend more time (10 hours per month and more) (Figure 5).
The third question of the survey relates to what people are willing to share in terms of agricultural products (e.g. food, biostimulants, etc.), skills (e.g. management and agronomics consultancies) and services (e.g. artistic performances, storytelling, etc.). According to direct beneficiaries, "Artistic performance" results at the top rank with 44,1% along with "Food" (41,2%). The potential beneficiaries, instead, prefer to share "Storytelling" (46,2%) and "Consultancy" (43,6%).
Finally, the fourth question refers to typologies of creative collaboration which Stakeholders can spark. According to 71,8% of potential beneficiaries, „Partnership on specific project" has been considered as the most likely type of collaboration; while 55,9% of direct beneficiaries stated that no form of cooperation has been activated (Figure 6).

The research results allow preliminary reflections about the definition of "creative ecosystem services" for overcoming some critical issues concerning cultural, economic, environmental, and social conflicts that generally affect the southern Italian communities. Pursuing objectives of effectiveness, efficiency, productivity, and sustainability due to CCEs and CE enabling key-factors that refer to creative capital, shared value, and circular supply chain can contribute to solve structural problems at the foundations of agri-food value chains (e.g. the reduction the quality of agri-food products, low management skills of producers, the deprivation of agri-food producers in social and economic term, etc.). The perspective of "creative ecosystem services", therefore, can deal with these problems through improving the productive capacity and increasing the negotiating power of producers.

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Figure 1. Public cultural event organized by "libreria due punti" in the urban gardens "Orto aperto" in Clarina, Trento. Source: Elisa Vettori, 2020.

SOCIO-ECOLOGICAL CONNECTIVITY FOR PRODUCTIVE, CIRCULAR AND RESILIENT TERRITORIES. THE EXPERIENCE OF THE "SATURN" EIT CLIMATE-KIC PAN EUROPEAN PROJECT

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Since the European conference on Sustainable Cities and Towns happened in Aalborg in 1994 the urgency to promote a more balanced relationship and to enhance the reconnection between urban and rural areas became a matter of discussion in research and policy-making. A further important push towards the implementation of reconnection strategies occurred in 1997 with the European Conference on Rural Development. Nowadays, many stakeholders involved in territorial and landscape planning, in order to implement a new relationship between cities and countryside, aim to remove rural areas from margins, to bring citizens closer to the urgent need to safeguard the entire natural ecosystem, and to preserve rural areas and the ecosystem services they provide. The food system can be a key of reconnection between urban and rural areas and has a great impact on materials and energy flows in the metabolism of a city-region. The contribution will explore the spatial transformation of urban and rural landscapes in the city of Trento through a multidisciplinary lens on social dynamics and the governance of food policies.

foodscape / multifunctional landscape / socio-ecological connectivity / rural-urban connectivity

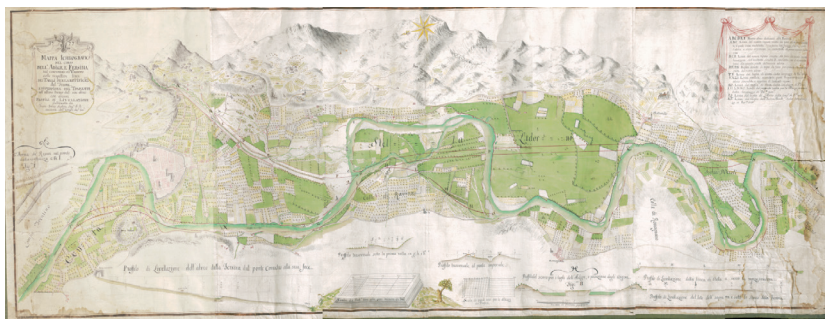

Figure 2. Gian Bartolomeo Scotini, Iconographic map of the Adige river and Fersina stream along the borders of Trento, 1777. Source: Archivio Storico del Comune di Trento, Biblioteca Civica di Trento, Ordinamento austriaco, Esibiti, ACT3.8-XXV.4373.1848

THE DEVELOPMENT OF THE CITY-COUNTRYSIDE RELATIONSHIP OVER THE CENTURIES

For centuries, urban settlements were shaped by the presence of rivers and nearby fertile soils as essential conditions for food production which determined a changing relationship between agriculture and architecture. This close connection between urban form and agricultural practices shaped landscapes. A major shift took place since Industrial Revolution which brought a transformation in agricultural techniques and consequently in city-countryside relations. Mechanisation of crops' growing and food production led to an increasingly strong orientation towards monoculture and larger plots. This caused agricultural activities to move further from fragmented and scattered urban environments in order to adapt more efficiently to the growing industrial and production facilities. The city-countryside relation became therefore weakened because of the increased distance between agricultural and urban areas (Marot 2019). Hybrid, fragmented, and multi-functional territories have emerged, often defined as peri-urban areas.

More recently, after the Second World War, the movement of significant flows of people from rural to urban areas occurred. Such migrations increased the dom-

Figure3. Plan der Stadt Trient mit einen Theil der Umgebung, 1834. Source: Biblioteca Comunale di Trento, TG 1 f 31.

inance-dependence relation between cities and the countryside. (Meloni et al. 2016). The fusion between urban and rural has so far been hindered by the rigid regulatory constraints imposed by urban zoning, according to which each function is located in a specific designated area. The overcoming of this planning model is prevented by an uncertain cultural and social condition, by the industrial crisis, and the need to transform the consolidated urban fabric (Dal Ri et al. 2020). While focusing on the region of Trento it is possible to recognize the territorial development dynamics above mentioned by studying the historical cartography of the city. Some of the paintings in the Buonconsiglio Castle, that date back to fourteenth century, show that agricultural activity was fundamental for society and in close connection with the urban area. This relationship remained unchanged until the nineteenth and twentieth century. As represented in the pictures, the city was a fragment within a rural landscape. One can say that settlements were in the service of the countryside (Fig. 2).

Since peasant activity was central, many people spent most of their time working in the fields. Until 1834, it can be said that Trento was surrounded by countryside with precise and linear boundaries between urban and rural areas. Buildings were rare episodes in rural landscapes and usually, they were functional for carrying out

agricultural activities (Fig. 3). In the Trentino region, there were mixed crops like fruit trees and mulberries grown in association with horticultural plants and cereals (Grandi 1976). Animals grazed in the countryside—to keep them clean and fertilized —and for this reason, some crops were protected by dry stone walls. By studying historical maps, it can be deduced that there were urban gardens also within the city's walls, in fact it is noted that there are the same graphic symbols both within the city walls and in the immediately surrounding areas (Buffoni et al. 2015). From the nineteenth century onwards, Industrial Revolution influenced the evolution of urban and rural landscapes. Productive activities were moved from the city and agricultural systems became always more mechanised and increasingly mono-crop. There was a first major change in historical maps in 1881 when the first walls were demolished and the city expanded into the countryside. But the real change came after the Second World War when the expansion of the city exploded towards the countryside. The disconnection between urban and rural landscapes could be due to two main facts: the localisation of productive-industrial areas in the surroundings of the city and the need to have extended plots of land for agriculture, available far away from the cities. This mechanism has continued throughout twentieth century. Its unsustainability has entered the debate only recently with the emergence of a new awareness, both from an economic-social and environmental point of view, related to issues of production and consumption of food.
Today, the increasing interest in food production and preservation of biodiversity is manifested by individual citizens, small-size farmers, and associations setting up vegetable gardens and valorising natural resources, pushing for a change from large-scale to local and micro-scale production. These dynamics are shown by the numbers of public community gardens, initiatives of indoor-agriculture projects, and the recovery of abandoned areas in the city for local agricultural production (Fig. 4). In the city of Trento, the demand for public urban gardens is higher than their availability as has been demonstrated by other research projects (Meyfroidt et al. 2019).

FOOD AS AN ELEMENT OF CONNECTION BETWEEN URBAN AND RURAL AREAS

The whole food system could be a unifying element between urban and rural landscapes, encompassing economic, cultural, social, historical values, and identifying elements for a certain region. These values are reflected both in physical and immaterial aspects of the territory and of people who inhabit it, creating important connections between them. The agricultural landscapes that we see today are inextricably linked to the cultural and social background of people who worked in the

landscape by modifying it (Fig. 1). The repercussions of the food system in rural but also urban areas go beyond the production phase: also the system of distribution, consumption, and waste have important repercussions at the level of the physical space they pass through, influencing the flows of material and energy that cross the territory.

Urbanisation phenomena have caused and exacerbated the physical and mental distances between urban and rural residents. This disconnection of people from food production has led to a certain degree of indifference about the origin of food, the used production methods, and the scale of the phenomenon and its consequences. This is particularly true in most industrialised countries, where well-being is widesprea and food is abundant and cheap (Halweil 2002). Indeed, it is important to remember that in these countries less than 5% of the population produces food and that the food supply is relatively secure (Herrendorf et al. 2014).

Even if there is a growing interest in healthy diets, safe food, and even environmental issues, this rarely takes the form of organised and collective actions (Kennedy 2018). Most urban consumer initiatives focus only on a few aspects related to individual critical consumption, such as the quality and price of products at the supermarket. The broader issues of food safety, environmental protection, or the socio-economic conditions of the workers involved in food production are external to most of the purchasing decisions. For this reason, food has become a commodity, an industrial product decontextualized in the market, without any clear understanding about the role of agriculture and livestock farming in ecosystems or the social functions of the production system, a „thing" without background or ethical aspects to worry about (Francis et al. 2005). However, the contextualisation and positive linkages between urban and rural populations can be recovered through the promotion of local food systems and through establishing and strengthening connections with the rural landscape.

Successful examples of positive linkages are the so called alternative food networks (AFNs),[1] farmers' markets,[2] the so called community-supported agriculture (CSA),[3] solidarity purchasing groups (GAS),[4] food centres (which aggregate, distribute and trade food from farmers to consumers), eco-belts (which help to link rural and urban areas with activities of common interest), and others, such as food cooperatives and fair trade (Allen et al. 2003; Renting et al. 2003; Goodman 2004; Ilbery, Maye 2005; Venn et al. 2006). Urban populations spatially connected in this way to workers employed in the agri-food sector can become consumers who are better informed about the problems affecting food production and, therefore, also more committed: citizens able to actively support an ecologically, economically, and socially sustainable food production system, as well as to enhance a healthy

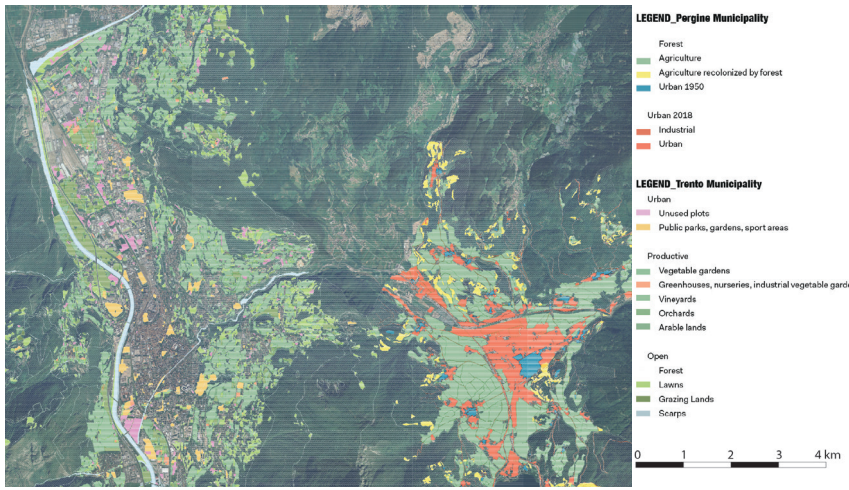

Figure 4. Thematic map based on land use layers of the Municipalities of Pergine Valsugana and Trento. Map elaboration based on Provincia Autonoma di Trento data from Portale Cartografico Trentino and Fabio Frisanco, and Municipality of Trento open source data. Map by Marco Ciolli and Sara Favargiotti, 2019.

and multifunctional rural landscape. In order to promote these changes, it is necessary to work with a multiscale and multilevel approach. The shortening of the supply chain could be a solution to improve the economic, social, and environmental sustainability of the supply chain itself. Unfortunately, this is still perceived by most as an expensive and elitist approach. This idea is sustained by the fact that, in many cases, the longer the supply chain is, the less expensive the food is for consumers. This does not happen thanks to a particular optimisation of the system but since mechanisms are triggered to extremely reduce farmers' margins. Furthermore, agricultural activities have increasingly moved away from cities.

In the scientific and physical context of the SATURN (System and sustainable Approach to virTuous interaction of Urban and Rural LaNdscapes) project funded by EIT Climate-KIC, these theoretical positions as been addressed on three case study areas: Birmingham (UK), Göteborg (SWE) and Trento (IT). In all three cases, efforts were made to create or start the debate towards creating local food policies.

Birmingham's actors act mainly on a governance level. Here, the goal is to develop a broader vision to connect and integrate initiatives related to the food system within a landscape governance framework. The development of a strong relationship is seen as a support tool for a political re-prioritisation of landscape policies

Figure 5. Public urban gardens in Mesiano hill, Trento. Source: Giuseppe Gorfer, 2019.

and is fundamental to enlarge the common interest about urban agriculture and to spread practical initiatives, and also to change the perception of local land uses. Food-growing traditions are also part of the pilot case; their sustainable improvement is supported with social farms and urban gardens. This actions are then considered for planning initiatives. To address the debate concerning food security issues and the loss of natural resources, it is important to connect cultural with planning initiatives. By doing so, it is also possible to increase the sense of place-belonging and long-term landscape stewardship (Nikologianni et al. 2020). In the context of Göteborg, where the theme of food has been fundamental for the administration for several years, it has been chosen to operate on a small-scale, with the creation of a Model Farm, the implementation of incubators, and the activations of education courses concerning farm management and urban agriculture. Farmers and citizens are empowered to develop their own farming business focusing on sustainable agriculture and the recovery of abandoned plots. Special leasing and financing schemes are dedicated to this kind of activities. Together with four other municipalities, the Municipality of Göteborg is mapping and matchmaking underutilised and abandoned land and buildings, to give them for use to new entrepreneurs who want to develop their agricultural business in the peri-urban and rural landscape.

TRENTO FOOD R-URBAN METABOLISM

In the Trentino context, it was decided to start from the enhancement of awareness of producers and consumers concerning food issues, activating communication between them, keeping high the interest on these issues, and supporting a debate around these topics at city level. To connect rural and urban landscapes it is possible to work on the beliefs of consumers—by dismantling the imagination of the elitist short-chain—and to reduce the physical and governance pressure on urban and peri-urban areas, giving space to self-production models and giving a new function to urban voids (Fig. 5).

The main levels of action are:

- the governance level, acting on local food policies;
- the analysis level of flows and involvement of the population in sustainable food consumption issues;
- the food production level, introducing innovations and improvements in the system.

The mechanisms by which the food system works today can be changed by acting on the three levels separately but it would be even better to integrate them. The starting point was the creation of the "Nutrire Trento" (literally "Feeding Trento") project through a collaboration between the Municipality and the University of Trento as part of the Unicittà Protocol in June 2017, preceded by a series of initiatives that involved local stakeholders (Forno et al. 2019). Nutrire Trento is a working table as an open and continuous discussion about experiences and visions concerning food issues and challenges for agriculture. The three main aims of Nutrire Trento are: to promote more conscious consumption patterns, to raise awareness of more sustainable production, and to shorten the distances between producers and consumers, as well as between city and countryside.
Today, Nutrire Trento is a pilot case of the SATURN project. The involved actors in these two projects are now analysing the territorial food dynamics through the study of the flows of matter and energy related to the food system. With the aim of reconnecting the countryside to the city through the production, distribution, and consumption of food, the research is developing a Food R-Urban Metabolism tool. It examines the complex relations between physical and social processes in the Trentino Alpine area aiming to connect and to enhance sustainable relations between urban and rural areas by analysing and mapping the biomass flows re-

lated to food cycles. We refer to Urban Metabolism as the "collection of complex socio-technical and socio-ecological processes by which flows of materials, energy, people, and information shape the city, service the needs of its populace, and impact the surrounding hinterland" (Musango et al. 2016). Following a review of different accounting approaches and methods, we focused on a spatial-oriented analysis merging 'top-down' and 'bottom-up' activities. They are combined with the Material Flow Analysis (MFA) as standardised accounting method.
We recognised that a 'top-down' approach ensures good comparability with other studies at the expense of a precise picture of the local condition and it does not include local stakeholders. For these reasons, the 'top-down' work has been combined with 'bottom-up' activities to assure a closer relationship with local stakeholders and a more precise picture of local flows. Once data has been collected, they have been used to calculate the ecological footprint of different biomass flows. Results will be compared to regional biocapacity to define which sectors have the highest resource consumption. Combining the two approaches and closing the gap with local stakeholders supports the development of locally-targeted guidelines towards a circular economy perspective.

FINAL REMARKS

Food production has a clear impact on landscape transformation: over the centuries, agricultural landscapes have changed in relation to production technologies and in connection with the relationship that society wants to set up for the production of food. The investigation on the Trento case study clearly highlights the opportunities of reconnecting the countryside to the city through the production, distribution, and consumption of food. The contribution illustrates the ongoing studies and preliminary results of the research, considering the experiences of the three case studies related to food systems and the relationship between cities and rural landscapes, and food growing. The foreseen achievements will be, on the one hand, to achieve a more comprehensive awareness about food system cycles, on the other hand, to guide and support local administrations in the adoption of more sustainable territorial planning policies by using the Food R-Urban Metabolism as decision-making support at the local level.

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FOOTNOTES

1 The AFNs are, for example, those food supply initiatives that are alternative to the Large-Scale Retail model, such as direct sales on farms.

2 It refers to physical retail markets with foodstuffs sold without intermediaries, directly from farmers to consumers.

3 The CSA are networks or associations of individuals who are committed to supporting one or more small or medium sized local farms, with farmers and consumers sharing the risks and benefits of food production.

4 The solidarity purchasing groups (GAS) are networks of consumers that link up with farmers to pursue certain fundamental values, such as product quality, dignity of work and respect for the environment.

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Figure 1.St Nicholas Market in Bristol. Photo by Visit Bristol, 2008.

FROM THE GLOBAL FOOD SYSTEM TO THE LOCAL DIMENSION THE URBAN FOOD STRATEGIES

Giorgia Tucci

European and global policies are increasingly moving towards new frontiers of sustainability, innovation and social inclusion. Many of the 2030 SDGs promoted by the UN, to which should refer all planning for the future development of cities, focus on urban food systems and waste food loss.
Recently, alongside the forms of reaction activated by organized civil society, experiments related to the so-called urban food policies, linked with holistic urban approaches, in which cities are configured as new actors in the food systems, are spreading internationally. The big news compared to this type of approach, of a punctual and sectorial type, is represented by the promotion by cities of real integrated and multi-sectorial food strategies (Urban Food Strategies, UFS), characterized by a holistic approach to supply chains of development through eco-efficient cycles linked with multidimensional agro-food systems and the multidimensionality of food. The article focuses on understanding how the holistic agro-cultural and social systems intercept spaces, actors, re-sources and dynamics present in a city, moving from the food system to promote a new kind the of agro-urban inte-grated system of where innovative food and multi-scalar approaches are combined.

food system / urban food strategies / food movements / urban policies / sustainability

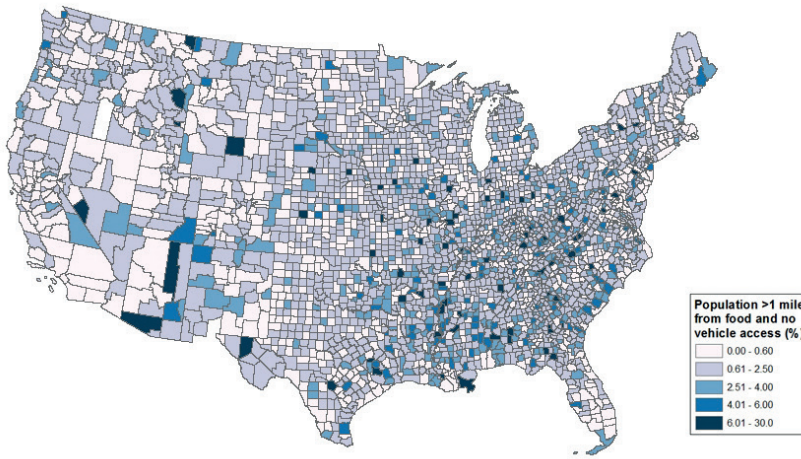

Figure 2. This map depicts food deserts in the United States by counties as reported by the USDA in 2010. Source: US Department of Agriculture, by Brianna Davis – 11/7/2016. University of Illinois Urbana-Champaign.

European and global policies are increasingly moving towards new frontiers of sustainability, in-novation, and social inclusion. 2030 Sustainable Development Goals (SDGs) promoted by the United Nations, that are a reference for the future development of cities, focus on reduction of food waste, sustainable food production systems, resilient agricultural practices [2 - Zero Hun-ger], management and recycle of waste, reduction of food losses along supply chains [12 –Responsible Consumption and Production], and sustainable cities [11 – Sustainable Cities and Communities].

Connecting to the international debate that legitimised the importance of the relationship between food, territory, and city, in many countries—in particular in the Mediterranean Area—food and nutrition (combined with heritage) are fundamental and recognised elements of culture, but also of economic development. The majority of consumers whose individual choices are decisive in defining the evolution of the food systems—associated to urban and territorial development —are already concentrated in cities and will increasingly concentrate.

At the same time, however, cities are the places where access to food is often problematic and where entire neighbourhoods exist, defined as food desert, where it is impossible to find fresh and healthy food. Various studies have examined the socio-economic and demographic charac-teristics of cities to understand what

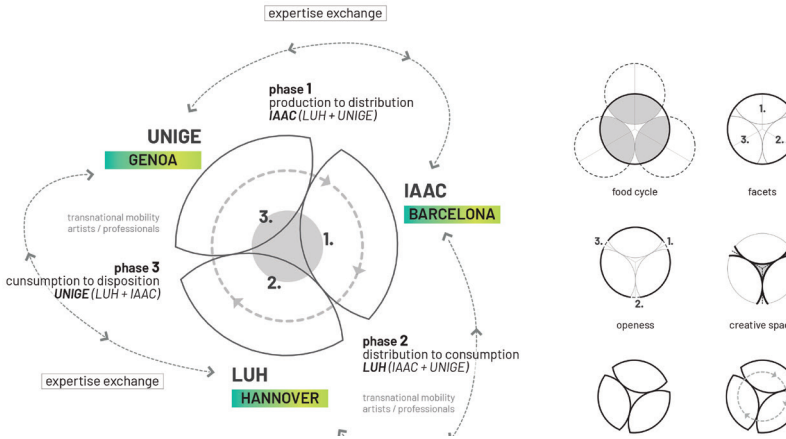

Figure 3. The Creative Food-Cycles Phases and partners: international exchanges. Image: LUH Regionales Bauen und Siedlungsplanung.

the factors for this problem are and to what extent they in-fluence the food desert status. The USDA Economic Research Service, for example, in a survey developed on 2000 census and 2006 data on locations of supermarkets, super-centers, and large grocery stores identified more than 6,500 tracts of food desert in the United States. It was found that "areas with higher levels of poverty are more likely to be food deserts, but for other factors, such as vehicle availability and use of public transportation, the association with food desert status varies across very dense urban areas, less dense urban areas, and rural areas" (Dutko et. al. 2012).

The lack of availability of fresh and healthy food, but also the shift from small-scale family-owned businesses to massive corporatised enterprises has led to a loss of connection between produc-ers and consumers and has raised concerns in terms of human health, environmental degrada-tion, and animal welfare. Starting from the awareness of this weakness, cities have been and still are the political and cultural arenas in which the movement of opposition to the standardised food systems are manifested with greater evidence, through different phenomena. "Food movements" (FM) have therefore emerged around these problems in the 1970s as one of the main actors of the contemporary local food movement. In the United States, there were 1755 FM in 1994; this number increased to 8144 in 2013 (USDA, 2002, 2013) and today FM are spread all over the world, some of the largest are

found in Japan and Australia. Unquestionably, part of the popularity of FMs stems from their ability to bring communities together and create distinctive cultures, especially for those who feel that urban areas have become too impersonal and com-mercialised.

In addition to food movements, alternative bodies have spread rapidly over the past 30 to 40 years: Alternative Food Networks (AFNs), Solidarity Purchase Groups (GAS), farmers' market (FMs), direct sales, inner-city markets, Community Supported Agriculture (CSA) are just some of the networks and practices that openly break with the dynamics and the values of the large-scale retail trade (GDO), proposing new values related to food production and consumption, genuine and cosmopolitan at the same time. However, it remains to be seen whether alternative movements will transform the way food is produced and consumed, locally and globally, through sustainable, local, and fair practices and whether the growing world population can be fed with non-intensive agricultural methods promoted by the AFN as an alternative to conventional indus-trial agriculture. However, industrialisation and alternative food practices need not be mutually exclusive, on opposite sides of a political agricultural continuum. Jarosc stated that "globalisation of food is part of the development of local food systems" (Jarosc. 2008 p. 242).

More recently, alongside of forms of reaction activated by organised civil society and local communities such as FM, experiments related to the so-called urban food policies are spreading in-ternationally, in which cities are configured as new actors in the food systems. The novelty of this type of approach, in a punctual and sectorial form, is represented by the promotion of integrated and multi-sectorial food strategies (Urban Food Strategies, UFS), characterised by a holistic approach to supply chains and the development of eco-efficient cycles linked with multi-di-mensional agro-food systems and the multidimensionality of food. In these dynamics some pio-neering realities can be identified, such as large North American urban areas, among all Toronto with more than 100 public markets, Seattle—home of the iconic Pike Place Market, one of the largest public markets in the US, as well as a network of 16 neighbourhood farmers' markets— and Pittsburgh, often called a "city of neighbourhoods" that has 48 markets in the city and inner ring suburbs. Subsequently, the phenomenon also extended to London and to small and medium-sized cities in the United Kingdom (which formed a network of Sustainable Food Cities, today called Sustainable Food Places) and Northern Europe. More recently, Southern European countries such as Italy, Spain, or Greece, are also beginning to implement participatory food policies, agro-urban revaluations,

and new cohesion processes of social sharing. Milan is the first Italian city to have approved an urban food policy, but also the metropolitan city of Turin has started a project in a logic of an multiscalar approach—Atlante del Cibo di Torino Metropolitana—with the aim of building a support tool for future territorial policies.

Of significant relevance is the case of the city of Bristol—that received the European Green Capital Award in 2015—which developed a sustainable and resilient food plan that is integrated on a regional level (Who Feeds Bristol?, report March 2011). The Bristol Good Food Plan is grounded on thorough analysis of how the city and its regional food supply system operates and how the different elements of the system are interconnected. Who Feeds Bristol targeted the six key components of the food system: production, processing, distribution, retail, catering, and waste, investigating the provision of basic staple food items; the land use for current and potential food production; and the current food supply capacity from the surrounding region in relation to the food needs for Bristol. It also investigated which businesses were involved in distributing, sellin and recycling or disposing of food across the city region and within the city itself. The plan identified eight themes that Bristol needs to address in order to ensure that in the future the city has a healthy, viable, and equitable food system that is as resilient as possible to any future shocks and challenges. The purpose of the food plan was to enable every organisation in the city to examine how they can influence the food system and where they can take action. All involved stakeholders—groups, organisations, businesses, individuals—are called to clarify where their input and expertise lie. Different groups lead on different themes according to their expertise; they can develop a clear advocacy and food policy leadership role for the Bristol Food Policy Council and enable strategies to create positive change in the food system.

The two main denominators of urban food strategies are the systemic approach to the theme of food linked with the urban potentials of patrimony, tourism and landscape, translated into policies aimed at integrating and connecting actors, resources, and tools as well as the inclusion of civil society within this processes. The next step towards which urban strategies, supported by the scientific community (Urban Food Actions Platform, FAO-UN), are moving is to understand how agro-cultural and social systems intercept spaces, actors, resources, and dynamics present in a city, moving from the food system —understood as a chain of activities related to the production, processing, distribution, consumption, and post-consumption, including related institutions and regulatory activities—to a new kind of agro-urban integrated system of where innovative food initiatives and

multi-scalar planning approaches are combined. Even if each city develops its own peculiar and contextualised process of defining, adopting, and implementing an agro-urban integrated agenda, it is possible to identify some common phases.

The Creative Food Cycles project follows this approach by addressing the theme of food at 360 degrees, from production to disposal, structuring the project into three main phases.

The production phase is substantiated in the city in the experiences of urban and peri-urban agriculture (producing in the city or around the city), the approach of commercial farms, agricultural parks, the heterogeneous set of horticultural experiences (social gardens, vegetable gardens collectives, private gardens, school gardens, regulated or abusive gar-dens, guerrilla gardening practices, etc.). With a view to the food system at the city-region scale, it is equally important to know the characteristics of production, analysing the agricul-tural sector in terms of quality and quantity. Specifically, the CFC project in this first phase aims to demonstrate how the use of technology can help to produce food in urban environ-ments, or in close proximity, and to enhance urban resilience. Urban agriculture can contrib-ute to enhance resilience beyond the provision of healthy food for citizens. Thanks to the use of digital fabrication and control interfaces, the aim is to create a hydroponic and aquaponics system in a close loop, teaching to citizens, architects, product and event designers how to build self-sufficient cultivations. The use of digital fabrication allows to install customised gardens and the use of sensors helps in controlling the performance. If soil cultivation cannot be practicable in many urban conditions, especially in dense city cores, hydroponic cultivation can represent a practical solution where the lack of space or farming knowledge are main limitations.

The distribution phase (GDO, retail stores, markets, alternative food networks, online commerce) is the service activity aimed at the transfer of food products from producers and processors to consumers. In general, food distribution intercepts urban dynamics in spatial terms (since it affects the way in which space is lived, designed, and consumed), social (in the relationship between actors), and environmental (because it generates impact in terms of pollution of the air and soil, energy consumption, etc.). In the CFC project, the concept of this phase is to focus on new models of distributing, marketing, processing—as well as cooking, displaying, sharing—food and regional products into a collective aggregation point (place-making effect). An "urban food hotspot" characterised by a multipurpose

stage able to con-nect different places to a single manifestation of material and immaterial open public activi-ties, trends, and movements. The aim is to recollect different sensorial experiences, aug-mented reality data processing and art installations, into movable pieces of urban furniture; offering interactive ways for audiences to participate to a product or service, to address ex-tended audiences, and ensure that their goods and commodities are attractive for customers. A sense of originality and unparalleled creativity are critical aspects that buyers take into consideration when shopping, consuming, and interacting in urban food issues.

The phase of consumption, combined with disposal, is complex and difficult to analyse, since it includes a multiplicity of issues, ranging from the spaces in which it is consumed (public and private collective catering, domestic catering), to the social and cultural implica-tions related to habits, traditions, consumer choices, ways, and times of consumption, food accessibility, the relationship between food and health, etc. The disposal addresses the issue of waste and scraps, which FAO distinguishes in food loss (in the production, collection, distribution and transformation phases) and food waste (produced in the final stages of sale and consumption) and that it is becoming increasingly important in relation to issues such as climate change, social justice, and food education. In particular, within the CFC project, in this phase the process that brings food from consumption to disposal is explored, by offering not only options for new uses of the discarded products (from waste to resources), but also to define new potentials of meaning and of spatial expression in an artistic reinterpretation (from scrap to art). It proposes a series of actions and performances based on the combination of the exposition of projects and researches that explore a new way of thinking food after consumption, or that aim at a reinterpretation of discarded products in an art or reuse. The creation of ephemeral and flexible installations to define a new configuration of public spaces (urban and artistic scenography) in order to attract the attention of target groups and stake-holders in the framework of public events constitutes a further action; such as the reuse of abandoned heritage buildings in order to promote civic participation and a convivial dimension in different urban settings.

The analysis of the qualitative and quantitative aspects, of local relationship and linkages with the larger scales is concentrated on these elements and their integration; in a logic of a multiscale approach, with the aim of constituting an effective support tool for the territorial policies. An important challenge for the future will be to strengthen collaboration and knowledge sharing be-tween actors of the food sector (groups, organizations, businesses, individuals, etc.), research organ-

isations, and enterprises by combining the technological capacity of enterprises, their prac-tical, operational, and market visions, with the conceptual capacity, the experimental and creative role of research in order to launch proactive exchange platforms on the theme of food and its expressive capacity, as a cultural vehicle of identity, innovation, and social integration.

In the last decade, the agricultural sector has been the protagonist of constant experimentation in integrated agro-food production processes, thanks to the introduction of new technological devices it has proven to be able to minimize waste, maximizing production, exceeding the con-cept of precision agriculture to approach that of sustainable agriculture. In addition to traditional tools, new technological devices have spread (drones, sensors, robots, apps, etc.) capable of controlling and facilitating production processes. The new generations of agri-cultural entrepre-neurs (farmers 2.0) have rediscovered a new system of "making agriculture" automated and in-novative. This brief reflection underlines the aim to focus on the current dynamics and to pro-mote social, technological, and logistical innovation processes in the transformation of the food sector in cities to facilitate the transition to a sustainable food system, which is changing the per-ception of how we live the city and which is able to support cities in a development process in line with the SDGs.

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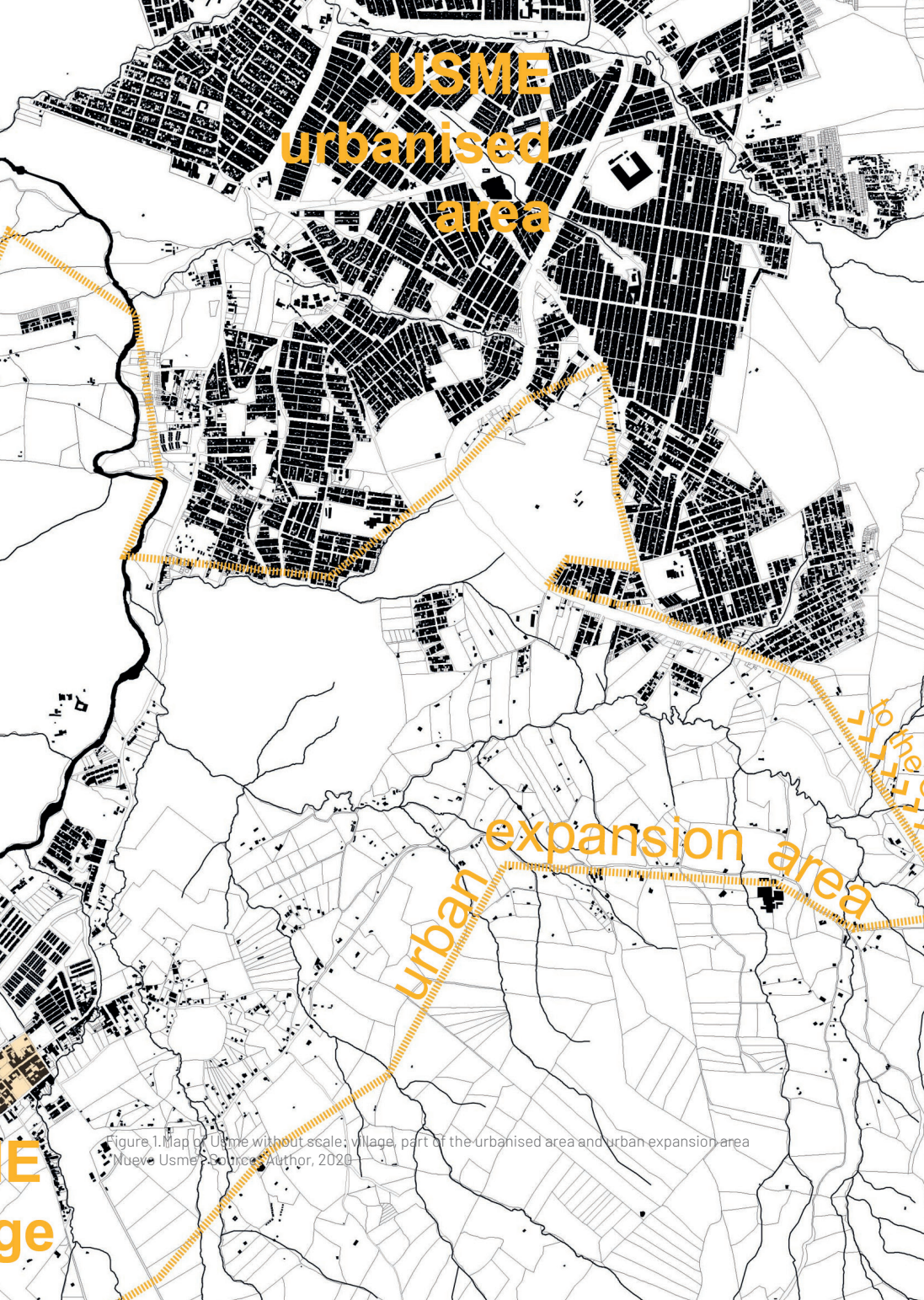

Figure 1. Map of Usme without scale: village, part of the urbanised area and urban expansion area Nueve Usme. Source: Author, 2020.

TRUEQUE BASED URBANISM

Alissa Diesch

Usme is a village and former municipality in the south of Bogotá. Urbanisation has transformed the social and spatial structure of the village deeply. Agrarian production and distribution has been affected strongly by the global trend of industrialisation of agriculture and changing agents in the field during the second half of the twentieth century, while at the same time a significant share of the area of the former municipality turned urban. Both processes are analysed in a parallel way with a focus on overlooked existing and changing relations and potentials of food cycles between rural and urban inhabitants and challenges regarding production and distribution of agrarian goods. The problems and solutions of food flows could represent alternative benchmarks for the sustainable future of the urban expansion area between the rural and the urban part of Usme. This analysis is developed in the framework of my PhD Thesis.

Bogotá / megacity / polycentric / rural-urban linkages / urban growth

Figure 2. Small scale mixed cultivation in the rural part of Usme and spatial encounter of the rural and the urban. Source: 1, 4, 6 Corporación Campesina Mujer y Tierra 2018, 2 Jaime Beltrán 2018, 3, 5 Author 2018

Since colonial times Usme has always played a decisive role in food supply for Bogotá. This is due to its agricultural productivity and its condition as a transit area. Usme is located in the south of Bogotá, where the high plains of Bogotá narrow and rise from 2,500 to more than 3,000 m to the Paramo area, a natural environment completely different to the Bogotá savannah. Crossing the Andean mountain chain, it also provides access to the hot and fertile Eastern Plains and has always been the gateway of Bogotá to that region (Fig. 1).

The scientific study of Usme is limited to very few works, so a huge share of information about Usme in my PhD derives from locally produced grey literature and local initiatives for cultural heritage. These sources have not yet been put in relation. My research intends to establish these references and to contribute to the debate on an extended notion of cultural heritage, also by applying a multi-method strategy: interpretatively historical methods for examining heterogeneous written and cartographic sources, qualitative and inventive methods for creating and interpreting participative mappings and photographs, interviews with representatives of institutions, as well as own site analyses. The intense field work in Usme was realised in 2018 with the *Mesa de Patrimonio de Usme*[1] (including interviews and images by Jaime Beltrán, Carolina Díaz, Harold Villay) and the *Corporación Campesina*

Figure 3. Closed down trading house, a small farmstead finca, an old dairy farm *hacienda*, butchers and a *piqueteadero*. Source: 1 Jaime Beltrán 2018, 2 Corporación Campesina Mujer y Tierra 2018, 3 Harold Villay 2018, 4-5 Luisa Ardila 2016, 6 Maria José Casasbuenas 2016; 4-6 in the framework of *Fotografía y Cartografía social* (miradas.poligran.edu.co/)

Mujer y Tierra[2] (including images by the group). The walks, pictures and discussions conducted with these actors have significantly contributed to my understanding of the place and the complex relation of rural and urban aspects in Usme.
During the conquest in the sixteenth century, the Spanish set up pueblos de indios (Indian Villages) in places of already existing settlements, to concentrate and evangelise the natives. These places became centralities in the colonial network and were surrounded by a small portion of common land (resguardo) for the self-supply of its indigenous inhabitants who were obliged to work mainly in a share-cropping system of tithe and forced labour (mita). The rest of the occupied land was mostly divided into big haciendas that became the centres of commercial agrarian production (Urrea 2011). In Usme the resgardo, with the national independence in the beginning of the nineteenth century, transformed into small scale farms that as the surrounding haciendas continued producing potatoes, cereals, and pulses for Bogotá (Moreno y Escandon 1778, Gutierrez 1887, Urrea 2011). In the twentieth century meat and dairy products became relevant products, too (Santafé 1998, Higuera 2012).

When in 1954 Usme and five other villages were incorporated into the Capital District of Bogotá the village's notion was still exclusively rural although since the

1930s the municipality hosted the water reservoir for the capital's first modern water supply system. However, the village itself did not receive water provision until the 1970s (Urrea 2011), and the railway that was built to construct the dam was dismantled immediately upon completion of the reservoir. With Bogotá's accelerating urbanisation in the 1950s, brick clay and gravel were other products exploited from the territory of Usme. In 1964 Usme did not present any urban areas and was home to only 4,626 inhabitants. Since the 1970s local urbanisation consisted of a growing number of informal settlements in the territory of the municipality (Fig. 2), increasing the number of inhabitants to 164,847 in 1985, but lacking access to infrastructure and legal recognition (Urrea 2011). The role of Usme in modern times remained unidirectional, an extractive exploitation, without receiving the benefits by the city.

The official ignorance towards the rural and urbanising everyday life has been contrasted by a strong internal sense of community in the rural and the urban part of the municipality. A large variety of community organisations have been the driving force to organise construction, transport, education, and culture, complementing rural traditions of tight agricultural collaboration among small scale farmers. Many of these activities, seen from the perspective of Bogotá, are widely considered to be "informal" and often watched suspiciously and without understanding.

Today, 345,689 inhabitants live in Usme (Secretaría del Habitat 2019), mostly in the urban part. The panorama of rural-urban relations and food cycles is complex. A local trading house in the village and a number of dairy farms functioning as intermediaries between rural producers and urban consumers have been closed since several years (Interview Jaime Beltran 2018, Fig. 3). The industrialisation of agriculture and the growth of the city have turned national food retailing into a lucrative business: the appearance of modern supermarkets and wholesale markets in the 1960 and 1970s led to long trade chains, raising the prices for the consumer and lowering the profit for the producer. Big landowners and wholesalers used their political influence to gain control over the market; resulting hygienic regulations particularly hit small scale farmers practicing mixed cultivation and using local and traditional seeds. The niche for Usme's farmers had become very small, although possible consumers were spatially getting closer by the ongoing urbanisation. Small scale networks in the rural part still function for producing and trading agricultural goods and even include traditions of barter trades (*trueque*).[3] Yet, the formal and informal markets in the urbanised part of Usme mostly receive their goods by wholesalers, without benefitting from the agricultural production nearby.

Concepts to reduce long retail chains on a big scale are thwarted and have failed. *Surabastos*, a *centro de acopio* (collection centre for local producers) and a whole sale market in Usme, that should receive and distributie local and incoming agricultural products, were never realised due to the interests and influence of Bogotá's central whole sale market (Santafe 1998, Interview Carolina Díaz 2018). Merkandrea, a supermarket chain with several branches in the poor south of Bogotá, arisen in the 1990s from a grocery shop in Usme, used to offer basic food supply to low prices because of direct contact to the producing farmers. However, in 2018 the owners were accused to launder money for the FARC guerrilla,[4] expropriated, and the stores were closed. (Fig. 4) This illustrates how powerful and ruthless external forces intervene in the field of food supply in Usme, while the consumers and producers have to bear the consequences.

Though, concurrently, less formalised novel coalitions have broadened and extended existing forms of exchange between the rural and the urban part of Usme. The inexpensive meat production in the rural part of Usme, partly due to unauthorised butchering, during the weekends has led to a dynamic of gastronomic shopping and popular party in the village centre, including cattle markets and horse shows. The gatherings of rural and urban inhabitants have led to the appearance of several piqueteaderos, rustic restaurants offering fried meat (Santafé 1998, Higuera 2012), generating the notion of Usme as destination for weekend trips. As an answer to the pressing need of affordable housing, the city of Bogotá considered Usme the ideal environment for the biggest urban expansion project so far, Nuevo Usme. Since 2000 the project with up to 53,000 housing units (Urrea 2011) is discussed, planned and to a small part already realised, but has above all caused harsh reactions in the rural area of Usme. As part of the refusal to sell their parcels to property development companies, peasant women founded the *Corporación Campesina Mujer y Tierra*, a cooperation actively acknowledging and dignifying traditional forms of farming by offering educational walks through their lands (Castellanos 2016). The initiative is well connected to educational and cultural institutions and further peasant groups that also promote eco-friendly mixed cultivation and support the concept of "food sovereignty".[5] This concept stresses the right to cultivate and distribute locally and culturally rooted food, understanding agriculture and gastronomy also as cultural concepts beyond the mere alimentary aspect of "food security", as mentioned for instance in the United Nation Sustainable Development Goal 2 "Zero Hunger" (UN-SDG 2016). When in 2007 excavators started the soil preparation for a section of the Nuevo Usme project, a huge pre-Hispanic necropolis was discovered. The finding of the archaeological legacy gave life to the

Figure 4. Contemporary food trading forms in Usme in the urban (above) and rural (below) part: *surabastos* building, markandrea supermarket, street market and peasants selling locally grown onions. Source: 1+3 Carolina Díaz 2018, 2 google maps, 4-6 Author 2018.

local heritage group *Mesa de Patrimonio de Usme* and pulled academic and artistic actors on stage. Protests, discussions, information events, and artistic projects such as *El territorio no está en venta*[6] by Maria Buenaventura shed light on overlooked dimensions of local agriculture and highlight new linkages between the rural and the urban, expressing multiple forms of cultural, historical, and environmental heritage (Fig. 5).

These dynamics, rooted in the territory, make use of the diverse cultural background as a resource and can deepen linkages between rural and urban communities. By strengthening and expanding traditional and at the same time sustainable food cycles, understanding the additional value of the countryside as much needed local recreation areas for the urban population, new value loops can be the outcome of the food production system. The periphery's linkages for producing and distributing food could be strengthened and enriched by a diversified system of value creation in leisure activities and gastronomy. Personal contact between producers and consumers in the framework of eco-tourism and the possibility of direct trading can help to put in value the fertile land and the urban diversity by mutual economic benefit: a refreshed and extended notion of trueque, exchanges based on community and trust. A personally based rhizome of exchanges and

Figure 5. trueque events in rural Usme, El territorio no está en venta by Maria Buenaventura. Source: 1-2 Author 2018, Subdirección Local Usme – Sumapaz at twitter @SLISUsmeSumapaz 2019 4-6 Maria Buenaventura http://elterritorionoestaenventa.blogspot.com/ 2011.

experiences might be more resilient and less threatened by corruption and take-overs than systems exclusively focused on business. Furthermore, this network of personal and spatial relations could be read as an excellent base for further creative development and understood as a resilient, locally developed system to base on the urban expansion project that will fill the morphological gap between the urbanised area of Usme and the village core. Though, for this the courage of understanding Usme and appreciating its multi-layered dynamics and an intensely changed attitude in planning for Nuevo Usme would be needed. When considering the small scale farms with mixed cultivation not as under exploitation, as presented in the land banks of the urban expansion project, but as "ecosystems of high biodiversity", "producers of oxygen" and essential parts of a bigger "architecture" (Interview Jaime Beltran 2018), existing structures would be recognized and could be edited for hosting also new uses. Longstanding places like the central plaza, the enormous necropolis and hacienda buildings could be meaningful sites and spatial references for Nuevo Usme rather than being considered hurdles in the masterplan. Existing and new dynamics would add a temporal aspect and create a framework of possibilities of new employment and gaining opportunity, supporting economic development for Bogotá's city district with lowest income (Secretaría del Habitat 2019). With this mindset even disposition could to be creatively

reconsidered, to be understood as a resource for up-cycling and value creation, disrupting the notion of Usme as a dangerous final repository as is currently the landfill of Doña Juana. With a brave and confident view on Usme, willing to see its potential, building on the sense of community and food production systems developed over a long time, existing structures could be a promising base for enhanced rural-urban circular systems and the new city district.

FOODNOTES

1 further information: https://www.facebook.com/patrimoniousmek/

2 further information: https://www.culturarecreacionydeporte.gov.co/es/corporacion-campesina-mujer-y-tierra

3 trueque is a system of exchange in which goods or services are directly exchanged for other goods or services without using a medium of exchange, such as money. In Usme revived trueques are regularly organised between the rural and urban communities where, in festive occasions with music and dance, packages of rural goods are exchanged for previously agreed products from the city, like household items or stationary.

4 further information: https://www.eltiempo.com/justicia/servicios/precios-de-supercundi-y-merkandrea-versus-los-de-un-supermercado-186218 and http://semanariovoz.com/victimas-falso-positivo-judicial/

5 further information: https://viacampesina.org/en/what-are-we-fighting-for/food-sovereignty-and-trade/

6 further information: https://mariabuenaventura.com/portfolio/el-territorio-no-esta-en-venta/ and http://elterritorionoestaenventa.blogspot.com/

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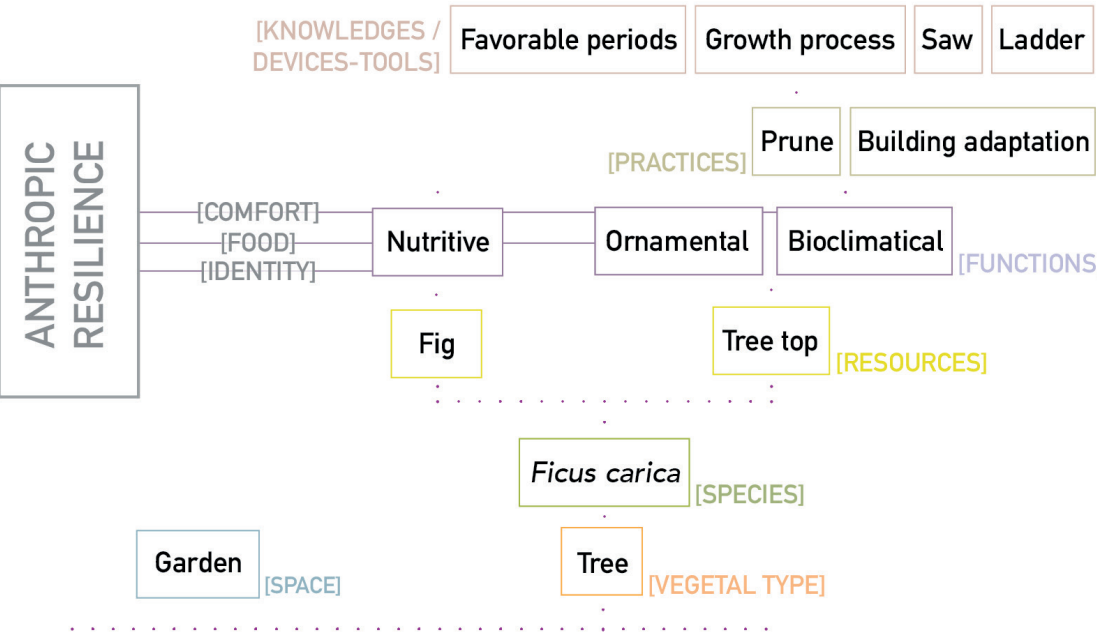

Figure 1 Map of Usme without scale: village, part of the urbanised area and urban expansion area "Nuevo Usme". Source: Author, 2020.

APPROACH FOR THE ANALYSIS OF SELF-CULTIVATION AS AN EXPRESSION OF THE RESILIENT CAPACITIES OF MIGRANTS IN BARCELONA DURING THE TWENTIETH CENTURY

Germán Guillén-Espallargas
Carles Llop i Torné

This paper offers an approach for the analysis of self-cultivation—as we define it—developed mainly by migrants who resorted to self-building during the twentieth century in Barcelona, Spain. Self-cultivation—as the object of study—fulfilled nutritional, ornamental, constructive, environmental, energetic, sanitary, and handcrafting functions, and most probably helped to improve the resilience of migrant communities in their transit between the rural world and the city. The evolving condition as well as the connecting migrant situation between factors such as origin, social class, and gender place this research in a privileged setting to observe social practices, especially with regards to plans and projects on urban ecosystem infrastructure based on greater social inclusiveness. Through the definition of the key factors for this investigation a proposition for the methodology to be developed is outlined, and also a sample of its application.

self-culture / self-building / ecosistemic infraestructure / migrant resilience / urban agriculture

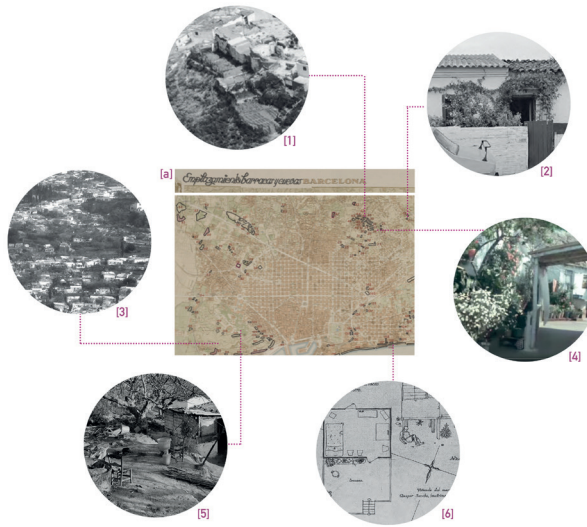

Figure 2. Distribution of self-building settlements in 1949 and detail of some self-cultures associated. Source: Own elaboration from: [a] Plano de Ayuntament de Barcelona (1945); [1,2,3,5,6] Camino et al. (2011); and Radio Televisión Española (1983)

The research presented in this document aims to analyse the crops grown by the migrant population that arrived at Barcelona throughout the twentieth century in the context of the rural flight to large Spanish metropolises. The starting hypothesis is that based on the phenomenon of what we call self-cultivation, there are a series of elements that illustrate the resilient capacity of such migrant families that make the transition between their places of origin—mostly rural—and the new urban life.

We define the term "self-culture" as all plant production and management that develops in a self-managed way by fulfilling different functions—nutritional, ornamental, constructive, environmental, and sanitary. The term emphasises its conceptual connection with self-building. Also emphasising in productive and recreational functions, and the use of edible and ornamental species that generally characterise the phenomenon studied. The relationship with aspects of the phenomenon is evident when referring to the Latin root "cult-", in relation to its structural capacity on social relationships and the connection between the popular culture.

The main purpose of this investigation is to provide knowledge, from a contemporary viewpoint, on the needs of the population, and how urban ecosystem infrastructures can satisfy such needs (Chiesura 2004). Special consideration is given to the popular social classes—the leading protagonists of the studied phe-

Figure 3. Settlement in Monjuïc (1967). Source: Camino et al. (2011)

nomenon. The research also aims to gain knowledge on the ecosystem benefits that result from such interaction. As stated by Corner (2006, p. 28)—paraphrasing Harvey—designers and planners must combine form and aesthetics "with the advancement of more just, politically emancipatory, and ecologically sane mix(es) of spatio-temporal production processes". Based on this, the research is situated as an ideal observatory given that the studied phenomenon combines the evolving nature of self-building (Turner 2018) and self-cultivation (Dixon, Wolschke-Bulmahn 1990) with social conditions such as class, origin, and gender.

For now, the work focuses mainly on how self-cultivation developed within the framework of the so called baraquismo.[3] Barcelona together with Madrid was the main destination for migrants during the twentieth century—especially from the countryside to the city. In this context, overcrowded flats were very common, but also the reason why many migrants resorted to self-building (Oyón, Iglesias 2010). This phenomenon was so widespread that in the 1950s it reached at least 100,000 people, 7% of the city's population (Ajuntament de Barcelona 2014). Despite a lack of concrete data, self-cultures would have been widespread throughout this context (Fig.2). With the data available so far, we conclude that self-cultivation could have contributed to the resilience of individuals and communities in various ways (Guillén-Espallargas 2020): Firstly, through the development of self-crops based

on the so called Traditional Ecological Knowledge (Reyes-García et al. 2014). This would have had consequences on the ecosystem of Barcelona, which was affected by the industrialization processes and therefor, had been receiving less management which ultimately would have meant a threat to certain species (Reyes-García et al. 2014; Guadilla-Sáez et al. 2019) with self-cultivators acting as mitigating factor for the process.
On the other hand, "self-building-migrants" would have constructed their community identity partially around self-cultivation, as a mayor link to their place of origin (Mazumbdar, Mazumbdar 2012) and as a sign of projection in the place of destination (Nesheim et al. 2006). With this in mind, the role of women stands out in the construction of such settlements (Gallego-Vila 2018) as well as self-cultivators, highlighted by their role in the Popular Iberian Gardening (Pinto 2005, Ríos et al. 2012). In the settlements, self-crops that occupied common spaces would be a demonstration of care for private and collective property (San Miguel 2004). Given the influence of materiality in the construction of a community (Fincher, Jacobs 1998) as well as the generation of social relations based on growing crops (Verde et al. 2000, Pinto 2005), the self-crops would have contributed to the establishment and development of connections that ultimately led to the organization of the demand on better living conditions as well as the strengthening of solidarity ties. Such issues conditioned by the ecosystem in Barcelona intervened in the self-cultivation and way of life of migrants (Watsuji 2016). Given that these same migrants would also have carried out a transformative process with positive consequences on the ecosystem, it is believed that there might be a mutual adaptation in which the system, a priori, would have benefited.
The research will attempt to deepen also other aspects that could enhance the apparent relationship between resilience and self-cultivation, such as the optimization of the internal flow of nutrients—through complex house gardening systems (Pons, Martino 1929)—, matter and energy—through the frequent reuse of materials (Pons, Martino 1929).

METHODOLOGICAL OUTLINE FOR THE ANALYSIS OF SELF-CROPS

The formulation of the hypotheses presented above is a result of a preliminary review based on photographic, cartographic, and documentary material. Since there are no previous investigations that address the phenomenon of this study, we are in the starting analytical phase, which allows us to have a general overview of the issue through which we can determine study cases and periods to be addressed in depth. Once cases have been determined, they will be defined on the basis of

the abiotic and biotic factors of the site that, a priori, determined the self-cultures in each case. Furthermore, we will target the practices of self-cultivation, comparing them with interviews that gather direct experiences from the main actors who intervened in the phenomenon. The dialogue between direct and indirect sources will be reviewed through a series of analytical devices—with a desire for detail—that will allow us to visualise the set of factors that determine the influence on resilience, as previously described, and to reconstruct—as far as possible—the specificity of such phenomenon (Fig. 3). This data will be subjected to environmental evaluation in order to establish an ecosystemic balance of the different actions that were carried out. Lastly, the structure of representation, description and communication is currently being examined. Below is a sample of materials (Fig. 1) that allow a partial approach on the application of the guide box.

CONCLUSIONS

Through what has previously been addressed, we have concluded that in the detailed analysis of self-cultivation we hope to verify a source of great interest in order to understand part of the resilient mechanism of the migrant communities that resorted to self-building. Furthermore, self-cultivation recognises an active willingness of the popular classes to address the transformation of integrating into urban life with the association of important ecosystem benefits. This activity, established in a large number of ways, opens up various possibilities for managing urban ecosystem infrastructure in contemporary situations that can have an impact on quality of life improvements. Finally, we consider that the study of self-cultivation in Barcelona during the twentieth century can serve as a basis for developing similar work elsewhere. In a context of attraction of large cities in which self-building is the only viable way to generate housing (Turner 2018), a deeper understanding of needs and requirements in relation to self-cultivation could make a substantial contribution to the effectiveness of a progressive, procedural, possible, and self-managed development.

FOOTNOTES

1 Term that has historically defined self-building in the city of Barcelona.

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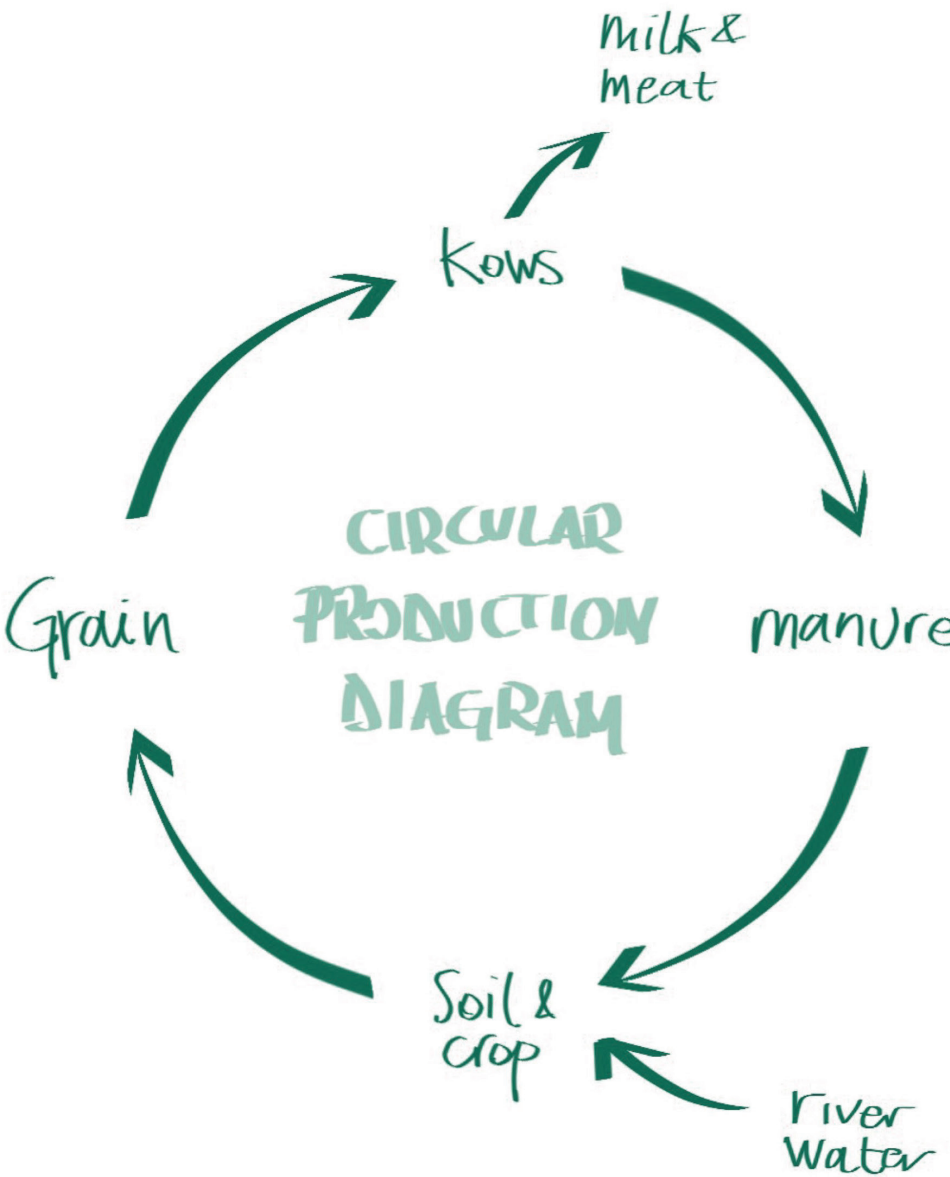

Figure 1. Keizersrande Nature Farm. Circular production diagram. Source: Keizersrande Foundation keizersrande.nl. (create by the author)

FOOD CYCLES AND HYDROGEOLOGICAL RISK MITIGATION. THE KEZERSRANDE NATURAL FARM PROJECT

Matilde Pitanti

Being at the base of the development of all societies, in so many different levels: food—its culture, production, diffusion, and consumption have a central role in shaping more resilient societies and habitats. This contribution, presenting the Dutch case study of the Nature Farm of Kezersrande, aims to highlight the possibility and the opportunity of exchange between different systems. The design of resilient food cycles is not limited to influencing our society and behaviour, but it also can shape our territories and our cities, in order to achieve both positive ecological results and a wider social integration. The presented project shows the possibility of exchange and integration between a resilient management of hydrogeological risk and a circular and sustainable food production system.

food cycles / resilient design / water-sensitive design / natural farming / river space

Figure 2. Flood plain along the Keizers and Stobbenwaarden and the Olsterwaard, north of the IJssel. Source: https://beeldbank.rws.nl, Rijkswaterstaat, Room for the River. Author: Ruben Smit.

"Food is the bridge. Food will be at the heart of the transition towards a regenerative future. It's the field where natural systems literally meet human systems" states Driesenaar (2020), talking about a regenerative future and about natural farming system. Food and its cycle have a fundamental role in our society and in shaping our habitats. If we intend a sustainable system as described by Bill Mollison, as any system that during its lifetime is able to produce more energy than the amount it takes to maintain and establish it, then we understand the importance of closed cycles, also in the food production, consumption, distribution, and disposition chain. Resilient food cycles imply the opportunity to reshape not only our habits and cultural values, but also our environment, our cities, and the economic context, for achieving positive ecological results and a wider social integration.
The contribution proposes a specific case study, to broaden the debate about food cycles towards a territorial scale, focusing on the relationship between food production and land management, with specific reference to the design of river banks and flood plains. Agriculture and livestock farming often negatively affect the risk of flooding rivers, however, in recent years several cases have been studied in which these activities have instead a positive impact. One of these cases, which is being operational for ten years, is here presented as a paradigmatic example. It shows how rural development, nature protection, agriculture, ecological improve-

Figure 3. Activities for the "Ruimte voor de Rivier" project on the southwest bank of the IJssel near Deventer. Source: Wikimedia Commons.

ment, economic aspects and recreation demand may sustainably be combined in a certain area.
The contribution aims, through the presentation of this case, to broaden the debate about creative food cycles and urban resilience, understood not only as resilience of the economic system, linked to the scarcity of food resources, but highlighting how food cycles can influence resilience in a territorial and ecosystemic scale and how they can become valid allies in the management of hydrogeological risk and river sides.

FOOD PRODUCTION AND RESILIENT STRATEGIES

Since 2000, scientific literature has seen the frequency of using the word resilience grow (Benè et al. 2017). Especially in the context of urban studies resilience is indicated as a goal to be achieved or a result to be pursued, the main development plans of the cities are being directed towards more resilient settlement. However, the diffusion of the term has been as wide as it is sometimes vague, and often risks becoming an empty slogan. Analysing the emergence of the use of the word, Chelleri identifies the will to broaden the spectrum of applications of urban resilience, no longer seen just as the ability to recover from natural disasters, but also

considering the evolution of the system itself through an adaptive and, therefore, evolutionary ability in the long term (Chelleri et al. 2015).

A useful tool to understand what we mean when we talk about a model of resilient city, or a resilient approach, and above all to be able to measure, at least according to some parameters, urban resilience, is the "City Resilience Index" published by Arup in 2014. This study suggests that the resilience of a city relates to four key dimensions: health and well-being, economy and society, infrastructure and environment, and leadership and strategy. A framework of 12 goals is then more specifically defined by 52 indicators. Analysing the framework developed by Arup, it is particularly interesting to note that food is a transversal indicator in different categories, connected with health and well-being, with agricultural production, with the infrastructural network and social aspects. Because of this transversality, food cycles have a central role in shaping more resilient societies and habitats.

Food production and the first human settlements have historically been linked to the presence of water; productive settlements, first agricultural and then industrial, have often been installed near waterways and rivers, essential as communication routes, sources of energy, for the provision of food and natural wealth. However, the close link between river dynamics and human activities has changed over the years, undergoing a progressive weakening, e. g. with channelisation, until a clear break occurred with the exploitation of water resources by industrial activity. The conflicting relationship between the natural dynamics of rivers and human activities is now exacerbated by the effects of climate change, which has favoured the shift of attention towards more adaptive design (Sendzimir et al. 2007). The proposed solutions often reside in the recovery of a synergy more linked to natural cycles, to the exchange between the different systems and to the creation of a more dynamic transition space related to climate conditions, temporality and seasonality (Berruti, Moccia 2016); the famous "water territories" mentioned by Dilip Da Cunha (2018) contrast with artificial geometries of old rigid river banks.

THE KEIZERSRANDE NATURE FARM PROJECT

A famous project that combines the hard, defensive technology of the dykes with a more dynamic approach is the "Ruimte voor de Rivier" program, started in Holland in the 2007, implemented through 20-30 specific projects, and completed in 2018. The Dutch project wanted to give the river more space to be able to manage higher water levels, get through flooding safely, and improve the quality of the

surroundings (Fig.1). A successful project developed within this framework is the activity of Annette Harberink with the Nature Farm Keizersrande, a biodynamic farm that combines both nature preservation and agricultural production, based on a circular food production system. The Nature Farm is located in the floodplains near Deventer (Fig. 2); its valuable characteristic is the renewal of the cultural landscape, consisting of meadows, flood plains, fields, woods, together with intensive agricultural land (Berk 2010). The location and the concept are directly related to the strategic project on the river Ijssel. DAAD Architects, in collaboration with Van Paridon X de Groot landscape architects, has drawn the project for Natuurderij Keizersrande, as a combination of sustainable farming, estate development, and environmental and water management.

The architects describe their project[1] as a mound, shifted on three different levels, that ensures flow into the floodplains at all water levels. While parts of the ground flow regularly, the farm needed to continue to operate and the building had to be always accessible; for this reason, a concrete retaining wall is located around the building and increases it in height up to three metres on the Ijssel side. The farm activities have a direct connection to the management of the floodplains: intensive grazing of the cows in the area ensures that the grass remains short and during high water the Ijssel river can easily burst its banks in the places where it is intended, and not in the city. After already ten years of activity, Kezersrande's main goal and success is to have created a closed cycle of breeding, food production, and resilient maintenance of the territory. The grains from arable farming and the grasses of the pasture lands are used as food for the cows and calves, which in turn provides fertilization of the area. It combines nature with farming, water management and recreation, while the cows of the farm help to keep the grass of the floodplain short which supports more balance in biodiversity (Fig. 3, 4).

The farm is currently active and it is supporting about 160 animals. Ox and young cattle graze in the lower areas, while, about 80 cows, that are usually milked, graze in the higher areas of the floodplains for most of the year. Only when there is high water level all the animals enter the barn. Cattle are housed in winter in a straw bed. The straw, mixed with manure, is the organic fertilizer for grain cultivation in the fields. Straw, as a remnant of that cereal crop, is stored, the grains crushed and used to feed the cattle. This way of farming, that allows the vegetation to remain low and the water to continue to flow, creates permanent meadows with space for flowering herbs, meadow birds and small animals. According to the Kezersrande Foundation, thanks to the open nature of the yard of the Nature Farm, the visi-

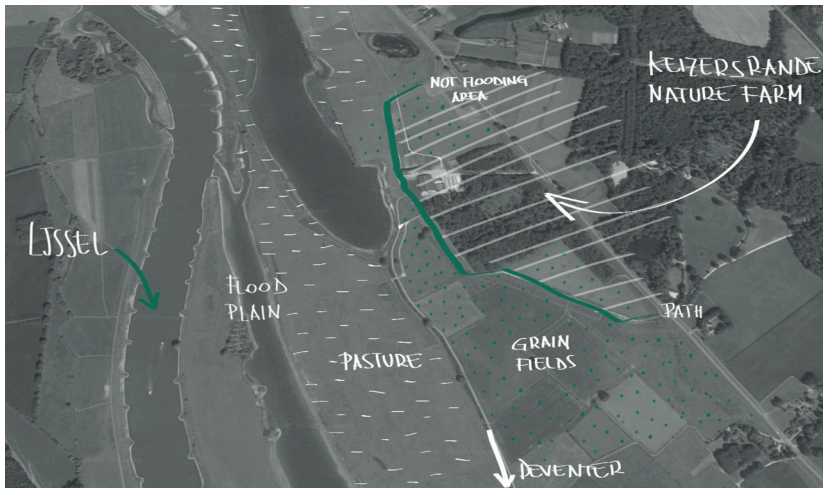

Figure 4. Context overview. Image by the author.

tor and consumers experience the entire food cycle. In the whole process, in fact, an important role is played by the involvement of visitors and by the educational activities carried out by the Keizersrande foundation, which is committed to offering didactic experiences related to the Keizersrande nature reserve and the floodplains, and which main topics are agriculture, nature, resource management water, landscape experience, sustainability, culture and history of the estate and the floodplain. The analysis of the entire project process includes its role as part of the "Room for the river" project: responding with a resilient approach to the need to maintain the dykes, achieving the important close production cycle, and developing teaching and information activities about the circular syste. Thus, we are able to identified Kezersrande Nature Farm as a paradigmatic case of how Creative Food Cycles are active and could shape our society and habitats.

FOOTNOTES

1 The description of the architectural project is available on the DAAD Architects web site. Available at: https://www.daad.nl/ontwerp/projecten/natuurderij-keizersrande-2/

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02 Session

CREATIVE FOOD CYCLES AS SOCIAL INNOVATION

This Session discusses how Creative Food Cycles can give impulse to social innovation, extending civic participation toward active engagement, novel urban communities, and circular models of social entrepreneurship. The lens of Design through a multitude of nuanced devises—ranging from speculative to tactical—elicits the capacity of territories, societies, and economies to co-create a desired change. How can communities be empowered to enable creative food nodes in cities? How can cohesive actions strengthen the role of food cultures in urban life? What steps are necessary to upscale food cycles as a model of co-design?
Interventions present recent progress toward social innovation answering to the need of novel materials, products, services, learning processes, and visions in food systems. A life-cycle approach is examined in which waste originates resources anew, mimicking the regenerative acts of nature, instilling a culture of caring in replacement of wasting habits. Supporting environs to pollination are proposed to confront with bees extinction and the risks for biodiversity and food production, fostering an ecological turn. Foodways are explored in terms of spices routes, culinary tastes, and trading exchanges towards building regional foodsheds. Coffee pulp and rice straw are tested in Lima to develop a biodegradable packaging for Peruvian coffee based on organic fibres. An incubation programme in Barcelona stimulates circular neighbourhoods co-creating, crafting, and micro fabricating with food waste and surplus. In Mirafiori district (Turin), training laboratories contribute to preventing food waste, engaging schools in applying circular economy principles. Three European experiences (Italy and Spain) are compared to distil the factors making food a catalyst of a novel city vibrancy. An analysis of initiatives emerged during the COVID pandemic shows innovation and resilient behaviours in the supply chains. A rejuvenation of Zitsa village is envisioned by stimulating a young generation of viticulturists to manage wine production and sustainable agro-tourism. On the other side, advanced ICT develops peculiar collaborative multispecies Urban Environments. German varieties of potatoes and flows are analysed to promote biodiversity and informed consumption. Through letterpressing, a Typeful Thinking workshop is developed as a tool for food education, dedicated to children in the K=12. Service design is applied for rural territory to support the surplus pickup programme of food bank in Bogotà. A system of "market making" provides farmers in Barcelona with infrastructures to gain voice and space in the distribution chains. A Quarantined Sobremesa translates an eating ritual typical of Latin America into a global digital commensality. Design culture is shown as vehicle to enhance multiculturalism: food creates opportunity of social inclusion and sustainable entrepreneurships.

Figure 1. Cooking the food surplus. Food Shakers-Food Remakers installation © M. Paolillo for UNIGE, Creative Food Cycles, 2019.

FOOD WASTE AS A TRANSITIONAL KEY FACTOR TOWARDS CIRCULAR ECONOMY

Silvia Pericu

Food waste becomes raw material for new cycles. Based on this assumption, the paper explores the food life cycles by starting from the process of wasting and then going backwards in the circular process that generally begins with production. The paper proposes a journey through projects, experimentations, and start-ups where communities are put at the centre and, in a way, drive social innovation ahead of food industry and large-scale distribution. From processing food waste to produce new food or zero-miles products (such as sustainable packaging), to distributing surplus through innovative services for communities, ultimately this overview helps to orientate in the consumption to disposal phase. It proposes, indeed, new ways of recycling and reusing food waste as a resource for new ecological materials. These innovative prototypes have been developed as concrete actions with the aim to persuade users to change their behaviours, while simultaneously exploring cultural, social, and economic perceptions of food waste. These practices face the challenge of building an alternative economy in which the innovative social enterprises, addressing design-based culture, can play the fundamental role of social actors able to create new values alongside the economic ones.

food / waste / creativity / circular economy / sustainability

FOOD CYCLES AND SDGs

Food—in its life-cycles—can become a crosscutting factor towards co-designing sustainability in cities and with urban communities (Schröder 2019). This can be also achieved by making available new products and services that, according to the United Nations Sustainable Development Goals (SDG 12.8), can raise awareness of sustainable development and lifestyles in harmony with nature.

Design cultures today have begun to question and innovate in the production, distribution and recycle models of food cycles. Food waste has a special role in these design activities as potentially a new material capable of starting new cycles: by coming back again as food, nourishment for life, or creating objects for everyday life such as packaging or for other purposes. Since access to food is often problematic in urban areas and the need to find fresh and quality food has been rapidly emerging, cities have become laboratories to experiment creative approaches. Contemporary cities represent the political and cultural arenas where networks and practices openly break with the traditional dynamics of food industry, and thus propose new values (Tucci 2016). These movements of opposition to the standardised food system are lifeblood to support communities' needs and practices, subverting the current patterns of food cycles in the urban environment. Moreover, the academic research is crucial in pursuing and promoting to a large audience the necessary radical change towards many of the 2030 SDGs with a focus on urban communities.

These new holistic approaches are well represented by the biennial European project Creative Food Cycles (CFC) developed within the Creative Europe Programme, aimed at improving and integrating interactions between the food system and the urban context in a transnational perspective, placing food at the centre of cultural discoveries and social innovation (Markoupoulou et al. 2019; Gausa et al. 2020).

In particular, within this project, the issue of food waste is examined as a fertile field for reversing course and enhancing circular economy in everyday life. From a scientific point of view, the research contributes to developing new materials derived from food-chain waste as well as to explore possible applications ready to market, investigating at the same time how the public perceives such products. This need emerges because the existing wide availability of waste-derived and sustainable materials—on which experiments are taking place everywhere and at different levels—does not correspond to their effective application on a larger scale. Today it is possible to retrieve online recipe books based on waste-derived materials as well as open data libraries to learn how to make new materials sourced from local biomass (Corbin et al. 2019). It is therefore necessary to understand, be-

yond the economic issues, what can really be the near future of waste materials in design.

Food waste reduction needs to update knowledge and develop new skills required by multiple social and economic agents. Food waste implies significant economic losses, ethical and social concerns, adverse environmental effects, and considerable nutritional consequences, posing a threat to global sustainability. The goal set by the UN is ambitious: to halve the global food waste per capita by 2030 at the retail and consumer levels and reduce food losses along the production and supply chains, as well as to ensure that everywhere people have the relevant information and awareness of sustainable development and lifestyles.

A study by the Ellen McArthur Foundation (2008) reveals that, in Europe, the circular economy can generate an economic benefit of 1,800 billion euros by 2030, and can create new jobs and increase annual resource productivity by 3%. This represents a new economic model that puts design cultures as a major driving force for the envisioning and realisation of social innovation processes towards resilient and sustainable cities, in which communities act collaboratively. If we consider that in the Mediterranean area food and nutrition are fundamental and recognised elements of culture and economic development, the topic of food as an opportunity of action towards co-designing sustainability comes to the fore. In this direction the activities, herein illustrated, explore new ways not only targeting design innovations of food waste as an industrial product, but also trying to move the levers of social innovation.

In the last two centuries, through a food globalisation process, food has turned out to be an industrial product strongly subject to profit (Liberti 2016). Just as the food industry has progressively and systematically designed the products that support distribution and consumption of goods in our daily lives, design cultures today have begun to rethink and question new recycle models of food cycles. It has to be taken into account that designing in the topic of food has the "ability to work on the functions of the emotional process, which is closely linked to the cognitive process, or rather to the aesthetic emotion that objects trigger" (Di Lucchio 2010, p. 150). Food is a powerful medium to convey these issues to a wider audience, as a tool for reflection, and to expand the field of investigation to solutions in response to future challenges: functional ones, above all, linked to the availability of food, consumption habits, production and distribution chains, environmental impacts of supply chains, and food waste through a creative approach.

As an industrial product food is a fertile field for thoroughly understanding both the relationship between ethical elements and the way we produce, consume, and recycle it in our cities.

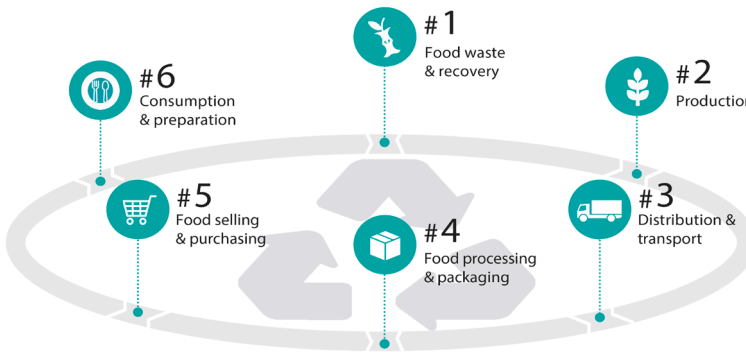

Figure 2. The Food Life Cycles: starting from Food Waste. © S. Pericu, 2020

Even more, this topic represents an interesting domain of studies for design having a "reparative role" (Antonelli 2019), with respect to environmental and social issues in which the system at a general level and the choices of individual consumers are intimately intertwined. "Designers and artists are able to formulate, through artefacts and concepts, urgent political questions that cannot rely solely on regular processes to enter public discourse. In regards to the environment and all associated concerns, in particular, state policy is driven to make reformations by the priorities that researchers, designers, activists, scientists, architects, and citizens set forth" (p.18).

The development of products, prototypes and services aimed at food—reducing waste generation through recycling and reuse in everyday life—needs, on the one hand, to be inquired within the academic design community as new artefacts and materials derived from food waste; on the other hand, it needs to be disseminated as new practices through creative events to raise awareness of the impacts of food cycles in our cities. Products derived from food waste can therefore vehicle positive messages to communities encouraging them to act in opposition to a food distribution system that leads to wasting and to the immoderate use of other materials with unsustainable costs. This bottom-up response should be able to subvert the economic interests of food industry, changing the course on the basis of

Figure 3. La Peruana Coffee packaging Peru', Lima, Peruana Coffee © Elizabeth Palomino Nolasco, 2018.

consumer interests. This can be achieved by involving urban communities (with a particular focus on creative communities), which are at the centre of these experiences and, in a way, can drive innovation ahead of food industry and large-scale distribution. The creative communities, accustomed to social innovation practices in cities, are able to design and make visible new ways of recycling and reusing food waste, as a resource for the creation of new environment friendly materials or prototypes. These projects are developed as material actions with the aim to persuade users to change their behaviours about food waste, exploring at the same time cultural, social, and economic perceptions of it.

WASTING AWAY

Before beginning an exploratory journey through the selected practices, following the lifecycle phases, we need to take a necessary step and overturn the notion we have of waste.
As to Lynch (1991) waste and waste places are natural in a quite different sense, also for us the aesthetics of waste must represent a land of freedom, of different possibilities with a high use-value. "Living among ruins has its delights... It can be a wilderness wilder than any natural one, an alluring mix of freedom and danger."

Figure 4. Permafungi mushroom farm. Permafungi, 2018.

(p. 23) We have to reconsider the aesthetics of waste, bringing them closer to us, but also to understand that in nature everything has its purpose, nothing is wasted away. The word 'waste' and the act of 'wasting' are just human inventions (McDonough et al. 2002). Yet, while awareness is growing, the problem of producing food waste remains a significant barrier to achieving a sustainable food system. An estimated 30% of the food supply is wasted in the developed countries. If food loss were a country, it would be the third-largest greenhouse gas emitter, behind China and the United States (Stenmarck et al. 2016).

According to the sense of urgency provoked by these facts, we need to adopt a radical approach, and to create a new meaning for food waste. To do this we must refer to the circular economy cycle, for food as a natural system of regeneration, in which waste becomes again food, transforming itself into a new resource. "Making the most of food" (Ellen Mac Arthur Foundation 2019) means to involve local communities, stakeholders and active urban society, developing a cultural and holistic approach, joining all the aspects of food cycles, but also to stimulate with an open and inclusive approach a deeper interconnection of disciplines dealing with the urban environment, to reduce food waste and co-design a new concept of waste. Above all, to do this we want to put waste at the centre of the food life cycle, as a primary resource and the starting point of the entire cycle. The aim is to enhance

Figure 5. Food Action. Final project in Design Sistemico R. Passaro © Politecnico di Torino, Food Design Lab, 2018.

the role of waste in the creation of new products and services that can have a value in activating creative communities and in allowing sustainable behaviours to everyone. This represents an alternative market to the predominant one, which creates and satisfies new needs in total respect of the environment and, therefore, destined for a bright future. It is also important to note that in all these actions the aspect of social innovation is always strongly linked to that of circular economy, thus creating a new social self-supporting system, which deals with food as a profitable field. These practices face the challenge of building an alternative economy that gives these social innovation enterprises a new and fundamental role as social actors in order to create new values alongside the economic one. The concept that lies behind is the non-linearity of the processes, which assume a regenerative dimension, as if they were biological life cycles able to recover living matter even at the end of life.

THE FOOD LIFE CYCLE PHASES STARTING FROM FOOD WASTE

This life cycle allows us to illustrate new products, in which the design of the product system—objects, communication, and services (Vannicola 2018)—goes hand in hand with social innovation actions that implement strategies at different levels.

A selection of examples and best practices explored in the Creative Food Cycle project are compared with the creative actions carried out within the CFC lifespan.

From Food Waste to Production

The organic component of soil, the humus, is formed through the decomposition of plant materials by soil microorganisms. Humus is the nourishment of life and the energy we need, in association with water, to grow food. Food waste through this process can be used to produce food. This process has always been performed in agriculture at a large scale and we can do it today even on a small scale in our own homes thanks to products that facilitate domestic farming activities. Designers can optimise products and services, creating closed-loops of material flows that are sustaining, and in which waste becomes a raw material. The project Perma-Fungi applies this principle and represents a perfect example of this attitude. It, was created and implemented by a social cooperative in Brussels based on participatory urban agriculture actions combined with circular economy principles. The main goal of this project is to recycle urban organic waste mixed with coffee grounds to grow oyster mushrooms and produce compost. In the same direction goes the installation "Myco-scape", developed in 2019 in Barcelona by the Institute for Advanced Architecture of Catalunya (IAAC), within the CFC Food Cycle in action. Myco-scape is a wood modular system with an external surface which supports the growth of edible mushrooms in the urban environment, producing both food and construction materials. This prototype project acts as a real manifestation of food life-cycles: creating a culture of caring for locally sourced and produced food and raising awareness of sustainable development and lifestyles in harmony with nature, according to the SDGs.

From Food Waste to Food Processing and Packaging

Climate change demands original and radical thinking and if, as Papanek (2019) and Fry (2010) argue design is a vital form of political action, designers play a major role as powerful agents of change who can imagine long-term freedom. Aiming at freedom from plastic packaging, for instance, is a necessity for designs that not only can serve the market, but can also realise alternative visions. In Peru, the Pulpaking project contributes to tackling this sensitive environmental problem by developing 100% biodegradable and compostable containers made from kitchen and agricultural waste. The cultural impact of the project is to generate awareness and environmental education with the use of sustainable packaging. Among the

various solutions developed, the most successful in terms of audience acceptance is the design of bio-packaging for the coffee brand La Peruana Coffee, which responded to an international call for best practices in the context of the Creative Food Cycles project. In the same project, the research unit of Genoa has developed with product design creatives various products from food waste. These projects work with the main idea of making citizens aware of recycling, looking for easy procedures that can be reproduced at home by everyone. These ways of processing waste can be easily achieved through the addition of bio-resins or homemade processes that we could define as "cooking chemistry", or by drying and weaving food waste.

From Food Waste to Food Selling

Services have also a major role in supporting communities of citizens as users and companies, by creating a virtuous circle in which everyone actively interacts for sustainability with a positive impact on the territory and the quality of life of all those involved. With a proper service and effective interaction design strategies, companies can promote their sustainable actions and behaviours, while consumers can lead sustainable lives. The example of Too Good to Go pushes in this direction. Designed as a free app by a movement against food waste, it allows the purchase of unsold food to prevent it from becoming waste and ending up in a landfill. Networks of actions for the recovery and redistribution of food surpluses with social solidarity purposes, such as the showed example, are growing in number, widening their impact on the territory. Following this strategy, as part of the CFC project, the "Food Shakers | Food Remakers installation" has explored the topic of food surplus by experimenting with food to become new material as packaging, or real products for consumers. The installation was part of an annual science event in Genoa, as an opportunity in which waste becomes a means for education and in which the true essence of contemporary design is expressed not merely as an intellectual exercise. Food thus becomes an artistic experience, because art makes the invisible visible and generates a sense of responsibility, which in turn is a social act in the form of creativity.

From Food Waste to Food Consumption

Starting from food waste, food design can develop strategies for reusing food surpluses to feed people by transforming the raw material. The project Food Action, developed by Polito Food Design Lab, creates new edible products transforming

vegetable and fruits that, otherwise, would end up in trash. Food Action promotes a new approach as a project of design-driven education empowerment and food products innovation targeted to the homeless people hosted in Turin's night shelters. These products take into account the importance of nutritional values and the consumption experience according to specific dietary needs. Innovative techniques in preparing the products guarantee a long shelf life that prevents the risk of food expiration.

CONCLUSIONS

The concept of food waste and food losses is not only a topic at the centre of the debate, but also a powerful tool for raising awareness of sustainable development at the community level. The actions shown in the paper aim at persuading consumers to change their behaviours, and at the same time exploring cultural and social perceptions in this new attitude. With the aim of making cities more sustainable, it is necessary to find out and develop tools to engage people also and above all from a cultural point of view. In this direction the CFC research has turned into an educational campaign and an open platform where prototypes, new materials, and products are developed as inspiration for change.

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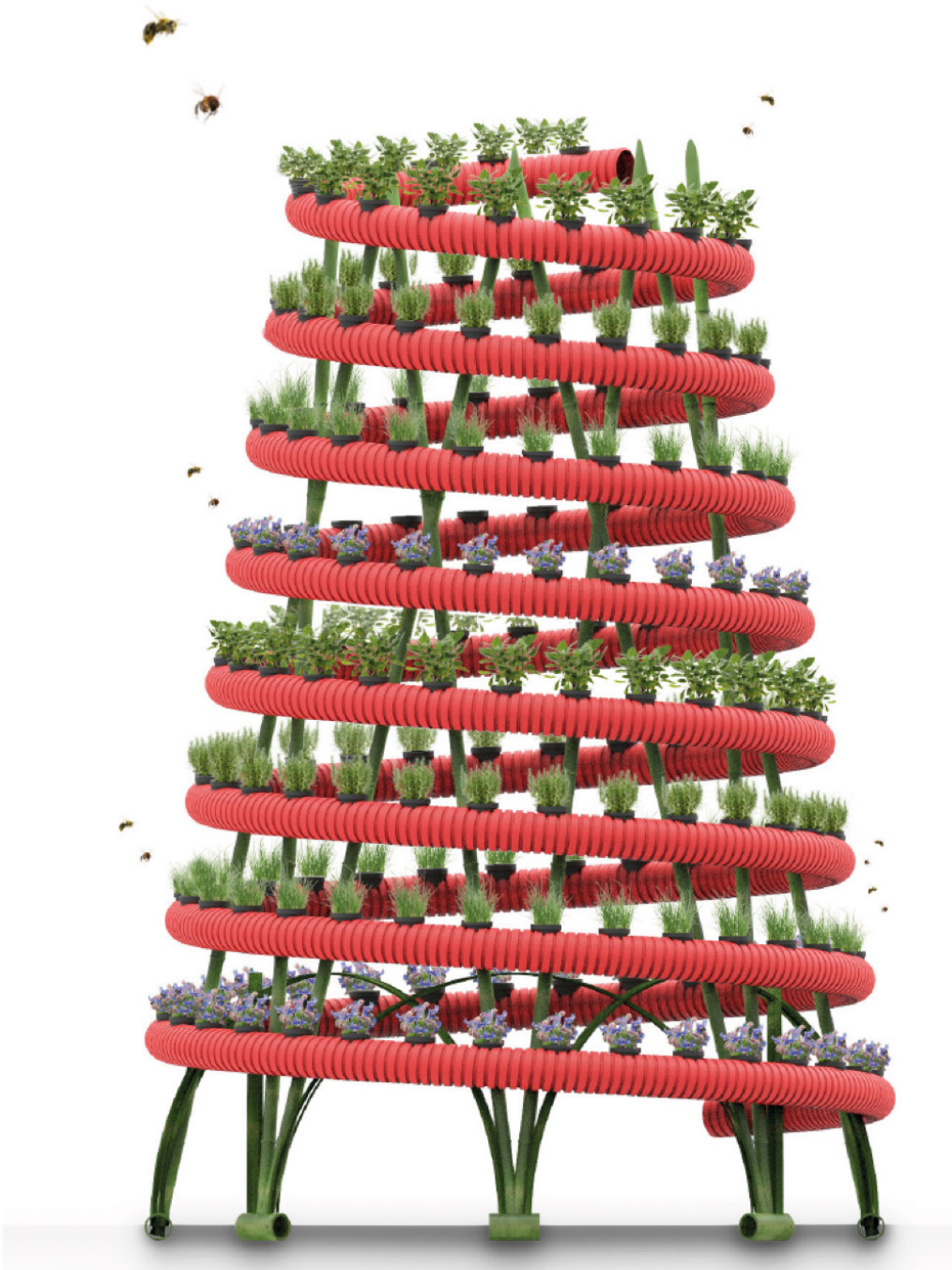

Figure 1. “There is no plan bee“. The DIY structure for hydroponic. @Giovanni Foppiani.

BE[E] THE CREATIVE FOOD OF SOCIAL INNOVATION

Raffaella Fagnoni

Three-fourths of the world's flowering plants and about 35% of food crops depend on pollinators to reproduce: more than 3,500 species of native bees help humanity to increase farming yields. However, due to climate change and pesticides, possible extinction scenarios for these insects have been reported. How can design address this problem? What can design do for bees? A bachelor final research project ("There is no plan bee")1 focuses on the city's abandoned spaces and the actions of creative citizens. On the one hand, the possibility to reuse abandoned places practising sustainable solutions. On the other hand, the chance for citizens and cities to activate bottom-up design practices and social innovation, facilitating a kind of circular city. Civic participation extends to the making of new urban communities, through simple self-produced installations, aiming to cultivate new visions and to influence creative food cycles. The paper aims to new models of knowledge production, addressing social, environmental and economic issues linked with food culture. It also deals with designing for common goods as a need for our next future.

social innovation / food culture / urban farming / reuse / creative food cycles

INTERSPECIES DESIGN[2]

One-third of our food depends on insect pollination: only in Europe, we can count over 4,000 types of vegetables. Unfortunately, bees are in decline, threatened by pesticides, habitat loss, monocultures, pests, diseases, and climate change, as documented by the specialist or international associations, such as Greenpeace. Development focused only on human needs has caused damage to the system, thus today Paola Antonelli talks about 'interspecies design', that means designing observing other species, imitating nature. She suggests a restorative design that not only reduces its footprint but regenerates the current condition, recognises the aberrations of the Anthropocene, and goes beyond. She seeks interspecies collaboration, shared activities and co-creation, mixture and circularity. It seeks empathy and the awareness that we are part of nature but not the owners. (Antonelli 2019) Also Kate Raworth, economist, proposes a vision of the regenerative and circular project to overcome social degradation that must go hand in hand with the environmental crisis. Too often the world of design has been generically criticised for not being able to provide adequate answers to the ecological issues. The great challenge, as Paolo Deganello defines it in his book Political Design (2019), represents the opportunity to respond to the environmental crisis by designing for the common good.

THE COMMON GOOD IS DESIRABLE

Even if the world is not yet ready to consider Design as a common good, we must aim for it. The notion of commons had its origins in the medieval peasant practices, and today, by commons, we can mean "social systems formed by three basic interconnected elements": a commonwealth; a community of commoners; the praxis of communing. (De Angelis 2019, p. 124) More and more often the community is wondering about the contribution of design to the common good, that means [...] benefits society as a whole in contrast to the private goods of individuals and sections of society (Stanford Encyclopaedias of Philosophy). Design as a discipline had always worked catering the private good. Recently, by necessity, the 17 UN Sustainable Development Goals considered Design as common good as a priority to co-create and co-design among governments, industries, academia, and civic associations to achieve socially desirable innovations.

NO MORE ALARMING NARRATIVE. WE NEED RESPONSIBILITY AND CIVIC AWARENESS

"If we look at the bigger picture in its entirety, the first thing that springs to mind is that there's nothing in this model that deserves to be sustained." (Morton 2019) The term "sustain" necessarily implies something to maintain, without altering a previous situation, which is why producers like it too. Many people today understand sustainability as the effort to maintain the system with which we have been inhabited until now. If we put together a business model with ethical issues without a real change in the production system, we get greenwashing solutions in the best cases or, worse, trivial marketing operations.
The emergentist and alarming narrative frequently used to communicate the environmental crisis, does not help the purpose. To frighten individuals does not help to change attitudes; on the contrary, it stimulates conservative attitudes, causes closure and rejection. So, as Morton suggests, we must focus not so much on guilt, but on a sense of responsibility.
One of the most important aspects of progress is that it does not concern the accumulation of objects, technology, and knowledge: it concerns awareness. (Mulgan 2018) We have experienced that economic growth does not automatically turn into social or human progress. It does not always produce what we need. Thus, thinking in terms of growth as we have done in the past does not bring great benefits. Awareness is the key to identifying the real needs of people and the planet and should guide innovations and policies.

FUTURES THAT HAVE A FUTURE

As Mulgan claims in his "The Imaginary Crisis" (2020) we are experiencing an unprecedented crisis of imagination. We are able to imagine apocalyptic scenarios or great technological developments, but we are unable to develop a better society, with healthy social balances and cooperation to better living. We know how to do business, but we don't know how to do society. To be good designers, first of all, we need to be good citizens. Being civic-minded and acquiring consciousness is the first step towards making the right choices. We need to tidy up the world we live in, for the benefit of all, but to do it, rather than great ideas, we need the fundamentals of civic consciousness. If we want to pursue what Escobar calls "futures that have a future" (Escobar 2018) we need more civic consciousness. We have to use design as an enzyme transforming our way of living, educating, practising. By spreading good practices some attitudes can be taught or trained, as, for instance,

Figure 2. "There is no plan bee". General vision of the concept in the Ex OGR area. @Giovanni Foppiani

taking care of relationships with others, following the key themes of social innovation. (Mulgan 2018) But to change we need to experiment through initiatives that strengthen the civic fabric, fostering horizontal relationships, able to promote and implement circular economy principles, and resulting in a resilient system that facilitates new kinds of social, environmental, technological, and economic activities.

MORE REUSE LESS RECYCLE

The risk of recycling is the legitimacy to produce anything. The importance of reuse on recycling is another nuance of concept not always grasped by designers. The use and reuse of already built objects or products take on, in addition to a pragmatic and optimisation value, the power of restoring life to something expired and unused. Above all, reusing means proposing a sustainable alternative to the rapid obsolescence of objects, goods, and artefacts without history and identity. The reuse creates economic and even social sense only if we can extend it to mass consumption and make it a widespread behaviour that reduces the production and consumption of the new and contributes to saving the planet's resources.

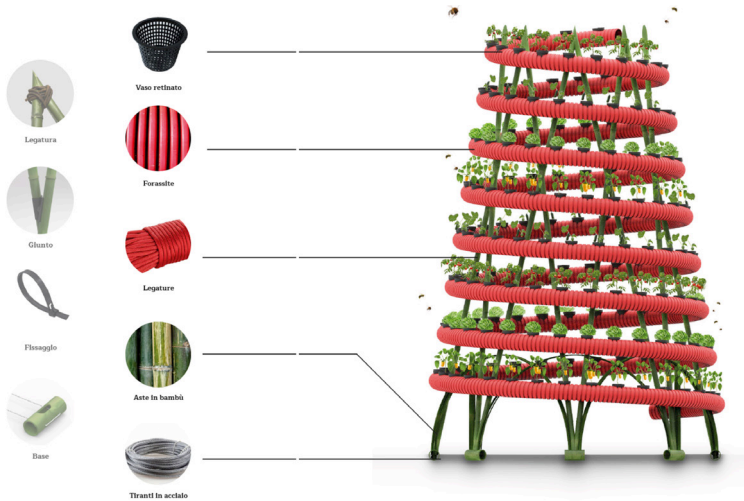

Figure 3. “There is no plan bee”. The DIY structure for hydroponic. Materials and details. @Giovanni Foppiani.

THERE IS NO PLAN BEE

"There is no plan bee". This is why today we need to imagine new scenarios, designing them by proposing visions, having the courage to experiment them to recover what we risk losing forever. "There is no plan bee" is the title of Giovanni Foppiani's graduation thesis, at ISIA in Florence, discussed in February 2020. It is one of the answers that our students seek to advance, stimulated to work as active citizens and to propose an ecological turn. The name of the project recalls the banners displayed by demonstrators during the first global climate strike called by Greta Thunberg, in March 2019. There is a strong link between the project and this historic moment. In the Anthropocene era, it is no longer possible to ignore the environmental crisis to which we have contributed so much. The environmental deterioration is the outcome of the anthropocentric vision that has so far steered the choices with disastrous influences on the planet. The consequences of these choices also fall on bees, which risk endangering the entire food system, since they are the main pollinators and breeding agents of plants.
The choice to link abandoned spaces and the conception of a new habitat for bees is not just an urban reuse operation. It is an opportunity to see abandoned spaces as a rich source of spontaneous biodiversity. Green infrastructures represent the

direct consequence of this kind of reflection on brownfields, where the urgency to find new alternatives for food production in cities also converges. Agriculture, food production and consumption represent one of the most impacting sectors on which to speculate since they are one of the main causes of climate change and lead to deforestation, polluting waste, desertification and reduced fertility, which are burdensome both for the environment and for human health. The project draws attention to the environmental crisis, and in particular to the extinction of bees, highlighting their fundamental role in the ecosystem.
The project lies in the abandoned space of the Ex Officine Grandi Riparazioni di Firenze, a former railway area that has been abandoned for many years, with a surface area of 92,000 m2 and represents one of the greenest areas in Florence, due to its proximity to the Visarno and Cascine parks but at the same time very close to the city. The physical degradation over the years has also intensified the social degradation.

The actions foreseen by the project are:

- a series of plantings and cultivations on the ground, to regenerate the soil and attract bees, allowing the adaptation of the space to be used as
- a place for agriculture and food production;
- the insertion of easily self-producing structures for vertical farming with hydroponics;
- a documentation and training centre on hydroponic, cultivation, bees and beekeeping.

The distinction between ground cultivation and hydroponics helps us to identify the most suitable solution for different crops. After a comparison with experts in the field, the Nutrient Film Technique (NFT) was chosen, which consists of running water on a slightly inclined tray where the plants can absorb what they need. This process ensures a constant supply of nutrients and water to the roots. This process is similar to drip irrigation. Hydroponic agriculture has assumed central importance in recent years both because of the urgency to find alternative solutions for food production by optimising water resources and because it allows the cultivation of plants even where the soil does not allow it.

The structures provided for vertical farming are intended to house crops of two types:

– nectariferous, located in strategic locations to attract bees to the abandoned plant where they will find a highly developed biodiversity (basil, chives, rosemary, sage and borage, aromatic plants that are very attractive to bees);
– fruit vegetables, which, in addition to being pollinated by bees, also represent an important solution for the set-up of the new city Zero Km. The main crops planned are tomatoes, peppers, cucumbers and all green leafy vegetables (chard, mustard, salads, lettuce, rocket) to be placed with the caution of the weight of the fruit and to prevent the broad-leaved ones from shading those below, obstructing their growth.

In this way, possible good practices of social innovation become practicable; an extended civic participation leads to the creation of new urban communities, with the aim to cultivate new visions affecting creative food cycles. The element designed for cultivating can be easily made by bamboo, economic or waste materials, with low environmental impact. The design solution experimented particular kinds of bamboo simple joints, combining easy to find materials.
If today's role of design is more and more concerned about how to scale-up solutions in everyday life i.e. services, social innovations or product-service systems that bring about social change, there is an immediate need of understanding how co-designed solutions can firstly, be sustainable and secondly, how these solutions can be replicable in other contexts on various scales. (Ballantyne-Brodie, Telalbasic 2017)

FOOD CULTURE, SUSTAINABILITY, AND SOCIAL INNOVATION

The idea of food is linked to that of nature, but the connection is ambiguous. The core values of the food system are not defined in terms of naturalness but as the outcome and representation of cultural processes that involve transformation, domestication and reinterpretation of nature. Hippocrates with the ancient doctors and philosophers defined food as "Res non-naturalis" including it among the life factors that do not belong to the natural but to the artificial order of things. Therefore, to the culture that humanity itself creates and preserves. (Montanari 2004, p. XI)
Projects like "There is no plan bee" (and many others) can help bring food culture—as it is close to people—back to sustainability through social innovation practices. Involving people in all the stages of the process, from the production of vertical farming facilities to the care and cultivation, from harvesting to consumption, is an opportunity to experience and spread the values linked to food culture.
In the production phase, people follow and experience knowledge about cultivating

and taking care of food, appreciating values.
In the preparation phase, people practice with food and follow rituals.
In the consume phase, people live the convivial moment, linked to the main rituals and important gestures of our traditions.
In the disposal phase, people apply knowledge and practices that intersect tradition and innovation.

BE[e] THE CREATIVE FOOD OF SOCIAL INNOVATION

From design for the common good to social innovation, food culture and rituals linked to food cycles mark important occasions of knowledge at every stage. They can be an opportunity to nurture processes useful for the development of civic awareness, to foster social innovation, to be the change that our reality demands of us. Gardening and preparing food from what is growing in the garden have been integral parts of religious and educational practice in many spiritual traditions, in many different times, from Christianity to Buddhism. Cultivating and cooking are examples of cyclical work. Work that has to be done over and over again, work that does not leave any lasting traces. You cook your food that then is eaten. You plant, manage the field, harvest, and then plant again. These rituals help us to recognise the natural order of growth and decay, of birth and death and thus make us aware of how we are all embedded in the cycles of nature. Food Cycles are one of the earliest and most important ecological concepts. From the beginning of the science of ecology, ecologists recognised that the food cycles are all interconnected; most species feed on several other species, as we do. (Capra 1999, p.19)
In a typical food cycle, the plants are eaten by animals, which are then eaten by other animals, and thus the plant's nutrients are passed on through the food web, while energy is dissipated as heat through respiration and as waste through excretion. The wastes are decomposed by insects and bacteria, which break them down into basic nutrients to be taken up once more by plants. (Capra 1999, p. 22) By experimenting these food cycles people become aware of how we are part of the web of life. The survival of humanity will depend on our ability to understand the principles of ecology and live accordingly. (Capra 1999, p. 52).

ACKNOWLEDGMENTS

This contribution is addressed to Giovanni and to all the young people who, like him, are working to have their future, using the design tools to change things. The innovators remain optimistic as Martin Luther King used to say, with the confidence to plant an apple tree today, even if there is the risk that the world will collapse tomorrow.

FOOTNOTES

1 Some parts of this paper are the result of thoughts shared with Giovanni Foppiani during the nine months of his bachelor final research thesis at ISIA Firenze, discussed on February 2020 session (ay. 2018–19).

2 The concept of interspecies design is treated by Paola Antonelli on several occasions, lately in the exhibition Broken nature.

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Figure 1. Maritime Spice Routes indirectly connect markets from East to West already in middle ages © Sommariva, 2020

FOODWAYS: DIASPORIC EXPLORATIONS AT THE AGE OF (DIGITAL) DISCOVERIES

Emanuele Sommariva

Food markets has been always globally connected (directly or not) since ancient times. Catalysers of discoveries and exploration, the supply of precious foodstuffs has represented throughout history a driver of change for society. Today, living in an age that pours its commercial energy in the *commodification* of food, exploring the complex and often non-transparent trajectories food cycles need to take in order to reach our plates is generally impossible. Could it be that the world already produces enough food and will continue to do so, while the critical problem is related to logistics and distribution models? Creative Food Cycles moves in this direction by exploring new co-production models, to enlarge *scopes* and *scales* of regional *foodsheds* filling the gaps in-between the necessary abstractions of models/policies and the transience of civic actions/collective existences (Schröder, 2019). By addressing the food cycles holistically and as a *motif* of design, the paper explores the research-by-design activities carried out by Leibniz University Hannover addressing new spatial formats for urban inclusiveness, while promoting the role of urban planners, architects, and designers as facilitator empowered with new languages, tools and practices to widening the interfaces between creativity, places and public awareness.

food explorations / supply chains / regional foodsheds / creative food cycles / co-design

Figure 2. Modern innovations in food shopping and supply systems which changed our lives: supermarket, refrigerator, shopping cart, station wagon © Sommariva, 2019

THE SPICES THAT BUILT OUR COMMON MARKET: TALES OF MEN, ROUTES AND EXCHANGES

The idea of a "global economy" was already in place during ancient times and it was connected to valuable food cycles and exchange of its produce (Cardini & Vanoli, 2017). The extant, best-known picture of movement of peoples and intercultural exchanges —at least from Western/Roman perspective— of what could have been the centre of this trades is the Mediterranean Sea; not simply as a geographic region and a basin of civilization, as mostly described in literature, but as a network of goods, languages, routes, images and ideas that peoples had of themselves and of distant trading partners, often shrouded in mystery (Mclaughlin, 2016). Mediterranean regions could not have been the same, without an intricated far-flung web of indirect connections to Asia, stretching from north caravans' trails (Eurasian Steppe Routes), to eastern merchants' routes (Asian Silk Road, Indian Grand Route) to the southern land-sea interactions (Arabic Incense Trail, Maritime Spice Route), eventually ending in Far East or Central China old's capital Xi'an, the source of fine luxuries perfumes, gems, and, above all, spices. (Abu-Lughod, 1989; Sidebotham, 2019) Spices has been a catalyst of discoveries; driver for reshaping world's trade geographies and, by extension, civilization. Among many biographies of explorers and

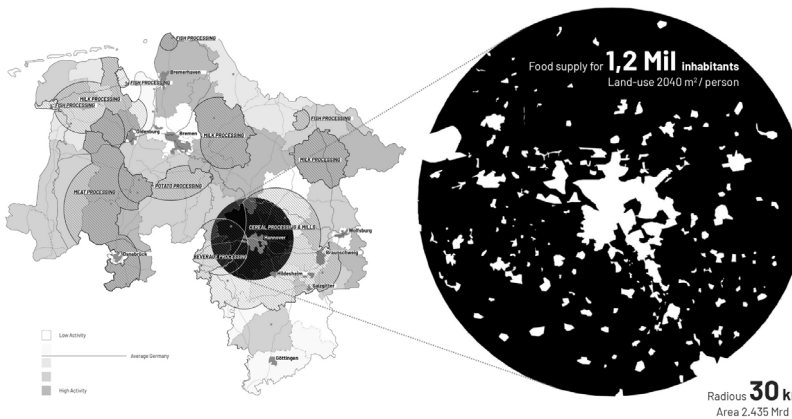

Figure 3. Hannover Regional Foodshed and local food supply capacity radius to satisfy local food demand © LUH_IES, 2019

mariners discussing East-West historical exchanges and long-distance food-related dialogues, such as Marco Polo (1295) and Edward Gibbon (1737), the one less-known of a bankrupt Venetian merchant by the name of Romano Mairano is fascinating, to give an idea of how Mediterranean basin has been always the terminus of a larger cosmopolitan and multicultural hub of commerce. (Lawton, 2005)
In 1173, Mariano set sail looking for a risky, but wealthy career in overseas trading —through a contract called colleganza,[1] which establishes an association among itinerant merchant and local emporia— related to silk, ginger and pepper imports from Alexandria and the head of the Nile Delta, where such fine goods arrived since ancient times, by virtue of the access to the Red Sea trade routes. Mairano was bold but not crazy. He knew, such schemes had enriched Venetian merchants for generations, while many European feuds and markets were supplied with appalling food, necessitating huge quantities of pepper, ginger and cinnamon to disguise rancid taste or the salt used to conserve dried old meat.

Especially during the Middle Ages, for the guilds of merchants of the Maritime Republics, the Middle-East with Alexandria, Cairo, Constantinople, Acri and Antioch represented the gateways to riches. Just to give an idea of the commercial values of spices, Venetian and Genoese merchants were used to sell a pound of pepper

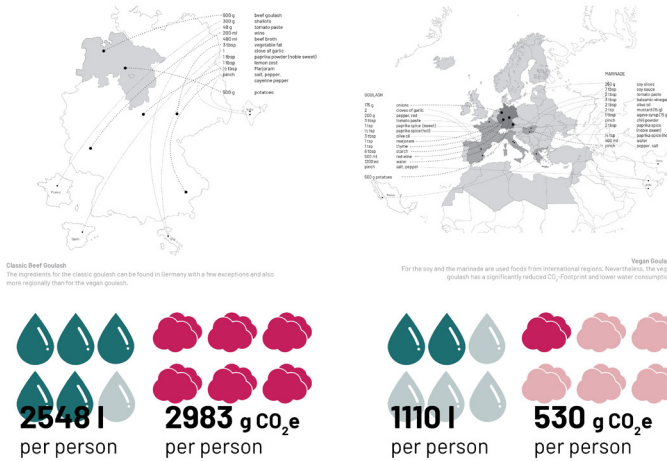

Figure 4. Example of Foodshed infographic realised for studying Goulash Variations by Jacob Fielers © CFC, 2019

in London and Bruges, for a sum equivalent to a week's work for a carpenter or a shipwright. (Cipolla, 1997) High transport cost alone ensured that banquet adorned with spices were recognised as symbols of high rank and wealth, as manors and coats of arms. (Turner, 2005) Spices were truly the most expensive and demanded products of the Middle Ages, as they were used in medicine, religious rituals, cosmetics, perfumery, as well as food confections and spiced-peppered delicacies for noblemen, such as Venetian panpepato and panforte.

However, if the rewards were great, so too were the dangers. At that time, sailors and traders were not insured back in case they lose their cargoes; no coast guard patrolled the seas and the risk of piracy or violence were as much as common, especially by doing business with a Muslim' kingdoms nominally at war with Europe and the Papacy. And when these fine commodities arrived to its destination, often they were ready to embark new route to be distributed across Europe. Some were resold directly to merchants arriving from the North or to emissaries of the Hanseatic League —just to mention the influent confederation of trading guilds operating from Flanders to the Baltic Sea— others were shipped on barges up the Po Valley, and carried on mules across the Alpine passes to Switzerland, Germany and France.

But this monopoly of the Mediterranean regions as a geographic fulcrum of com-

Figure 5. Diasporic cuisine recipes presented at Foodshed Convivium and PorTable unfolding event © CFC, 2019

merce among East-West could not last forever: the fall of Constantinople (1453) barred Europeans from important combined-land-sea routes. In parallel, the rediscovery of Ptolemy's cartographic knowledge was a revelation to provide worldview evidence that the Indian Ocean, for Roman culture, was landlocked. (Love, 2006) Again, creative inventions and social innovation triggered by growing food markets and commodities demand, resulted in extensive overseas explorations to find new sources of supply. From the early navigation to the Atlantic archipelagos of Madeira (1419) and Azores (1427), to the coast of West Africa (1434), looking for new ways to reach India (Vasco da Gama, 1498), the discover of the Americas (Columbus, 1492-1502) till the circumnavigation of the globe (Magellan, 1519-22), Portuguese and Spanish emerged as the main competitors of a Spice-race: an appetite that spanned the planet and, in doing so, transformed it. Food and fine goods started to be mapped alongside nautical routes to reach them in newly-discovered lands outside Europe. Understanding how food supply represented a powerful factor in European culture to foster social innovations and new economic perspectives, is strictly related to the beginning of what we known today as "globalization". (Arnold, 2002)

THE AGRI-BUSINESS SOCIETY: CURRENT TRENDS AND SUPPLY CHALLENGES

Whether the Asian colonial empire of Portugal, England and the Netherlands might be said to have sprouted for the sake of cinnamon, cloves, pepper and how fortunes were made and lost due to them, yet to modern eyes it might seem unrealistic that spices should have exerted such a powerful attraction, however different was culinary taste, food condition or the preservation methods. Mildly exotic condiments, one can argue, but how the world changed around them is hard to believe. Food has been always a material for sustainable renewal of cities.
Living in an age that pours its commercial energy in the standardization of food, according to the "take-make-dispose economy"(Ellen MacArthur Foundation, 2014), which has long relied on the commodification of finite goods to sustain growing population and stability, today exploring the complex and often non-transparent trajectories food cycles need to take in order to reach our plates is generally impossible. Even if the civic debate on food safety, organic produce and nutritional values is internationally sound, and we think to know a lot about good and healthy diets, looking at the effects of globalised food networks is a topic about which not everybody is completely aware. For instance, two recent surveys led by British national newspapers, like the Mirror and the Sun (Tiplady-Bishop, 2019) show that only 22% of UK citizens known that most of the bacons sold in supermarkets came from foreign farms, and only 36% of children distinguish correctly the vegetables served in schools. As Robyn Metcalfe argues in her recent book Food Routes (2019), domestic economies has been transformed by our continuous quest for newly fresh and healthy food we can trust as well its convenience and personalisation to satisfy consumers' wishes and food phobias: the peaches from the farmer next door, one hundred types of bread, spices and exotic fruits for all seasons, dozens of coffee types, long-life milk and great quantities of pork, chicken and beef, which indeed is not quite the most efficient way for feeding us, considering the intensive sub-tropical land-use transformation for creating new arable and pasture lands since up to 18% of South American and African deforestation emissions are caused by Europe, as the world's third largest net importer of agri-products (Rifkin 1992; Zell-Ziegler et al. 2017).

In the same way, the proliferation of all-you-can eat, fast-food or diasporic ethnic cuisines compared to regional food heritage is indicative, especially in urban areas, of parasitic forms of collective consumption (Merrifield, 2014) and the diffusion of socio-economic inequalities related to food accessibility, known as food deserts or obesogenic environments (Townshend & Lake, 2017). If Food is a shared necessity, it is also a shared way of thinking. The question of how to develop this all-inclusive supply challenges, on the one hand, has fostered the tsunami effect of big distribu-

tion chains and specialised places for trade in home products (e.g. shopping malls) or in fake-diversities (e.g. discount-stores, mini-stores), on the other, leading to a progressively relocation of food tastes at the expense of a diffuse urban metabolic imbalance, making citizens more and more subject to a "supermarket diet".[2]
The figures are staggering, seeing the city as the pivotal context of action. Hungry Cities (2009) as stated by Carolyn Steel, where we take for granted that food availability in a store or a restaurant will be continuously replenished day after day, while people's perception are drawn apart from on current levels of production, distribution and consumption related to food, it's indeed remarkable that cities in the world get fed at all.
Every day, in urban areas the size of London Paris or Berlin, more than 30 million meals are produced, processed, transported, stored ready to be consumed, of which almost the 47% —amounting to a footprint of 0.74 kg/day per person— is wasted away, without adopting any recycling strategy. Just to figure out the nutritional values compared to agricultural yields: it takes about 10 calories of fossil-fuel energy to produce a single calorie of modern supermarket food. (Pollan 2006; Steel 2009; Newman, Cepeda-Márquez 2018).

But one of the great ironies of contemporary society is that this change of paradigm regarding food as an urban commodity is related to five product design inventions which have deeply produced social innovation and transformed Western Society more than any other urban design project have done in history. This is the legacy of the modern shopping and supply systems which affect our life today: (1) Fanny Farmer Candy (1920) was one the first self-service store, forerunner of modern supermarket supplied by distribution centers of parent food companies; (2) General Electrics (1927) commercialized one of the first domestic refrigerator which use Freon, expanding the "cold chain" market, necessary to grant long-last preservation of foodstuffs; (3) Sylvan Goldman (1936) introduced the shopping cart in his supermarket chain in Oklahoma, in order to let customers be able to move and to buy more foodstuffs; (4) Malcom MacLean (1956) transformed how food and goods is transported globally, shipped on cargos or loaded on trucks and trains through modern containers; (5) Ford automotive (1957) produced the family-station wagon increasing the number of vehicles able to carry more groceries and goods.

Could it be that the world already produces enough food and will continue to do so, while the critical problem is related to logistics and distribution models? Might we make a dramatic reduction in food waste if we could just distribute more of what we already produce? Can digital transition and ICT can help stop the bleeding of

food within our global supply chain? Much of these challenges will depend on urban ability to support transformative mechanism to enhance sustainable co-production models, to enlarge scopes and scales of urban-rural linkages in order to investigate mutual influences and synergies of regional foodsheds[3], to understand how to satisfy locally our food demands, confronting spatial changes, inequalities, conflicts and insecurities determined by globalised food regimes.

CREATIVE FOOD CYCLES: ACTION-RESEARCH FOR A FOODSHED CONVIVIUM

In last twenty years, many attempts to target food issues into urban agenda and planning debate[4] have been investigated. Creative Food Cycles explores a field of research-action, which establishes a multidisciplinary dialogue between urban policies and governance models related to food, while promoting the role of urban planners, architects, and designers as facilitator empowered with new languages, tools and practices to widening the interfaces between creativity, place-making and public awareness. (Schröder, 2019)
Design disciplines, in fact, can support the urban community in building the places of its own interaction with food through multiple occasions of social innovation and co-management, with different levels of transversal interactions: (1) by envisioning operational strategies dimensioned according to the expected impacts and policy frameworks, in order to define spaces of civic interactions and multifunctionality and daily care practices (places); by explores the geographies of change and the territorial performances of food-sharing practices, prosumer model, new start-ups, living-lab and community spaces (flows); in raising food awareness through responsible social habits by promoting a Zero-waste knowledge education and a new recycle culture (players).

By addressing the food cycles as design concept through which experiment new forms of social participation and co-creation, the activities carried out by project's partners in open-day laboratories has been significant to promote the transformability of urban spaces to enhance ecological resilience and creativity at different scale of interventions. In this context, the workshop organised by Leibniz University Hannover (Chair of Regional Building and Urban Planning) focused on the development of a new urban food hotspot (Sommariva & Sposito, 2019) to give visibility to urban-rural linkages, by designing a multi-purpose stage for pop-up markets with an open and flexible programme of shared uses.
Among the different lines of inquiry explored by the participants, the one of Conviviality and Sustainability has bene chosen as the most significant, for having in-

terpreted the paradigm of low-carbon urban transition through the contribution of a simple piece of urban furniture: PorTable, an unfolding movable table which can functionally re-activate unused parking slots providing a community raised bed for the cultivation of culinary and wild herbs. The transition to a "car-free urban model", it means more unused (parking) spaces opening a wide range of micro initiatives and possibilities, to be envisioned according to the logic of tactical urbanism (Lydon & Garcia, 2015), driven by residents with the aim of recycling abandoned space into new community hubs.

The necessity to put higher attention to the role of open public space in the urban agenda of 2030, is linked to the challenges posed by a rapid urbanization trends, towards sustainable transportation models in the era of digital transition and the post-metropolis. With this scope, PorTable installation wants to contribute by investigating the potential networking logic of sustainable foodshed, recollecting local narratives, grounding international food flows, exchanges and transfer of everyday simple rituals: the care of an allotment garden, the laying of a community table, the setting up of a pop-up market enriched by cultural activities and manifestation, a stage where to display a Foodshed Convivium.

This final act, indeed, promotes the communicative meaning of the installation, extending the concept of conviviality though the embodiment of art-language and graphics design connected to food cycles.

The aim is to critically trace food-flows starting from Hannover/Lower Saxony regional foodshed impacts, to widen cultural geographies, hybridization and dependencies at global scales, looking at the changes occurred through times in regional recipes and local food culture. Discrepancies of tastes and local cuisines have been analysed and re-valued through a selection of dishes, according to main categories of organic, conventional, or experimental food processing methods in Northern Europe, while four topics defines the different areas of co-design: (1) low-impact cuisines and low-carbon daily diets; (2) recipes of memory and territorial identities; (3) food innovation and cross-overs; (4) waiting cuisine and trail cooking.

The output of the workshop ranged from traditional to diasporic cuisine recipes, but with a look to traceability and seasonal availability of ingredients to reimagine meals by means of creative inventions and multi-culturalism, replacing commercial products with those that allow for a lower impact both on nutritional and environmental aspects (e.g. vegan goulash), or those naturally more adaptive to climate changes. In other cases, variations to the records of regional cookbooks and cross-cultural influences produced unfamiliar results enriching Foodshed Convivium of participants' personal view on changing societal food habits (e.g. abendbrot,

zigara börek).
Reconnecting to its Latin etymology as a prologue to a shared dinner, the Foodshed Convivium, expressed a way of living together by re-creating an urban atmosphere. A collective display of different food culture and meals enriched the role PorTable of real aggregator of civic-engagement; a public living room, where everybody can access, taking a seat by bringing a chair, tasting and exchanging food while exploring curiosities and data about ingredients, cooking phases and food-supply infographics, drawn on an eclectic table-cloth which specific zoom, recipe-by-recipe, into regional foodsheds. In its intention, Portable can be transferred and revised according to different configurations, community demands and creativity. Given the modularity of its design, the installation can catalyse strong place-making effects through different forms of spatial engagement, while promoting awareness on current trends, data visualization of food cycles.
Unfolding urban spaces for conviviality and social rituals is, therefore, a design-driven strategy to give voice to communities' interests a personal implication in new fields of action, such as self-sufficiency, food sovereignty and cultural biodiversity, creating narratives of urban-rural linkages and circular economy experimentations. The challenge towards the definition of responsive urban spaces, able to implement models of conviviality alternative to traditional logics, represents an opportunity to rediscover the role of the design as a tool for intertwining relationships, places and identities. The theme of the urban project and its relationship with food, which apparently may seem far from the field of action of architects or designers, on the other hand, represents a horizon still to be investigated, in order to combine the relationship between places of production, marketing and diffuse sociality in the urban scene.

FOOTNOTES

1. In Venetian law, *Colleganza* was a notary contract of command, widespread in maritime trade since 10th century, for association of capitals established by itinerant and resident merchants in overseas emporia. The office allowed a merchant short of substances, but willing to take all the risks of the journey, to act as a free-trader, facilitating the supply of goods for import/export; the experience of the resident merchant in matters of local products and pricing was the other crucial aspect for the success of the business. For more info see: Rösch G. (1992) "Mercatura e Moneta". In: Storia di Venezia. Dalle origini alla caduta. Treccani, Roma.

2. In Germany, for instance the 85% of food retail trade is controlled by only four big distribution chains —Aldi, Edeka, Rewe, and Schwarz Group (Lidl and Kaufland), excluding specialist retailers and e-commerce. These companies operate on an international level, acting as gatekeepers for the global import/export in food products. The German discounter Lidl has stores in 26 countries worldwide, the French Carrefour is represented in 34, and the US giant Walmart in 29 (German Federal Cartel Authority, 2019)

3. W.P. Hedden in the book How great cities are fed (1929) describes with the term *Foodshed* a region of food flows, conceptually analogous to a watershed, which is characterized by a socio-geographic space where food is produced, processed and distributed within a particular urban region and for a given city, market and population.

4. In the framework of recent action research dealing with food and urban governance, the most interesting lines of investigation respond to systemic (Gandy 2004), infrastructural (Morgan, Sonnino 2010), processual (Girardet 2015), urban-rural (Schröder 2017) strategies, multiplying the level of academic debate and innovations in food policies, territorial evidence and food economy, everyday urban life and social practices, and future urban sustainability goals (Sommariva & Sposito, 2020).

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Figure 1. Prototype of sustainable packaging. Source: La peruana coffee, 2019.

DEVELOPMENT OF SUSTAINABLE PACKAGING USING AGRICULTURAL RESIDUES SUCH AS RICE STRAW AND COFFEE PULP IN PERU

Elizabeth Palomino Nolasco

The presented research paper investigates a socio-environmental project that consists of the development of a sustainable packaging, based on organic waste such as coffee and rice. Peru is a global rice and coffee producer, exporter, and distributor country. Therefore, it has a great supply of agricultural residues. In the case of coffee, a considerable amount of waste is generated such as the pulp, the shell, the breadth, and the fresh water; in the case of rice, the residues include the shell and the straw. Based on these materials, our packaging "La Peruana Coffee" will be marketed as a sustainable container for processed coffee, especially intended for coffee consumers in the city of Lima, Peru.

peruvian food system / agricultural residues / sustainable packaging / coffee pulp/ rice straw

Gr (%)	
Cell content	63.2
Neutral detergent fibre	36.8
Detergent acid fibre	34.5
Hemicellulose	2.3
Cellulose	17.5
Lignin	17.5
Lignified protein	3
Crude protein	10.1
Insoluble ashes	0.4

Table 1. Constituents of cellulose walls of coffee pulp. Source: INCAP 1978.

Coffee is the leading agricultural export product in Peru; moreover, Peruvian coffee is accounted as one of the ten most export products, following other assets as some minerals, oil, natural gas, and fishmeal (MINAGRI-INIA 2019). However, the agricultural, forest and agro-industrial residues of Peru—such as those of coffee and rice—are resources not currently exploited commercially (INIA 2019). Indeed, there is a lack of development of an innovation product based on these materials (INIA 2019), for which we approach proposing the development of a new sustainable packaging—"La Peruana Coffee".

The coffee sector, indeed, as many others in the world, is highly affected by the cycle of plastic production, contamination, and waste management. Coffee is a ferociously in-demand product, and it takes a toll on the planet. Every year, as reported by National Geographic, approximately eight million tons of discarded plastic reaches the ocean from coastal countries. In addition, certain additives that usually increase materials performances in terms of strength, elasticity, and durability can extend the timeframe of wasted plastics to decompose (Parker 2019). For this reason, we consider that developing a new 100% biodegradable container to package coffee could contribute to reducing the environmental pollution generated by the use of plastic in the coffee sector.

Figure 2. Coffee pulp in the coffee production areas. Source: the Peruvian coffee, 2019.

THE FOOD PRODUCTION SYSTEM IN PERU

The food system builds on the concept of a 'system' in which there are attributes of the whole that the single elements do not own per se (FAO 2017, p. 4). In this sense, FAO (2017) defines the food system as made up of the integration and interdependence of various "elements", "activities" and "actors", enabling the cycles of production, processing, distribution, and consumption of food in a country. In Peru, agriculture mostly shows a low productivity or low market competitiveness of small farms (finca), as well as a high vulnerability to climatic fluctuation, with estimated losses of up to 15,000 ha per agricultural season (FAO 2010). In the production and distribution cycles of our country, it is argued that, after being harvested in the agricultural portions of the coast and the forest, food is transported for transformation and marketing in the city of Lima, where currently live 9,674,755 inhabitants of a total Peruvian population of more than 32 million inhabitants (INEI 2019).
The consumption of organic food in Peru has increased due to a local demand of healthy and genuine products, with no further transformation or added value. According to the group of producers Ecológica Perú, an increase of 70% has occurred in ten years. Evidence of this positive trend is given by the rising number of "bioferias"—especially in the city of Lima that counts seven of these organic mar-

Figure 3. Rice straw. Source: La Peruana Coffee, 2019.

kets—which provide local population with Peruvian produce free of pesticides and artificial fertilizers (Soto Fernández 2015).
With respect to coffee, there is 2% of internal coffee consumption that increased 66% in the last three years in Peru thanks to the opening of coffee shops in the country, mainly in Lima, as informed the Peruvian Ministry of Agriculture (Peru21 2012). Despite the greatest amount of it is exported to USA and Europe, the trend of domestic consumption is growing in the country, together with a demand for national production and the use of coffee residues.

Coffee in Peru

Peru ranks as the ninth coffee exporting country and the second exporter of organic coffee, following Mexico, worldwide. The socio-economic context surrounding its production is characterised by more than 200,000 farming families working in the sector and only 30% of producers belonging to some type of organisation. A third of agricultural employment is related to the coffee market and coffee plantations cover the 6% of the country's agricultural lands. (MINAGRI–INIA 2019)

Figure 4. Obtaining a prototype based on coffee pulp and coffee straw. Source: Peruvian coffee, 2019.

Rice in Peru

In the period 2001–17, an increase in the production of paddy rice occurred in the country at an annual rate of 2.4%, shifting from 2 million 28 thousand tons in 2001 to 3 million 39 thousand tons in 2017. A growing trend of rice production has been observed in this timeframe, with the exception of 2004, that registered only 1 million 845 thousand tons of rice. (MINAGRI–DGESEP 2018, p. 1) Such trend was driven by a double factor: an increasing harvested area (grew 2.0% average per year) and the increase in yield (grew 0.4% average per year). (MINAGRI–DGESEP 2018, p. 1)

AGRICULTURAL WASTE

Peru collects 16 Mt per year of waste derived from agricultural, agro-industrial, and logging activities. The province of Chiclayo (Lambayeque) has the highest amount of this waste (1.3 Mt per year). This province produces rice and sugar cane in significant volumes. The provinces of Ascope (La Libertad) and Santa (Ancash) are in a similar situation and produce more than 1 Mt per year of this waste. (FAO 2010) The agro-industrial coffee sector contributes to the total amount of agricultural waste: it produces, indeed, 2 Mt of annual coffee, whose residues are made up of pulp and

peel (FAO 2010). Coffee pulp has favourable fibres to make a type of paper, according to the research of Aguilar-Rivera et al. (2014), who did an experiment applying the physicochemical analysis used by the TAPPI (Technical Association of the Pulp and Paper Industry). With the objective of evaluating the quality of the coffee pulp for the manufacture of paper, the samples of the experiment gave favourable results to continue compressing with another fibre (Aguilar-Rivera et al. 2014).
Accumulation of coffee pulp is a widespread phenomenon in the country. Figure 2, for example, shows the mass of these residues in a farm, in the Peruvian jungle called "Paucarbambilla".
Residues from coffee processing in the extraction of the grain are discarded into the environment, causing contamination (INCAP 1978, pp. 19). Table 1 shows the chemical composition of the coffee pulp.

There are investigations of new products based on coffee pulp such as the production of organic fertiliser, protein extraction, and pulp for the extraction of molasses. Likewise, although this material has not been extensively investigated and currently does not have an immediate application to industry, it represents a viable alternative given its enormous organic potential (INCAP 1978, pp. 19).
Rice straw is easy to pulp as a paper fibre because of the open structure of the plant and its low lignin content compared to wood; chemical reactions are surface reactions. The thin cell walls of the straw present a large initial surface area for chemical attack and for the pulp. Rice straw is undoubtedly an agricultural residual potential to be used in innovations of new products according to its own characteristics (Saldívar Chea 2005). This indicates that it is a potential resource to develop paper or similar to cardboard.

MARKET INVESTIGATION

Currently there is a clear trend in the international arena to take ecology into account. The packaging of the products has become one of the factors that have long polluted the environment. Hence, aspects such as the possibility of recycling and the biodegradation of the packaging should be considered essential (Apaza Quispe 2014). Sustainable packaging is on the minds of all brands today due to the increasing pressure from consumers regarding eco consumption in all sectors. This leads brands to rethink the ecological credentials of their products and packs and, as we said in previous lines, the trend is already an urgency (Raconteur 2018). Among the recyclable packaging stands out that biodegradable, which disintegrates in less time than traditional plastic and is harmless to the environment. Another even

better option is that of compostable packaging, which can be integrated together with other waste to obtain compost. Likewise, the trend in 2020 for eco-packaging has become more fashionable than ever, not only in technologies, processes, and designs, but also in the need to use recycled and recyclable materials. (Solutions packaging 2018)

Sustainable packaging companies

- The Chilean company "Biogusto" employs rice husk, the waste deriving from the rice industry, as a raw material to develop biodegradable packaging. Thus, it offers a 100% natural, biodegradable, and recyclable product (biogusto.cl 2018).
- The startup "Ooho" has created a container made from seaweed extract that breaks down in a natural environment in six weeks, being it also edible. With this, it intends to combat the excessive use of plastic in single-format water bottles (Notpla.com 2020).
- The "Maracuyea" is a Peruvian venture that seeks to relate to Peruvian food and educate on issues of responsible consumption, local agriculture, and environmental responsibility. This undertaking is a healthy, delicious, and eco-friendly ice-cream, whose packaging is the passion fruit shell so that, when you finish eating it, all the residues are degradable. It boosts a process of raising awareness not only of nature, but also of the agricultural reality (Maracuyea 2020).

Packaging design for sustainability

Packaging concerns the containment, protection, handling, delivery, presentation, promotion, and use of products. It aims to create economic, social and environmental value (Varghese, Lewis, Fitzpatrick 2012). Strategies toward sustainable development, such an increased efficiency, recyclability and elimination of toxic components, must be balanced against all relevant performance criteria during production, distribution, storage and use (Varghese, Lewis, Fitzpatrick 2012).
The idea of balancing, however, implies trade-offs. While this is often necessary, the aim should be to design and manufacture packaging that simultaneously delivers economic social and environmental value. This may require a departure from "business as usual" to find "win-win" solutions and new innovative ways of achieving the required objectives.
Designing for sustainability requires a commitment to rethink the design of the product-packaging system. There are potential points between objectives, for example:

– Material efficiency of a plastic pouch vs. the recyclability of a plastic bottle.
– Environmental benefits of enhanced recyclability vs. the cost of changing the packaging.
– Elimination of heavy metal-based inks or pigments vs. the marketing advantage of vibrant and durable colours. (Varghese, Lewis, Fitzpatrick 2012).

The use of sustainable resources such as agricultural residues greatly helps innovation and the creation of new products.

LA PERUANA COFFEE

Our project "La Peruana Coffee" consists of the development of a sustainable packaging based on the agricultural residues of the Peruvian production system of coffee and rice. In particular, rice straw and coffee-pulp have been employed in the design, as a high potential of use was found in their organic fibre components. The prototyped container (Fig. 4) is characterised by being entirely compostable due to a degradation period of approximately five months.

The main objective of the project is to generate social and environmental benefits for the community of Peruvian farmers and consumers, through an innovative product design strategy. Novel approaches to the design process should, indeed, begin by rethinking the agricultural waste problem in a more open and creative way. That is why we tackled the socio-ecological impact of local coffee and rice residues and, after investigating the characteristics of this type of waste, we began to redesign the coffee packaging, by proposing an alternative that focuses mainly on sustainability and circular economy. "La Peruana coffee", indeed, originates benefits in the entire value chain of coffee: an added value concerns the use of its own by-products for the distribution of processed coffee to the final consumers in the city of Lima. The main benefit consists in reducing the environmental contamination caused by cumulated and badly processed agricultural waste, as well as preserving the environment by composting and recycling it. On the social side, we aim to reduce the excess work of farmers in burning and processing this waste matter, thus decreasing the atmospheric emissions they generate. In obtaining the raw material, therefore, we coordinate and help farmers in the processing before transporting it to the city of Lima where the packaging is developed. Additional benefits are produced throughout the products lifecycle by avoiding the manufacture and waste of single-use packaging such as plastic, and by promoting the use of ecological materials in Lima. Currently our packaging is sold in organic and ecological wineries that encourage the sustainable consumption of coffee, valuing the social responsibility of the product.

CONCLUSIONS

It is concluded that in Peru there is a large amount of agricultural residues that derive from the country's food production system. These agricultural and agro-industrial residues, which in total amount to 16 million tons per year in the country, have high potential of use for the development of new products based on organic fibres. Rice and coffee waste are poorly managed in the production areas, and thus it is essential to generate new alternatives of use, being coffee and rice products of international (and growing) demand.

Currently it can be observed a positive trend in using sustainable packaging, as consumers have started to value more social and environmental responsibility, according to the international consulting firms already mentioned in the development of the project. Therefore, we consider that our initiative can awake a great interest in continuing developing new basic products of organic and agricultural matter in the country.

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Figure 1. Enhancing the potential of olive seeds. Source: Naifactory-Re-Olivar.

REMIX EL BARRIO: A CO-CREATION JOURNEY TO FOSTER INNOVATIVE ECOSYSTEMS CRAFTING AND MICRO-FABRICATING WITH FOOD SURPLUS AND WASTE

Anastasia Pistofidou
Marion Real
Milena Juarez Calvo

Important challenges are about instigating communities to learn, create and manufacture systems with more eco-efficiency and sufficiency, and to raise awareness about local food waste in order to use it as potential resource for material driven design, crafts and micro-fabrication processes. In this paper, we question how to transform and contextualise educational practices based on circular biodesign to raise knowledge locally and co-create with emerging communities. We present and reflect upon the results of the incubation programme "Remix El Barrio", an ongoing action-research in the neighbourhood of Poblenou in Barcelona during the EU-H2020 SISCODE project.

co-creation / food waste / community engagement / biomaterials / biodesign

The accelerated urban population growth, its related intensity of material flows and linear supply chain models are provoking important paradoxes in cities. One of these paradoxes is the fact that one-third of the food produced is being wasted all along the food supply chain (Gustavsson et al. 2011). This brings challenges and opportunities to the management and revalorisation of organic waste as energy, bio-based products, food, and feed, which are better described with the term Bioeconomy (European Commission 2018).

Food cycles are about better valuing our ecosystems, creating self-resilience and designing more circularity in the ways of producing, distributing, consuming, and recycling. Those new designs highly depend on the territorial context and the scale of the systems we are acting on as well as on how each system will be connected and will care about the others.

From the perspective of systemic design (Battistoni et al. 2019), cosmopolitan localism (Manzini 2013) and Fab City network (Diez 2018), the Circular Economy (CE) could be described as a web of smaller circular economies where the core development is situated in local areas, like cities or regions, with the active participation of territorial stakeholders (Real et al. 2020). In this context, the new challenges are to transform stakeholder networks so as to enable communities to learn, create and manufacture new systems with more eco-efficiency and sufficiency, raising knowledge about local food waste, reducing it and using it as a resource for the exploration of opportunities for material creation, new forms of crafts and micro-fabrication systems.

This is aligned with the recent works of material designers that consider that the creation of materials from alternative sources is of great interest and could be a means of the reduction of the environmental footprint of conventional materials (Camere, Karana 2018). Circular initiatives such Fruit Leather, Orange Fiber, Vegea, Malai, Piñatex, Ecoplaso and new waves of designers are already transforming food and agricultural waste and surplus into valuable products. Platforms, books and databases (Fabtextiles's books, DIYMaterials, Materiom, Food Waste explorer, Chemarts Cookbook) are being created to share practices, data, recipes and projects, while innovative courses (Fabricademy, Aalto Chemarts, Master in Design through New materials) are already integrating such circular design practices into their curriculum considering product life cycles.

To better sustain those new practices into science and society, efforts remain to incubate the emerging practices into new territorialities and understand their capacity to be deployed in specific contexts. This paper addresses the following research question:

How could co-creation foster the development of innovative ecosystems crafting and micro-fabricating with food surplus and waste?

Our ambition is to present and reflect upon the results of an ongoing action-research that have been carried out in the neighbourhood of Poblenou in Barcelona within the EU-H2020 SISCODE project. Fab Lab Barcelona (Fab Lab Bcn) team members have co-designed and experimented with local stakeholders, an incubation programme, named "Remix El Barrio" that aimed at fostering community engagement using waste streams of urban services for the creation of innovative products, platforms and services.

CO-CREATION FOR CIRCULAR NEIGHBOURHOODS: LEARNING FROM REMIX EL BARRIO'S PRACTICE

The co-creation approach of Remix El Barrio will be described by following the SISCODE1's co-creation experimentation framework (Real et al. 2019) introducing context determinants, gathering elements to characterise the process of activity, highlighting the key structures of the emerging actor network and synthesising the main outputs of the process.

Context. Barcelona is renowned for the original character of each of its 73 neighbourhoods—"Los Barrios". The barrios are seen by the city as a relevant size and scale to generate societal transformations. Poblenou is one of them. Since January 2019, Fab Lab Bcn has been engaging with local stakeholders in the pilot of SISCODE to create synergies in Poblenou on the topic of food waste and craft. The pilot used a set of design and co-creation methodologies to support a transition towards re-valuing surplus food and bio-waste at the neighbourhood scale (Real, Calvo 2019). In this first year of activities, a collaboration with Fabtextiles has emerged with the organisation of a first learning workshop dedicated to biomaterial innovation with food waste and has been strengthened by an investigation about the potential of collecting eggshells to produce pots and plates for urban gardens and restaurants. Following the interests of the stakeholders, it was decided collectively to focus on the development of local food waste upcycling by supporting the incubation of emerging ideas and practices. This was the starting point to create the incubation programme "Remix El Barrio".

Process. Remix El Barrio has been created with the ambition to propose a learning place to foster and nestle solutions based on designing with food waste. Through an open call for participation and an invitation of stakeholders from previous activities, 13 participants were invited to start an incubation journey, identifying possible

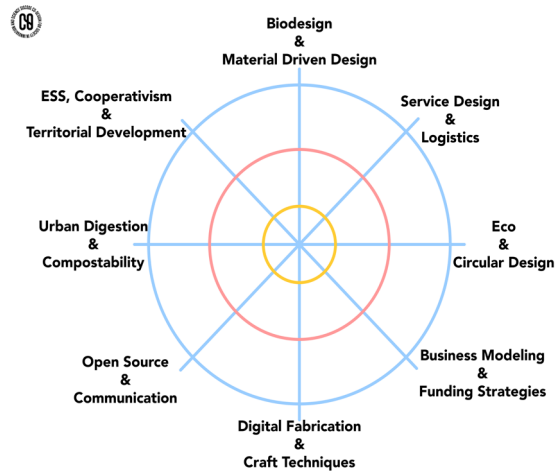

Figure 2. Radar of contents for Remix El Barrio. Source: Authors, 2020.

waste streams in Poblenou services for the creation of new product systems. The participants were provided with materials, fab lab access to machines and experts, online interaction spaces, weekly collective activities and individual coaching both at technical level and community engagement.

During the 20 weeks of the incubation period, the participants and the Fab Lab Bcn team identified eight areas of knowledge for facilitating the incubation of the projects (Fig. 2). The areas of knowledge were: biodesign and material driven design, service design and logistics, eco and circular design, business modelling and funding strategies, digital fabrication and craft techniques, open source and communication, urban digestion and compostability, and social and solidarity economy, cooperativism and territorial development. The first step of learning has consisted in knowing more about the food waste resources and how to design biomaterials. Participants were immersed into the practice of biodesign and design driven material innovation. From recovered waste to materials and materials to product systems, the introduction to digital fabrication supported the participants to learn techniques on how to design and craft products from new types of materials. An important set of skills was also integrated to raise knowledge on environmental impacts with the dissemination of tools and contents on eco-design and circular design principles as well as on compostability and urban digestion. Introduction to

Figure 3. Awareness campaign in the circular barrio. Source: Digue Miguens-Shellskin.

systemic and service design has then permitted the participants to think on how to integrate the user's perspective and concretise logistic issues to run the activities at the neighbourhood level. Finally, for encouraging participants to sustain their project, a public presentation and a series of conversations were created with relevant stakeholders and specialists to learn how to communicate their project with an open-source vision, to better understand the opportunities of social economy and cooperativism in Barcelona, and to find an appropriate business model for future steps of development.

Actors

Remix El Barrio is born in a dense network of stakeholders bringing together various perspectives and cultures and has given stimulus to new collaborations, learnings and organisational transformations in and beyond the existing laboratory ecosystem. Four nodes of stakeholders have been categorised consisting of the group of project participants (the "Remixers"), the Fab Lab Bcn team, the local active communities, and the network of global platforms. Each node comes with a diversity of people, a story, a proper mode of governance and ways of interacting with other nodes. The community of the Remixers. The Remixer's community is now composed by

nine projects with 13 active participants living or working in the neighbourhood of Poblenou, composed by a majority of women (85%), different levels of design expertise (from beginners to advanced people), various cultural profiles (design, graphism, fashion, architecture, catering, restaurant management).
The Support team of Fab Lab Barcelona. Fab Lab Bcn facilitated the Remix El Barrio programme with a dedicated team interacting with other departments to optimise the support and the access of the infrastructure. The team is composed of a trio of "mentors" with different backgrounds, and roles in programme management. The team interacted regularly to synchronise the activities all along the project.
The Local communities in Barcelona. Remix El Barrio also engaged with a series of local stakeholders as a continuum of the first step of the SISCODE pilot. Five active stakeholders, from local community facilitators, urban garden entrepreneurs, to circular symbiosis and digital manufacturing experts, integrated a local co-creation team and have been engaged in Remix El Barrio either to co-define the criteria of selection, to connect with specific projects, or to participate in the cycle of open conversations.
The Global Design Platforms and networks. The last node identified as relevant for the Remix El Barrio's stakeholder network consists of all the knowledge platforms and EU projects partners allowing the participants to enhance their experience and knowledge during the project while connecting with a wide network of designers. This connexion is facilitated by the local Fab Lab Bcn team.

Outputs

From materials, products, services and platforms, nine proposals emerged from Remix El Barrio incubation pilot, combining the interests, needs and synergies between participants and local stakeholders. Two projects (Gos Leka and Look Ma No Hands) create edible solutions from mixed leftover food, thus keeping the use within the food industry, creating co-products such as snacks for dogs and 3D printed cookies. The latter can also be combined with culinary experiences and B2B (business-to-business) services of 3D printing food in local restaurants. All participants decided to focus on the collection, processing and design from one specific type of food waste. Participants were collecting or reusing olive pits, avocado pits, eggshells, and orange peels to wasted oils collected in restaurants, cafes, shops, or domestic homes. The proposals range from furniture and interior design, biodegradable textiles for fashion elements, artistic objects, dyeing colours, cosmetics, packaging and educational workshop proposals for the raise of awareness and knowledge transfer (Fig. 3,4). Two projects (Organic Matter and

ShellSkin) developed in the pilot are focusing on the creation of platforms and communication campaigns that seek to connect different stakeholders, further engage and expand the network of the "circular neighbourhood" and reassure the longevity of the project through the promotion of participation.

DISCUSSION

Among the variety of learnings about co-creation, the practices of Remix El Barrio particularly raised the importance of solidarity and cross-pollination of knowledge in the development of circular food ecosystems at the scale of the neighbourhood.
Solidarity. A core and difficult part of co-creation, especially when transiting towards a circular neighbourhood that is regenerative, accessible and abundant by design (Ellen MacArthur Foundation 2015) is about bringing mutual aid and trust within the ecosystem. From Remix El Barrio, and the overall SISCODE Barcelona pilot, several examples of mutual-aid could be described. A shared system of values has been co-created from the beginning of the project with the holding of the "Synergy Soup" workshop, bringing people around principles of circularity, environmentalism and co-creation together to identify potential synergies for collaboration in the territory. Then, both the external stakeholders and the selected participants joined the activities exploring and learning together without specifying particular expectations or asking for direct, short-term reciprocity when offering a service, mentoring a project or proposing a new material. The forms of collaboration have evolved all along the project from the initial possibility to engage in co-creation activities to the opportunities of being part of a local co-creation team, to integrate the programme as participant, to provide services for expertise and coaching. Another moment of solidarity occurred at the level of participants with peer-exchanges and collective support from participants themselves when doubts and difficulties emerged. Whatever on the WhatsApp group or in open sessions, people were caring about each other, regularly shared contents and thoughts dedicated to other participants' projects.
Cross-pollination of knowledge. The Fab Lab Bcn facilitation team co-developed a framework for the incubation of the projects by initially contextualising the area of research, showcasing the past projects and demonstrating with a hands-on approach the biomaterial crafting process, tools, and materials. Then an experimentation phase was conducted in various iterations, starting with intuitively experimenting and mimicking from the demonstration learnings as a first approach to material crafting, then scientifically experimenting by measuring, testing, observing and finally by creating materials for specific applications. In parallel, individual

Figure 4. Remix El Barrio Projects Chart. Source: Author 1, 2020

mentorship was also a key element to raise doubts and guidance, foster new learning and identify new opportunities and publicly present their developments. The importance in this process is that within the experimentation phase the Remixers had the opportunity to interact with advanced material designers by sharing the same space, tools and materials and also to interact with beginners from public open workshops. This approach enabled them to observe, learn from the experts and transmit knowledge, gaining confidence, and re-question their practices with the beginners. Thus, they had the opportunity to swap roles, from apprentices to educators, cross-pollinating knowledge (Marcelino, Castro 2013) and contributing to the growth of the local biomaterial crafting community.

Beyond the support of each project to be developed, the programme has empowered participants to find their own paths of development and their own ways of acting in the emerging ecosystems around circular design and biomaterial innovation. A posteriori, four polarities of profiles have been identified looking at the participant's practices and ambitions. Participants could follow their own path, navigating in between profiles—acting as "researchers", pushing for investigation on new materials and models, as "educators", wishing to organise collective workshops to transfer their knowledge, as "makers", designing and prototyping in makerspace or at home, or as future "social entrepreneurs" incubating their project for

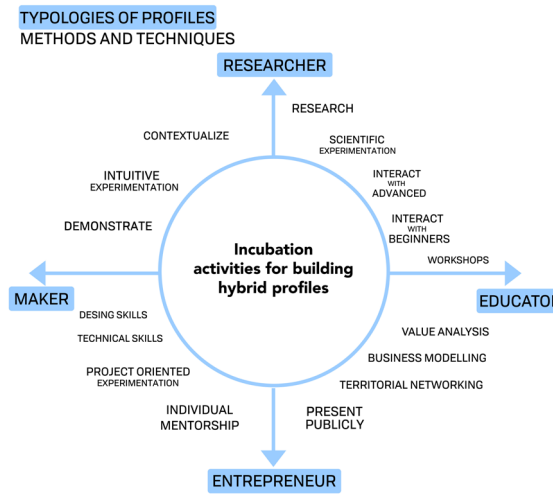

Figure 5. Building Hybrid Profiles for food waste community champions. Source: Authors, 2020.

a concrete territorial development. (Fig.5)

Through the description of the Remix El Barrio project, the paper outlines the importance and complexity of applying co-creation to foster the development of innovative ecosystems crafting and micro-fabricating with food surplus and waste. From a collective learning experience, key outputs were co-developed and are now finding a path for sustainability: the nine proposals of solutions, the implementation of a cooperative of services at the local level and the integration of the incubation programme approach in the wider distributed ecosystems.

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FOOTNOTES

1 SISCODE is a EU funded project aimed at stimulating the use of co-creation methodologies in policy design, using bottom-design-driven methodologies to pollinate Responsible Research and Innovation, and Science Technology and Innovation Policies

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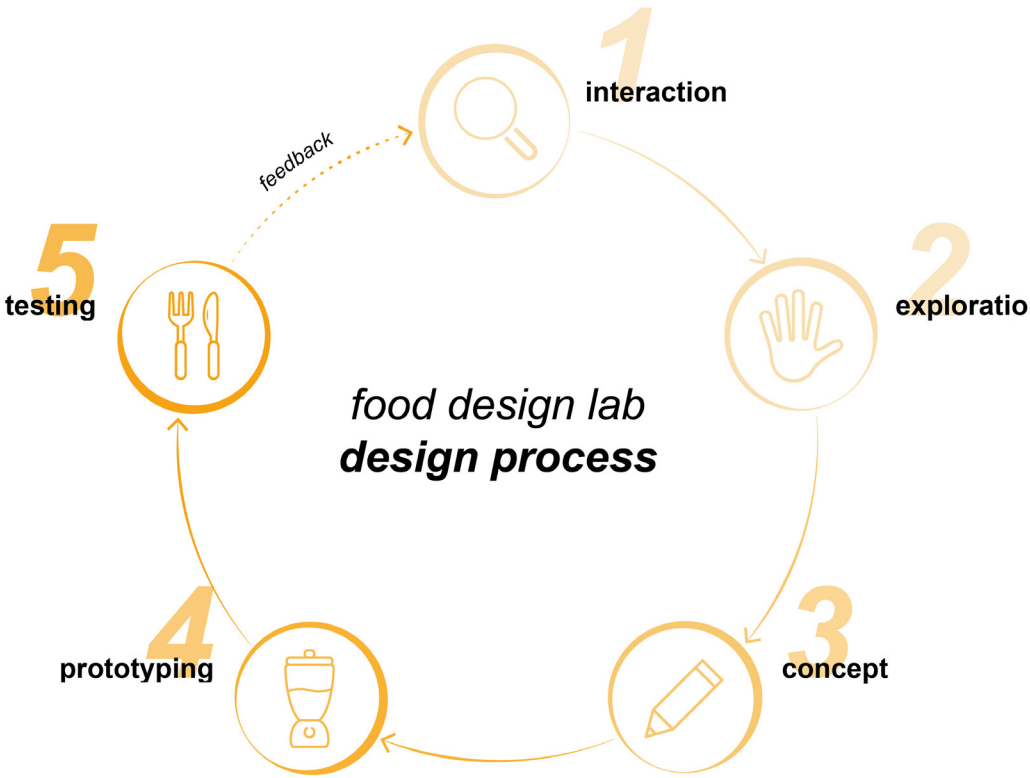

Figure 1. Design process. Source: Food Design Lab, 2019

THE UOVO DI COLOMBO LAB: DESIGNING AGAINST FOOD WASTE

Cristian Campagnaro
Raffaele Passaro
Barbara Stabellini

Food waste is an increasingly central issue in our daily lives. It is estimated that, every year, a third of food produced for human consumption is wasted. Considering this, the paper illustrates the experience of the "Uovo di Colombo Lab", a project offering training activities that address the issue of food waste along the entire food chain, with a particular focus on the phases of recovery, redistribution, processing, and consumption. A workshop organised into mobile kits and providing an assortment of low-tech professional equipment allows young students and members of the public to experience the food transformation processes. This is achieved by applying the circular economy principles in design, creative processes, and co-design methodologies.

educational project / food waste / food design / active engagement / territory

Figure 2. Students at work. Source: Food Design Lab, 2019

About one-third of food produced for human consumption worldwide is currently wasted (FAO 2011). The waste production occurs throughout the food chain—from "field" to table—caused by a set of different dynamics dealing with overproduction through agricultural stages, industrial processing, distribution, and final consumption. Food waste contributes significantly to environmental pollution, degradation and depletion of natural resources, threatening food safety (Foley et al. 2011). That is why its reduction is one of the goals of environmental policies globally. According to the Agenda 2030 and the Sustainable Development Goals defined by the United Nations in 2015—and, specifically, goal number 12 that is aimed at food loss reduction and responsible consumption of resources—the waste of food should be halved along the entire supply chain by 2030 (UN 2015). Thus the concept of Education for Sustainable Development (ESD) gains importance, providing individuals with the knowledge and skills they need to engage themselves as active citizens (UNESCO 2017; Holfelder 2019).

In this framework, universities, as public institutions, are seen as key players in tackling the challenges of contemporary development, thanks to their role as promoters and generators of innovation, knowledge, and skills. Within this context, through the "Uovo di Colombo Lab"—a project of the Department of Architecture and Design (DAD) of the Politecnico di Torino, and part of "Mirafiori Cultura in Cir-

Figure 3. Transformation process: from food waste to new edible products. Source: Food Design Lab, 2020

colo"[1]—the university reinforces its commitment to supporting innovative and design-led food waste prevention and education strategies with a focus on circular economy and social cohesion. The group of involved and interested actors goes beyond the student body to include the citizens, collaborating with local organisations sensitive to the question of sustainable development.

THE "UOVO DI COLOMBO LAB" PROJECT

Food has always been one of the areas of interest and analysis focused by the Design research team at the DAD of the Politecnico di Torino. Starting from a repertoire of projects promoted through the interaction with organisations of the business world, the third sector and the private social sector, the researchers' work has contributed to reflecting on the interrelation between design and food as well as between innovation and sustainability (Bistagnino 2011; Barbero, Tamborrini 2015; Campagnaro, Porcellana 2015; Gaiardo et al. 2016; Bozzola et al. 2017; Bozzola, Dal Palù 2018; Barbero, Bicocca 2013; Campagnaro et al. 2019; Fino et al. 2019). The body of knowledge developed over time, which combines through a multidimensional approach social and environmental aspects with processes able to involve users in innovation design, is proof of a constant interest in the subject of food

Figure 4. Some prototypes developed valorising products such as pomegranate, broccoli, red cabbage, and pistachios.
Source: Food Design Lab, 2019

and nutrition: a strategic area for orienting design towards the development of projects that are sensitive to the needs of society, paying particular attention to the social role—of inclusion and equalisation of rights and opportunities—of design. Based on this consistent collection of experiences, the project Fighting Food Waste Design Focus (FFWDF) emerged in 2017, along with its operative tool: the Polito Food Design Lab (Polito FDL). The project aims to bring students closer to the topics of food waste, food poverty, and sustainable design, with an emphasis on practical and theoretical tools and knowledge capable of fighting food waste with a view to social cohesion and the best possible use of raw materials.

The "Uovo di Colombo Lab" is organised into a series of educational workshops, characterised by a strong dimension of tangibility and practicality. The programme consists of training activities addressing food waste aspects during the recovery, redistribution, processing, and consumption phases. Specifically, young students and citizens are engaged in processes aimed at experimenting with sustainable practices by focusing on the circular economy principles.
As a tool of the Polito FDL within the project "Mirafiori Cultura in Circolo", the workshops have involved students of the high school "Primo Levi" and residents of Mirafiori district in Turin.

Figure 5. Heterogeneous teams. Source: Food Design Lab, 2020

The social identity of Mirafiori district reflects its industrial character and the transformations it has been undergoing since the FIAT plants opening from 1939 to the present day. Therefore, it is mainly expressed by the post-war migration phenomena and the consistent presence of workers, which define the area as a working-class neighbourhood. Nowadays the district still suffers from the effects of significant criticalities such as a decreasing population and ageing, an increasing unemployment rate (higher than the city average), and a low average level of schooling (Mirafiori Sud in numeri 2018). However, despite the current socio-economic disadvantages, Mirafiori includes a wide network of territorial subjects[2] whose organisations also operate through food in different areas of human life (health, personal care, education, work) (Atlante del Cibo di Torino Metropolitana 2019). This network, through public utility services, promotes initiatives based on strong cohesion, integration, and active citizenship, to tackling phenomena of poverty and exclusion.

Within this context, the workshop has been held at the education institute's premises ("Primo Levi"), which, by virtue of the project itself, has strengthened its role as an inclusive cultural hub in the territory. Twelve meetings have taken place since October 2019. Each meeting has lasted four hours, involving a total of over 150 peo-

ple with different skills, interests, characteristics, and backgrounds: high school and university students, homeless people, neighbourhood elderly dwellers, and community volunteers. The participants have reflected on the circular economy principles[3] (Ellen MacArthur Foundation 2015) through a practical experience of fighting food waste by working literally "getting their hands dirty" with pots, pans and food, cooking and tasting (Fig. 2). Great attention has been paid on how to obtain new edible products by transforming food surpluses, by applying circular strategies, the methodologies of collaborative design, and creative processes. In this way the workshop participants have been guided in the valorisation of resources still useful for human consumption, the reuse of food resources to fight food poverty and the rethinking of resource management to reduce the environmental impact of the food supply chain.

METHODOLOGY AND EDUCATIONAL GOAL

In the "Uovo di Colombo Lab" learning by doing (Dewey 1938; Kolb 1984) plays a fundamental role for education and is constantly present in every phase of the activities, oriented by the following questions/topics: how and why food waste is generated in the local markets? How and where food waste can be transformed before becoming an inedible resource? Through which practices food waste can lose the connotation of a useless object? The activities have been carried out in three different but complementary ways to face food waste.

1. Observing food flows and dynamics of waste generation through visits to neighbourhood markets: to get in contact with local associations and actors involved in recovering unsold food;
2. Recovering and redistributing food surpluses by participating in the associations' activities: to discover the potentials of the territory as a source of resources in terms of existing skills and subjects to support social and economic development in the district.
3. Transforming and regenerating food surpluses into new edible products.

The third action has been especially focused. The practice of food processing, indeed, can benefit from the methodologies of design, its creative processes, and co-design methods, to make the best possible use of food waste. The designers of the Polito FDL have mentored participants in the design of new edible products based on the raw materials (fruit, bread, and vegetables) recovered from local markets[4], by addressing the following issues:

- the transformation and regeneration of food from the viewpoint of a creative and domestic economy: how a product that might not look and taste perfect can still be suitable for human consumption in terms of perceived quality—if treated properly;
- the reuse and exploitation of resources that are still valuable from a nutritional point of view but which, due to their aesthetic imperfections, discourage the consumer from eating them, changing status from food to food waste;
- the re-destination of food resources to contexts of food poverty where access to healthy and nutritious food confronts with socio-economics barriers. Thus imperfect food products become of value, as they are capable of alleviating the difficulties in accessing food.

This approach makes food a "design material" that offers textures, thicknesses, new ways of consumption and enjoyment (Allione et al. 2012; Lerma et al. 2012); a new material that the participants use to create edible products by combining creativity, technique and exploration (Germak 2008). The goal consists in designing with food (Zampollo 2016), gaining first-hand experience of tools, practical and theoretical knowledge and low-tech transformations, useful to transform products perceived as waste into new valuable and edible products by designing new forms, flavours and ways of use. (Fig. 3).

The design process took place within a four-hour time frame and included the set-up of small heterogeneous working groups made up of five to six participants spanning five consecutive phases (Fig. 1). These phases, aimed at developing one or more new eatable products, can be summarised as it follows.

1. Interaction with the raw material and identification of weaknesses and strengths through the use of a guidance sheet.
2. Exploration of the organoleptic and aesthetic characteristics of food through a sensory and mechanical analysis.
3. Definition of possible "design with food" concepts to enhance product qualities (e.g., texture, colour, taste, smell).
4. Creation of edible prototypes using only the instruments that were available at the laboratory (Fig. 4).
5. Testing the obtained solutions by sharing results with the other workshop's participants to get feedback.

In this way, problems that usually inhibit consumption (appearance, taste, shape, shelf-life) have been faced through design and a practical approach, combining creative thinking (Perrone, Fuster 2017) with collaborative attitude to work. Working side by side (Fig. 5), the laboratory groups have experienced new and unusual ways of transforming food focusing attention on how to "keeping the material in use" by approaching, often for the first time, ways to be easily replicated in the domestic environment. The ultimate goal of the project, indeed, is to shift the participants' attention towards a new creative and exploratory approach, especially to trigger a change of attitude among people; this is the only way to operate in an innovative and sustainable way (Tamborrini 2014).

CONCLUSIONS

In a context of non-expert learning, food proved to be a very accessible medium for participants to interact with the issues of circular economy. During the workshops, food products recovered from local markets have been easily managed in their processing. They have proved to be more manageable than other "second" raw materials such as wood and iron, whose transformation may require expert skills, prior knowledge and specific tools that could be a critical barrier in introducing the theoretical and social responsibility principles of a transition towards sustainable and inclusive economies.

Transformations applied on food materials can be easily replicated in a domestic context, using everyday tools such as knives, pots, and pans. In this way, their effectiveness at generating new circular products is immediately apparent: if they are good, edible, and visually appealing, the process has been effective. Otherwise, we have to start again, but these transformations are also indicative of a regenerative approach to waste typical of the circular economy (Bistagnino 2011). Thanks to food and using a design with food approach, the students and the community members taking part in the workshops, were able to practise the circular economy consolidating the idea of food, including wasted food, as a means of improving people's quality of life. Many of them continued the experience beyond the workshop, changing perspective on food waste, and bringing home the concept that a material classified as waste often can still be used, in this case eaten, if creatively transformed.
Moreover, the students were asked to complete a questionnaire[5] that assessed their experience as a whole; it showed that the components of creativity, fun and innovation in the Polito FDL's activities were appreciated and conveyed the theo-

retical concept of "keeping the material in use" through the proposed practical and exploratory activities.
The collected results[6] open up for the workshop the possibility of being replicated and scaled to other educational contexts and places. More precisely, we are encouraged to promote the Uovo di Colombo Lab as an educational mechanism based on the "learning by doing approach". Thanks to the methodologies of Design (Cross 2006) and of food design (Stummerer, Hablesreiter 2010), we believe that it is possible to disseminate among primary and secondary educational agencies the principles and contents of both sustainability and creativity, which would otherwise be impossible to be experienced by students personally and directly. In this sense, the "Uovo di Colombo Lab" enriched life of participants providing them with social awareness and sensitivity to face the future as responsible citizens.

FOOTNOTES

1 The project "Mirafiori Cultura in Circolo" won the "Piano Cultura Futuro Urbano 2019 – Scuola Attiva la Cultura" programme of the Ministry for Cultural Heritage and Activities and Tourism (MiBACT). The Department of Architecture and Design of the Politecnico di Torino is a project partner with: Istituto di Istruzione Superiore Primo Levi di Torino (lead partner), Fondazione della Comunità di Mirafiori Onlus, Mercato Circolare, Off Grid Italia, Triciclo Impresa Sociale, Balletto Teatro di Torino. The project took place in the Mirafiori district, in the southern outskirts of Turin, where the IIS Primo Levi is located.

2 Fondazione della Comunità di Mirafiori Onlus was born in 2008, in order to not interrupt the positive transformation process of the district, begun between the 90s and early 2000s; this is a tool able to guarantee local and community development that goes beyond emergency or extraordinary interventions. Over the years, the foundation has started several collaborations, both with public and private sectors. It created a wide network of actors that moves on strategic axes to guarantee the continuous development of the neighbourhood, focusing on the following themes: community, social inclusion, culture, economic development, education, and territory. To know more about the work of the Foundation and its partners consult the following link: https://fondazionemirafiori.it/.

3 Workshops were focused specifically on the concept of "keeping products and materials in use". In a circular economy approach, economic activity builds and re-builds overall the system health. According to the Ellen MacArthur foundation, circular economy is based on three principles: (1) design out waste and pollution; (2) keep products and materials in use; (3) regenerate natural systems. The activities proposed by the Polito FDL, through a design-oriented approach, investigate how food materials considered waste can be reused to design new edible products, keeping them in use for human consumption.

4 The workshops' implementation was made possible thanks to the collaboration with the following associations and projects: Fondazione Mirafiori, Progetto Fa Bene, Progetto C.A.R.O.T.A., Progetto Mirafiori non spreca. Food used for the workshops was collected by the associations recovering products from local markets. Specifically, foods such as fruit and vegetables were recovered daily from the vendors in the neighbourhood local market (Onorato Vigliani Street); instead, the bakery products like bread and breadsticks were collected thanks to a partnership with a big supermarket player,

which has two stores in the district. All of these products (fruit, vegetables and bread) are indeed considered, to all intents and purposes, food waste, the result of an oversizing commercial offer, which presents problems related to shelf-life, aesthetic and sensory characteristics that lower the appeal to the consumer.

5 Twenty-four questionnaires were handed out to the IIS Primo Levi class III work experience students who took part in all the activities, both within the school-work experience and community programmes. One of the questions concerned the identification of three words to describe the workshop experience. The words emerging from this point were creativity, fun, and innovation.

6 The positive results of the activities can be traced out. On the participation side, (1) the number of people higher than expected (131 expected, 153 actual participants until the stop of the activities in March 2020 due to Covid-19); (2) the willingness expressed by some participants to attend other future activities proposed by the Polito FDL and (3) to work in mixed groups interacting with people they did not know before. On the organisation side, by (1) the ease in setting up the laboratory inside generic spaces, such as a school; (2) the willingness of the associations to collaborate with the Polito FDL supporting the phases of food waste collection and (3) promoting workshops to citizens in the neighbourhood.

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Figure 1. Salinas de Añana. Source: Author's elaboration, 2016.

FOOD CYCLES: ACTIVE ENGAGEMENT AND NEW URBAN COMMUNITIES

Federica Scaffidi

In recent years, researchers and practioners have paid increasing attention to the field of food, nutrition, sustainability, innovative and traditional productivity, and how they affect communities. The present paper analyses the contemporary literature and aims to explore the current situation in Europe. In this study, three european experiences of social innovation in food production and consumption are analysed and compared. The article presents a review of these studies and shows risks, limits, and opportunities. The results reveal that new urban communities can be the engine of creative food cycles and local development. In conclusion, this study represents a contribution to the existing body of knowledge and presents implications of the results and possible future research directions.

food cycles / social innovation / urban communities / local resources / european experiences

Figure 2. Un posto a Milano. „Chef e food lover" event. Source: Cascina Cuccagna, 2020. With kind permission of Cascina Cuccagna.

In recent years, there has been an increasing amount of literature on food, sustainable production, gastronomy, and their impacts on people's lives and urban and territorial contexts. Researchers and local community activists have shown an increased interest in these topics creating a fertile ground for interactions and cross-cutting paths among universities, enterprises, associations, and citizens. Today, food is not only conceived for its nutritional aspect, but it also assumes a creative role in the contemporary society, in the definition of urban food systems, the impulse for alliances among cities, and the reconnection of urban milieus (Rigoberto Anguiano, Guadalupe Reyes 2008; Sommariva 2019; Sposito 2019). Social networks such as Instagram are full of images and hashtags about food. Many projects, relevant exhibitions, and events have been oriented around this theme, e. g. EXPO 2015. Nevertheless, several studies have also highlighted critical aspects in the overuse of these terms and their influence in the community (Urroz 2008). The current trend illustrates the risks of abusing this topic for local marketing, contributing in the touristification and development of entire roads and districts mainly designed for food consumption (Fernandez 2008; Palermo, Ponzini 2014). Despite these critical issues, food can be seen as a protagonist of innovative experiences that combine culture, social engagement, and local development.

Creative Food Cycles considered as cycles that foster civic participation, active

Figure 3. I coltivatori di musica. Resistenza Gastrofonica Viaggiante. Source: Cecilia Sammarco, 2015. With kind permission of ex convento/spazio culturale.

engagement in co-design, and combine it with new models of collaborative and social entrepreneurship (Schröder 2019). This paper illustrates how innovative urban communities can generate creative food cycles and support the development of urban and territorial futures. According to Caroli (2015) and Neumeier (2012), social innovation fosters new forms of management and entrepreneurship, whose goal is to respond to a social problem and create benefits for the local community (Moulaert et al. 2005; Marra et al. 2015, Phills et al. 2008). Therefore, this paper aims to show three international experiences recognised as cases of social innovation, where food is the main activator of new urban circularity. The three cases were selected from a wider database that include fifty experiences of reactivation of cultural resources (Scaffidi, 2019). The article focuses the attention on the analysis and comparison of these cases considered as an important branch in the european scenario regarding creative food cycles and social innovation.

SOCIALLY INNOVATIVE VIBES: FOOD CYCLES AND NEW URBAN COMMUNITIES

In this study, the cases Valle Salado de Añana, Cascina Cuccagna, and Resistenza Gastrofonica Viaggiante are analysed and compared. The main objective is to explore how gastronomy, food production, and correlated local activities suggest

Figure 4. Festival I Teatri della Cupa - Novoli e Campi Salentina. Source: Ph. Eliana Manca, 2015. With kind permission of ex convento/spazio culturale.

new directions for local development.

Resistenza Gastrofonica Viaggiante (Gastrophonic Traveling Resistance) was a project of "ex convento/spazio culturale" born in 2013 in the former Capuchin Monastery of Belmonte Calabro, a town in the Southern part of Italy, in the Calabria region. The main objective of the project was to promote the active engagement of local inhabitants through cultural events, in which food was the main protagonist (Fig. 3). The project had two relevant parts: i) the itinerant one was based on the ambition to spread the motto "do not make war but gnocchi and tomato sauce" around Italy, with cultural events aiming to promote socializing moments (Fig. 4), and enhance good music and local cuisine (Marazzo 2015); ii) the second one was based on the valorisation of the former monastery and the involvement of Belmonte's community with traditional cooking experiences in a suggestive atmosphere, between the sea and the mountains. This second aspect was a site-specific intervention that uses the former monastery outdoor spaces for their events. The project also organised several activities and projects with other creative communities in Southern Italy, such as Farm Cultural Park in Sicily. The idea was to combine food and music as vehicles of socialization and to create cultural performances that enhance local products and involve musicians, artists, and other talents of the territory. As the promoters confirm, the project wants to break predefined pat-

terns of public food consumption and create more vibrant realities able to innovate the town and define new directions for the creative development of the place. Resistenza Gastrofonica Viaggiante wanted to overturn traditional models of use of public spaces with traditional tools. Food, specifically "gnocchi e pomodoro", are the main ingredients of this resistance. The project promoted new cultural pathways for the future development of the territory.

Cascina Cuccagna is a cultural centre located in a seventeenth century farmhouse in Milan, reactivated by Associazione Consorzio Cantiere Cuccagna (ACCC), thanks to the twenty-year assignment of the property by the Municipality of Milan. The Association ACCC is a centre of aggregation and social involvement (Fig. 2). They support initiatives of community development, orientation, and social interaction between Italians and foreigners. Since 2012, Cascina Cuccagna is a place of culture and participation that spreads ideas of innovation, sustainability, and creativity (Mattioli, Treville 2013). The site belonged to the Fatebenefratelli Fathers who cultivated the officinal herbs for the Ospedale Maggiore. Today, Cascina Cuccagna reactivated the productive dimension becoming an agricultural hub in the centre of Milan. The objective of the promoters is to create a connection with the territory, local producers, traditions, and sustainable food and to innovate by organising new interactive experiences, teaching courses, laboratories, and workshops. They pay particular attention to the food quality, seasonality, and the short supply chain, and support small farms and artisans that work with respect for the environment and workers' dignity. Cascina Cuccagna also has a kitchen, bar, and guest house called Un posto a Milano where genuine dishes with raw materials selected by small and medium-sized farms in Kilometro Vero are served. They organise several projects that promote "agroecology", solidarity, social art, and passion for cooking. Food is one of the central aspects of Cascina Cuccagna. The promoters believe that it is possible to have good meals and to eat "slow food" and high quality raw materials even in a big metropolis such as Milan. For this reason, Cascina Cuccagna is an important centre for artisanal companies and small farms of the local territory, place of encounter of local producers, workers, and cooking passionates. Il cucinista. All around food is a cooking school, a laboratory for catering and a location for events. It organises cooking classes, corporate food events, team cooking and show cooking. Cascina Cuccagna is a place where creative food cycles are combined with processes of sensitisation, love for the local territory and its resources.

A similar objective can be found by analysing the case of Salinas de Añana in Spain. Valle Salado is a saltworks that has been reactivated thanks to the Foundation

	Resistenza Gastrofonica Viaggiante	Cascina Cuccagna	Valle Salado de Añana	Limits & risks	Opportunities
KEYWORDS					
Social engagement and participation	■	■	■	Manipulation & social washing	Higher sense of community
Music and social art	■	■	■		Creativity and socio-cultural development
Solidarity and orientation		■			Higher sense of community
Agricultural hub		■	■		Development of urban food hostpots
Food quality, seasonality	■	■	■	Brandization	Communuty awareness
Kmo 0, short supply chain		■	■		Communuty awareness
Traditional cuisine	■	■		Limitation: local focus	Valorisation of local traditions
Traditional production techniques		■	■		Valorisation of local traditions
Territory: local raw materials	■	■	■	Limitation: local focus	Local development
Territory: local producers (farms and artisans)	■	■	■		Local development
Territory: cultural resources (neglected assets)	■	■	■		Local development
ACTIVITIES					
Events: concerts, exhibitions, show cooking coorporate food events, virtual tours	■	■	■	Social washing	Creativity and socio-cultural development
Cooking classes		■	■		Socio-cultural awareness
Team cooking		■		Social washing	Social engagement and team working
Laboratories and workshops		■	■		Creativity and socio-cultural development
OBJECTIVES					
Spreading the culture of good food	■			Brandization	Communuty awareness
Spreading the culture of good products		■	■	Brandization	Communuty awareness
Networking for local producers		■			Local development
Networking for international productive cultural resources			■		Internationalization
Discovering of traditional production techniques		■	■		Valorisation of local traditions
Innovating in services and productivity	■	■	■		Local development and innovation
Involving communities, visitors and citizens	■	■	■	Manipulation & social washing	Social participation

Figure 5. Comparative analysis. Source: Author's elaboration, 2020.

Valle Salado. The mission is to preserve and recover the site, develop cultural and touristic initiatives with citizens' participation and produce high-quality salt with traditional techniques. In 2013, the Management Plan updated the guidelines of the Master Plan from 2000–2004 and works on the general objective to make Valle Salado a key point for revitalizing tourism and for addressing its cultural, economic, and social dimensions for the province of Álava and the Basque Country. The Valle Salado de Añana Foundation also promotes many activities open to citizens and at the same time it promotes scientific researches, the valorisation of other local resources, and the dissemination of traditional construction and production systems. The productivity of the salt of Salinas de Añana is the main aspect of this process (Fig. 1). Around it revolves many offers and services for local people and visitors. People can get a cultural experience in the salt valley, getting to know a unique territory, feeling immersed in a wonderful atmosphere that involves architecture, natural and geological landscape, history and archaeology. The project promotes salt workshops for children, school and university students and adults, visits to the Salt Valley and the productive process, virtual tours and the saline spa. The collaboration with other international cases of salt production and with national and international chefs contributes to promote the quality and consumption of the Añana salt, but also shows the interesting experience of Valle Salado in the world. The original aspect of this project is in the general development of the valley and the ability to generate new offers, innovative experiences, and to attract many people, new inhabitants and tourists, to a small village of the Basque Country (Scaffidi 2018). Salt is the real activator of the development of this site. Furthermore, the sale of the products and services contribute to the self-financing of the project.

The three presented cases show different locations and missions; however, they activate new food-oriented circularity and develop socially innovative urban communities for specific territories.

DISCUSSION: CREATIVE FOOD CYCLES AS SOCIAL INNOVATION?

The study illustrates three experiences of social innovation in Italy and Spain that focus their development on food production and consumption. The findings provide a general overview of the cases, the selection of specific keywords, the comparison of the main activities and objectives related to food cycles, and possible limits, risks and opportunities. A relevant aspect to consider is the ability to succeed over the years, and also to refresh themselves, as evidenced by the experiences of Cascina Cuccagna and Valle Salado de Añana. All three cases have the

goal to regenerate the space in term of spreading new cycles and influencing sustainable urban futures. As Figure 5 shows, there are some common keywords that illustrate the tendency of these examples to innovate the territory by improving local raw materials, enhancing cultural resources and local production, but at the same time this can be a limit, if the development is only focused to the local level. The local focus can be an opportunity if it enhances the cooperativeness, the solidarity and networking. Cascina Cuccagna, for example, is a centre of aggregation that support the community, provides orientation facilities and connects people through food. Resistenza Gastrofonica Viaggiante aimed to provoke Italians with their motto defining new experiences of food consumption, whereas Valle Salado innovates a simple product, salt, creating new cycles for the whole territory.

Other relevant aspects assumed as creative food cycles are the activities promoted by these communities, such as the organization of cultural events, cooking classes, laboratories, show and team cooking. These aspects can be considered as opportunities to strengthen the socio-cultural dimension, engaging people in creative experiences, but they can also conceal the risk to give in to "social washing". The findings illustrate the possibility to trigger positive and negative results. Food events, new products, cooking laboratories, show cooking, or virtual tours are activators of creativity and new cycles in food production and consumption, but are they promoters of social innovation? The findings show the way these centres approach innovation, how they find new solutions to emerge from the ashes, from neglect and decay. From the data in Figure 5, it appears that the spreading of the culture of good food and products, the discovering of traditional production techniques, and the development of new networks among productive cultural resources and local producers are important goals for the selected cases. The identification of high quality of food products and traditional productive techniques, and the development of new networks facilitated the reactivation of these resources and innovate the social interaction as well.

These actions are also relevant for the improvement of the community awareness, internationalisation and local development; nevertheless, at the same time they can conceal the risk to limit the development to "brandisation". From the evaluation in Figure 5, it becomes also clear that the main objectives of the analysed cases are the innovation in services, in productivity and in the involvement of local communities. According to recent literature, social innovation promotes participation, social engagement, improves networks, economies, and creates the conditions for a better use of local resources and goods (Caroli 2015; Moulaert et al.

2005; Marra et al. 2015, Neumeier 2012; Phills et al. 2008). Therefore, the present study confirms that Creative Food Cycles, conceived as creative actions that promote food culture and new circularity, are also activators of social innovation.

CONCLUSION

In conclusion, in the last few years, numerous studies have focused on the food topic and many researchers have discussed about its impacts on urban development, the risks of touristification, and its influences in the urban context; nevertheless, another field of discussion put the attention on the socially innovative vibes that can be created around food. In this study, three experiences of Creative Food Cycles and social innovation were analysed and compared. The study was designed to determine the effect of food production and consumption in the urban community, observing the limits, the risks, and the strengths of these experiences. The presented results may facilitate improvements in this field of knowledge, comparing these cases to others outside Europe, for a better understanding of the involved dynamics and the influence in the urban and territorial dimension. This research is conceived as a specific view in the context of resources' redevelopment, food and social innovation, further studies might extend the selection to a different set of experiences.

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Figure 1. BIS. Prototype by Giulia Centineo, Margherita Lequio, Li Changrui, Shi Xinran. CFC Food Shakers | Food Remakers Workshop Genova.Photo by Matteo Paolillo 2019 for UNIGE Department Architecture and Design DAD.

FOOD REVOLUTION. SERVICES AND SOCIAL INNOVATION AS A REACTION TO LOCKDOWN

Chiara Olivastri

The global coronavirus pandemic is revealing major weaknesses, inequities, and system-wide risks in global food systems, renewing the urgency to foster novel pathways towards a greater sustainability and resilience of supply chains. This emergency not only has affected human beings, but also caused crisis in the entire economic, political, and social spheres. Yet, in these situations the resilience of society as a whole can be measured. The purpose of this paper is to analyse the initiatives adopted in the food sector during the pandemic that have contributed to the creation of new supply chains, new behaviours and good practices leveraging social innovation. The service sector has been a fertile ground to convert and revive different activities and, as designers, we observe and interpret these phenomena to turn the health emergency into a new scenario of virtuous practices.

food / social changes / services / technology / new post-pandemic scenarios

History has shown us that after every moment of war, famine, or epidemic important social, behavioural and food changes follow, many of which endure marking the event as a revolution. In the Cambridge Dictionary, in fact, revolution stands for a significant change in the way people do things. Infectious diseases are still challenging societies. After the outbreaks of SARS in China in 2002, Ebola in West Africa and MERS in 2015, the beginning of 2020 has been marked by COVID-19, a novel coronavirus. The international spread of social distancing has turned the virus into a social disease, affecting food as a cultural product. Over three months, one third of humanity was under a lockdown, urged to stay at home and to go out only to meet the most essential needs like buying food. In the book "Epidemics and Society: From the Black Death to the Present," Frank M. Snowden, a professor emeritus of history and the history of medicine at Yale, examines the ways in which disease outbreaks have crushed revolutions, and entrenched racial and economic discrimination. "Epidemic diseases are not random events that afflict societies capriciously and without warning," he writes. "On the contrary, every society produces its own specific vulnerabilities. To study them is to understand that society's structure, its standard of living, and its political priorities." (Snowden 2019) Thus, as designers we have to observe and analyse the crucial levers of change and to create reactions not only to fight diseases but also to develop better behaviours and processes.

Epidemics have also altered the societies they have spread through, affecting many aspects of people's relational life, the work of artists and intellectuals, and the man-made and natural environment. The coronavirus epidemic has taken us back more than half a century, when the majority of Italians prepared and consumed meals mainly in their own homes; food has become a sort of authorised release valve. Besides it, the quarantine has also triggered initiatives by developing new forms of resilient answers. The globalisation we were accustomed to has suddenly stopped due to the closing of national and also regional borders: food was one of the few goods that continued to travel, with restrictions and fears about origins and sanitary measures. As a result, this emergency has forced us to reconsider the local food and distribution network by activating new behaviours. At the same time, adaptive responses to the coronavirus illustrate the multiple ways in which more resilient and sustainable food systems could evolve, going forward.

The already high-growth service economy has accelerated, and it was the strategy of redemption and innovation chosen to attend consumers' needs. The service economy primary activity is the provision of services, so the access and use of the

goods rather than the production and the property of goods.
In the last decade, indeed, our lives have largely moved to "clicks", shifting from a physical dimension to the digital world where most transactions are concluded online. Services create smart and real networks to optimising what already exists by enhancing the sharing concept and technology speed. During the pandemic what was considered a trend has become a priority, and Internet-based platforms turned the leading actors of this technological shift, thus standing unquestionably at the heart of today's digital economy. They offer outstanding advantages, including a new outlet for goods and services, easier access to information and content in general, a large variety of choices, real price competition, and new business opportunities. The service sector touches all areas of our lives and in particular food becomes the main driver for resilience.
This paper focuses on the innovation triggered by novel relationships between food and social behaviours in the service sector and highlights the main changes in each sector of food cycles: production, distribution, consumption, and disposal of food. For each cycle, a project deriving from a bottom up approach or proposed by start-ups has been identified that develops services capable of innovating the relationship with food. The sector most engaged in such innovations was that of distribution, with the creation of new supply chains or the optimisation of existing ones; however, interesting projects raised in the other food cycles too.

PRODUCTION PHASE – THE GLOBALISATION STAND-BY

The pandemic is making agriculture across Europe suffer. Every year, Coldiretti writes, 370 thousands regular farm workers who come from abroad, especially from Eastern Europe, work in the Italian agricultural supply chains. As travelling across international borders has been suspended under lockdown, they will not be able to reach our country to harvest fruit and vegetables and sow the various crops, thus a good part of the yield will be wasted. Farmers with longstanding reliance on migrant agricultural labour struggle to access support for the upcoming harvest season. Lockdowns and border closures are reducing economic opportunities such as day labour and agricultural markets in some regions. As such, the production chains have been shortened by activating local networks and encouraging ethnocentrism.
The EU Platform on Food Losses and Food Waste (FLW) has focused the first issue of its Newsletter on the prevention actions taken by its members in the different Member States of the EU in the context of this unprecedented crisis. For the larger amounts of products made available by farmers with no market access, the Dutch

Figure 1. The year 2020 will also be remembered for activation of new paradigms

Food Waste Taskforce, a case described in the EU Newsletter, has launched a B2B marketplace to support the matchmaking process. The Dutch Taskforce, launched in January 2017, aims to contribute to preventing and reducing food waste becoming an international frontrunner in the valorisation of streams of agri-food residual. The Taskforce is a coalition of companies across the whole food supply chain, national and local authorities, a civil society organisation, and other invited members. Regarding interventions to prevent consumer food waste, emphasis is currently being given to the "value" of food as well as to the aspects of shelf life and storage. In June 2020, a multimedia campaign on shelf life and date marking will be launched. Small-scale farmers are innovating to connect with buyers and with each other, including through new online marketing initiatives. Digital agriculture[1]—where farmers use digital technologies to access useful information—could revolutionise how communities secure their livelihoods. Since COVID-19 has been making us more dependent on digital technology than ever before, it is necessary to ensure that the world's poorest communities are not left behind in the process of a food revolution. Increasing investments in technologies to help small-scale farmers will yield far-reaching benefits long after the end of pandemic.

The web platform "Barn2Door"", for example, connects farmers to customers by in-

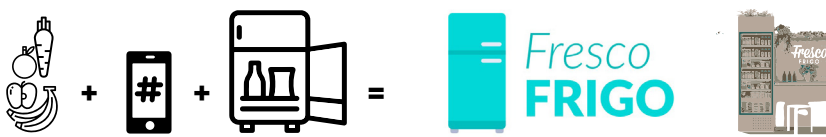

Figure 2. A distribution solution developed during COVID-19 lockdown

tegrating online and local sales, while "La Ruche Qui Dit Oui!" links consumers with local producers for trading foodstuffs produced within a short distance from the distribution point in France. Moreover, in Milan a map[2] with local farms and farmhouses has been created in order to promote their activities and the new service of home delivery.

DISTRIBUTION PHASE – CAPILLARY AND SOLIDARITY NETS

Consumers have turned to online grocery providers as a safer alternative to shopping in stores. The closure of bars and restaurants to the public has been also one of the first measures put in place by many governments, forcing businesses to increase or, in some cases, build from scratch their online presence.
The Italian startup "Fresco Frigo" was born in 2018 to offer a healthy alternative for vending machines. The founder Enrico Pandian explains that the vending machines, for a matter of shelf life, cannot contain fresh and very fresh products; for this reason, they thought of a normal refrigerator that would contain fruit, vegetables, dairy products to be consumed in the workplace and, thanks to Rfid technology and cloud connection, could be stocked whenever it was lacking. With the pandemic, positioned refrigerators in condominiums too.

Figure 3. Solidarity food distribution networks based on traditional Italian ritual.

Fresco Frigo offers snacks and lunches based on seasonal products; through the app you can unlock and open the fridge, take the product, and finalise the purchase by closing it. When the lockdown was introduced, Fresco Frigo decided to install five smart refrigerators in the Social Village Cascina Merlata (a residential complex in Milan) to meet the needs of over 900 residents, allowing them to buy basic food without leaving home and queuing at the supermarket.

In this way the consumer does not order the products online, but the new concept is that Coop (supermarket) supplies them according to sales—accessible 24 hours a day, seven days a week, with the prices of the products on sale identical to those in the supermarket, to give priority to the products most requested.

Another example in the distribution system is "Food Aid System", developed by the Municipality of Milan in collaboration with many public and private actors: it aims to offset the closures of associations and charities active in Milan by centralising the entire food supply chain. The System is responsible for the distribution of weekly food aid until the end of the COVID-19 crisis, with eight temporary hubs being opened to prepare food aid packages for the elderly and people in need. Through a new cooperation with the municipal fruit and vegetable wholesale market, fresh food will also be added to the food aid bags. The Food Aid System helped the municipality to monitor the food to be collected and redistributed to families in need,

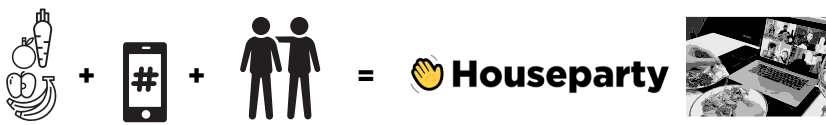

Figure 4. Aperitivo and food meeting during lockdown.

and take measures to avoid food going to waste.
Another solidarity initiative is "Spesa Sospesa", promoted by Coldiretti, Italy's main farmers' association offers consumers who buy groceries online through Campagna Amica, selling products from Italian agriculture, the possibility to donate a food package to families having difficulty paying for their own food shopping.

The habit takes origin from the Neapolitan tradition of leaving a paid coffee (suspended) at the café as a symbolic gesture to give even the poorest the opportunity to taste the classic Neapolitan espresso. Translated as a social ritual within the food sector, it has inspired initiatives of "suspended groceries" in various areas of Italy. The volunteers of the Shalom Association have taken up and modified this concept by testing a programme of "self-sustenance" for local communities based on "urban social solidarity" in the territory of Torre del Greco. The programme consists of donations left in charity-boxes at collection points, within a solidarity circuit of participating local shops sustained by the association of local traders (ASCOM). Rather than providing specific food products, money is donated by customers to form a budget for the Spesa Sospesa: converted in vouchers, it is distributed monthly among beneficiaries to buy in the circuit during the initiative. Participation in the circuit, in turn, requires shops to sign a charter of ethical com-

mitment to support good practices in the area. On Instagram, the hashtag #Sospesa has gathered photos and narratives of those trying, in times of emergency, to open channels and boost initiatives that help and encourage donating as a collective ritual.

CONSUMPTION PHASE – DISTANCE MEALS AND ANTI-WASTE HABITS

During the lockdown 'Altroconsumo' recorded a 41% drop in food waste production: for six Italians out of ten nothing went into the bin. Food waste decreases thanks to a targeted and planned expenditure that avoids rotting products and promotes the use of leftovers (+33%). There is also an increase in good "anti-waste habits" such as planning meals and making the shopping list (39% do it more often) ('waste-watcher[3]).

Through the "Love Food Hate Waste campaign", WRAP has been supporting the public to become 'food wise' during the crisis—providing advice and information about how to plan for shopping, store items and use up the food they buy. It is important to observe these trends and to understand whether these attitudes are only due to the restrictions of the emergency or have actually triggered new attitudes over time.

Another interesting trend to monitor is the distance meals with friends and family. In Italy, more than in other countries, the culture of eating together is a hallmark that quarantine has reinterpreted in new forms: remote cocktails have been organised between balconies among neighbours; remote lunches and shared aperitifs have multiplied all over the world using new social media, such as WeParty, Zoom and Jitsi Meet apps, which have been downloaded millions of times during the quarantine.

Under normal circumstances, people in Italy would meet in the early evening for aperitivo, accompanied by a buffet of finger foods. This ritual has been one of the first missing elements of social urban life; however, it has quickly moved online, with new "smart" habits taking place in living rooms. An invitation circulates in groups of friends to join an aperitivo through a link, and then they gather online with a glass of wine or beer in hand to converse. This ritual is perhaps more intensive than usual, and maybe more inclusive. Because of the small size of some apartments, it is not easy to create a completely private space, and thus this new gathering event includes relatives of all ages. Digital and real are integrated, not substituted, but often reinterpret traditional rituals and translate them into wider levels, thus providing new opportunities.

The need to meet or even just see people has also changed the way we eat; those

owning balconies or terraces have moved a lot of activities in those spaces, to be able to cross some passing glances, or have a word with the neighbour; in the surreal scenario of the pandemic the streets were isolated but the balconies were crowded. Another interesting DIY and isolated experience regard two neighbours friends of Porto San Giorgio in the Marche region: they placed a wooden plank between the balconies of their respective homes. Then, they laid the tablecloth, set the table, and had lunch together, thus overcoming the forced isolation.

CONCLUSIONS

These few examples are intended to demonstrate how each revolution is a break between pre-Covid, which will remain only in the history books, and a post-Covid era that we can help to improve. Emergencies activate special measures that are implemented quickly and en masse, no tests can be made before, only conclusions can be drawn later. All priorities are reconsidered. Food is one of man's vital resources and as such it becomes a primary necessity to ensure, but also a stimulus to reconsider previous models. In a crucial and difficult historical moment, resilient projects can be activated using the convivial dimension of food, social innovation, and mutual aid as levers to develop interesting and unexpected social initiatives, some of which could remain linked to the crisis of the moment, but many have opened up scenarios that could become new post-pandemic constants.
Coronavirus is not just a tragedy; it can be seen as an opportunity to build a better world. As designers, we should read the spontaneous initiatives born from the bottom, as user needs to be strengthened and structured into service and system projects capable of optimising the supply chains and developing new virtuous scenarios.

FOOTNOTES

1 http://www.fao.org/digital-agriculture/en/.

2 Available online at: https://geoportale.comune.milano.it. [Accessed 24.06.2020].

3 Waste Watcher is the first national Observatory on Waste, active on the initiative of Last Minute Market: https://www.sprecozero.it/waste-watcher/. [Accessed 06.07.2020].

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Figure 1. Collective work in vine harvesting. Source: Zista Cooperative Winery „Zoinos".

ZITSA WINE HUB

Andreas Nikolovgenis

Zitsa is a village belonging to the north-western region of Epirus in Greece where the homonymous "Zitsa" wine is produced, from the local PDO Debina variety. The location is an aggregation of villages as Chianti or Rioja. The phylloxera pest in the 1970s together with the shift of Greece's economy towards the tertiary sector, led to the fleeing of the population and to the partial cultivation of the land. Despite its small size, Zitsa has a hyperlocal character. The current, milder climate enhances the quality of Debina wine. This coincides with the planned experimental planting of almost 32 extinct local varieties of Epirus vines. These two factors create the momentum for the area's re-planning into a hyper-local centre of wine in Epirus and Greece. This will promote social innovation based on wine production, however with a twist, by introducing complementary programmes of education, culture and sustainable agro-tourism.

Zitsa / wine / agricultur / education / agro-tourism

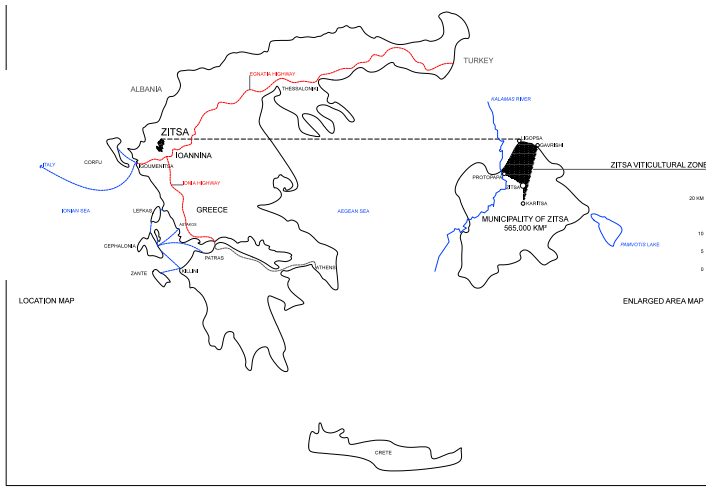

Figure 2. Location map. Source: author.

Zitsa[1] is a village, 25 km west from the city of Ioannina which is the capital of Epirus region and the administrative and financial centre of the North-western Greece, in the crossing of the northern and western highway networks of the country, and in close proximity to the Albania borders and the port of Igoumenitsa that connects Europe to the Balkans and Asia. The village belongs administratively to the homonymous Zitsa municipality whose seat is the village of Eleousa. The municipality is quite large, with an area of 565,000 km^2 and a population of 15,000 inhabitants and is a result of the merging of former smaller municipalities. It is also quite diverse, containing urban and rural settlements, lowlands and mountainous landscapes, industrial and farming activities, local and moving population. The municipal unit of Zitsa itself, has an area of 65,000 km2 and a population of 1,300 inhabitants. Despite its small size, it has schools of all levels and the majority of the public services of a city, which grant to the village a hyperlocal character. Thanks to wealthy locals living abroad, the village acquired an interesting number of public buildings such as a municipal library, a municipal guest-house, an engraving gallery with an important collection and a former dormitory for school students.

The area, which includes six communities/villages (Zitsa, Protopappas, Karitsa, Ligopsia, Klimatia, Gavrishi), has a total cultivated area of 1,700 acres and appears as an aggregation of villages similar to Chianti in Tuscany or Rioja in Spain. Here

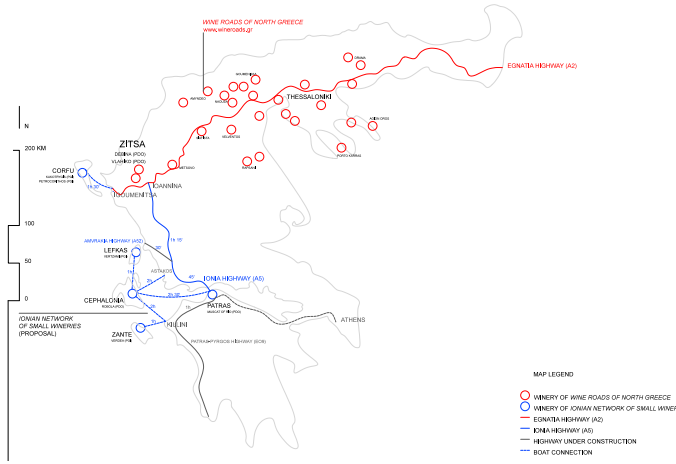

Figure 3. Ionian Network. Source: author.

the homonymous "Zitsa" wine is produced, from the local Protected Designation of Origin (PDO) Debina[2] variety whose name originates probably from the Italian phrase "de vino", meaning vines suitable for wine. The PDO recognition has been granted by the State in 1972.[3] Zitsa is located at an altitude of 700 m with orientation towards the coasts of Ionian Sea. Its climate is moderate with mild winters and cool summers, because of the winds of the Ionian Sea, which pass through the gorges of Kalamas and Arahthos rivers. The area has a high rainfall, except the dry summer months that result to a fertile ground for the cultivation of Debina variety (Kontos, Zikou 1992, pp. 9–11). The most characteristic local wine is a fresh, semi-sparkling orange-white, similar to prosecco, a character which is granted by an old custom; the locals used to store the wine in bottles in late October, afraid of spoil. The fermentation process was not finished at that time and as a result, a second fermentation was happening inside the bottle unleashing carbon dioxide in the form of little sparkles. This local custom is translated by the new vinification process through the French cuvee-close or Charmant method—the one used for champagne as well. Together with Debina, the area produces also the exceptional red Vlachiko and a small production of the red Bekari. Worth mentioning Lord Byron, the famous English philhellene who came in Zitsa during one of his travels in 1809 and stayed overnight in St. Elias monastery drinking the local Kolokythas wine, similar to Debina.[4]

LOCAL VITICULTURE AS DEVELOPMENT OPPORTUNITY

Despite the location's long tradition in wine production since the seventh century[5], the vineyard is relatively new, developed after the phylloxera pest in the 1970s. The new vineyards have been planted with American, resistant rootstocks grafted with tender shoots from the local varieties—mainly Debina (Kontos, Zikou 1992, pp.14-15). The pest and the shift of Greece's economy towards the tertiary sector after 1980, led to the fleeing of the population and to the partial cultivation of the land, which was also a result of the insufficiently developed road network and the lack of an irrigation system, which even today is carried out by tractors transferring the water. Today, the cultivated area remains small, appearing more as a sparse piercing in the landscape, there is no young generation of viticulturers, the average age of the population is quite old, and the permanent population is less than 500 inhabitants. The main causes (Interview Kostas Karambinas 2020) is the high cost of cultivation, mainly because of the inefficient distribution of the land, meaning properties constituted by small, segregated plots; the lack of an irrigation system, necessary especially the first years after planting; the restricted by law forested land covered once by vineyards, and of course the general financial crisis. One could add to this the unattractive atmosphere of the village, expressed mainly by the lack of culture and leisure infrastructure (Baklavaridis 2017).

The main asset of the area is the climate change and precisely the warm, sunny autumns, which enhance the quality of Debina wine, as the grapes remain for a longer period on the vine and ripen better. This appears on recent experiments and studies (Interview Eleni Sindou 2020), and it is also certified by awards in recognised international competitions.

This is coupled by the new legislation frame[6], voted in 2019, that declassifies the forested lands that were former vineyards and allows for rejuvenation and a cooperative agronomist, covering the need of the producers for consulting and troubleshooting during the cultivation of their vines.

Though, the most important opportunity is the launch of a research programme ran jointly by the local wine cooperative and several agricultural universities of Greece[7] under which almost 32 extinct local varieties of Epirus vines will be planted in a special test vineyard. The scope of the programme is the research on the respective varieties so to feed future viticulture and reproduce indigenous wines.

VISION

The fact that local wine becomes better, the possibility to cultivate the former forested land and the important research programme set the ground for a vision towards the development of the entire place based on wine. This vision skips heavy infrastructure and legislation issues—as considered the field of other experts—focusing on creating the "social infrastructure" by inviting young people to live and act in the village investing simultaneously on education and tourism. This will be followed by an "architectural infrastructure"—a multi-programmatic community space, ending up with large-scale gestures, even hyperlocal. These "immunizations", or "grafting"[8] in the vine's language, will be launched in a stepped manner or three scales.

Step 1: Small Scale
The first step will commence with the launch of a wine education programme in the form of travelling fellowships referring to students of oenology and agriculture from Greek universities. The focus of the young researchers will be the experimental vineyard with the local varieties of Epirus, their vinification procedures and the performance of the respective wines based on contemporary, technologically aided methods and smart systems. This will be accompanied by an art residency, open for students from the local University's Fine Arts School. The young artists will work on special large-scale land art works altering the viticultural landscape and promoting the villages' single identity. At the same time, they will be responsible for the operation of the local engraving gallery, which currently remains closed lacking personnel. The fellowships and the residencies will be supported by a collaborative initiative ran jointly by the universities, the municipality which will cover the living expenses, the cooperative winery and the gallery which will offer the respective objectives and wealthy locals that could offer a stipend in the form of a grant reclaiming the long tradition of the place in donations.
The above-mentioned gestures will allow for a mixture of the local population and the infusion of the village with a young generation able to activate culture and leisure programmes and invite more young people of the area to become viticulturists or entrepreneurs and live there.
This will be coupled by the founding of a single-identity wine festival, spread yearround. The festival will commence with the wine feast every August, including also the end-of-harvest in late September, the tsipouro feast in late November, the wineries open-house in early December which connect Zitsa with other wine-regions in Northern Greece, the new vines planting in April ending up with the local St Elias

feast in July. This network, which can be spread also in the different communities of the area, will act as an extended festival and it will require a single, recognised and memorable graphic and communication identity. The food will be prepared in every feast according to the local work-share method, led by the local women's association and eventually by other local associations related to food. The music will be performed by local traditional bands and events organised by the local University's School of Traditional and Folk Music. All these will be accompanied by seminars by invited experts. The network's organisation will run in collaboration with the producers' team, a group which numbers almost 100 members and since 1980 organises the local wine festival, in late August, attempting to promote Zitsa wine culture as well as to sell their products and strengthen financially the local viticulture.
Finally, an agro-touristic product will be released containing participation in the viticultural works (different during each period of the year) together with wine-tasting seminars and visits in historical places and interesting landscapes around but also water sports in Kalamas river. This new "product" alludes to the cultivation of the land itself, and the respective agricultural works in the vineyards, which is a collective work in Zitsa as the producers help each other to cultivate their vineyards diminishing the labour cost. The programme will ask for the cooperation between the municipality, the wineries, the hotels and the restaurants of the village but also with the producers' team and could be provided by several tourist agents from the area and beyond.

Step 2: Medium Scale
The above-mentioned steps will be examined for an adequate period of time according their impact on population change and tourism. If the results are satisfactory the ground will be fertile for the founding of a multi-programmatic social hub for Zitsa and Epirus wine and its respective culture. The hub could occupy the reclaimed former student dormitory, a large 2-storey building, built to accommodate students from the periphery to study in the village's schools—the only in a large and mountainous area. With the development of roads and public transport the necessity for such infrastructures expired and after a short period when the building served as a dormitory for elderly tourists it started decaying. Despite the current state of decay, building's structure and equipment are still in a good shape. Last but not least, the building is located in a symbolic place, on top of the village; therefore it is both visible and overlooks Zitsa and the Kalamas river valley.
The ground floor is imagined as an open, "arts and crafts workshop" for the creation of utensils of wine production and consumption as barrels, bottles and pottery but also unique art pieces. The workshop will reclaim old techniques, as for instance

barrel-making, which are described as intangible heritage, though with a twist, enhanced by computer-aided design and fabrication which will allow even for the production of new viticultural tools. The workshop will run by the founding of a community of makers and will provide educational workshops by old craftsmen, artists and young makers from all-over Greece and abroad, referring both to adults and children from Ioannina and beyond. Part of the space will be a gallery with the makers works for exposition and purchase. The space could also accommodate the local engraving gallery, offered by the important local painter Kostas Malamos. This follows a previous idea of Mrs. Efi Malamou, the painter's daughter and chair of the gallery's foundation board. The collection contains more than 450 art pieces of important Greek painters, and it is constantly expanding.

Another part of the hub will be the reclaim of the old professional kitchen and its transformation as a "collective food workshop" operated by the local women's group. The scope of this collective kitchen will be the accommodation of special food and wine pairings, food and wine festivals, collective cooking/ preparations for local feasts but also cooking workshops for visitors and young locals. The idea is inspired by the local fests, where the preparation of food, mainly pita bread stuffed with vegetables and cheese, is a collective work during which women either cook together or split the materials and the preparation, cooking a portion of a large meal for 2000 people or more. The kitchen, standing as an event space, will promote local cooking traditions but also exchanges with other regions of Greece and abroad, discovering relationships with the Ionian islands and the Balkans and introducing new methods of preparation and altering the local cuisine. The scope of this kitchen is to act as an enclosed public space were people interested with food and wine could meet, cook and discuss.
The first floor arranged in dormitory rooms could be converted into rooms for the wine researchers and artists-in-residence, but also for student excursions, using the well-arranged infrastructure of bathrooms and storage spaces.

Step 3: Large Scale
The multi-programmatic social hub acting on the first hand as a vivid enclosed public space offering to the locals several opportunities for leisure and creativity and on the other as a landmark and destination will increase the fame and value of the place. At this very point will be necessary to apply larger gestures intending to refresh the entire village and unpack interconnections with other places. These could include:

The launch of a municipal programme for free disposal of the state plots to young viticulturers who will commit to live and work in the village for a long period of time following the example of Italian municipalities providing houses for 1 euro to people deciding to live in abandoned villages so as to counter the population outflow and to give a new birth to troubled areas.[9] This could extend or even combined with abandoned houses with a small rent (even paid by the municipality) enforcing the permanent population. To this scope the existing infrastructure of schools and public services will act as a catalyst while the local market and the construction sector will be enhanced.

The collaborative founding of an "Ionian network" of small wineries which produce indigenous Greek varieties, most of them characterized as emerging, as for instance PDO Rombola in Cephalonia[10], PGI Vertzami in Lefkada[11], and PDO Muscat of Rio Patras[12]. This could be combined with the active network of Northern Greece wineries "Voroina" with Zitsa standing at the junction between them merging traditions and customs. Interestingly enough the network could follow the path of the Ionia Highway (as "Voroina" follow the Egnatia Highway) activating also a parallel naval route and the respective ports that connect with the islands (as Igoumenitsa, or Astakos, a small fishermen village in Aetolia) suggesting another way to travel in western Greece and interesting cost-inner areas linkages. This network could be coupled by the founding of a tsipouro route, referring only to spirits produced by distillation from grapes, containing all the Epirus region and South Albania, discovering relationships in production and customs and extending to broader cultural exchanges as in food.

CONCLUSION

The evolution of the above-mentioned vision based on wine will attempt to promote the whole aggregation of villages, refreshing its population, products, and services and transforming it in a combined educational and touristic destination. This will act as a model for other areas in Greece that produce unique alimentary products creating a new vision for the countryside in Greece as a total. As stated, this is only the framework for research; further in-depth studies informed by discussions with the stakeholders would be necessary.

ACKNOWLEDGMENTS

The qualitative part of this research is based on interviews in situ with Kostas Karambinas (viticulturer and retired teacher), Eleni Sindou (chief oenologist, Zoinos Winery), Efi Malamou (founder of the Zitsa Engraving Gallery, chair of the gallery's foundation board) and Michalis Pliakos (mayor, Municipality of Zitsa).

FOOTNOTES

1 Municipality of Zitsa, htpps://www.zitsa.gov.gr. [Accessed 02.08.2020].

2 See a description of Debina Variety at this link: www.debina.gr [Accessed 02.08.2020].

3 Government Gazette 40 /1972. Available on line at: http://www.et.gr/index.php/anazitisi-fek [Accessed 02.08.2020].

4 Marchand A. L. ed. (2016) Lordos Vyron, Epistoles apo tin Ellada [Lord Byron, Letters from Greece]. Athina, Ideogramma.

5 PDO Technical File. Available on line at: http://www.minagric.gr/images/stories/docs/agrotis/POP-PGE/OINOS/lista_POP_080119.pdf [Accessed 02.08.2020].

6 According to the law 4617/2019 previously cultivated fields now forested if their area is less than 30 acres can be cultivated with respect to their surrounding natural environment.

7 "Pyrrou Ampelos" Research Programme, https://zoinos.gr/ [Accessed 02.08.2020].

8 "Grafting" is a process in which a new grape vine is produced by cutting the rootstock and then fitting a scion wood inside the cut. The process's scope is to enhance or/ and change the variety of vine.

9 For more information see: https://1eurohouses.com/case-a-1-euro-houses/. [Accessed 02.08.2020].

10 Wines of Greece. Roboao. Available at: https://winesofgreece.org/varieties/robola/[Accessed 02.08.2020].

11 Wines of Greece. Vertzami. Available at: http://www.newwinesofgreece.com/lista_ellinikon_poikilion_ampelou/en_vertzami.html.[Accessed 02.08.2020].

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Figure 1. Facade element fabricated at IAAC using digital manufacturing optimized to grow Oyster Mudhroom

DESIGN FOR COMPANION SPECIES: DEVELOPING COLLABORATIVE MULTISPECIES URBAN ENVIRONMENTS

Chiara Farinea

The Urban Environment has been developed through centuries as a complex machine to host human beings and their activities, excluding external factors disturbing anthropogenic activities. Part of this process consisted in excluding the so-called "nature" (except a few selected species) from cities. However, a new consciousness about the effects of anthropogenic activities on our planet and about the regulating properties of nature on the environment is bringing us to reconsider the introduction of nature in cities, rethinking our cities as environments built to host multispecies co-existence and collaboration.

anthropocene / nature-based solutions / design / multispecies environments / bio-integration

Figure 2. World making project - Arachnocampa luminosa glowing structures in its environment to attract prey.

ANTHROPOCENE: GAIA 2.0

Through the development of civilization and human knowledge, philosophers have described Nature as a grand and universal realm with its dynamics and equilibria, but also determined by series of cyclical evolution and passive transitions. Nature was a backdrop and resource for the intentionality of Man, which could tame and master it. It has happened that many things undermined this vision. Considering all the anthropic processes, which have been exacerbated in the last century, has determined such a significant footprint that it is unclear whether life on Earth can continue (Tsing, 2015). This new awareness led geologists to coin a new term and began to call our time Anthropocene, the epoch in which human disturbance outranks other geological forces. (Crutzen, 2002; Sijmons, 2014)
According to the Gaia hypothesis by Lovelock and Margulis, living things are part of a self-regulating mechanism on a planetary scale that has preserved habitable conditions for the three and a half billion years ago. It is based on the premise that the oceans, seas, the atmosphere, the Earth's crust and all the other geophysical components of the planet remain in suitable conditions for the existence of life, thanks to the behavior and action of living organisms, plants and animals (Lovelock, 2009). Gaia worked without foresight or planning on the part of organisms,

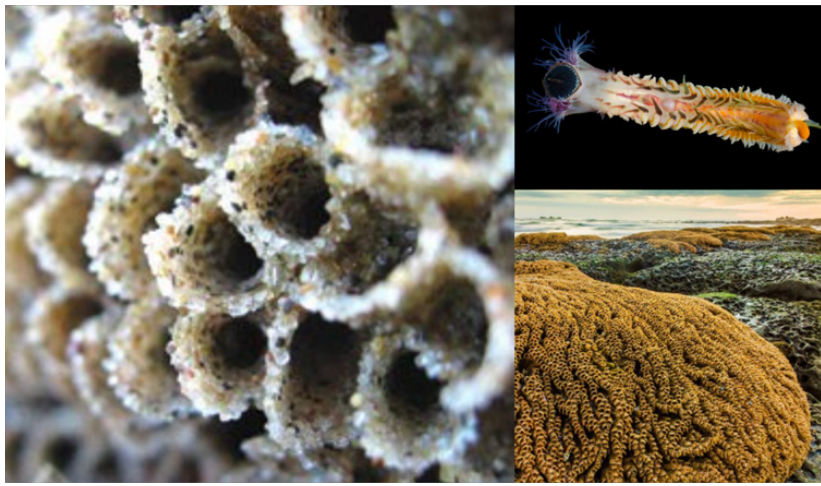

Figure 3. World making project - Phragmatopoma Californica lives in a tube structure and extends its tentacles out of the tube to catch food particles and sand grains

but the evolution of humans is changing this equilibrium. As said, this change has been described as the starting of a new epoch in which disturbance outranks other geological forces and people are beginning to gain awareness of the global implications of their actions. As a result, intentional self-regulation —from personal action to global geoengineering schemes— is either happening or imminently possible. Making such conscious choices to operate within Gaia constitutes a fundamental new state of Gaia, which Timothy Lenton and Bruno Latour call Gaia 2.0. According to their theories, by emphasizing the agency of life-forms and their ability to set goals, Gaia 2.0 may be an effective framework to foster global sustainability (Lenton & Latour, 2020). Consequently, to this new understanding of the planet, we are starting to think beyond inherited categories and capacities (Haraway, 2016) and to analyze and describe the Earth's dynamics according to a new sensibility. Anna Tsing (2015) describes the activities of life-forms as making words. She states that we are surrounded by many world-making projects, human and not human. These projects emerge from practical activities of making lives, in the process these projects alter our planet. Without the ability to make workable living arrangements, species would die out, at the same time, in the process of making, each organism alters everyone's world (fig.2,3). World-making projects can overlap, allowing room for more than one species, for example bacteria made our oxygen atmosphere, and

Figure 4. Facade element fabricated at IAAC using digital manufacturing optimized to grow Oyster Mudhroom

plants help maintain it, and plants live on land because fungi made soil by digesting rocks.

DESIGN FOR MULTISPECIES: ASSEMBLAGE, ENCOUNTERS AND COLLABORATION

The idea of altering everyone's world is crucial to understand how this alteration can determine assemblage, encounters and collaboration synergies. In order to explain the relationship between life forms, Tsing refers in particular to the concept of assemblage: varied species mutualism influence each other in several ways, some thwart (or eat) each other, others work together to make life possible, still others just happen to find themselves in the same place. However, assemblages don't just gather lifeways, they make them: encounters and contamination changes world-making projects, mutual worlds and new directions can emerge. Species identities the place to begin and ways of being our emergent effects of encounters, and this means that we change through collaborations within or across species. As a consequence, contamination makes diversity (Tsing, 2015). Cohousing, coworking, community allotments and ethical purchasing groups are just some of the examples on which people are staking the future of design disciplines, from product

Figure 5. Floor element fabricated at IAAC using digital manufacturing optimized to grow herbs

design to infrastructure design (Mancuso S. et al., 2018). However, co-existence and collaboration is mainly conceived and planned as a single spice environment. What if we start to create cities designed to host and allow multi-species co-existence and collaboration? The example of natural ecological systems reveals mutualistic attitudes whereby living beings can help to shape the ecosystems in which they live, making them stronger, longer-lived and more resilient (Mancuso S. et al., 2018). In order to strengthen our cities resilience, using the words of Donna Haraway (2016), we require each other in unexpected collaborations and combinations.

DESIGN CITIES FOR BIO-INTEGRATION AND BIO-RECEPTIVITY

Marcos Cruz (2019) refers to the idea of designing and creating scaffolds for inhibition not only for humans, but also for surrounding biota according to the principle of bio-integration, moving from thinking about tectonics, performativity and materiality in buildings, to the understanding of architecture as an integrated system of inert and biological matter. According to specific environmental conditions, external surfaces can be designed as bio-receptors and eventually become bio-colony. If we implement bio-receptivity on a very large scale, we could really shift our cities from being the biggest polluters to becoming active agents in reversing climate

change. In a city in which the buildings and the urban environment are scaffolds designed for hosting multispecies coexistence and collaboration, living organisms become, alongside human beings, bio-citizens (Pasquero, 2019), contributing to multi-levelled system of exchange and collective intelligence. At this purpose Donna J. Haraway (2016) speaks about the need of a multispecies justice. The development of cities designed for multispecies coexistence and collaboration requires architects to imagine new urban typologies, able to host different living organisms. It is a crucial transition, where the urban environment stops being just a container of programmes and functions (Pasquero, 2019) and becomes an inclusive space that fosters dynamic processes of exchange.

Most natural organisms require specific conditions to live (e.g. specific temperature, humidity, light exposure, etc.) and the process of creating or re-creating habitats requires high precision and accuracy. The ultimate technologies in the field of construction have the potential to help us to manage this complexity. Advanced ICT and AI software can contribute to simulate growing systems, while digital manufacturing gives us the possibility to build specific, complex and unique pieces (fig.1,5). These innovations open the possibility to reach a design sophistication that was not even possible to control before.
In conclusion, a new approach to city design, which objective is to foster co-existence and collaboration between species, let us imagine the city of the future, where new encounters enhance resilience and boost diversification and evolution.

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Figure 1. Traditional market in the city of Hannover, Linda. Source:Aldana Bouzas Mendoza, 2019.

GERMAN POTATOE: ANALYSIS TOWARDS SUSTAINABILITY

Aldana Bouzas Mendoza

Potato cultivation in Germany has expanded enormously over the last thirty years. The aim of the study is to carry out an analysis of the current situation of the potato with a view to the future of a sustainable consumption. The supply chain and the consumer, their advances, problems, and needs, as well as the role of social, economic, and cultural actors in making a coordinated contribution to sustainable development are investigated. A view through information collected from governmental and non-governmental agencies, statistical reports, and fieldwork on the supply of potatoes, and information available to the consumer is provided. As a result, it concludes with the importance of emerging local initiatives and the need of public policies that enforces a conscious consumption in the citizens.

biodiversity / conscious consumer / potato / supply chain / sustainability

Figure 2. Traditional market in the city of Hannover, Adretta. Source: Aldana Bouzas Mendoza, 2019.

Potato cultivation has expanded enormously in the last thirty years. The potato is considered a gift of nature with a great influence on food security due to its interesting nutritional qualities and its capacity to adapt to different soils. The great economic development that has taken place in many countries around the world highlights its potential.

In the European Union, the potato production harvested in 2018 was 51,9 million tons. Germany was the largest potato producer with 8,9 million tons, corresponding to 17,2% of the European Union total (Eurostat 2019). With a cultivation area of around 113,900 ha, Lower Saxony is the Federal German state with the largest potato cultivation area, followed by Bavaria with around 41,700 ha. The third in the alliance is North Rhine-Westphalia where potatoes are grown on around 27,000 ha (LSN 2019).

The different food products have diverse environmental, economic, and social effects. Seasonal products that have been produced organically and locally are the most ecological and climate friendly option. Reliable information on food composition and quality is a prerequisite for responsible consumption. This implies, on the supply aspect, making accurate data available and, on the demand side, taking a proactive approach to the proper interpretation of what you read, hear, or see. A selection of evidence-based and results-oriented initiatives is contained in the

guidelines published by FAO for the 20 actions (FAO 2018).
If the goal in the future is to create sustainable consumption, it is necessary to consider both the producer and the consumer. For sustainable consumption to be a viable option, production must be possible. The producer must be supported through incentive schemes or by considering their products in particular and, for example, by setting appropriate minimum standards according to it. From the consumer's point of view, sustainable consumption is only possible through the provision of information and education. For people to be able to reflect on their daily purchases and their behaviour as users, they need true and easily understandable information.

VARIETIES

Today in Germany it is difficult to find old varieties of potatoes in the market, very few consumers know that potatoes offer such a large variety, and there is currently no market large enough for them. The standard offer of discount stores makes it possible for the customer to get used to buying large, clean, yellow tubers with a uniform taste. About half of German households prefer predominantly Gala or Agria cooking varieties, followed by varieties such as Belana (BZFE 2019). As revealed (Fig. 1,2,3 by the information collected on the main supermarkets and markets in the city of Hannover, the most popular varieties to be found are the following: Adretta, Gunda, Melina, Christa, Désirée, Agria, Gala, Agata, Marabel, Princess, and Linda.

The choice of planting seed that gives high yields at the cost of sacrificing biodiversity is predominant. Many of the potato varieties harvested in the past simply do not fit into the rigid commercial quality scheme that is currently regulated. Certain natural varietal characteristics, such as deep eyes or tubers, do not affect the taste, are unknown to the consumer, and initially require additional work when processing them at home. In this case, today, the law and regulations correspond to the interests of large companies and commercial chains.
There are more than 4,000 varieties of potatoes, 221 varieties are allowed in Germany but only a fraction of them end up in the supermarket. Not all types of potatoes arrive because many of the potatoes that are processed such as Fontane, Arcade, or Challenger are grown and processed into ready-to-eat products such as crisps and snacks (BSL 2019).
In Germany, not all potatoes can be sold for human consumption or as seeds. The Seed Potato Ordinance regulates which varieties of potato can be labelled as seeds. The Federal Plant Variety Office decides which fruit and vegetable varieties

Figure 3. Marketing strategies, Hannover supermarket.Source: Aldana Bouzas Mendoza, 2019.

are on the shelves.

The variety descriptive lists issued by the Federal Plant Variety Office (BSL 2019) describe permitted, protected, and other important varieties in terms of their cultivation and use characteristics.

In order to fight pests and diseases, increase production, and maintain cultivations on marginal lands, today's potato-based farming systems need a steady supply of new varieties. This requires access to the entire gene pool of the potato. However, potato biodiversity today is at risk; old varieties have been lost due to various diseases, climate change, or social conflicts (FAO 2008).

It should be noted that the efforts of organic farmers and horticulturists to support the cultivation of various varieties prevented the valuable genetic material from disappearing forever. As far as the consumer is concerned, there is a tendency to value unique flavours or variations in consistency, nuances such as nut, butter, or cream. Due to this reason a market for the old potato varieties has emerged. As an alternative there is the possibility of making visible or emphasising the direct marketing route and the possibility for consumers to approach farms and thus have a more conscious consumption.

FLOW

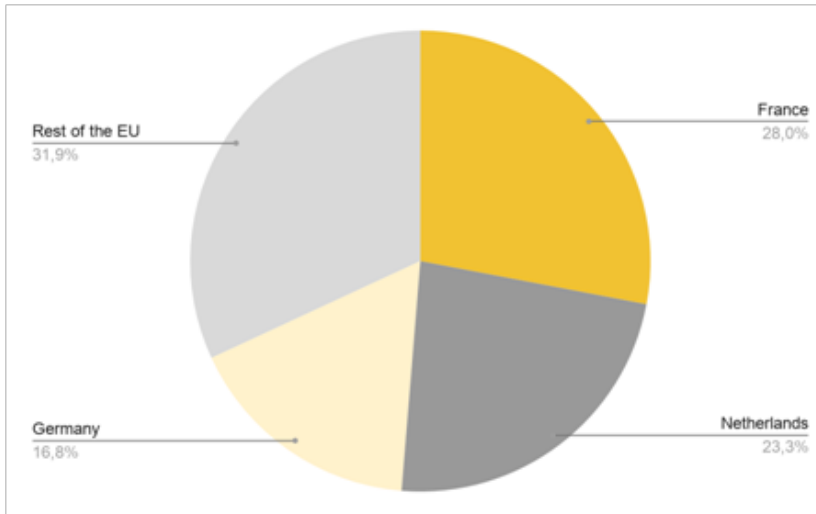

Figure 4. Intra-Community potato exports in value terms (Eurostat 2019).

The European Union Member States marketed around 7,000,000 tonnes of potatoes in 2018 with a market value of 1,7 million euros. Standard table potatoes accounted for two thirds (65,5%) of total intra-Community potato exports in terms of value, seed potatoes represented a quarter (25,2%) of the total, early potatoes constituted 7,6% and starch potatoes the remaining 1,8% (Eurostat 2019). Three member countries were responsible for two-thirds of intra-Community potato exports in value terms (Fig. 4).

While France and Germany were the main exporters of primary potatoes (36,8% and 21,7% of total intra-EU trade in value terms), the Netherlands alone accounted for more than half (58,2%) of the value of all seed potatoes traded within the EU, and Cyprus (24,9%) was the main intra European Union trader in early potatoes (Eurostat 2019).
Other countries outside the European Union are becoming important exporters of fresh potatoes, such as China, Pakistan, India, and Egypt. A considerable example of a country that is strongly developing its potato sector at a national level is Egypt. From 2007 to 2017, the country almost doubled its fresh potato exports to 652,000 metric tons, quadrupled its exports of frozen processed potatoes, and is one of the

largest importers of seed potatoes in Europe. (Rabobank 2019)
It is important to note that due to a change in consumer behaviour corresponding to the desire for fresh products, a year round supply of fresh potatoes must be guaranteed. The marketing put the interests of the market before the environmental impact and the consumer is not aware of the impact. The quantities produced in Germany are not sufficient. Therefore considerable quantities of potatoes are imported annually. On the supermarket shelves you can find early potatoes from Morocco, Tunisia, Egypt, Israel and Cyprus from January, from Spain and Italy from April, and then from France and other countries. The local harvest on the fields usually begins in June and ends at the beginning of October.
Reports from the State Statistical Office show that the Niedersachsen potato is on demand all over the world, not just in Germany. In 2014, with a value of 510 million euros, around 900,000 tonnes of potatoes and potato products were exported. The tubers from Lower Saxony reached 135 countries on all continents. The main exporters are the Netherlands, Denmark, Italy, Poland, and the United Kingdom, making it an important production region (Proplanta 2016).
A remarkable number of these 2014 results can be collected for analysis. Despite producing large quantities of potatoes, Lower Saxony imported around 150,000 tonnes of potatoes and potato products that year, including early potatoes and sweet potatoes. This illustrates that even in the region with the largest potato cultivation there is a considerable flow of imports, mainly driven by the objective of meeting consumer preference (Proplanta 2016).
The trade has an impact and therefore there are more and more initiatives aimed at putting the issue of climate change on the trade agenda; while this could generate restrictions, it could also be seen as an opportunity for countries to start adopting more efficient processes with lower carbon footprint.
Food supply chains need to become intelligent, supporting and prioritising local agricultural production. If small producers are involved, this should be done through direct interaction between producers, businesses, and consumers, thus creating more informed consumers (EIT Food 2019).

PUBLIC POLICIES AND LOCAL INITIATIVES

The current production system is the result of the industrialisation of agriculture, which allowed fewer farmers to produce more food, coupled with government policies that subsidised the investment needed for consumers to continue buying. Now this system faces a major challenge: the supply chains of the future need to

produce healthy and nutritious food that can be grown in an ethical and environmentally friendly way, while at the same time it needs to cope with the important demands posed by population growth, climate change, and diminishing natural resources (EIT Food 2019).
There is growing attention in Europe for the social and environmental conditions in areas of production. Most European buyers have a social code of conduct, which they expect suppliers to adhere to. Social compliance is important, although public policies and local initiatives have the highest priority. The objective is a sustainable and efficient management of biodiversity resources, soil, water, and climate protection.
The German government is encouraging people to eat in a healthy and sustainable way. To this aim, the German Nutrition Society (Deutsche Gesellschaft für Ernährung, DGE) has developed general regulations and quality standards for the public sector catering. The idea is to incorporate sustainability factors into the federal government's guidelines for food served in public sector canteens in accordance with its Sustainability Measurement Programme (INFORM 2019).
Social innovations for sustainable consumption comprise new organisational procedures, services, products and practices, which are able to make consumption habits more sustainable. They can help solve social problems and injustices in the field of sustainable management, consumption, and lifestyles by working on the level of everyday life. Examples include cooperatives, urban gardening initiatives, and swapping platforms. The Lower Saxony Chamber of Agriculture, Solidarische Landwirtschaft (Fig. 6), and Einkaufen auf dem Bauernhof, are just a few such organisations operating at public body level.

CONCLUSION

The consumer usually buys large and clean yellow tubers with a uniform flavour. Technical progress in agriculture does not take into account activity-specific factors such as diversity, soil conservation, agrotoxic contamination and takes into account only short-term productivity and market outcomes.
Numerous genetic attributes of the potato are present in the old varieties. Due to the qualities these varieties possess, such as resistance to biotic and abiotic factors, the choice to preserve the biodiversity of the potato is a decision at the service of food security.
Consumer interest in product safety, quality, and authenticity opened the door to direct sales, supported by digitisation and cooperation of urban initiatives.
Nowadays, for the consumers maintaining a direct relationship with the producers

represents a bonus that adds value to their purchases' experiences. Thanks to the boom of new technologies such as mobile apps and different digital platforms this connection can be achieved, reaching equilibrium between the offer and demand. Substantial public and private investment are needed to improve the value chain, especially improving programmes and infrastructure to support and coordinate activities along the chain.

Today it is necessary to have committed nutrition councils, programmes to support agricultural investment and develop the exchange of knowledge between local authorities and producers.

It is important to reflect in the long term on the form of agriculture that will favour our health and social welfare, especially when we talk about a food product with such a high quality world importance as the potato is.

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Figure 1. Workshop with design students. Source: Personal collection Cifuentes Daniela, Reyes Iris, 2019.

DESIGNING AT THE SERVICE OF RURAL TERRITORY

Daniela Cifuentes Avendaño
Iris Andrea Reyes Forero

The paper illustrates the opportunity that, as designers, we have explored to solve Service Design issues related to food waste in the Colombian food system, while working hand in hand with the Archdiocesan Food Bank of Bogotá. Founded in 2002, it aims to join the academy (university and school system) and big companies with non-profit organisations that serve vulnerable populations by collecting, selecting and distributing food, goods and services—either donated or purchased. Our project focuses on how to improve the actual service of PREA ("Programa de Recolección de Excedentes Agrícolas", Agricultural Surpluses Pickup Program), one of the many programmes carried out by the Food Bank.

food design / service design / food banks / agricultural surpluses / circular economy

Colombia has evolved in the agribusiness sector, due to the large amount of natural resources and the great climate conditions. According to the Department of Agriculture, this category generates more than 20% of Colombian employment and contributes approximately 5% of the Gross domestic product (GDP). However, not always food business models are also sustainable: hardly ever they are adjusted to what local communities, vulnerable populations, and farmers need. We must also consider that a huge amount of food is wasted and thrown away in the cities, meaning that in Colombia 10 million tons of food are wasted (Chamber of Commerce, Bogotá 2016).
Given this, and with the premise of fighting malnutrition in the rural and urban area of Bogotá (Colombia's capital city) the Archdiocesan Food Bank of Bogotá emerged in 2002. Nowadays it is the only food bank in the city, located nearby the city´s central area. Linked to the bank as interns, we had the opportunity to get to know more about how it works and decided to improve the service it provides. We focused our attention on the "Programa de Recolección de Excedentes Agrícolas" (PREA), the agricultural surpluses pickup programme in which small farmers from rural towns around the city rescue post-harvest waste, to give in exchange of products of the basic food basket and other goods.

GOAL AND METHODOLOGY

The goal was to apply a design thinking mindset with service design tools, to increase the number of PREA beneficiaries, while identifying weak and strong points of the whole service by observing the system operation in order to strengthen and extend existing networks.
The design process was divided into six main stages:

1. Discovery: Ideal models research, referents study.
2. Understanding: Project planning, interviews.
3. Observation–Definition: Stakeholders map, organisational chart, actual blueprint, fieldwork.
4. Ideation: Brainstorming, critical insights, co-creation workshops, new blueprint.
5. Evaluation: Solutions flow, implementation timeline, future recommen dations.
6. Communication: Storytelling, blueprints.

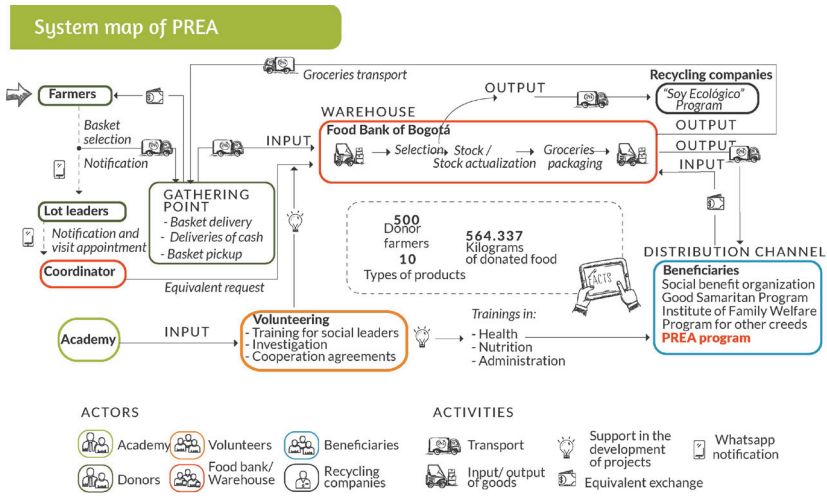

Figure 2. System map of PREA. Source: Personal collection Cifuentes Daniela, Reyes Iris, 2019.

PROCESS

The agriculture development and the food industry imply that the products we eat today are made from inputs usually transformed and altered for consumption. Therefore, although farmers are the main suppliers for large industries, their activity has lost importance because their labour has been replaced by the agri-food system. This system, most commonly known as agribusiness, "consists of the total sum of operations related to production of agricultural products, like activities on the farm, storage, processing and distribution" (Caldentey 1998).
In considering this, we decided to study the system of PREA and registered the whole process the food bank follows and any other key information in a system map (Fig. 2).

One of the most relevant PREA advantages is the product's commercial route. The conventional logistical route from farmers to the final consumer has at least five intermediaries. While in the PREA route, the bank is the only intermediary. All the intermediaries are very important, but, the more intermediaries, the more expensive the products are, and it is more likely the produce gets ruined.
As part of the internship, we worked as volunteers in the warehouse sorting food to recognise the quality standards for human consumption for each product that ar-

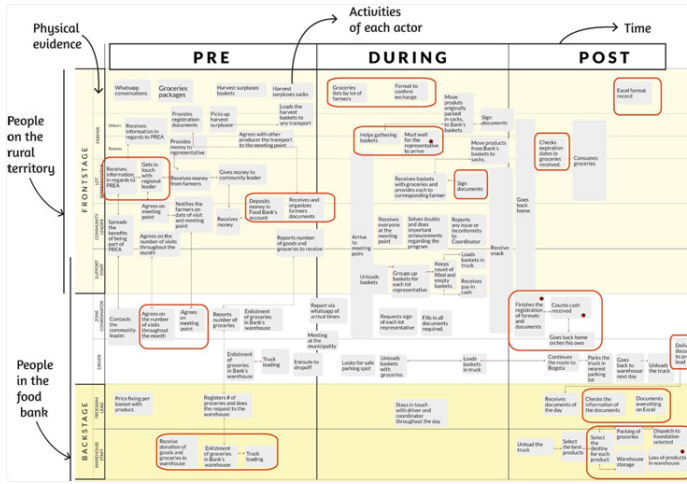

Figure 3. Actual blueprint with critical points. Source: Personal collection Cifuentes Daniela, Reyes Iris, 2019.

rives in the food bank warehouse and goes for donation. We also worked in a "Food Rescue Day" (part of PREA) in the rural territory of Viotá Cundinamarca, picking up surpluses of fruit alongside harvesters. Then, a workshop was organised with industrial design students of our university in Bogotá, to reflect on the problem and the importance of working on a reality of national interest. Finally, we met the PREA director and the coordinator to show them the service blueprint with improvements, inviting them to make any necessary changes (Fig. 3).

The actual PREA's blueprint (Fig. 3) was organised by four variables: timeline, physical evidence (or products service mediators), frontstage (people on the rural territory), backstage (people in the Food Bank warehouse), and the activities (interaction between actors).

At the same time, service was divided into three columns or three stages: "Pre", the activities necessary to be done before the next scheduled Food Rescue Day; "During", what goes on in the course of the Food Rescue Day; finally, "Post", the activities held after it.

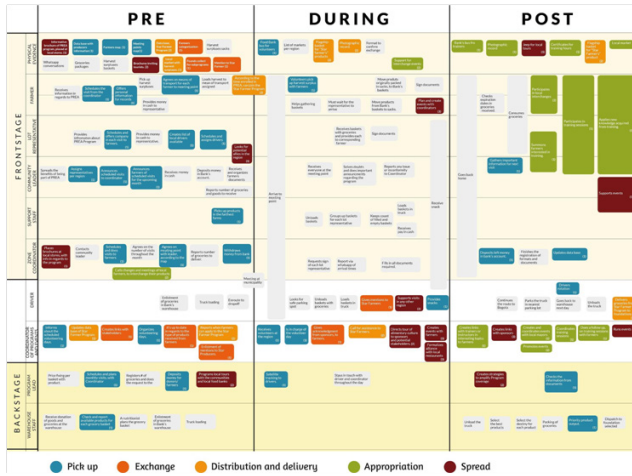

Figure 4. New blueprint. Source: Personal collection Cifuentes Daniela, Reyes Iris, 2019.

Critical points were located on the actual blueprint:

1. Road conditions: a large group of farmers lives far away from the nearest rural town, it means they do not count on good conditions roads. Not always farmers find a way to reach the meeting point in time, and the Food Bank team cannot solve it.
2. Irregular event planning: Special events are not regularly planned.
3. Lack of sponsors: PREA is unknown by potential stakeholders. The team we worked with believed they could profit from these connections, but did not know the best way to extend the network.
4. Logistic errors: Given the short time they have to plan a Food Rescue Day, there are activities left aside but key to provide a better service.
5. Delivery from warehouse: The warehouse staff usually have to throw away a large percentage of PREA products, because the distribution schedule was not properly planned and perishable items would turn into waste.
6. Food bank perceived image by producers: The Food Bank team does not want to be seen as a permanent problem solver. It is important to encourage farmers to be independent.

Figure 5. Classification of fruits suitable for human consumption. PREA Food Rescue Day. Workshop with design students. Workshop with PREA staff. Source: Personal collection Cifuentes Daniela, Reyes Iris, 2019.

RESULTS

Proposals for each phase

The first phase relates to "Pickup". Its objective is to control and record data from each food rescue day. In this, we propose an "Information management protocol" to avoid improvisation when fulfilling their functions. Moreover, registering the producers' localisation and follow-up to drivers is advised, so that they are geographically monitored to ensure the safety of personnel and product.
The second objective of the Pickup phase is to get more human resources. For this, besides increasing the number of volunteers, we suggest the introduction of these three new agents:

- The PREA Director: Someone with any kind of studies in project management and a related career in agricultural production, with special capacity of leadership.
- The Zonal Coordinator, in charge of the community leaders of each municipality, and responsible only for what happens in the rescue days related to op-

erational tasks in the rural territory.
– The Programmes and events Coordinator, similar to a community Social Worker, responsible for promoting alliances to strengthen sub-programmes.

The second phase relates to "Exchange". Its objective is to recompense producers for their hard work. We propose to make a Sub-programme called "Star Producers". In this way, producers already registered in the database with the largest number of donated produce, will have the opportunity to work with businessmen for product-marketing negotiations and not rely solely on the exchange with the Food bank.
The third phase "Distribution and Delivery" has the purpose of differentiating the PREA product. We propose, indeed, to create another Sub-programme called "Sponsorship producer" where PREA producers promote a school or a foundation in their town, delivering fresh products. In this way, the bank could create support networks.
The fourth phase relates to "Appropriation", with the objective of promoting the independent development of producers and product rotation through the region. For this, training such as agro development courses, entrepreneurship, management and food handling, nutrition, preparation of food for sale, etc. must be implemented. In addition, the exchange of food between producers on events in the rural towns could take place.
The last phase mentioned as "Spread" has the purpose of attracting more producers. This could be possible with three main activities: 1) Brochures with FAQs displayed for people without internet access; 2) Campaigns of the alimentary culture telling stories behind their main and typical recipes; 3) Events on special days, like the farmer´s national day.

New blueprint

With the new blueprint we could see how our proposals could work in the service of PREA. A new actor "Programmes and events Coordinator" was added. It remains the variables of time and physical evidence. New activities were classified with a colour code (Fig. 4).

CONCLUSIONS

It is important to define service standards that can be flexible to be replicated in any of the regions. The service, indeed, can be replicable in other Food Banks in the country.

The Food Bank should differentiate PREA products, prioritise their departure, and contemplate new channels for distribution, because the programme guarantees high quality products.
Along the design process we have focused on the "Ideal PREA". We understood that even so, we could not neglect basic determinants of design such as the lack of Internet connection in certain regions, or the availability of monetary resources.
Finally, it is important to clarify that the solutions implementation is governed by the foundation's policies and we used its regulations.

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Figure 1. The park with market. Source: G. Damiani, C. Moretti, 2020.

ALIMENTAR EL BARRIO: FARMERS' MARKET, A NEW OPPORTUNITY TO DRIVE CHANGE

Giulia Damiani
Chiara Moretti

In Barcelona, food markets have always been a symbol of the city. In recent decades, by adapting to new forms of consumption, they have conformed to large-scale distribution, selling only a small percentage of local farmers' products. Through the project described below—"Alimentar el Barrio"—actions have been undertaken to support farmers, by improving the current market system with low-impact micro-interventions. The research describes a way to create a new "system" of market making to promote local culture and products, thus regenerating the urban space, driving communities towards responsible food consumption, and spreading best practices. This paper shows how design and communication can provide farmers with an adequate physical and culture-driven infrastructure, to increase their competitiveness and decrease inequalities of the large-scale distribution.

farmers' market / urban regeneration / systemic approach / behaviour change/ co-design

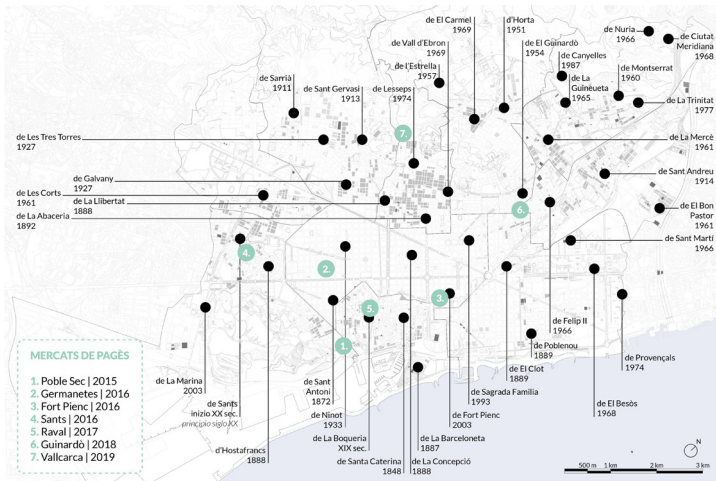

Figure 2. Municipal and farmers' markets in Barcelona. Source: G. Damiani, C. Moretti, 2019.

The food sector contributes the 30,0% of total energy consumption and is responsible for the 20,0% of greenhouse gas emissions worldwide (FAO 2011a, p. III). While a significant environmental impact in this sector occurs from the production phases, people contribute to it through dietary choices and by generating waste (UN 2015, SDGs 12); indeed, one-third of food gets lost or wasted globally (FAO 2011b, p. 4). To respond to this linear economic model a change is needed—a sort of "paradigm shift" as Thomas Kuhn defined it— through a series of achievements shared by a community to define problems and solutions (Kuhn 1962): little daily actions, such as the establishment of ethical purchasing groups and the opening of urban gardens. In considering this, the paper focuses on Barcelona as a city with several realities linked to the local food system and one of the European pioneers emerging as a "sustainable food city". This especially relates to the engagement of city authorities with different food actors through a horizontal decision-making process, in order to observe the system of water-energy-food as a crucial driver for sustainability (Covarrubias, Boas 2019, p. 4). In this context, the 39 food markets of the city stand out for their relevance, and for being a symbol of the city (Soler 2013, pp. 31–34). The first market dates back to the tenth century, yet it was during the twentieth century that the number grew considerably (Soler 2013, pp. 24–25). However, according to a City Council study (Ajuntament de Barcelona 2009, p. 11),

Figure 3. Installation set up for the participatory laboratory. Source: G. Damiani, 2019.

in recent decades the municipal markets have conformed to the large-scale distribution to adapting to new forms of consumption: 42,0% of the volume comes from "Mercabarna", the food polygon management company, and only 7,0% directly from farmers. In recent years, a parallel phenomenon has been emerging: the Mercat de pagès (Fig. 2), a new network of farmers markets for distributing proximity products, managed by local associations and taking place on a weekly basis. As spontaneous initiatives, they are often "at risk" because of a reduced participation and a lack of services.

MERCAT DE PAGÈS AND THE "PARC DE LES TRES XEMENEIES"

Barcelona counts seven farmer's markets[1], which have the ability to revitalise—using low-cost equipment—the urban spaces in which they stand, both in central and peripheral areas. However, they are usually lowly attended due to social degradation and mismanagement of public space. By buying at these markets, citizens can support local agriculture while, indirectly, reducing carbon emissions (Maulèon 2011, p. 56), and thus could contribute towards emerging scenarios for a low-carbon city: Barcelona, indeed, has been recently launching the plan to fight climate change, the Pla Clima 2018-2030 (Ajuntament de Barcelona 2018), which includes

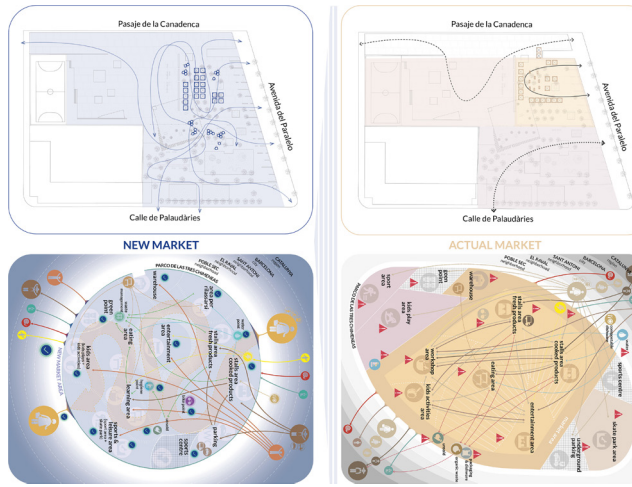

Figure 4. Architectural and systemic schemes. Source: G. Damiani, C. Moretti, 2019.

the Super-Blocks programme. This programme fosters physical and digital urban spaces where local networks interact for building a better place to live[2].
Considering these scenarios, we developed the research project "Alimentar el Barrio" in collaboration with ELISAVA School of Design and Engineering, joining the platform Design for City Making[3], started in 2017 to launch projects for the sustainable transformation of the city (Elisava 2019), and focusing on the Super-Blocks topic (Manzini 2019). The project area consisted of the "Parc de les Tres Xemeneies" in the Poble Sec neighbourhood, a place characterised by a strong historical identity linked to the old power station La Canadenca, subject to repeated restoration works4, yet little perceived by the local community. Every Saturday it hosts the Slow Food Mercat de la Terra (market n. 1, showed in Fig.2). During the market event the park is fully exploited, remaining instead in a state of decay during the rest of the week (Fig. 1).

ALIMENTAR EL BARRIO

The case study investigation, resulting from a six-month residence in the Catalan city under the scholarship "Premio Barcellona[5], is based on the acquired research data, the analysis of the city's commitment towards eco-transition and the devel-

Figure 5. Experimental market organised on 1 February 2020. Source: G. Damiani, C. Moretti, 2020.

opment of a participative process. The project goals consisted in improving the urban spaces for a better interaction between farmers and consumers, orienting communities towards a more responsible consumption as well as spreading best practices on resources management, such as guided recycling or public water consumption. We experimented on a pilot farmers market, collaborating with Slow Food Barcelona and local farmers. A participatory workshop (Fig. 3) was organised over three Saturdays by placing a stand in the middle of the market area. Users were invited to express an opinion by using a model to design their ideal market and by leaving suggestions on post-it. Even if the market was recognised as a key point for buying local and healthy food, certain critical points were highlighted: unaware consumers, low participation during the activities, deteriorated infrastructures, lack of connection in-between the different areas of the park and with the surrounding neighbourhood.

Two approaches were applied for the project intervention (Fig. 4):

1. "Architectural", for the spatial regeneration and the design of new furniture. As a result of re-organising the stalls setup, the market can integrate with the other existing areas in the park (see Fig. 4), avoiding visual barriers and creat-

ing a single integrated space. In addition, the project includes a primary analysis, with a performance requirements summary, for the future construction of new modular, removable, and self-built furniture dedicated to an educational path about responsible consumption.

2. "Systemic", for the reformulation of the market service. It concerns new paths for the flow of people and materials in accordance with a re-distribution of stalls and activities. This intervention is necessary to exploit the potential of each area in the park, and to encourage ecological behaviours by using communication tools (i.e. posters explaining the programme of activities). A new market management was designed for a more collaborative network, in which each territorial actor makes its own contribution: local associations, market's staff, and citizens, with their behaviours, can contribute to the market success.

According to the project guidelines, the experimental market was organised on 1 February 2020. On this occasion, the following actions were put into practice: spatial re-arrangement of stalls and relax areas by designing a new grid, info-point, five reference points (water, bathroom, hand washing, bike, recycling), connection to the municipal electricity (instead of using petrol generator), agreement with local parking to store farmers' vans and use the toilets, as well as with associations to held environmental activities (creative recycle, reusing scraps to new recipes and wasted oil to produce soap).

CONCLUSION

In line with the United Nations SDGs, agreed by 193 countries in 2015, the systemic market responds to "Goal 12: Ensure sustainable consumption and production patterns", by promoting local and seasonal products, drastically reducing the use of non-renewable fossil energy for goods transport, and protecting biodiversity. Proximity agriculture combined with a well-designed and oriented service can become, indeed, a responsible alternative. For this reason, the Mercat de Pagès will be a key place for the sustainable future of the city, not only to promote healthy food consumption, but also to trigger economic opportunities for local trade and farmers, strengthening the fight against climate change. As such, it is necessary to provide farmers with the right tools to become real levers for change. This is particular relevant also in view of Barcelona becoming World Capital of Sustainable Food[6], around the topic "Growing resilience: sustainable food societies to cope with the climate emergency" (Ajuntament de Barcelona 2020). Finally, the presented research identifies possible future scenarios for upscaling to a system

of market making to the whole city of Barcelona, by considering the expansion of the Super Block city programme.

FOOTNOTES

1 For the list and descriptions of the farmers markets: Ajuntament de Barcelona (n.d.) Mercats de pagès. Política alimentària. Available on line at: https://ajuntament.barcelona.cat/economia-social-solidaria/ca/politica-alimentaria-mercats-de-pages. [Accessed 20.07.2019].

2 See: Ajuntament de Barcelona (n.d.) Presentació. Superilles. Available on line at: https://ajuntament.barcelona.cat/superilles/ca/presentacio. [Accessed 23.08.2019].

3 A programme of design initiatives driven by Elisava, in collaboration with different partners and coordinated by the Director Prof. Albert Fuster, Prof. Roger Paez and Prof. Ezio Manzini (Politecnico di Milano).

4 See the history and the redevelopment process of the park by the Les Tres Xemeneies per al barri (n.d.), available at this link: http://les3xemeneies.cat/historia/

5 The scholarship was offered by the Italian Ministry of Foreign Affairs and the Ministry of Cultural Heritage and Activities, represented on the Catalan territory by the Instituto Italiano de Cultura de Barcelona (Premio Barcellona 2019).

6 Since 2015 Barcelona takes part in the Milan Food Policy Pact, an international pact supported by FAO and signed by 210 cities from all over the world to develop sustainable, fair, and healthy agri-food models.

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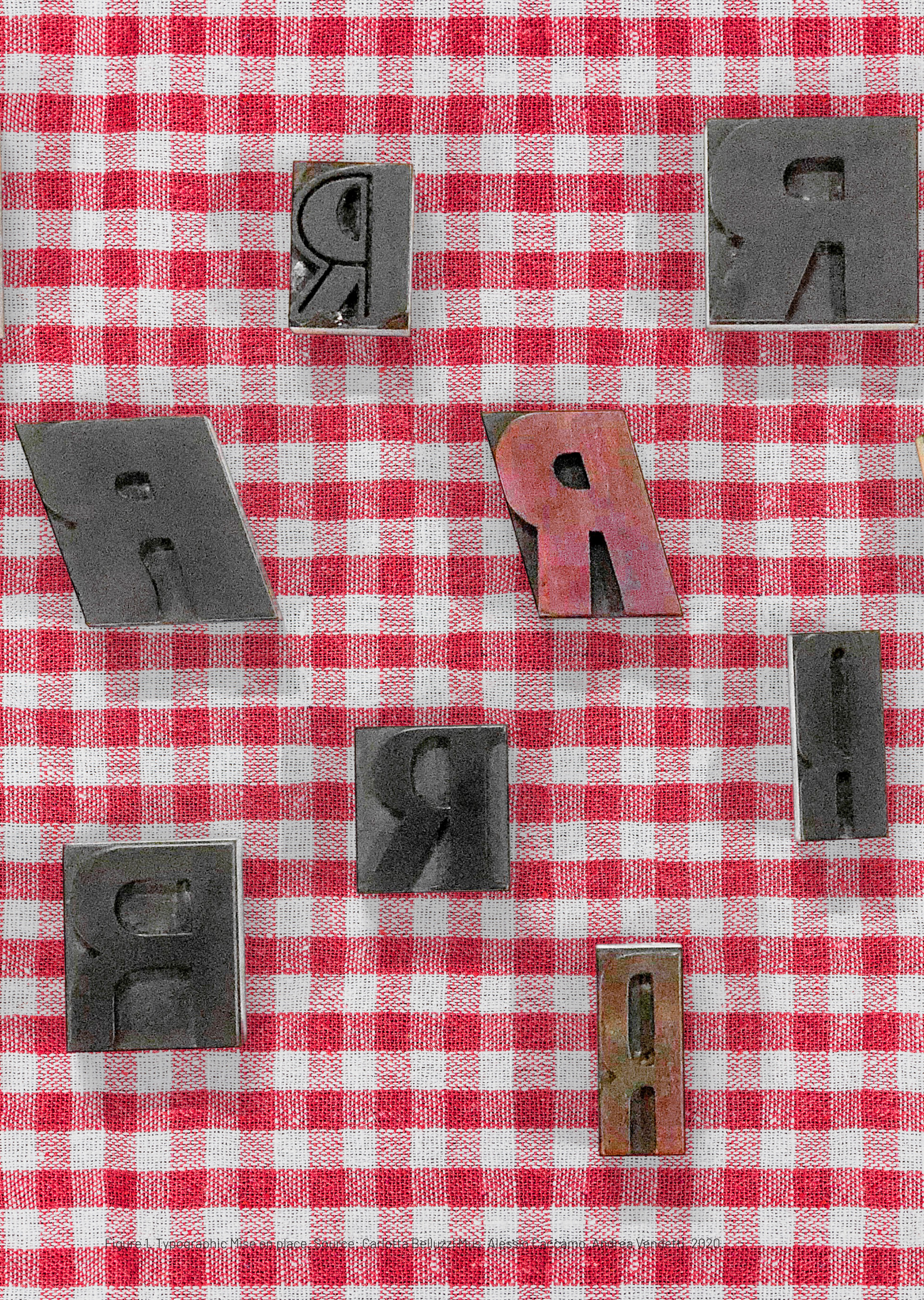

Figure 1. Typographic Mise en place. Source: Carlotta Belluzzi Mus, Alessio Caccamo, Andrea Vendetti, 2020.

EATING WITH TYPE: DESIGNING A LETTERPRESS WORKSHOP BASED ON TYPEFUL THINKING APPROACH FOR FOOD EDUCATION

Carlotta Belluzzi Mus
Alessio Caccamo
Andrea Vendetti

Starting from the observation of an evident precariousness in the contemporary relationship between man and food, this contribution is meant to show a new proposal of workshops for children in the K=12, Grade 4–5 category, aimed at stimulating in a creative and experiential way a critical and conscious thinking about food. Starting from the methodology of Artful Thinking and Object Based Learning, the project shifts the pedagogical focus from the interaction with the artistic object to the interaction with the design object; and in particular with the movable type, identified as an activating element of the educational process in the transition from Artful to Typeful Thinking. The Typeful Thinking workshop therefore represents a potentially innovative food education tool that leverages on the concretisation of critical thinking through five thinking routines that go from conceptual abstraction —through a physical artefact, the letterpress printing— to their tangibility.

typeful thinkin / letterpress printing / workshop / educational design / object based learning

Figure 2. Letterpress Workshop at National Central Library in Rome.Source: Slab, (E. Scotucci, A. Vendetti), 2020.

PREMISE

In contemporary society, the relationship between man and food is part of a complex system that origins economic, social, cultural and value impacts (Corazza, Scagnelli 2016). The dangerous precariousness of this system makes innovation an imperative: new challenges require new learning methodologies (OECD 2018). Pedagogy, assisted by the discipline of Design, can contribute to the pursuit of social innovation, able to satisfy shared needs (Mulgan et al. 2007).
One of the most fertile experiences of this activity is precisely the use of workshop as an educational learning tool (Marzotto, Caotorta 2007); moreover, already in the past (Freinet 1973) it had been demonstrated that the use of typographic composition should be considered a valid pedagogical tool. In recent years, attention has been paid to the relationship between typography and food (Hyndman 2015), with a strong emphasis on the experiential question. Against this background, the research project to be presented here aims to highlight the possibility and effectiveness of the design object (typefaces) and its semantic value as a pedagogical tool for reflection related to the theme of food and its education through design-oriented workshops (Freeman et al. 2014).

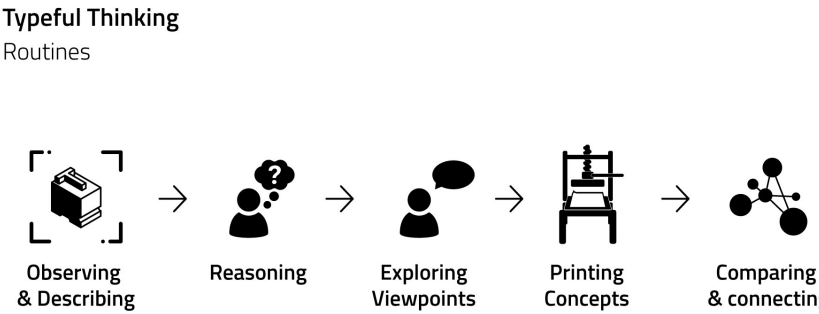

Figure 3. Typeful Thinking Routines. Source: Carlotta Belluzzi Mus, Alessio Caccamo, Andrea Vendetti, 2020.

In order to obtain effective outcomes from the project, pedagogical workshops belonging to the methodological field of Object Based Learning (Chatterjee, Hannan 2015) and Artful Thinking Program[1]—focused on up-close, hands-on and physical interactions (Schultz 2019)—have been taken as a model.Compared to the state of the art of the above mentioned methodologies, the innovation element offered is the substitution of the artistic object—which implies the univocal fruition of the artefact—to the design object—whose fruition can match an activity—as an activating element of the educational process: from Artful to Typeful Thinking. In particular, the movable type is chosen as an iconic element of visual communication design.

THE TYPEFUL THINKING WORKSHOP

The location chosen for the experimentation is the movable type printing house and research centre Slab[2] (Fig. 2). The activities designed by us are aimed at a heterogeneous group of 10-15 children in the K=123, Grade 4-5 category, and require experts skilled into pedagogy, nutrition, design, and letterpress printing.
The Typeful Thinking workshop is based on the sequence of five stages (Fig. 3) able to stimulate in a creative and experiential way the critical and conscious reflection on the food issue starting from the statement that morphological attributes of the

letters, like the roundness/angularity of the type shapes represent a key element in the crossmodal matching of tastes with shapes (Velasco, Woods, Deroy, Spence 2015).

Thinking routine 1: Observing & Describing

It represents children's first contact and interaction with the type-object. The structure of the See, Think, Wonder4 model has been chosen for the definition of the first in-depth activity. In the specific case, the object of investigation is a series of single movable types chosen on the basis of possible morphological analogies able to stimulate an association/reflection on the food issue. The selection is made up of 15 wooden types between 12 and 15 typographic lines (55–70 mm), arranged above a tablecloth (Fig. 3), which offers a visual context aimed at highlighting that the topic of the workshop is food. In order to represent the single typographic set in a coherent and neutral way, the letter 'R' was chosen, as it formally lacks direct references to the food—which is obviously not possible with other more connoted letters, such as 'I' or 'O'. The group of children, once the kit is shown, will be asked to answer three key questions: what they see; what they think; what they imagine compared to what they have just seen/touched. For instance, a bold typeface could be associated with a fat food, rather than a thin typeface that could evoke, instead, a light food (Velasco, Hyndman, Spence 2018).

Thinking routine 2: Reasoning

After the first phase, the group of children will be asked to make a first reasoned formulation of free thoughts. The basic structure follows the Claim, Support, Question. A series of statements will then be listed and recorded and will become the basis for the final reflection of the step in progress (Question). For instance, a child looking to a bold slab typeface could be brought to think that this typeface is linked to "hamburger" or similar food because of the visual connection between the form and the brand identity of former famous Fast Food Chain. Children and educators will establish a dialogue on peer with the statements made, trying to highlight, strengthen, or modify the thoughts expressed at the beginning of the activity.

Thinking routine 3: Exploring viewpoints

The reference structure, in this case, is that of the Headlines. With respect to Artful Thinking, the participants are asked to try to synthesise the reflection of the

Figure 4. Example of printing during a Letterpress Workshop at National Central Library in Rome.Source: Slab, (E. Scotucci, A. Vendetti) 2020.

previous phases through an adjective related to the world of food that describes in a punctual way the concepts expressed in the Reasoning. For instance, if a child has developed a concept about fatty or unhealthy food, as burger, he may choose the adjective "fatty" or similar (Velasco, Hyndman, Woods, Spence, 2015). In addition to the choice of the word itself, the children will be asked to choose the typeface that best expresses the concept they have identified.

Thinking routine 4: Printing Concepts

The greater detachment from Artful Thinking takes place at this stage through the materialisation of thoughts. The group of children will then be asked to compose the chosen adjective with the identified types and proceed with the printing process (Fig. 4). The final output will be the printed version of the chosen adjective composed with the letterpress technique. This stage plays a very important role in terms of pedagogical impact, as participants have the opportunity to follow step by step the process of conceptualisation, design and materialisation of their thinking. This possibility is offered by the letterpress printing, which by its nature allows a total control of the design phase (Caccamo, Vendetti 2019).

Thinking routine 5: Comparing and connecting

The artefact thus produced will become the object of reflection in the last stage of the laboratory experience. In this Thinking Routine, the children, starting from the observation of the printed concepts, will develop a series of thoughts based on the structure of Connect, Extend, Challenge. In this phase, it will be possible to reveal the first effects in terms of understanding the food issue on the workshop participants. In particular, the dialogue with supervisors and educators will in fact lead the children to confirm or reconsider thoughts and beliefs, in order to replace the instinctive and superstructures-driven thinking with a more conscious and objective knowledge of the characteristics of food: taste, quality, and health.

CONCLUSIONS

This contribution aims to highlight the possibility of an implementation of the Artful Thinking methodology through the introduction of a thinking routine, identified with letterpress printing. The past scientific results concerning the effectiveness and flexibility of the practices of Artful Thinking and OBL allow us to look with optimism at possible successful outcomes that, of course, will have to be verified as soon as the emergency situation due to Covid-19 will allow it. However, the research of new inclusive, experiential, and hands-on pedagogical approaches has already shown the capability to stimulate the minds of young people (Chatterjee, Hannan 2015). For this reason, unless later denied or extended, we believe that the introduction of the design artefact—and the related Typeful Thinking approach—as a pedagogical tool for active use in food education can actually play a role as an accelerator of the critical abilities and a proper knowledge of nutritional and cultural facts for the children involved.

FOOTNOTES

1 The Artful Thinking Program—originally developed in 2013 by Project Zero at Harvard University—uses the figurative power of art to develop students' thinking arrangements, enhancing not only the critical thinking of the individual, but also his or her learning ability.

2 Slab is one of the Italian realities involved in safeguarding and spreading the history and culture of typographic printing. Founded in Rome by Elettra Scotucci and Andrea Vendetti in 2019, it has already organised letterpress printing workshops. In particular, Slab organised letterpress workshops in the Biblioteca Centrale Nazionale in Rome.

3 The K-12 system stands for "from kindergarten to 12th grade". This equates roughly to a school starting age of around five through to Grade 12 at around the age of 18. The system is broken down into three stages: elementary school (Grades K-5), middle school (Grades 6-8), and high school (Grades 9-12).

4 The structures mentioned are the result of the development of Harvard's Artful Thinking Model through Project Zero (2013). For further details, structures are available at: http://pzartfulthinking.org/?page_id=2

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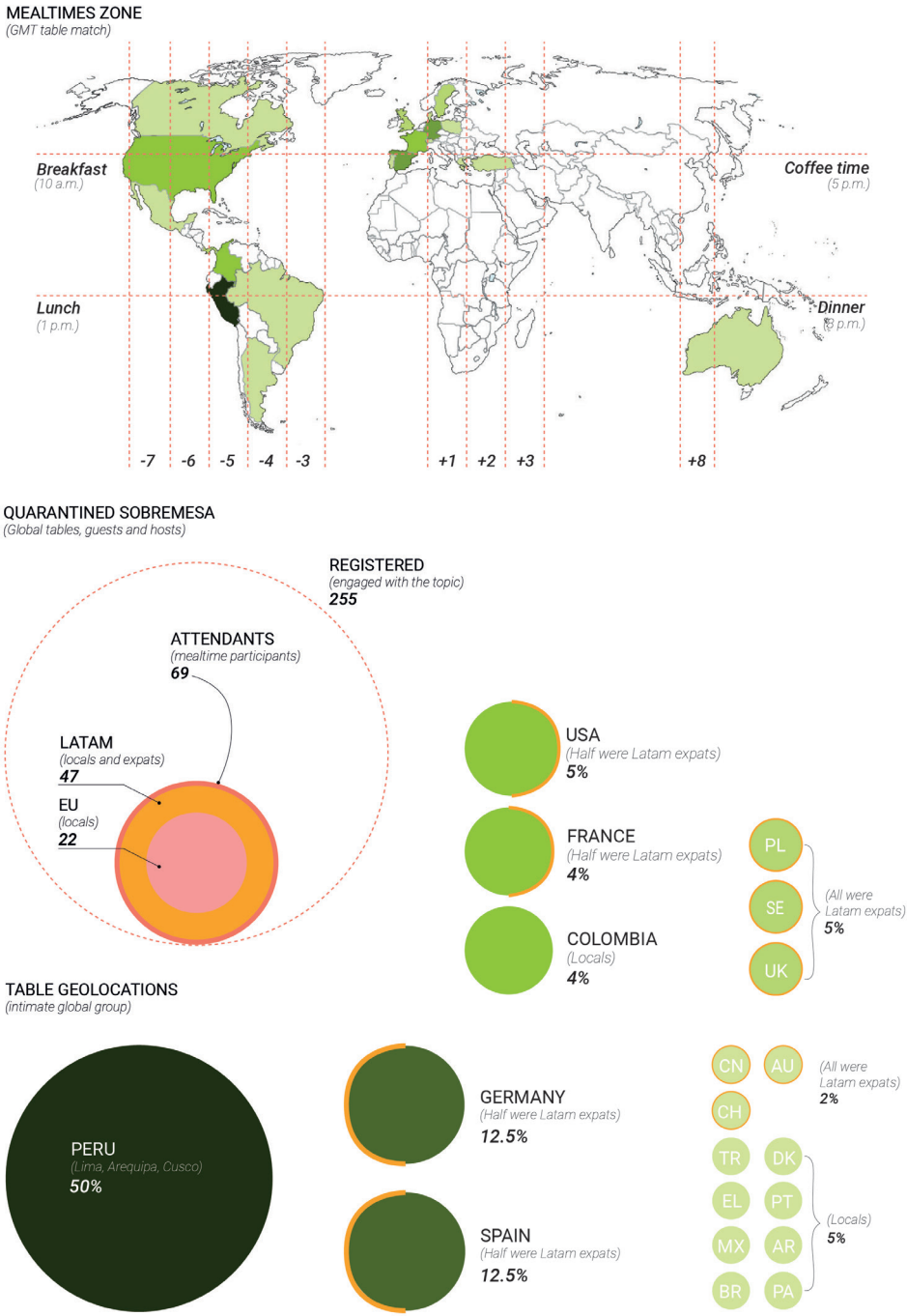

Figure 1. [QS] Tables and mealtimes geolocation. Source: Designer archive, 2020.

QUARANTINED SOBREMESA

Gabriela Aquije Zegarra

This paper looks into the challenge of adapting a Sobremesa (familiar eating ritual from Latin American culture) into a digital platform. Along the design process, Quarantined Sobremesa [QS], weaves the methodological approach of Speculative design and the interdisciplinary research of Food Systems. In the midst of the current COVID-19 pandemic, this digital mealtime provided an interactive platform for different actors and commensality backgrounds across the lockdown globe. Overall, this experience suggested how a meal could be a joyful and critical medium to allocate our everyday eating habits in the bioregional food systems. Consequently, the narrative of this text will articulate a theoretical research review, qualitative data and participant observant notes from [QS], as well as news and journalist information.

food systems / speculative design / foodways / digital medium / bioregion

Figure. 2 [QS] Digital sobremesa invitation answers. Source: Designer archive, 2020

HACKING A SOBREMESA, DISCONNECTING TO CONNECT

Quarantined Sobremesa [QS] project started in the second week of March 2020, during global lockdown due to the COVID-19 pandemic. The world began to slow down, as daily habits and tasks squeeze inside households across the globe. This context triggered that two designers[1] in two different countries, Peru and Germany, started sharing lunch (Latin America) and dinner (Europe) breaks "digitally together" (Washington Post 2020). As a matter of fact, this idea emerged in different cities and geographies simultaneously, as a way to replicate the eventful eating gatherings that the quarantine had taken away (EAT 2020).

When we (creators and designers) named the project Quarantined Sobremesa [QS], we mistakenly assumed that everyone had experienced a Sobremesa. Whereas there are similar commensality practices around the globe, the sobremesa ritual is still rooted in Hispanic and Latinos communities as part of our everyday food culture and spoken language. In the case of Peruvian culinary culture, even the greatest chefs aim to emulate a food experience that "feels like home", for the act of hosting with care family and friends, set the table and serve the "especialidad de la casa" (household special dish) that is typical of a "sobremesa peruana" (Myopia 2017). This intimate eating tradition sets the stage for "the time after a meal where the family [and friends] may sit around a table and discuss with each other. It is a

time for reflection and discussion and a time to simply be immersed [...]." (Perez 2010, p. 28). Thereupon, with hunger in the heart, we set this eating ritual re-enactment as a design challenge. (Fig. 2)

Hence, during the course of three months and five editions, [QS] evolved from a support system, between friends overseas during early quarantine days, to a digital mealtime format, which mediated a horizontal conversation between international strangers. In other words, we hacked a real sobremesa to exchange food and topics with a global community online. By engaging with over 200 people (Fig. 1), the experience passed through several adaptations, although the core structure remained as follows:

– A shared mealtime: the scheduled gatherings had to fit, overall, Latin America and Europe typical meal hours (breakfast, lunch, and dinner) and time zones. Appealing to food as an empathy tool, for one hour you 'set the table' to eat together during the digital encounter. Although, along the process, we learn that having a plate of food for the session was optional.

– A topic: after the first couple of sessions, we noticed that participants with a common interest had a smoother table talk (sobremesa) and even continued the conversation after [QS]. Thus, often the host suggested a topic and a certain mealtime schedule, which was communicated one week in advance at the registration form and the Instagram social media account of the [QS] project. It is crucial to mention that the topic acted as a conversation trigger that could open up a horizontal dialogue. This talk could derive into a rich debate but did not aim for a webinar-type of exchange.

– An intimate global group: as any good gathering, there is someone who takes care that everyone has a good time. At first, we (designers) filled that role, but as the community grew, former participants assumed this caring duty. The group size depended on the quorum of the topic proposed during registration week, as well as the language available for conversation. On average, we would have one to three hosts, around three to seven guests and at least two different nationalities/geographies sitting in one table (mealtime and topic).

– A digital medium[2]: an element that is the convergence of technological and creative tools to carry out a digital Sobremesa. The hardware was a stable Internet connection, an email account, and a virtual chat room (Google Meets). The software was a restaurant/hosting use of language in all our communication canals (email, Instagram, Google forms, WhatsApp) to the point of even creating a reception space where a greeter welcomed you to the experience and promptly redirected you to the selected table. Also, we adapted analogue

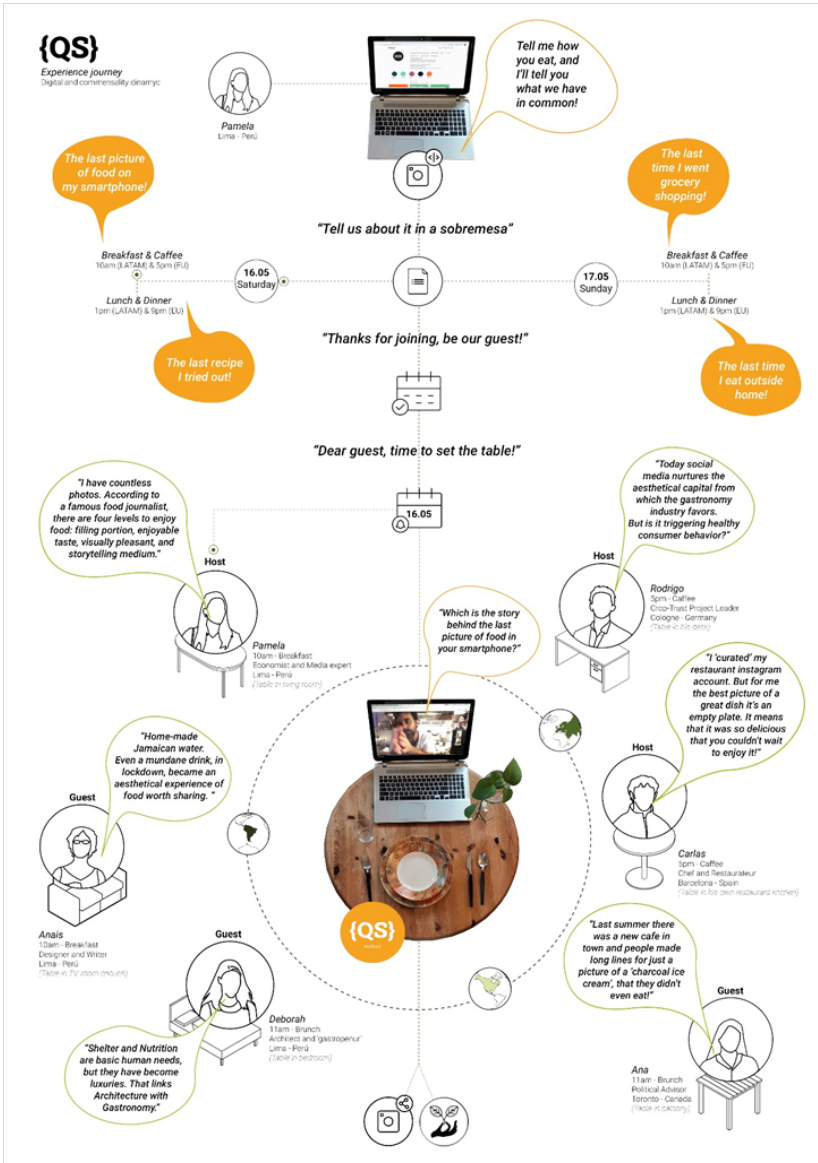

Figure 3. [QS] Experience journey. Source: Designer archive, 2020[5]

elements of the dining environment to a careful set of indications such as table setting or register the host's meal preparation to communicate "how to prepare for a Sobremesa". (User Insight Workshops 2020)

DESIGNING A TABLE IN THE QUARANTINED FOOD SYSTEMS

We need to situate the [QS] team and project at the intersection between the research realms of Speculative Design and Food Systems[3]. The first realm enables designers to evaluate and generate debate around new objects or technologies. According to Kristina Lindström and Åsa Ståhl when "inviting participants to engage in issues that emerge when things are already in use" we apply speculative design as a method for "designerly public engagement". Thus we foster the participant agency "to [an] inventive problem making in their own everyday life" and encourage them "to shift the parameters of an issue or a concern". (Lindström, Ståhl 2016, p. 187)

In the means of adapting a dinning cultural ritual to a digital platform, we understood that we would need to readapt hardware and software of [QS] to respond to our users' concerns and geographical backgrounds. In most of the cases, this digital mealtime became an "out of the quarantine-ordinary moment" in which a conversation with a global stranger refrained their perspective on a certain topic. In others, the topic brought together long-distance friends for a "digital reconnection to their country of origin through table memories" (User Insight Workshops 2020). As in a real-life Sobremesa, the household (designers) only has control over the table setting, not on the guest's behaviour or spontaneous interactions.

The second research realm emerged as we became more familiar with the pandemic context, its impact in our everyday life eating habits, and even more acquaintance with the digital versions of public engagements (Nielsen 2020). Onward with this new lockdown environment and due to the empathetic nature of the interaction we were able to build a global network of commensality. Whereby we touch upon, direct and indirectly, the subject of Food Systems by looking into eating habits and cultural "foodways"[4]. According to the Food System Dashboard there is "a large body of nuanced research on consumer behaviour", and among the key elements to understand it are forms of food exchange (FSD 2020). Consequently, by the fifth edition of [QS], we wanted to reflect on food as our medium and make it our main topic. By inviting specialists and enthusiasts to a sobremesa we approached the Food systems discussion through an affective—nonetheless critical—human connection.

Taking on Lindström and Ståhl, "[…] invitations have always been important as a way of articulating an area of curiosity, and a proposal of how to engage with it." (Lindström, Ståhl 2016, p. 190) Therefore, we named the edition: "'Tell me how you eat and I will tell you…'", and complemented it with four storytelling abrebocas (trigger topics): "… the last picture of a meal in my smartphone", "…the last recipe I tried out", "…the last time I went grocery shopping", "…the last time I eat outside home. Each abreboca had a global table and mealtime, which debated each quotidian material and space dimension of the food systems and the effect that the pandemic had on it. (Fig. 3) First, the picture opened up a discussion on food, communication aesthetics, and globalised eating practices. Then, the recipe led to childhood 'doing cooking' memories, food waste-conscious, and pantry cooking. Later, grocery shopping developed a debate on gastro politics, food access, and market informality. Finally, addressing eating outside turned out into an open debate, about the restrictions and changes in public behaviour. (Sobremesa Dynamic 2020)

Food was the thread that connected, not only hosts and guests that interact in it but also their food network and cultural behaviour. (Fig. 3) There were many moments in which "the collective debate intuitively touched upon an ecological reflection of their eating habits, and that was truly meaningful" (User Insight Workshops, 2020). Accordingly, the journalist and designer John Thackara introduces this ecological thinking as "bioregioning", which re-connects our every day with the living systems that support it. He also urged designers to take up the role to connect diverse groups of actors inside the bioregion by designing for system change, creating platforms that give priority to human-nature knowledge exchange, for "[…] the practice of ecology is the forging of relationships." (Thackara 2019, p. 21)

SOBREMESA CONCLUSION

In this short essay, we have presented the design challenge of Quarantined Sobremesa and how it reunites the cultural and caring cohesion of the household dining format with the 'foodways' of a global community, along a digital medium. Based on our experience, we can conclude that digital platforms helped us bridge huge physical distances, and—although its limitations—can quickly open a window into other global realities and become a space for dialogue. Also, that by linking our 'digital tables' we could understand how the cultural and ecological networks of our meal connect to each other. Consequently, we believe that a cohesive local and global community is crucial to reinforce ecological thinking inside the post-COVID Food Systems.

Thus looking ahead, could this project that started as a digital meal-time exchange bring awareness on the link between our tables and bioregional Food Systems? We certainly learned during the prototype phase of [QS] as much as from the cultural background and everyday hacks of our food-savvy digital community. So moving forward we would like to develop a co-creative 'digital commensality' incubator for critical food design projects. Thus continue to set the table for creative knowledge-exchange between transdisciplinary actors inside the local and global Food System.

FOOTNOTES

1 [QS] Project Co-creators: Gabriela Aquije, Anais Freitas Eléspuru, and Diego Polo Chávez.

2 Food and digital mediums have a variety of ways of interacting, some beneficial and other adverse. One that can relate to the [QS] platform is 'digital commensality', which includes "[...] a number of scenarios, from physically eating together with someone as a result of some digital technology-based intervention [...] while eating, [...] as well as more elaborate tele dining installations that allow for some element of interactivity with those whom we may be dinning with remotely [...]." (Spence et al. 2019, p. 2).

3 Within the Design Research realm there is also a specific—and rather young—niche of practice-based theory named 'Food Design', by the Italian design scholar Francesca Zampollo, which relates design with transversal concerns from the realms of Food Studies and Food System research (Zampollo 2017, p. 3). The subcategory of 'Critical Food Design' (Ibid. 2016, p. 7) uses speculative design strategies and explores inside (but not exclusively) the problematics of Food Production Systems. Nevertheless, the design-thinking methodologies of Food Design, according to the mentioned author, are often applied to food product or service development, which are not main concerns of the presented [QS] experience.

4 "In fact, human foodways are a complex result of the interaction of human nutritional needs, ecology, human logic or lack of it, and historical accident. [...] They construct their foodways within limits set by biology, economics, and psychology." (Anderson, 2005, p. 2)

5 The vectorised icons were designed by Lluisa Iborra from the Noun Project [open source platform]. Available at: https://thenounproject.com/marialuisa.iborra/

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Figure 1. Refugee Food Festival in Cape Town. Source: Refugee Food Festival ©Cindy Helfer, 2018.

FOOD DESIGN AS A STRATEGY FOR THE GLOBAL COMMUNITY

Ivo Caruso
Silvia Cosentino
Carlo Martino

The paper aims to identify the role of Design Culture in adopting food and gastronomic practices as strategic tools to enhance dialogues between different cultures. The research analyses the cases in which contemporary Design Culture adopts food as a possibility of social inclusion, understanding of the global flows of people, transformation techniques, and novel rituals. Food and food cycles can be interpreted as "language", as well as an opportunity to create circular business activities based on the rediscovery and on the strengthening of the links between territories and communities in a globalised scenario increasingly attentive to the experiences of fusion between cultures. Design culture can become a mediator, a facilitator and a promoter of solutions and models of integration between cultural components we commonly consider "strong" and "weak", "host" and "settled", "traditional" and "modern", "slow" and "fast", "typical" and "atopic". Thus an "open" scenario is outlined in which projects and researches oriented to the diffusion of more sustainable and "community centred" food cultures are renewed and take on new meanings. New cultures emerge which, while keeping their cultural roots, evolve into a transcultural society. The Design Culture is called to recognise and co-design these new “food acts” of the contemporary transcultural societies.

food design strategy / shared citizenship / global communities / new models of social entrepreneurship / transcultural societies

Figure 2. Making of Ugastoves in Kampala. Source: Uganda Stove Manufacturers Ltd., 2019

In recent years, companies and organisations have oriented themselves in structuring services, "social" actions (Bujdosò 2019), business, and "open" (AAVV 2011) design strategies that affect the cycles of food sector (Bistagnino 2009). These dynamic patterns are able to move "from particular to general", with multiple consequential "effects"; and they are able to look at the spread of local culture through the agricultural productions, processes and services chains connected to them. The result is a strong sense of sharing and hybridisation between cultures, the possibility of implementing new "interpretations" of local traditions, both in the technical-aesthetic modalities, with the creation of new specific trends, as well as in the structuring of new economic models based on social inclusion processes. The drive for evolution and growth is a natural mechanism that refers to the evolutionary processes of living beings and communities and is canonically associated with entrepreneurial dynamics. Design culture in the food cycles offers new cross-sections, new wide horizons, as it involves both the field of the project and that of distribution. This results in new visions linked to the business models shaped consequently to the reference contexts and which must take into account the new stimuli linked to multiple sectors. The adoption of the traditions related to the gastronomy from different cultures for design-driven entrepreneurial strategies is, on the one hand, a clear opportunity for sharing and creating bridges be-

Figure 3. Refugee Food Festival in Geneve. Source: Refugee Food Festival, 2019.

tween cultures; on the other, it is also a fertile incubation basin for new ideas which have the possibility of being capitalised by generating work and innovations encouraged by the kind of designers defined by David Kelly as "experts in the process that guides a specific subject in bringing innovation" (Kelly 1999)

In this sense it is possible to observe dynamic, fluid, non-linear trends that aim at design models characterised, paraphrasing Andrea Branzi, by a widespread and distributed nature capable of proposing an "expression of an idea of reform of the environment, of the city, of the habitat, to realize that it is a widespread avant-garde form." (Branzi 2017)
Specifically, it is possible to note several international case studies that collaborate in a coordinated and interdisciplinary way, oriented towards social activation, inclusion, enhancement of the territories and, sometimes, to the reformulation of traditions, processes and cultures functionally to the generation of widespread, systemic, sustainable and supportive economies.

Design Without Borders Organization, born in 2001, has the aim to introduce product and service design skills and practices as strategies to provide "sustainable and long-term solutions in low and middle income countries" (Design Without Bor-

Figure 4. Les Petites Cantines in Lyon. Source: Refugee Food Festival, 2019

ders 2015). Among the organisation's initiatives, we can mention the Malaika Honey project; a beekeeping company, founded in 2005, with the aim of reducing poverty in rural communities through beekeeping. In this significant case, the food cycles are interpreted as elements that stimulate the creation of business acts and new economic models. The role of the beekeeper is reinterpreted as a subject that re-defines the entire production process of honey and its derivatives, starting from the interaction between man and bee, based on deep respect for the living beings, communities, and territories. Simon Turner, the founder, describes his company as a new social economic model. "We buy expensive and sell cheap", he explains, "stimulating value chain growth while making profit on quantities of scale". (Turner 2015) Malaika Honey Ltd, in addition to honey production, also deals with developing specific tools for beekeeping. They designed a tool dedicated to cutting and collecting honey, locally manufactured. An example of "open product design" (Bassi 2017) inspired by the desire to enhance work operations, using local raw materials and labour.

Transcultural explorations in gastronomic cultures can be declined in the areas of research of artefacts, in cases where the product becomes a link between communities, services, old and new needs and possible business opportunities.

Figure 5. Refugee Food Festival in Paris. Source: Refugee Food Festival ©Mahka Eslami, 2019.

Innovations and strategies of evolution and development of project-entrepreneurship in the food sector can also be driven by issues related to the health of the individual.

This is the case of the reinterpretation of a cooking tool typically used in Uganda (Fig.2). As we can read on the official website: "Most households and small-scale restaurants in Uganda use charcoal cook stoves to prepare their daily meals", the diffusion of which is highly harmful to the environment and to the health of people in the proximity. The Ugastove collaboration is "a project where positive impact was created in the entire value chain of the product. [...] The design team was able to help Ugastove meet their strategic goals through extensive processes that involved end-users, resellers and production staff. The solution was the new Frame Stove with highly improved quality and usability. [...] With a successful design in place, Ugastove and Design without Borders entered a new collaboration to increase the production capacity of the Frame Stove."

Design practices can become an element of communication and sharing of cultural processes related to the world of professional catering and traditional cuisine, in which companies offer global communities the opportunity to get to know and explore local cultures, through community action processes. The English Nesta Foundation has developed—through the Mazi Mas social enterprise—a project

aimed at women from migrant and refugee communities to capitalise on their culinary skills through the "pop-up" restaurant model. The social-entrepreneurial project was launched in October 2012, offering authentic ethnic cuisine in the city of London. The founder, Nikandre Kopcke, has created a bilateral business model, which encourages new generations of women to professionalise their skills, capitalising them, while doing a work of dissemination of local cultures in the rest of the world.

A further case of community action linked to the definition of new collaborative models and restoration of the possible social role of food is the "Refugee Food Festival", an annual event, started in 2016, which presents itself as a collaborative channel between community cooks of refugees and local restaurateurs, with a spread covering 15 cities worldwide (Fig. 1, 3, 4, 5). "The Refugee Food Festival is a citizens' led initiative which aims to show that civil society has a fundamental role to play in the way refugees are welcomed. All organisers of the various Refugee Food Festival local editions are committed citizens who reached out to lead the project in their cities." (Refugee Food Festival 2019)

Food Design Culture, working on different fields (products, services, systems, strategies, social actions, events, communication), can therefore represent a clear bridge between cultures. The hybridisation between typologies, human-centred initiatives, materials, manufacturing processes, methods and rituals of use, is a possible experimental design path that fuses multiple aspects in an interdisciplinary way, giving back results that are tied to traditions but aim at innovation, and they openly move from a local to a global dimension.
Reflecting on the processes of crisis and revolution that are influencing the dynamics of the food sector, one might wonder how companies, designers and different stakeholders, starting from traditional systems, have managed to adapt and are more and more adapting in an innovative and flexible way to scenario changings. So, in such contexts we can observe that equity, sustainability, creativity, flexibility, and self-organisation capacity are determining factors.

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03 Session

CREATIVE FOOD CYCLES BASED ON DIGITAL TECHNOLOGIES

The session explores how Creative Food Cycles based on digital culture, ICT or human-mediated technological inputs can experiment new cultural and social impacts in changing urban society. While agri-food sector is currently facing major challenges to feed a growing world population, advanced technologies, robotics, AI are inhabiting our food culture with different applications. Moreover, app-based solutions for food delivering are drawing apart people perception of food cycles and their trajectories.

How do we manage creative invention and innovation in food system, preserving also the sensorial, social meaning of mealtime? How can design discipline contribute to humanize technological transition pathways?

Interventions present projects, prototypes and experimentation of digital interpretation and technological application to Creative Food Cycles. The concept of bio-integration could represent a horizon for upscaling existing food innovations strategies, understanding architecture as an integrated system combining organic-disposal and self-growing practices. If nature-based solutions respond to environmental sensitivity, the reduction our consumption trends pass through ecological adaptability of urban metabolism. Shifting to support plant-based diets should represent a real opportunity to involve citizen-driven initiatives, creative industries, SMEs, start-ups empowered by the possibilities of digital milieu. What could be the role of architects, designer and urban planner in this scenario? Computation design and digital methods applied to fabrication can develop a generation of professional sensitive to new composite-materials, responsive application mimicking nature (i.e. algae bio-reactors, hydroponic systems), and parametrically design structures to host mutualism colonization (e.g. fungi, roots, insect hotels). Interesting applications can be found also in the consumption to disposal phase, proposing recycling food waste as a source for bio-materials and bio-plastics to fight against climate change or to put them back in circulation by 3D food printing to make it consumable and appetizing again. The desire for customisability integrated by means of digital gastronomy represent a significant driver of change, where collaborative design and gaming-approach enhance the role of the final consumer. Virtual realities applied to sensorial experiences and performative dinners mixed with 3D videos, can be a medium to enhance social interaction in the age of millennial "foodies", encouraging knowledge creation across food cycles. Are digital technologies already affecting daily life of people? Probably in a near future digital platforms, ambient-assisted living organization and augmented domesticity will support new architectural systems for social welfare, questioning what could be the role of a traditional kitchen in our home in the era of internet of things, just-in-time logistics, E-commerce.

Figure 1. FoodSHIFT 2030 project kick off event © Marcel Rodriguez, 2020.

FOODSHIFT 2030: A CITIZEN-DRIVEN TRANSITION OF THE EUROPEAN FOOD SYSTEM (EU HORIZON PROJECT)

Kate Armstrong
Emily Whyman
Luke Schafer
Christian Bugge Henriksen
Dirk Wascher

Food poses major challenges for European citizens; be it attaining nutrient rich diets or the disproportionate contribution the food system makes to climate change. Currently, food system innovations don't sufficiently address these challenges, nor do they take advantage of the opportunities and barriers for scaling up successful food system solutions. The FoodSHIFT 2030 project takes departure in the EU Food 2030 Research and Innovation Policy Framework, the EU's commitment under the Paris Agreement and the UN Sustainable Development Goals (SDGs) to launch an ambitious citizen-driven transition of the European food system towards a low carbon circular future, including a shift to less meat and more plant-based diets. It does so by creating a framework and efficient mechanisms for maturing, combining, upscaling and multiplying existing food system innovations through the operationalisation of nine citizen-driven FoodSHIFT Accelerator Labs and a further 27 FoodSHIFT Enabler Labs to be established in city-regions distributed across Europe.

food systems / innovation / citizen-empowerment / plant-based diets / open-source technology

Figure. 2 Citizen engagement at City Agro-Park Lab, Oostende Belgium © City of Oostende, 2019

THE TRIPLE CHALLENGE

When it comes to food security in Europe, a triple challenge is posed by the increasing effects of malnutrition, global emissions and urbanization. Currently, 60% of deaths in Europe can be ascribed to non-communicable diseases that are affected by what and how much we eat (cardiovascular, cancer and diabetes-related diseases)(WHO, 2018). In a business-as-usual scenario with increasing greenhouse gas emissions, global average temperature is projected to increase by 4°C in 2100 (European Commission, 2018) while the division among rural and urban regions will become increasingly noticeable. Territorial evidences of these trends are visible in the GDP per capita in urban regions, which is 24% higher than the EU average level, while the GDP per capita in rural regions is 30% lower (European Commission, 2013). The context presented by these combined challenges is one in which European citizens are not equally provided access to safe, healthy, nutritious and affordable food. Recent research, including a report from the EAT-Lancet Commission published last year clearly demonstrates that a healthy diet is primarily a plant-based diet and that a plant-based diet has lower GHG emissions (Willet et al. 2019). The potential posed by a transition to less meat and more plant-based diets could have significant health and climate change co-benefits including a sig-

Figure. 3 Next Food applied technology in-situ © Next Food, 2019

nificant contribution to achieving the EU targets for reducing GHG emissions to at least 50% and towards 55% by 2030 as proposed by the European Green Deal (European Commission, 2019). FoodSHIFT 2030 focuses on the take-up of more plant-based diets in European city-regions in response to the triple challenge. It focuses on the shift to less-meat as a method to increase the nutritional quality of meals eaten by Europeans, provide food sources that have a lower carbon footprint and to enable more frequent local food supply and procurement.

THE FOODSHIFT 2030 APPROACH

The FoodSHIFT 2030 project approaches the need to shift toward plant-based diets by enabling the maturing, combining and upscaling of existing food systems innovations in various localities across Europe. Under the H2020 programme of the European Union, it brings together a strong multi-actor consortium composed of local governments, SMEs, NGOs, universities, research institutes and network partners. The project aims for a fast citizen-driven food system transition, through the operationalisation of nine citizen-driven FoodSHIFT Accelerator Labs (FALs) and a further 27 FoodSHIFT Enabler Labs (FELs) to be established in existing and emerging city-region food system hubs distributed across Europe.

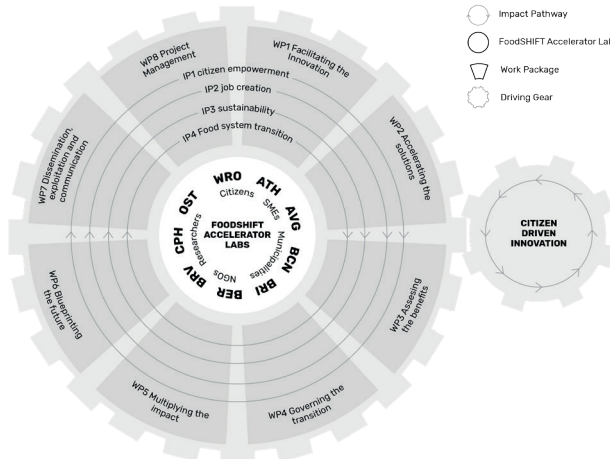

Figure. 4 FoodSHIFT 2030 work packages structure as driving gear of the Accelerator Labs © FoodSHIFT, 2019.

The FALs are established as open innovation living labs featuring multidisciplinary local collaboration between key food system stakeholders from private companies, local governments, research institutions, and civil society in nine European city-regions. The FALs are under establishment in frontrunner city-regions across Europe, including the large metropolitan such as Barcelona, Berlin, Greater Athens, Greater Copenhagen, Wroclaw and smaller city regions such as Avignon, Bari, Brasov, and Oostende. Each has a defined innovation focus and innovation actions within ten major project themes and eleven SDGs across the Labs. The FoodSHIFT 2030 framework focuses on increasing the technological and societal readiness levels of existing food system innovations. It takes a particular interest in citizen-led innovations, that respond to social and environmental challenges of the local communities, in which the FALs are established and will use sustainable design and circular economy principles to foster, scale up and widen the initiatives to become economically viable and socially valuable. FoodSHIFT 2030 places citizens at the centre of food system transition and aims embed their existing efforts into the development of support frameworks, toolkits and knowledge transfer systems, including Blueprints, to ensure lasting positive impact on food system sustainability that will continue beyond the project lifetime.

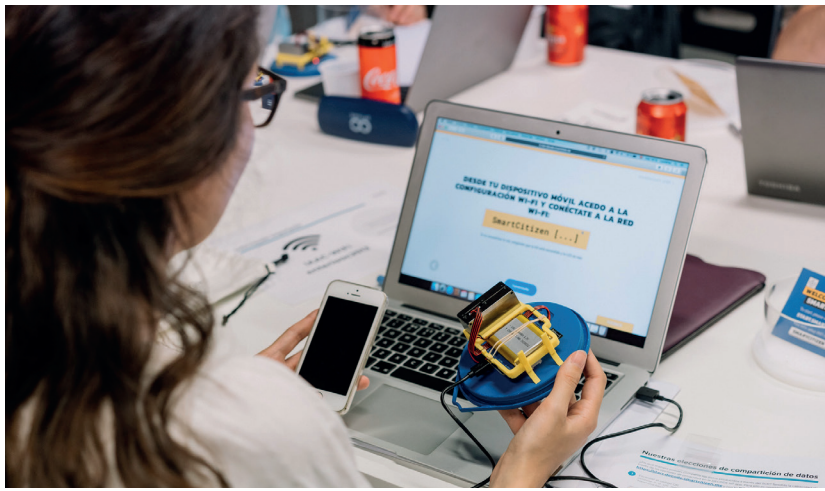

Figure. 5 The Smart Citizen Kit in use at Fab Lab Barcelona © Smart Citizen Team, 2019

To understand each local context, FALs will map and catalogue the existing local food system innovations and identify their potential for further development. Common priorities will be defined based on this process and tailor-made trajectories will be developed for each of the FALs. Innovation is applied as a wide concept by FoodSHIFT 2030, with particular reference to the sociocultural perspective; the project aims to further define it through the project activities. In particular the Barcelona Lab —Food Tech 3.0 Lab— focuses on digital innovation and citizen empowerment. It aims to develop and pilot open source food technology, that can facilitate the management, monitoring, socialisation and efficiency of food production in cities. The Lab aims to promote existing and new innovations in urban farming technologies in Barcelona, with facilitation of the municipality and offer support and training for their use. A focus on food-tech flagship innovations, for wider application in other city-regions and coastal communities, will become the focus of continued collaboration and potential upscaling of open design and 'Fab Lab' initiatives, under the aims of the 'locally productive, globally connected city' following the logic of Distributed Design and methodology of Fab City . The Barcelona FAL consortium includes Fab Lab Barcelona at the Institute of Advanced Architecture of Catalonia and Next Food, a food-tech start-up based out of Copenhagen and Barcelona.

Each FoodSHIFT Accelerator Lab will contribute and share knowledge within the consortium in an effort to achieve the aim to upscale and multiple exchanges between the FALs. Furthermore, each of the nine FoodSHIFT Accelerator Labs will initiate the establishment of three FoodSHIFT Enabler Labs to facilitate the food system transition in other city regions. To support the acceleration of food system innovations each of the FALs will be supported by a team of experts from the Project consortium. The consortium is composed of 30 partners comprised of seven municipalities, nine SMEs, seven NGOs and seven research institutes from twelve European countries. These experts will advise on the innovations across the entire food value chain, including production, distribution, consumption, and recycling/upcycling.

STRUCTURE OF THE SUPPORT APPROACH OF THE PROJECT

The project is organised using a work-package structure to provide targeted support to the FALs. The first work-package is dedicated to the establishment of the FALs, counting the foundation of the local Lab steering committee who facilitate local efforts; consisting of Lab leader, Lab host and Lab assistant from the city-region project partners who are responsible for dedicated roles in initiating and managing the local FAL including tasks such as communication, organization of events and agendas; each FAL has the same profiles and structure. Furthermore, this process includes the exploration of the existing food system innovations in the city-region and definition of common priorities in order to co-develop the tailor-made trajectory for food system innovation with experts from the consortium and the FALs which is undertaken in the packages that follow. A work-package dedicated to mechanisms for accelerating the transition by maturing, combining and upscaling the existing solutions within the food value chain, including production, distribution, utilization, recycling and upcycling. One work-package in which FALs contribute to the collection of data and provide input for assessing the benets of existing and accelerated food system innovations to inform their further development and provide decision support for policy makers on governing the food system transition. Finally, FALs will work on co-creating food system governance strategies at a policy level to support the acceleration of food system innovations and democratize food system governance in the participating city-regions.

MULTIPLYING THE IMPACT

FoodSHIFT 2030 project aims to be embedded into the social fabric of the Euro-

pean cities in which FALs are established through both local and global actions. The project presents a comprehensive dissemination and exploitation strategy, with a strong focus on activating international city and food networks and local civic groups. Local events are designed to support stakeholders' engagement and showcase food system innovations to broader audiences at a local level, for example the Barcelona Food Tech 3.0 Lab will host an open-house and food-tech convivial events, in which the neighbourhood gather and explore synergies. A specific work-package is dedicated to facilitate Social Innovation events and meet-ups, with the aim of increasing the civic impact of the FALs and furthermore, to ensure audience visibility and accessibility to the innovations in the local context. Outcomes will be multiplied through knowledge transfer systems including asynchronous online peer-to-peer forums and dedicated webinars between the FALs and to the 27 FoodSHIFT Enabler Labs. On the other hand, at a project level, outputs, deliverables and findings will be embedded into food systems dialogue, beyond the project and through a number of city-region networks, including the Fab City Network, the Sustainable Food Cities Network and the C40 Food Systems Network who are engaged in the project to multiply results through their respective networks.

In addition, FoodSHIFT 2030's innovative framework has integrated horizontal workflows on key topics that are essential to the project, named as Impact Pathways. Four 'horizontal' Impact Pathways will ensure citizen empowerment, job creation, sustainability, and food system transition to be adequately addressed and fully integrated across the project. The Impact Pathways will ensure that the outputs of the individual WPs have tangible outcomes and real-life impact for citizens, policymakers, businesses, and the environment in both the participating city-regions and in the EU. These Impact Pathways safeguard the development of four FoodSHIFT Blueprints which aim to continue beyond the project lifetime.

The Citizen Empowerment Impact Pathway, managed by Flanders research institute for fisheries agriculture and food, will unlock civic potential, ensuring that citizen-driven innovation and citizen participation will be the cornerstone of all FoodSHIFT Accelerator Labs. The Citizen Empowerment scheme will promote citizen-driven strategies for improving food system governance, whilst also placing them in the centre of the knowledge transfer ecosystem and ensuring their involvement in the four FoodSHIFT Blueprints. The FoodSHIFT Citizen Empowerment Scheme will be co-created together with citizens active in the FALs. It is planned, that the scheme will feature interactive tutorials and downloadable files,

outlining the actions that local governments, SMEs, NGOs, and citizens themselves can take, in order to facilitate the empowerment of citizens in focus areas. One approach will utilize open-source digital fabrication and citizen science. The FoodSHIFT project will develop customized FoodSHIFT Sensor Kits – in which citizens can actively participate in the collection of data which will be relayed to the Smart Citizen Platform.

The Job Creation Impact Pathway reflects job innovation opportunities connected to FoodSHIFT 2030, specifically when defining common priorities and the tailor-made trajectories for the FALs. This includes realistic job creation plans within innovative business plans for food system accelerations. The Job Creation Platform will support business development for food sector start-ups and ensure that this knowledge is included in the knowledge transfer between FALs, from FALs to FELs, and via city and region networks. The FoodSHIFT Job Creation Platform will be designed with the FALs and made available online. Under the Sustainability Innovation Pathway, the Sustainability Scoring System, led by Draxis Environmental will make it possible for food system stakeholders around the world to assess the impacts of different food system innovations on the Sustainable Development Goals.

Finally, Food System Transition aims to produce the FoodSHIFT Transition Toolkit which will be co-created to guide SMEs, NGOs, local governments and citizens on how to design a sustainable local food system, in which citizens are empowered to take an active part. It will extract the cumulative knowledge on all aspects of food system innovation generated throughout the project and will offer multi-criteria search functions on a wide range of food system innovation issues and will incorporate the FoodSHIFT Citizen Empowerment Scheme, the FoodSHIFT Job Creation Platform, and the FoodSHIFT Sustainability Scoring System. The FoodSHIFT Transition Toolkit will be made available online and share throughout existing city networks to guide cities through the transition process which has been piloted by the FALs and FELs.

FoodSHIFT 2030 aims to employ a wide definition of innovation within the social context of European cities in order to identify, mature, combine, upscale and multiply existing food system innovations that can help cities respond to the urgent need to shift food systems to support plant-based diets. The project proposes the use of digital technologies as one aspect of this transition; a tool that can be applied to enhance the experience and increase the potential for citizens to par-

ticipate in actively changing food production and consumption. The use of open citizen-technologies developed in a Fab-Lab, The Smart Citizen Kit, is evidence of this, as is the use of open online forums, toolkits and platforms. FoodSHIFT 2030 proposes an approach to embedding digital technology into daily civic practice, to enable the connectivity, knowledge transfer and network participation between geographically diverse, likeminded nodes.

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Figure 4. Permabioreactor Prototype © Tiago Vasconcelos, 2018

CULTIVATING SOCIAL CAPITAL—RESILIENCY AGAINST ADVERSITY

Thiago Vasconcelos

Based upon the fieldtrip and context analysis developed during the Master Architecture and Extreme Environments at KADK Copenhagen, the work described in this paper explores the resilience of food supply system, connected to extreme scenario development and socio-political trends, largely impacted by climate changes in Alaska, USA. A specific design focus has been set in the city of Anchorage where the project *Permabioreactor* explores new modalities for combined cultivation of super-nutrients, such as Algae, which sequesters excess carbon dioxide. This results in activating a process of circular economy, by providing a source of food and alleviate the impact of onset permafrost thaw because of the warming climate. Introducing a critical discussion on how scenario building methodology could be a strategic tool for planning against uncertainty, the contribution deals with themes across food production and security, energy resources and population distributions and development.

food production / future scenario / architecture / climate change / resilience

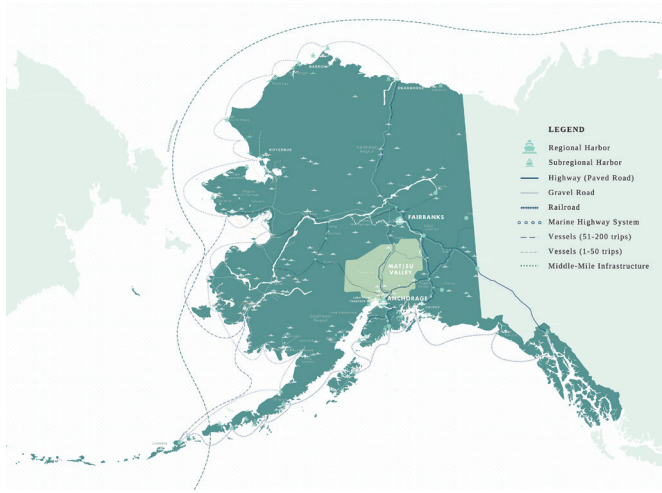

Figure 1. State of Alaska Infographic © Tiago Vasconcelos, 2019

CULTIVATING RESILIENCE IN ALASKA

Food cycles: production, distribution, and innovation have and certainly will continue to be greatly affected by the impacts of climate change. As the global industries continues to grow —to meet complex urban demands— so too do our environmental woes. Scenario planning has, since the early 1970's, been an integral strategy of Royal Dutch Shell's preparations for an uncertain future. Dealing with energy, water, and food security, Future Lens Scenarios assisted the exploration of possible ways forward. (Shell and International, 2014)

Studies show that resiliency within a society acts as a key marker for determining the capacity for a group to "weather a storm". (Gotham and Powers, 2015) Resiliency, through cultivating Social Capital may offer a means to a more cohesive social unit —one which may be better prepared to face adversity and uncertainty of the future. For the purposes of the investigation, the concept of Social Capital is defined as "the collective values of social organization such as networks, norms, and public trust that facilitate coordination and cooperation for mutual benefit." (Putnam, 2016)

Thus, when faced with adversity and challenges, socially cohesive communities may fare better overall when evaluating outcomes. (Aldrich and Meyer, 2015) In or-

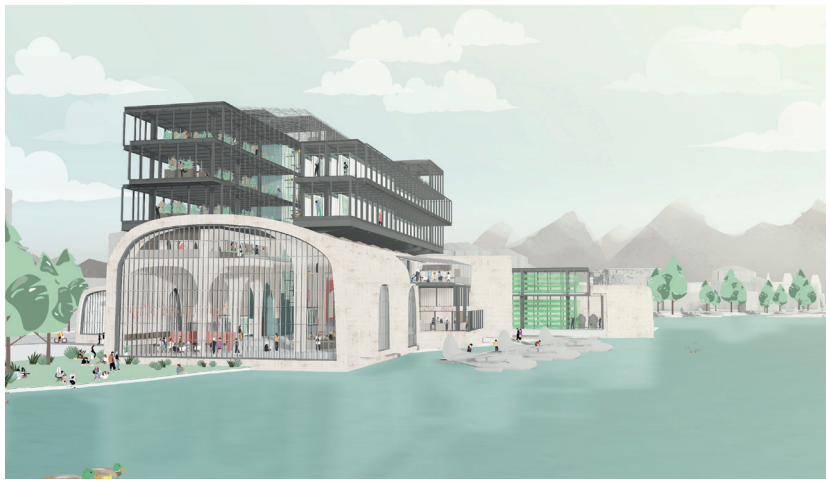

Figure 2. Building Perspective - Food Museum and Cultivation Facility © Tiago Vasconcelos, 2019

der to face current urban-societal challenges we need the cultivation of multi-sectoral approaches by connecting dots, coupling ideas, and creating solutions to potential impacts by responding to seemingly unrelated issues simultaneously.
The scenario building methodology adopted for this paper is based on extreme conditions and socio-political trends, largely impacted by global warming and climate changes. It aims to open and initiate critical discussion on how scenario planning could be leveraged as an effective methodology for strategic planning facing uncertainty. Alaska serves as an intriguing case study, given its climatic, social, and geo-political conditions. (Himes-Cornell and Kasperski, 2015; Jay et al., 2018)
In particular, the history of Anchorage has been explored not at its current state, but how it might come to be tomorrow. According to the Fourth National Climate Assessment, (Jay et al., 2018) as climate change continues to mar our planet and prospects of comfortable and sustainable habitability, Alaska has been warming twice as quickly as the global average since the middle of the 20th century.
The study is organised through a scenario-planning approach, with reference to the methodology introduced by Royal Dutch Shell company connected to the status-quo of current local territorial trends (Shell, 2008; Shell and International, 2014). The story draws heavily from and builds upon the current state-of-affairs (2018), recent news, discoveries and discussions being had within the selected the-

Figure 3. Building Corner Section - Food Museum and Cultivation Facility © Tiago Vasconcelos, 2019

matic spheres in Anchorage and Alaska today, and is too, inspired by explorative fieldtrip spent by the author in Anchorage, Alaska.

2010 | 2019 Scramble for Sustainability

Throughout Alaska, record temperatures and adverse weather conditions have been plaguing the state with greater frequency as time has progressed. Recent news has confirmed that the Government identified 31 towns and cities with impending risk of sea level rise —due to coastal erosion and ice melting— evidence of rapid climate change at an ever-increasing pace. (Goode, 2014) Some of these coastal settlements are predicted to be uninhabitable by 2050, laying down a difficult choice for the native Alaskans who have settled here for generations.
Contemporary food production technologies have gradually made their way into main urban areas and social scape over the past few years. Alaska Seeds of Change —a hydroponic greenhouse located in midtown Anchorage which implements direct cultivation and smart distribution methods— employs and empowers local youth, promoting self-reliance and community involvement, to cultivate and sell fresh products. It offers employment and educational opportunities at the modular hydroponic growing facility for those who might not find opportunities elsewhere.

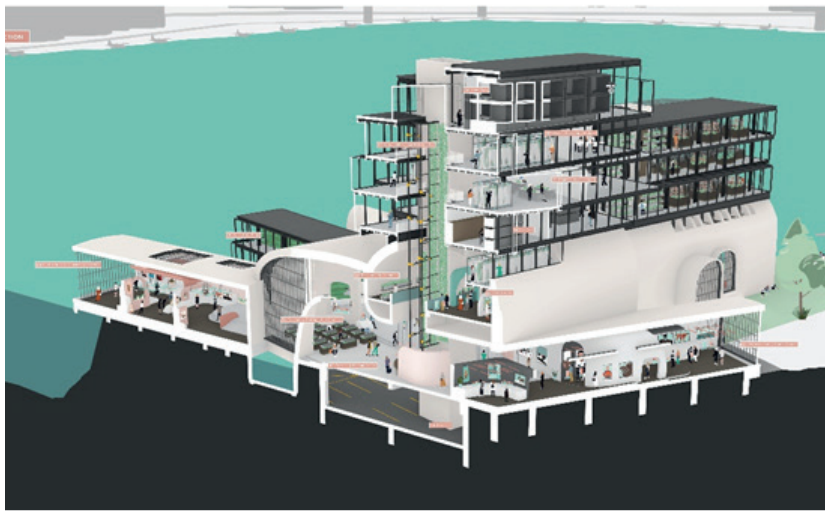

Figure 3. Building Corner Section - Food Museum and Cultivation Facility © Tiago Vasconcelos, 2019

(Giving teens POWER!, 2018)
This place has become a local haven for civic participation, co-creation, and inclusivity for the most vulnerable social categories. Its central location facilitates the role of a multifunctional urban-cultural hub: cosy, vibrant and open most of the day, every day, offers some respite from the cold to those who seek it. The office spaces above remain operational; Seeds of Change administrative employees plan out the week's schedule and milestones —forecasting productivity and making way for professional and self-help workshops— to this young, vibrant community which now shares the space below.

Beyond the metropolitan area, Seeds of Change run precision agriculture research operations extending into the Matanuska-Susitna Farmland Valley, also known as Mat-Su by native Alaskans. 56 km north of Anchorage, over 95% of Alaskan vegetables are cultivated (Meter and Goldenberg, 2014) The Mat-Su valley is as enormous as it is beautiful; flanked by the Matanuska river to the east and the Susitna river to the west, it encompasses a 60,000 km2 area which extends northerly all the way up and past the Denali National Park.
It is estimated that as much as 14% of the state's population is food insecure and that a staggering 100,000 out of 700,000 Alaskans is serviced per year by the char-

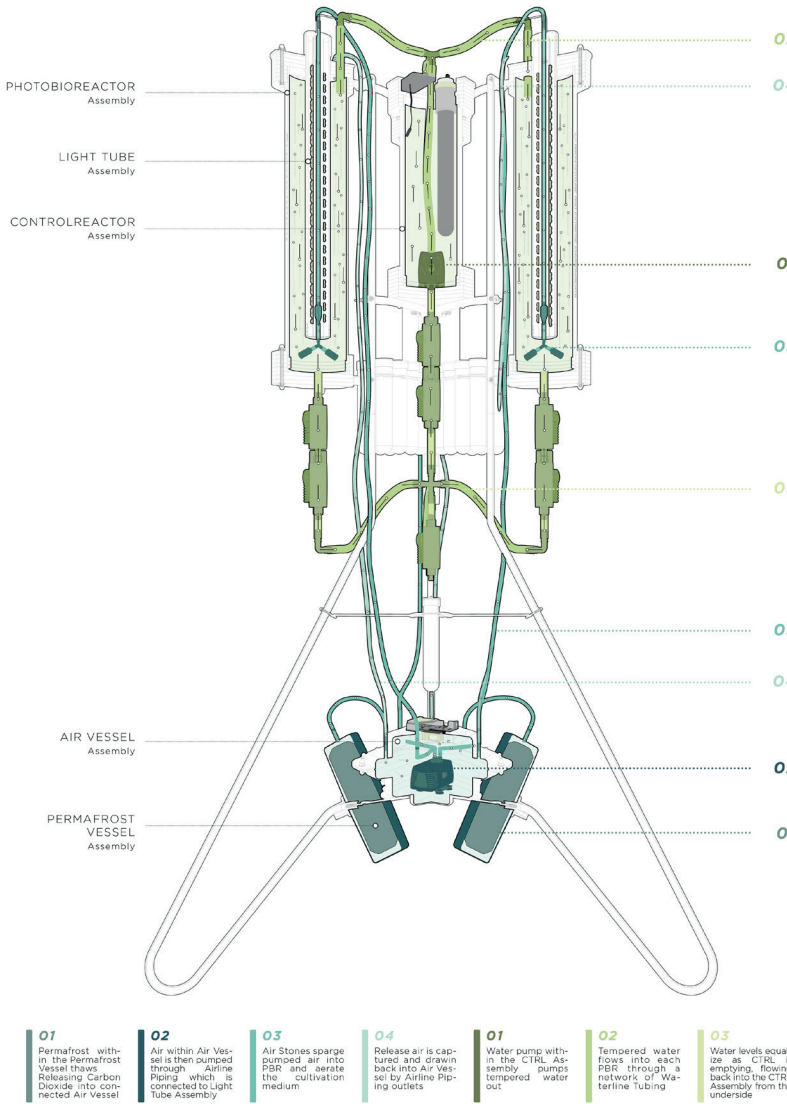

Figure 5. Permabioreactor Section Drawing © Tiago Vasconcelos, 2019

ity measures from Food Bank of Alaska. Food insecurity as defined by the "three Pillars of food security" (Sullivan, 2014) is strongly connected to three key-features: (1) food availability, as the possibility of obtain food products on a weekly consistent basis; (2) food accessibility, as the ability to purchase food or attain food from other sources; (3) food utilisation, as the ability to meet daily nutrient requirements.
Production and security, however, is not singular ubiquitous theme at the Alaskan food policy frontline. Energy sources have too been affected by the ever-decreasing supply of oil from Prudoe Bay, which has inadvertently severely affected the U.S' cost of petroleum and refined oil production despite a global reduction in price per barrel of oil. (Walker et al., 2017) In light of this, legislators have sought alternative avenues for fuel production, and biofuels are fast becoming the go-to source. A 2018 Farm Bill which expands export prospects for farmers by providing an additional $500 million in permanent funding over the next decade has recently been passed. (Congressional Research Service, 2019)

2020 | 2029 The Next Green Revolution

In a report published by the Organization of Petroleum Exporting Countries (OPEC, 2017), the projected global oil demand will increase on average by 2,2% per annum leading towards 2040. The trend in 2022 remains consistent with report projections; and much of this increase is attributed to non-Organisation for Economic Co-operation and Development regions (OECD).
Despite the apparent push toward more sustainable energy solutions, global coal and oil production has remained consistent and as such global warming has continued on-trend. Emissions and temperature observations are on track with RCP6.0 (Representative Concentration Pathways) projections and has led to an increase in global policy concerns. (Hayhoe et al., 2017)
Alaskan summers have, year on year, continued to lengthen and warm up. This year marked an extension of over four days compared to the previous decade; signs that the globe is not only warming but doing so at an increasing rate. On-going coastal erosion has significantly affected northern land masses, because of thawing permafrost soils, and as such a number of the towns which were earmarked back in 2016 for relocation have been evacuated "ahead of schedule". (Wexler, 2014)

2030 | 2039 Necessity, The Mother of Invention

Considering the lengthier growing season and reduced costs of technologies, the agricultural industry in Alaska has seen a boost in interest from corporations

based in the Lower 48 — the Contiguous United States, which excludes Alaska and Hawaii and other archipelagos. Investment into the expansion of agricultural infrastructures has come in waves from large companies, such as Foster Farms, Tyson Foods and Alltech. Additionally, industry fuel leaders, such as Royal Dutch Shell and Exxon Mobil Corporation, have also opted to begin investing more extensively into local agriculture. Alaskan reliance on liquid fuels —given its slow up-take of electric vehicles— makes for an obvious deduction that these oil giants are aiming to profit heavily off the continued development and proliferation of biofuels since the mid-2020's surge in algal systems. (Kothari et al., 2017)

Dwindling game populations, erratic migratory patterns, reduced fishing locations and increasingly sparse fertile landscapes are quickly leaving rural Alaskans with little to no options, when providing for themselves. This necessity for adaptation has opened channels for opportunity and engagement between an organisation like Seeds of Change, and the Native Peoples. (Himes-Cornell and Kasperski, 2015) Climate change consequences have continued to worsen at a global scale, and the Lower 48 US has been hit especially hard by adverse weather conditions and natural disasters. Worsen climatic conditions in the Global South and the mild summers in the northern states have prompted what is being called widespread "climagration", migration as a result of climate change. (Hamilton et al., 2016) Given its relatively temperate climate, compared to the rest of the Arctic region, its interconnectivity and mostly stable weather conditions, Anchorage has resulted as one of the more attractive cities for climatic migrants along northern latitudes.

2040 | 2049 Blueprints for Climate Change Responses

The heavy investment of past decades into Alaskan agriculture has marked a tremendous improvement in the industry's ability to provide local food supply. In 2040, Alaskan imports of fresh produce came in 18% lower compared to that of the late 2010s, marking a significant reduction in economic outsourcing, increase in freshness, quality and finally strengthening the argument for development of localised production. This warmer Alaska, with an average growing season of 134 days (20 days longer than in 2010) albeit represent a significant step forward for agricultural sector, it has also come with dire future consequences, which are at the forefront of today's Alaskan challenges.

Amongst others, the principal issues at hand are a severely diminishing supply of fresh water, and immense infrastructural damage caused by thawing of permafrost as the main climatic impact in Alaska registered since 2017. Water supply has been impacted by the continuous shift and adverse conditions brought on by

a warmer climate. Meteorological patterns and weather offsets have affected how precipitation falls to Anchorage. In addition, the warmer summer months have become drier, an effect which places strenuous demand on the capabilities of the city to store water safely long-term.

2050 | + An Ever-Warming Globe

All of Alaska, for many years has experienced wave after wave of harsh territorial effects, and lingering consequences as a result of climate change. Anchorage now, with its developed agri-infrastructure and densification, faces a much more substantial adversary; how will it continue to deal with struggle, tackle challenges and face hardship. How will the city of Anchorage position itself, its policies; and how will its people adapt and overcome?

REFLECTIONS ON RESILIENT FOOD CYCLES

Whilst this essay offers but a sliver of one possible future scenario, it becomes evident that despite uncertainty, change is absolutely certain. We will continue to see change, as an inexorable shift of our climate, territories, industries, and societies, and with change comes adversity. Cultivating resiliency may be a credible way, in which we can begin to prepare current and future generations to be better equipped to tackle adverse challenges. (Ferreira et al., 2018) Resilient food cycles in and of itself are a means to an end; a mechanism through which means may be developed: by providing a stable platform upon which they may flourish. A resilient society may ultimately be better equipped to generate the eventual solutions to face inevitable change.

A new territorial resilience borne of adaptive cycles, responding to climate changes, not only as a social practice may offer just the platform. Thus, the question becomes "how?". How do we begin to generate this sort of social capital and territorial resilience? Could systems of production not coincide with spaces of collaboration? Do places of learning and healing benefit from cultivating and tending? And how does the interplay between biology and technology open opportunities in our current socio-cultural climate? These questions: spurred on by the research, essay and timeline which built the scenario, led to the Permabioreactor prototype (CFC, 2019). How could technology, synthesized with biology, through a research-by-design thinking, begin to respond to the challenges of climate change?

The prototype aims to deal with this discussion, by serving as a physical departure point for these questions: generating new modalities for cultivation by exploiting climatic impacts. By cultivating algae which sequesters excess carbon dioxide, the process of providing a source of nutrients could in turn alleviate the impact of onset permafrost thaw because of the warming climate.

The project does not present just a technical solution to what is a globally-related problem. It is neither feasible nor practical to think that in its current form it would even begin to scratch the surface as a 'solution'. Rather could this become a device to be deployed at different scales on a spatial perspective? Could we imagine that with sufficient resources and governance, we someday utilise the carbon-sequestering abilities of algae to deal directly with one of the consequences of permafrost thaw through design and architecture? And in turn respond to social issues by offering a supplemental solution?

It is this notion of coupling through architecture which this paper aims to initiate the critical discussion and consideration of imagine the possibility for generating novel adaptive cycles. Alaska Seeds of Change has already implemented a novel adaptive cycle today; coupling a space of cultivation with social programmes which empower disadvantaged youth. Could coupling be an effective mechanism for responding to technical and social challenges? A response which may in turn provide the platform upon which we develop adaptive cycles generating territorial resilience?

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Figure 9. “Food Reality Experience” in Cozinha Nomade © Michele De Sanctis, 2020

FOOD REALITY EXPERIENCE

Kedy C. Cellamare

How can virtual reality be a medium to enhance inclusion and interaction among tablemates? How is it possible to humanize technological divide, leveraging accessibility and literacy of people of different ages, towards the correct use of technological devices? This paper discuss how the use of ICT at Social Tables has created a new language and has fostered connections and interactions among participants; how it has spread the knowledge of food, places, and traditions from different countries; how it has created and activated a fluid experience of all the senses with which we are endowed. This has been made possible, through the experiments conducted during the *Food Reality Experience:* performative dinners where ingredients and food are mixed with 3D videos.

digital co-design / gastrophysics / neurogastronomy / social dinner / virtual reality storytelling

Figure 1. A detail of the Cardboard we used for the prototype of Food Reality Experience ©Michele De Sanctis, 2018

THE CONNECTION BETWEEN GASTROPHYSICS AND VIRTUAL REALITY

Food Reality Experience is a virtual dinner with real dishes. It's also a social and communicative experience, during which tablemates, equipped with virtual reality headsets, explore a new way of being together. It is also a multisensory and culinary performance that takes place around the table: the visual stimuli provided by virtual reality are accompanied by the activation of other senses often to determine different and unexpected perceptions.
Food Reality Experience is a path of research on gastrophysics and neurogastronomy, which is the ability of our brain to process information from each sense (Spence, 2017). In fact, the food perception occurs not only in the mouth but also in the mind. The result is a multisensory performance in which each participant interacts at 360 degrees: on the one hand, by being a protagonist in the video due to full immersivity of ICT devices, on the other, by experiencing an interaction between senses, actions and conviviality. The significance of these experiments was to test how food perception is influenced by aesthetic aspects, tastes, smells, textures, and noises of what we eat. While working on Food Reality Experience, the main references has been the studies of gastrophysics related to flavours, perceptions, cognition and memory. Specifically, the term comes from the union of "gastron-

Figure 2. Culinary performance „Ecosistema" in Cozinha Nomade © Giovanna Picca, 2018

omy" and "psychophysics"; it's a set of possible culinary experiences and studies on our perceptions of them. Coined by Charles Spence, the concept focus on the multisensory perceptions which characterize our daily life and specifically the culinary experience.

Many research and experiments related to food estimate that the pleasure of gastronomic experience also depends on side elements, such as the shape of a dish, the weight of cutlery, the temperature of the environment, the colour of tablecloths, which directly affects our emotions, senses and memory.

Food Reality Experiences plays with gastrophysics, by watching an immersive video, while tasting a meal without knowing which are the ingredients and recipes proposed to the participants. Hiding the courses of a meal allowed tablemates to fully dive in the experience and not be influenced by their own cultural background and biases about that meal.

The idea to work with sensorial experiences and tastes is not new but always inspiring, as suggested by Jean-Anthelme Brillat Savarin, a French politician and gastronome. In his book The Physiology of Taste (1826) he mixes scientific notions, philosophical reflections, historical anecdotes to explore taste importance. Taste, such as it is by the grace of nature, remains the one among our senses, when everything is taken into consideration, which procures us the maximum of delight:

1. Because the pleasure of eating, used with moderation, is not followed by weariness;
2. Because it is of all times, all ages, and all conditions;
3. Because it recurs out of necessity at least once, and may without inconvenience be repeated twice or three times, within a single day;
4. Because it can be enjoyed in company with all our other pleasures;
5. Because the impressions which it receives are more durable and more dependent on our will;
6. And lastly, because when we eat, we experience an indefinable and peculiar sensation of well-being, arising out of our inner consciousness; so that by the mere act of eating we repair our losses, and add to the numbers of our years.

GASTROPHYSICS MEETS BISCEGLIE: ONE-YEAR PROTOTYPING FOOD REALITY EXPERIENCE

The works of both Charles Spence and Jean-Anthelme Brillat Savarin served as the basis to implement a first experimentation with virtual reality and gastrophysics. Food Reality Experience: a year – on the World has been designed and promoted in Bisceglie, Apulia (2018) in collaboration with Cozinha Nomade whose founders have years of expertise with food-related experiences, and MoreView , with a focus more on storytelling and technologies.
While designing the experience, the main driving concept was to make tablemates travel around the world, while comfortably seated around the same table. In the neighbourhood kitchen of Bisceglie —where Cozinha Nomade is located— a single table has been set, hosting twelve people, each wearing Oculus VR headset and enjoying different tasting kits, depending on the country they were visiting.

In this first experiment, augmented reality videos significantly representing different food cultures has been edited. Starting from the study of the original ingredients from different geographic areas, the videos extended and combined the five fundamental tastes perceived by receptor cells present in the human oral cavity: sweet, bitter, sour, salty, umami (kokumi).

Together with taste perceptions, different flavours have been investigated through their ability to arise positive emotions and memories connected to food. Another main aspect to perform a complete tasting experience has been the meticulous care for details: from the table setting, to the music selection, from the wall projections, to the weight and colour of each single plate, cutlery, glass and napkins.

Regarding the selection of contents related to the AR 3D videos, the driving criterion has been the possibility of bringing the users gradually to feel comfortable with the Oculus headsets.
In the first video (Fig. 4), we proposed a virtual roller coaster ride, one of the most popular and intense experience in a Theme park. To facilitate the immersivity, we have chosen to provide the user with a bag of hot and crackling popcorn: a "playground" product, which is fragrant and easy to enjoy despite the curves of the mountains. The video is set in North America, where roller coasters became a mass attraction at the beginning of the 20th century, whereas the ancient inhabitants of the new continent (Aztecs, Incas, and Mayans) invented popcorn nine thousand years ago . The idea was to play on the differences between the surrounding environment, the videos and the food proposed.

The first impressions on the videos confirmed that viewers do not separate the act of tasting food and the possibility to establish dialogues with other participants, in the convivial setting of the shared dinner. A basic condition was that all participants do not know each other, but sharing this experience creates an emotional linkage able to foster interaction and exchange.

For the second video, we moved to Brazil (Fig. 5), exactly in Salvador: a large and varied drum circle welcomes our guests, where a group of people is playing different types of percussions in forrò, a samba and bossa-nova cross-over. During the performance, the audience taste a revisitation of regional bruschetta made of Altamura bread and easily available ingredients that characterize South America: avocado cream, black bean mousse and puffed amaranth. Here tablemates, who are still unexperienced with their Oculus VR headsets, eat with eyes covered.
At the end of the vision and tasting, the participants were amazed by having eaten such an unexpected fusion recipe —discovering the combination of typical Brazilian ingredients with an Italian cereal bread from Altamura— while the selected music drifted tablemates in a totally colourful and tropical mood.

From the tropical notes of South America, we travel to India (Fig. 6): we are on a bike through the narrow streets of Chandni Chowk Market, the largest and busiest spice market in New Delhi. Peeping out on the big table are a flood of spices that can be touched, smelled, passed from hand to hand while the video proposes a sequence of crowded streets and market stands adorned with mountains of cumin, cardamom, turmeric, sacks full of coriander, pepper, nigella, licoricey and cinnamon sticks.

Figure 3. Molecular spheres flavored with seaweed, tomato, ginger, parsley © Michele De Sanctis, 2020

In this case the participants immersed in the Indian atmosphere, could calmly touch the spices displayed on the table, bringing the, closer to nose and mouth, but with their eyes uncovered, preparing their palates to enjoy an Indian Curry Soup which could recollect all the tastes and flavours elaborated in their mind during the streaming of the video.
This different experience is based on Gordon Shepherd's research on neurogastronomy, the complex of mechanisms that allow the brain to create flavours. According to the neuroscientist tastes are not in food, but are created by our brain by our olfactory system. Odour molecules carry information and stimulate our olfactory receptors, which transmit this information to the brain, which translates it into images or personal memories.

"Given the importance of the flavours we learn to love them. It seems curious, but at the same time regrettable, that most people are unaware that flavours are largely due to smell, and that they mostly arise from the smells we perceive when we breathe with food in our mouths. Few people know that modern research has shown that an odour triggers patterns of activity —a kind of 'olfactory images' in our brains— which are the main basis of our perception of taste. These olfactory images are hidden factors that determine most of the pleasure we derive from eating and share some of

Figure 8. Edible Soil used for the installation "Architecture of the Shame" © Joseph Geoffriau, 2019

the responsibility for the problems we encounter when we eat food that is not good for us. Better understanding the central role played by smell also means understanding how to reduce problems and increase pleasure". (Shepard, 2012).

In the following stages of the journey, we went to Japan (Fig. 7). In this case a fragrant tea has been offered to accompany a virtual tour in a traditional tea ceremony where serving and preparation techniques were explained in the videos. While virtual travelling through the Sahara Desert in Morocco we integrated tasting experiments that propose more often the active use of hands and hearing. Completely unexpected for the tablemates, we offered edible sand (Fig. 8) composed by cinnamon short crust pastry, cocoa beans, carob flour, inspired by installation of Joseph Geoffriau "Architecture of the Shame" (2019).

LEARNINGS FOR FURTHER APPLICATIONS: LEARNING THROUGH CONTINUOUS EXPERIMENTING

The first prototype of Food Reality Experience collected vivid curiosity, positive feedbacks and great satisfaction. The different comments received allowed us to further develop the project and to improve the access to professional augmented

Virtual Reality technologies. Finally, the changing of the seasons gave the possibility to experiment new dishes with the methodology of shared social table, running Food reality experience once a month for a whole year.
In order to test further fields of experimentation, in 2019 we applied and won a cooperation project thanks to the strategic partnership with the association "Molfettesi nel Mondo", scaling up and transferring the Food Reality Experience to Buenos Aires, connecting Italian-Argentinian communities to the territories they, or their relatives, originally came from.

In order to promote Apulian food culture, specific videos have been shot in places rich in traditions that could have potentially rise emotions and reminiscence in the participants. We enhanced collective knowledge through three methodological steps: (1) A site-specific question connected to a virtual map has been posted on Cozinha Nomade Facebook page, tagging invited experts to point out significant locations and personal tastes related to regional cuisine; we ended up with a map of around 20 places worth to visit in Puglia; (2) Semi-structured interviews with locals has been conducted in order to perfectionate the local tours and activities (3) Six detailed tours has been shoot in dedicated videos trying to express the different cultural landscapes of Apulia, such as: Gargano National Park, Arco di San Felice, Trabucco, Castel del Monte, Polignano a Mare, Alberobello.
In parallel, different food experiences have been designed to transfer traditional Apulian recipes in different location in Buenos Aires, such as: Restaurant Cucina Paradiso, Feria de turismo Sudamérica (FIT) and the association "Molfettesi nel Mondo". This time, the users were more varied: children, elderly people, local administrators, shopkeepers, professionals. People were impressed thanks to the augmented reality experience in combination with food tasting. In particular, the VR technology allowed us to incorporate dynamic immersive visions and to offer a complete experience in places that were not directly accessible. While watching the 3D video though Oculus headsets, sounds, images, and the idea of different flavours, has been formed in the brain of the participants.

Talking about food, it means to dive into a cultural journey where creativity and social relationship are enhanced. In the book The ritual of Dinner: Origins, Evolution, Eccentricities, and Meaning of Table Manners (1992) Margaret Visser reminds us that "food is never just something we eat. We use eating as a means of social relations: the fulfilment of the most individual of all needs becomes a means of creating community". Thanks to the development of Food Reality Experience we have learned that the active involvement of people in the design process, allows you to

observe places and things —which often looks familiar— with a different perspectives, where technologies can be "humanized" in order to create equal interaction and collective experience rather than isolation.

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Figure 3. Upprinting Food projects – 3d printing with food waste, 2019

URBAN REVOLUTION AT TIMES OF CREATIVE FOOD CYCLES

Nicola Canessa

Contemporary cities are constantly evolving and digital processes seem to have entered overwhelmingly into every activity daily life as well as into everyone's home. But how much and in which way this transition will affect positively our social and working life is still to be demonstrated. In food supply chains, whether in production, processing or disposal applications, the innovation factor related to digital processes still represents an early-stage field of investigation. Advanced research on Bio-materials derived from food-waste are a strong bet for urban environments, where product replacement can significantly reduce CO2 emissions and foster the implementation of a new raw material policy to rebalance the support bio-based strategies versus industrial material use. This paper explores some urban challenges and examples related to ICT implementation and creative methods connected to 3D printing and digital fabrication connected to food waste valorisation able to influence we live our domestic spaces.

urban farming / food-waste recycle / bio-based materials / digital innovation / 3D food printing

Figure 1. Pocket City Farm in Camperdown commons © Luisa Brimble, 2015

URBAN FARMING POTENTIAL SCENARIO: FROM SELF-PRODUCTION TO SELF-DISPOSAL

For several years now, the return to the countryside and agriculture, even by the younger generations, has led to an increasing knowledge sharing and transfer of some methods and approach of direct cultivation methods among networks of cities. Against this backdrop, food consumption and waste-related production is staggering: a third of all the food produced for urban context is disposed every year (FAO, 2011) of which about 1.3 billion tons is mostly coming from fruit and vegetables damaged during transport.

What we are talking about is not simply an increase in urban vegetable gardens, but a real urban cultural revolution that brings individual production into cities on roofs and balconies, as envisioned for Agropolis Munich (Schröder et al., 2009). Urban Agriculture alone couldn't be the only response to this dramatic trend, but it can help revolutionize the environmentally unsustainable food industry, providing evidence of thriving social practices and new methods of cultivation within "food deserts" and describing the global movement towards alternative food production. Creative Food Cycles (CFC) project tackles these challenges, trying to combine new cycles, mainly domestic ones, from food production, its distribution to the

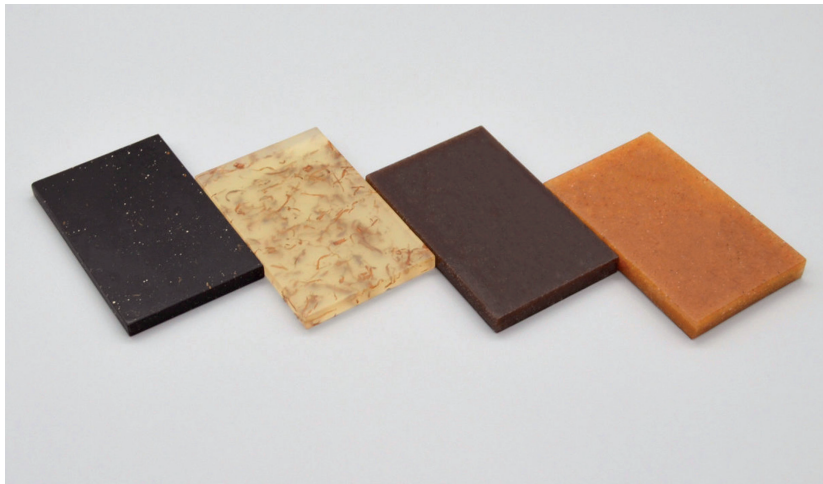

Figure 2. Chip[s]Board Parblex composite samples, 2018

reuse of food waste. In this direction it is possible to find even technologically advanced projects that work to integrate logics and new possibilities connected to food cycles. For instance, in food production large hydroponic systems have been introduced for years, in order to save soils and avoid contamination by using mineral nutrient solutions in an aqueous solvent, but what is particular interesting is the proliferation of these devices for in-house domestic structures.
Micro Smart Gardens, are becoming research objects able to fascinate both start-ups and large companies such as Ikea— which has developed indoor growing kits, nursery and sprout boxes— as piece of home furniture able to grow almost anything hydroponically, promote a new culture of care and healthy food.
With the same ease the technology enters the distribution communities. The new apps aim to give awareness about the products, to promote the exchange and solidarity consumers' groups, while new digital milieu offer social diffusion and networks of buying groups and direct cultivators to be closer to customers, promoting trade and innovative distribution. In most cases these urban agriculture practices raise from grassroots organization, associations or active citizens who wants to share experiences and emerging trends around ICT facilitated food sharing tools in urban contexts, offering at the same time alternative access to healthier food and recreational spaces able to reinforce a sense of community in the urban environ-

ment (Canannes, Marocchino, 2018). This happens in some cities where vacancy become a resource or abandoned plots are transformed into social farms or collective vegetable gardens. Sometimes this happens spontaneously after winning a municipal public announcement as happened for the Pocket City Farms opened in Sydney in 2016.
These initiatives manage to support themselves through crowdfunding campaigns, public/private support or in most of the case through direct sales of food grown locally, by creating small networks of facilities, such as farmers markets, social tables or small restaurants to empower the community through real micro economies, while offering multi-functional programmes of amenities.

Digital transition and advanced technology represent a significant added-values which has entered into these realities, not necessarily to transform the organizational structures, but to enhance communication, visibility and the transferability/replicability of processes enhanced by online communities, especially when foster public/private associations, new job opportunities and community engagement.
However, there are probably three factors that have influenced this renaissance of urban farming, transforming it from a niche of socio-environmental activism to a structural component of urban and planning agendas (Parham, 2018). The first is undoubtedly a significant perception of the uncertainties related to climate change and the diffuse effects on different regional productions. Secondly, the renewed demand of food security and safety according to new paradigm of higher nutritional values, healthy lifestyles and diets, organic and Zero Km products. The third is the freedom of networking and sharing practices linked both to the management of open spaces in the metropolitan dimension, as well as the necessity of direct traceability of food cycles and supply chains.
A particular link to ICT implementation and food cycles is represented by the ongoing research of food cycles impacts in the waste management process, exemplified by the motto "From waste to resource". Technologies to produce new materials from food waste are now available to start-ups and creative industries and soon be able to enter our domestic spaces, considering that of the billion tonnes of solid waste produced by cities annually, it is estimated that 47% is organic and mostly food waste. (Newman, Cepeda-Marquez 2018)
Considering the global market pressure and soil-contamination trends, the advantage of using food waste as a raw material, instead of low-quality agricultural produce, will improve the reorganization of food cycles, in particular connected to a more democratic access to secure and healthier food. Producing locally on regional-based supply chain a significant reduction in costs will be possible, avoid-

ing complex food processing with OGN and preservatives, long stocking periods in refrigerators and international shipping to supply great distributors and supermarkets. In parallel, a significant reduction in packaging and food-waste treatment will open possibility of new investment, research and development for creative food-industries, contributing to towards a Green New Deal transition (Archer & Hamerschlag, 2020), advocated as significant challenge for territorial justice and our urban future.

NEW BIO-BASED DESIGN PRODUCTS FROM FOOD-WASTE RECYCLE

Advanced research on Bio-materials derived from food-waste are indeed a strong bet for urban environments and new possibilities for domestic economies also in Europe, where product replacement can significantly reduce CO2 emissions and foster the implementation of a new raw material policy to rebalance the support bio-based strategies versus industrial material use. (EC, 2020) In the bio-plastics sector, brand leaders have expressed interest in long-term shift to using bio-plastics and biopolymers for their product packaging. In addition, bio-plastics are being increasingly used in more durable applications such as home appliance, cosmetics, furniture, children's toys and building materials. This new life cycle applied to food-waste is a real technological evolution, because can sensitively influence policymakers, local authorities, companies and active urban society to define new value chains towards circular economy.
In the last years, SMEs and creative industries already experimented processes for the transformation of food-waste into new packaging, as in the case of Scoby , designed by Roza Janusz, as a high-performing and home compostable bio-plastic membrane, made out a fermentation process from bacteria and yeast. In the same field, Lucy Hughes introduced a translucent, stronger than low-density polyethylene (LDPE) and flexible bio-composted film, obtained from fish scales and skin waste: MarinaTex . Similar experiments have been conducted by Margarita Talep with algae, in order to test possible solutions to the accumulation of plastic waste in marine environments, which persist not only in sea surface waters but also affect natural cycles. Similar approach to organic waste is currently under development by ARUP in order to provide industry with cheap, low-carbon materials and further application to building sector (e.g. pigments, insulation, carpets, acoustic treatments and interior finishes). Some of the applied food-waste materials proposed are: peanut shells, which can be used to produce low-cost partition boards that are resistant to moisture and fire; rice, whose husks can be turned to ash and mixed with cement to reduce need for fillers; bananas, whose fruits and leaves

Figure 4. Upprinting Food prototypes – 3d printing food topping with food waste, 2019

can make rugged textiles due to high-strength fibers; potato peels, which can be pressed and dried to create a low-weight, eco-friendly alternative to single-use materials like MDF and chipboard, as tested with Chip[s]Board project, excellent for digital fabrication process and performances.
What all these researches have in common is the sharing experimental methods to ameliorate rising levels of waste and shortfalls of raw material, as well as to be characterized by a strong communicative and visual approach, shown through events and social campaign to share knowledge to wider audience, trying to influence both industrial and domestic economies with creative spirit. A particular audience target is represented by younger generation and students, who are the most sensitive towards new technologies, creative design approach, as well as to current environmental issues, but also show particular interest to experiment direct sustainable strategies to recycle commonly unusable waste domestic products.

With particular reference to young creatives and designers, Creative Food Cycles explores the role of ICT implementation and creative methods connected to urban food productions and food waste valorisation, as shown in Food Interaction Cat-

Figure 5. Upprinting Food – Karpendonkse Hoeve Logo, 2020

alogue (Markoupoulou et al., 2019). A database on existing international practices, which puts together unconventional results, co-design actions and start-ups experimentations on how creative recycling methods applied to food waste can be valuable marketing resources for industrial design sector, as applied for new clothing materials derived from orange peels (Santonocito, Arena, 2019) or pineapple leaves (Hijosa, 2019).

What is particular interesting in relation to ICT and new fabrication techniques is the similarities to Fab-Lab philosophy, to produce locally through open-source platforms, enhancing equal access to sustainability in a globally connected networks of cities. CFC projects' database represents "new seeds" of shared-knowledge that need to be tested and upscaled on a higher level of production, distribution and consumption to understand the real performances in a concluded life cycle thinking vision. Through smaller prototypes, which can be replicated at home with a simple 3D printer, is it possible to give new values and meanings to daily food waste, by composting the portion which cannot be recycled, while creating new healthy habits such as the direct cultivation of a rooftop or backyard community garden. This is the way in which urban agriculture and smart-technologies can be combined to promote a real food revolution in our supply chains and consumption logics. (Cockrall-King, 2012)

POST-PANDEMIC HOUSES: 3D FOOD PRINTING AND CREATIVE PROCESSES

Especially today, after the dramatic consequences of COVID outbreak, through the rediscovery of self-sufficient habits and prolonged individuality due to social distancing, the digital transition and the role of social media to connect people are seen not anymore as the only way to enhance human social relations and dialogue. During our forced confinement at home, the unexpressed potential of our domestic spaces to host small self-sufficient practices, such as the cultivation of a kitchen garden, or self-composting and recycling techniques, could have been associated with creative intuition and smart devices, sometimes just for leisure.
However, most of the cases as skilled "survivalists" we stocked up on toilet paper, detergents, tomato puree and yeast for baking, filling our homes with a large amount of bulky materials. We ordered objects through e-commerce online platforms, filling our storage rooms with cartons or plastic to dispose of, and finally cooking a large amount of canned food, often complaining about the lack of quality choice at supermarkets and great distributors. Probably the blessing in disguise, while coping with the pandemic, is represented by the opportunities offered to transform our daily domestic rituals of "serial wasters" in wiser consumers, reducing consumption levels, adopting healthy diets and correct disposal habits, and maybe implementing creative invention and recycling.
The real novelty can lie also in the ability to create new objects and materials enriched by artisanal or digital fabrication work, a sharing practices to promote social engagement and civic associationism. In these regards, ICT will certainly bring great progress on the ease of transformation of digital communities, which should be inspired by open-source platforms and principles like the ones adopted by Fab-city network and 3D printer communities where exchange of tools, software, methods, hints and "recipes" are the normality. In fact, today we are in a condition where 3D printing methods can represent a new milestone for innovative homemade food processing. After having experimented printing with plastic polymers, concrete and steel, the new frontier is represented by digital gastronomy and customized food fabrication. Different from robotics-based food manufacturing technologies designed to automate manual processes for mass production, 3D food printing integrates 3DP and digital gastronomy technique to manufacture food products with customization in shape, colour, flavour, texture and even nutrition. This introduces artistic capabilities to fine dining, and extend customization capabilities to industrial culinary sector. For instance, the Italian bio-engineer Giuseppe Scionti founder of Novameat , has invented the "world's first" 3D-printed

meat-free steak made from vegetable proteins, which mimics the texture of real beef or chiken. In similar way, the project Upprinting Food aims to use the 3D print technology to recover the food that would be wasted and make it consumable and appetizing again, by blending and combining the different ingredients in purees. The prints are then baked and dehydrated for crunch and longevity. Using current advancements in biotechnology the startup Genecis is currently applying machine learning processed and microbial engineering to convert food waste into PHAs. A fully biodegradable form of plastic, PHAs can be used to make more sustainable toys, medical devices and 3D printer filament. PHAs —scientifically known as polyhydroxyalkanoates— are polymers produced by bacteria which have various benefits over other forms of bio-plastics. They can be developed into a thermoplastic, to be turned easily into different products. Moreover, unlike many other forms of bio-plastics, the PHA won't spoil the recycling process. PHAs fully degrade in the environment within one year, and under 10 years in water. Whereas synthetic plastics can take more than a hundred years to degrade in similar environments.

These experimentations are very reminiscent of science fiction movies, but they make us understand how it is possible to manipulate food and food waste to obtain something else. Surely it will take some time, before something could be launched on the market for big productions, but it is already interesting to see the different research and development trends in industrial design sector related to food.
The current scenario gives us a significant pictures of direct cultivation and ICT-assisted method for urban farming often born spontaneously and community driven; in parallel, innovative start-ups produce, transform, deliver food ecologically, showing a large amount of case studies able to influence directly our domestic spaces; finally the presence of larger consumer groups and targeted audience open to environmental sensitivity, quality of food production and reduction of waste disposal underlines the desire to a rising consensus towards circular economy and sustainable development goals.
These three topics together represent a key-outputs of Creative Food Cycles projects and a future research perspective that would be worthy to be investigated. What is missing (for now) is the change of scale and a cluster of industries intended to invest in new digital infrastructures and fabrication supply chain able to push forward this change in the urban society.

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Figure 7. Final installation of the Myco-Scape prototype at CFC Barcelona event © M. Elatab, 2019

MYCO-SCAPE

Mohamed Elatab

Abstract: The research presented in this paper investigates the development of a modular system, which supports the growth of edible oyster mushrooms in the urban environment (i.e. public space, facades, rooftops), by producing both food and construction materials. It consists of modules to locate the mushroom substrate (straw and mycelium) and an external surface, parametrically designed, tailored to control the environmental conditions (e.g. shading and humidity). In order to develop a growing module as sustainable as possible, wood has been selected for realisation of panels and the frame structure. A second main objective of the installation, is to act as a demonstrator: creating a 'culture of caring' for locally sourced and produced food. The paper explores the complex design negotiations between these drivers, focusing particularly on their performance optimization, and finally highlights the system potential as exemplified through a successful implementation of a 1:1 responsive wall prototype.

mycelium / parametric design / food production / responsive design / performance optimization

Figure 1. Making of the natural straw substrate and incubation process © F. Ciccone, 2019

DIGITAL FABRICATION AND NATURE BASED SOLUTIONS

Myco-Scape is a living system designed to promote the integration of nature in cities and to allow the use of Mycelium-based composite materials —panels grown from mycelium supported on a plywood frame—which can provide performance control from micro-climate conditions to the production of oxygen, food or new construction materials. (Hebel, 2017)

The project uses digital technologies, such as computation design and digital manufacturing, to implement and control of site-specific features, so that the prototype is capable of passively controlling the parameters that affect plant growth (e.g. temperature, humidity, solar radiation). By implementing Myco-Scape in buildings, hybrid facades can be built to combine the production of food (fungi) with construction materials (facade panels made of mycelium), while simultaneously improving the microclimate and also contributing to the production of oxygen.

The project opens the possibility to new hybrid and collaborative urban micro-economies: active citizens and associations can contribute to produce food and objects with materials derived from nature-based solution; while start-ups can develop the brand of their products and take care of their commercialisation.

Myco-Scape represent a first experiment of digital fabrication and design opti-

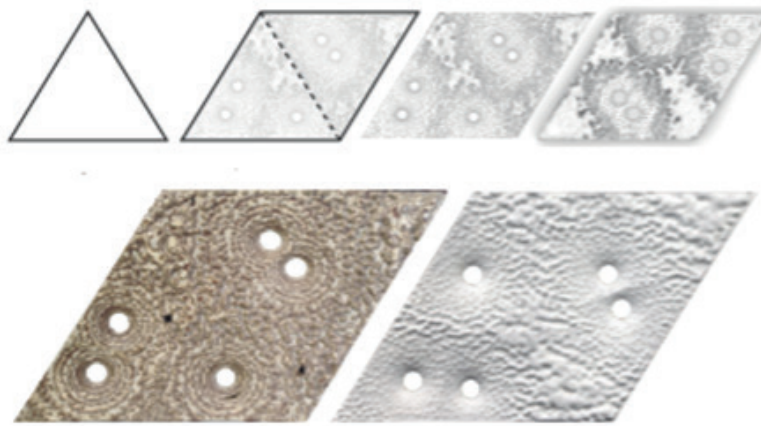

Figure 2. Exploration with 60 degrees triangles & 45 degrees triangles © M. Elatab, 2019

mised prototype able to transform buildings into systems for living, producing, and restoring the environment.

Substrate Setup

The prototype development has been organised in different design-controlled and growing phases. The first is focused on the creation of a natural straw substrate for the cultivation of mycelium. After pasteurising the straw for half an hour in boiling water, it was let to cool down and was spread out evenly in a sterilised table surface to fasten the cooling process. Then the substrate was separated within sterilised bags which consisted of half straw and half mycelium. These bags were then placed into a hydroponics tent, at a stable humidity level and temperature of 24 °C. (Figure 1)

INTEGRATION OF DIGITAL DESIGN EXPLORATIONS

Computational design software —specifically Rhino 3DM and Grasshopper — were implemented for design modelling and optimisation of the panels, as a reference of bionic research pavilion ICD (2011) as well as facilitating the development of a common design platform that allows for adjustments based on defined parametric inputs. This algorithmic script influences the system design on both the indi-

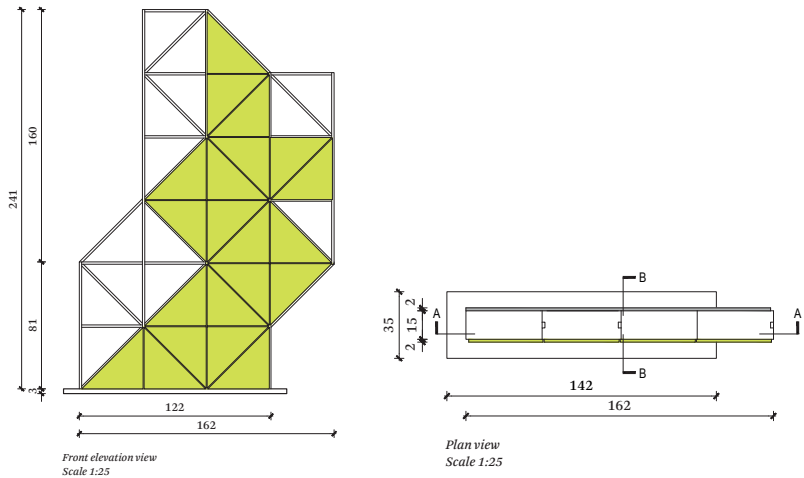

Figure 3. Final panel layout development and implementation © M. Elatab, 2019

vidual panel and the overall global system design, according to site-specific and climate-specific inputs, resulting in an innately digitally fabricated responsive design.

In terms of the pattern design, the surface was divided into points according to the U-direction and V-direction, then circle packing was applied on the surface based on the attractor points (openings) and an attractor curve (highest surface). Different tests were held regarding the pattern logic, according to shading analysis and water collection analysis. Then, the results of these tests have been optimized to implement the final design.

STRUCTURAL DEVELOPMENT

Advanced ways of fabrication require new ways of designing and manufacturing (Figure 2). Myco-Scape was conceived under the paradigm of Co-Design, where new possibilities in fabrication are explored through continuous computational feedback. In this project, the algorithms developed by the project team generate the shape of each element of the installation according to architectural design intent and structural requirements, while all Computer numerical control fabrication aspects are directly embedded and negotiated. Two topologies have been

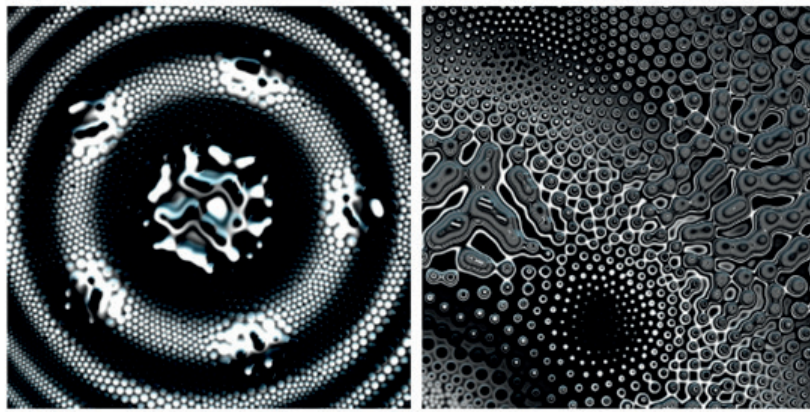

Figure 4. Reaction-Diffusion precedent images in Quantum Decoherence © Robert Hodgin, 2010

experimented: the first, is an equilateral triangle (50x50x50 cm) while the second is a right triangle (50x50x70 cm). The second design solution was chosen, due to the better implementation of the waffle structure and in a dynamic vertical layout. Multiple geometries based on 21 triangulations has been tested to optimize surface-pattern relationship. (Figure 3)

PATTERN RESEARCH

Two of the most important strategies that are required for the growth of fungi, at the fruiting stage, is water and shade. With these two factors into consideration, the design of the pattern aims to recreate microclimate conditions through a varied topography, which regulates the flow of water and the lighting exposure around the holes that allow mushrooms to fruit. For these reasons, the meatball method is used to generate the overall pattern. These new geometric entities permit to precisely details surface pattern through special animation software like WaveFront (Schumacher, 2018). Furthermore, this method was chosen because of its smoothness through the merging of different metaball fields together. (Figure 4)
Figure 4. Reaction-Diffusion precedent images in Quantum Decoherence © Robert Hodgin, 2010

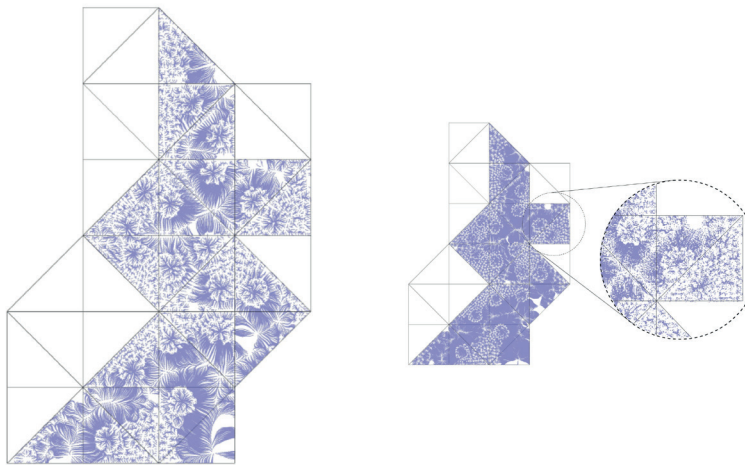

Figure 5. Water strategy - sparse pattern simulation © M. Elatab, 2019

DESIGN EXPERIMENTATION STRATEGIES THROUGH ENVIRONMENTAL CONDITIONS

Water strategy

Specific water flow algorithm (Park, 2018) has been simulated on the designed surface pattern, allowing water to drain towards the lowest area of the structure. Since the substrate needs to be hydrated, a water collecting pattern has been overlapped on the design of the waffle panels. Design-wise, the pattern forms metaball bumps around the holes that can maintain water and keep the surface moist which in its turn, helps the growth of mushrooms. (Figure 5)

Shading strategy

A crucial element for the fruition of oyster mushrooms is also the placement in a shaded spot with exposure to some indirect light. The specific layer for the pattern design serves this purpose, by creating a shading system which is formed around the holes. The homogenous red area that describe high light exposure has been

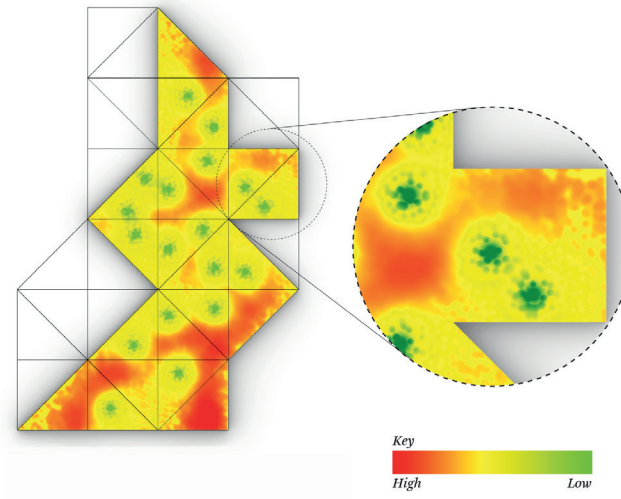

Figure 6. Shading strategy – high/low exposure simulation © M. Elatab, 2019

avoided for the localization of holes, while dark-green areas prompt the suitable positions.

A simulation of the shading method (Lopez, 2016) was performed to demonstrate where to avoids structural joints, connectivity and holes positioning conflicts. The method reflects this presence where red colour translates to higher points than that of green (lower points) in the overall height of 5 cm. (Figure 6)

Fabrication process

Plywood is a semi-natural product, stronger than steel in static bending strength, made from a renewable resource, which allows the cultivation and wide application to gardening. On the other hand, it serves the design purposes for revealing wooden layers and to control the waffle modules (plywood board of 30mm) fabrication though CNC milling machine . To improve the pattern simulation, different milling tools in various depths have been used for smoothing the surfaces and holes. Moreover, this strategy has been adopted in order to reveal wood's natural colours and to create a topographical effect on the final surface. At the end of the milling process, the overall surface has been cut into triangular panels. Smaller

connectors have been cut in two plywood boards of 15mm and then assembled all together.

The final prototype consists of a plywood waffle structure and 21 specifically designed plywood panels. The substrate, which was ready for fruition, was perforated with different openings and attached behind each panel. In the presence of regular water spraying the mushrooms fruited in few days and perfectly blended within the design of the prototype. (Figure 7)

FINAL REMARKS AND FUTURE RESEARCH PERSPECTIVES

Climate change and the need for adaptation, forces us to rethink our way of life and to reconnect agriculture back into the urban realm, considering that 80% of all food is expected to be consumed in cities by 2050. Nature-based solution represent a significant field of inquiry in this development scheme, considering food overconsumption and waste management two connected challenges for the transition to a real circular economy model (MacArthur, 2019). Myco-Scape represents a provocative vision of how nature-based solution can contribute to research and development debate on new sustainable materials in the light of reducing our environmental footprint in the construction sector. Building with mycelium will investigate the innovation and alternative strategies behind the potential uses of food-waste as new material for design, that can be consolidated into customized devices for architecture.
Open research perspectives, in this direction, would include the embedding of AI systems and further ICT technologies in architecture and nature-based prototypes like Myco-Scape. Further interaction with autonomous robotic machines which are able to detect the stages of mushroom growth through software algorithms and harvest them would be very interesting to be explored. In this way, cultivation, substrate replacement and mushroom collection could be fully controlled. (MAEID, 2019) Moreover, applications for controlling the environment (water/humidity/ventilation) and/or applications for people's interaction with the installation could raise awareness regarding the maintenance of the prototype.

ACKNOLEDGMENTS

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Figure 8. Plotted controlled piece of polystyrene to be eaten day 1 © Eve Nnaji, Madhavi Ohja (2020)

STRANGE IS BETTER: AN EFFORT TO BIOLOGICALLY CONVERT POLYSTYRENE INTO ORGANIC MATTER USING MEALWORMS

Eve Nnaji
Madhavi Ojha

The current narrative of the World's plastic consumption, promiscuously sprawls at the shores of economically competitive coastal regions, in the streets of vulnerable developing nations, and in the digestive tracts of the native animals that depend on the dwindling resources of their environment. Since plastic waste production increasingly proliferates almost all known and unknown regions of the planet, many methods and efforts to degrade, eliminate, and convert these compounds are being investigated. This project investigates the use of biological agents, mealworms and superworms, to directly convert plastic into organic matter using their natural digestive process.

mealworms / eating / polystyrene / organic matter / converting polystyrene

Figure 1. mealworms within porous eaten polystyrene block © Eve Nnaji, Madhavi Ohja (2020)

From 1950 to 2015 the rate of plastic production increased nearly 200-fold, with PPA (polyphthalamide), PET (polyethylene terephthalate), PVC (polyvinyl chloride), and PS (polystyrene) in the lead of demand and production. Different programmes, such as Barcelona's door-to-door waste collection program, have been developed to recycle these plastics products in a manner accessible to the public (Anastasio, 2018). However, the process of recycling requires large operations consisting of various means of lengthy transportation, high energy output, machinery and hazardous chemical compositions, ultimately producing new dangerous materials, which require even more specialized disposal techniques.

Polystyrene, the fifth most hazardous waste existing, is a common household and commercial plastic that requires such arduous processes in its recycling program. PS can only be recycled if it is clean, un-dyed, and uncontaminated; contamination includes food residue which PS is often used to contain. Once PS meets the strict recycling standards, it can then be melted into a paste to be reformed. Nevertheless, the process of collecting, sorting, prepping, and processing PS is a feat too expensive and onerous for most cities to implement. Currently most PS recycling plants are operating at a loss.

Figure 2. mealsworms in porous eaten polystyrene disk © Eve Nnaji, Madhavi Ohja (2020)

Biomimicry is a process in which the design and production of materials, structures, and systems are modelled on biological entities and processes (Vincent et al., 2006). Mechanical innovations often seek shortcuts found in nature to compress tedious manmade processes efficiently. This practice has brought several breakthroughs in aerospace engineering, deep learning, and parametric architecture, but recently even larger and more sustainable innovations have been made, using biology itself rather than mimicry.

In 2015, researchers of the Civil and Environmental Engineering Department in Stanford University and Beihang University produced a study finding that mealworms (the larvae of Tenebrio molitor Linnaeus) and superworms (the larvae of Zophobas morio) are able to safely consume and biodegrade polystyrene due to the bacteria (i.e. Exiguobacterium sp. strain YT2) in their digestive tracts, which can safely breakdown PS and convert it into organic matter (Yu et al., 2015). The resulting organic matter has the potential to carry micro and nano remnants of PS, however, they are encased in fecula, the primary matter of the mass. The study found one mealworm to have an eating rate of 0.0001gram of PS per day (100 mealworms = 0.1g per day). This study became the foundation and catalyst for the agenda of this project.

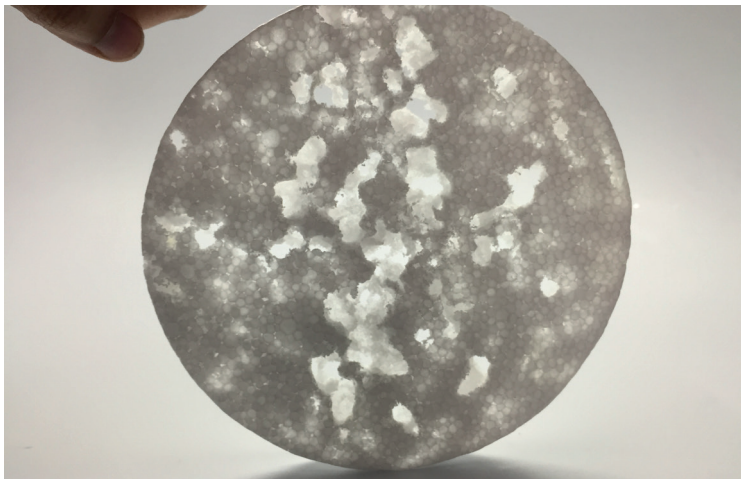

Figure 5. porous eaten polystyrene disk © Eve Nnaji, Madhavi Ohja (2020)

With this study, the project aimed to accomplish four major goals: (1) reproduce the findings; (2) perpetuate the eating rate; (3) control the eating pattern; (4) use these controls to efficiently and rapidly convert vast amounts of PS waste into organic matter at sustainable and safe rates. The first experiments were executed in order to understand the eating behavior of the mealworm and the superworm with PS in contrast with organic food, bread.

These experiments proved the findings of the case study, with roughly the same eating rate. The experiments also revealed the contrast of eating rate between PS and bread; the bread was swarmed and consumed immediately by the mealworms while the PS only attracted a fraction of the population. Another finding showed that the mealworms consumed the block of PS by eating the outer layer rather than penetrating the block. This noted that there was no incentive to exert energy in order to penetrate the block. In order to incentivise the worms, a syringe was used to insert juice into the polystyrene at various points. Penetration was achieved using this method and more importantly, the eating rate was also increased from 0.0001g per mealworm to 0.0005g per mealworm per day and 0.005g per superworm per day (a 5x increase). The eating pattern produced by the mealworms after penetrating the polystyrene was a porous geometry. By eating their way into the block, they were simultaneously creating cavities in which they could safely inhab-

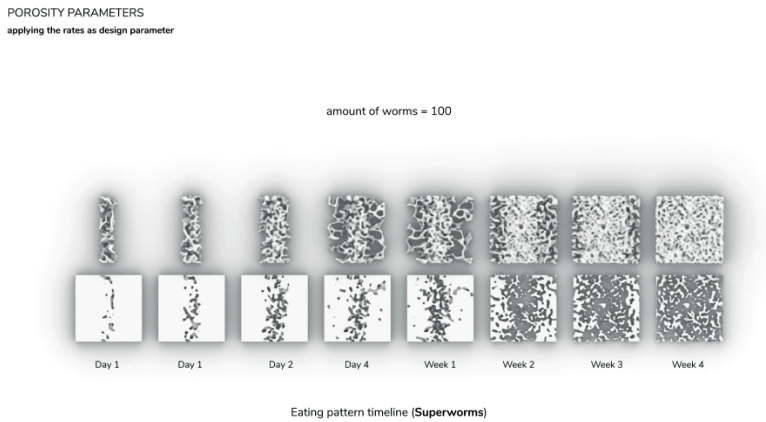

Figure 6. grasshopper porosity parameters visualization 1 © Eve Nnaji, Madhavi Ohja (2020)

it, sheltering them from direct light and exposure, a typical trait of insects (Fig.1-5). To achieve control over this eating pattern porosity, experiments were conducted focusing on the placement of juice points. In one experiment, juice points were placed within a linear boundary drawn onto the PS block. In another experiment, juice points were placed following a curved path drawn onto the PS block (Fig.8-9). The experiments yielded successful results; the mealworms and superworms only ate within the boundary, creating porosity mostly in the regions populated by juice points. A further experiment used sugar water in order to achieve control. The difference in eating rate could not accurately be measured, due to the incapacity to measure the minute difference in grams. The next set of experiments focused on the processes post consumption: samples of the organic waste matter produced were taken from mealworms 1, 2, and 5 weeks after having consumed styrofoam. The difference in these samples were visible: the samples taken within 1 week were a mixture of white and brown particles; the white being identified as styrofoam. The samples taken after 5 weeks were finer and consistent of only brown particles.

The next phase of the project focused on the reusability of the organic waste matter. The establishment of a digital system was used to parametrically design 3 dimensional porous structures baked on the studied eating patterns of the worms.

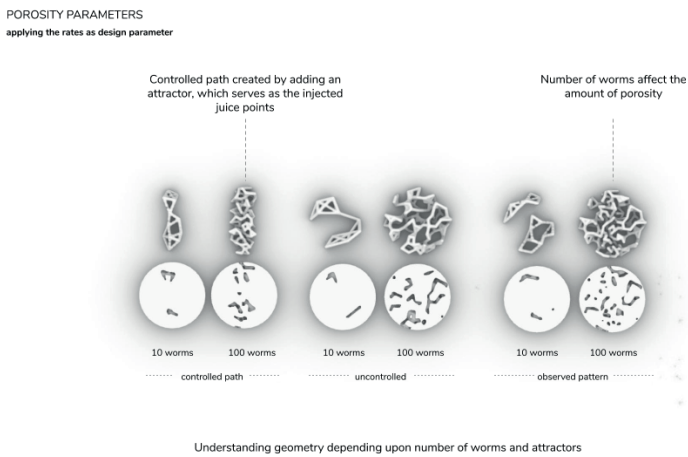

Figure 7. grasshopper porosity parameters visualization 2 © Eve Nnaji, Madhavi Ohja (2020)

By using Grasshopper in Rhino, points could be used as attractors to simulate the juice points while controlling the number of worms in the simulation, directly influencing the size and condensation of the porosity (Fig.6-7). The same process was used to design 2 dimensional patterns that could accurately simulate the eating pattern in relation to the number of worms and given area.

With the findings of the conducted experiments in hand, the next step of the project aims to tackle the last goal, eliminating vast amounts of PS. The proposed project aims to partner with waste companies in order to jointly tackle this problem. A mealworm farm will be situated on the compound of the waste company with direct access to discarded PS. The mealworm farm will host 500,000 mealworms per square meter at which a 500 square meter farm will eliminate 1 ton of PS per month, the equivalent of 18 million PS cups per month (1 cup = 0.05g). The waste produced from the worms will be used as soil in-house in order to grow crops that will be used as supplementary mealworm food, in order to supplement their diets with nutrients. Because the mealworm is the first stage of a 4-part lifecycle, the pupa will then be separated to hatch into darkling beetles, which will then mate and reproduce more mealworms. Some worms may not transform and die from natural causes, such as failure in the competition of acquiring food. These worms will be

Figure 9. plotted controlled path of polystyrene to be eaten day 6 © Eve Nnaji, Madhavi Ohja (2020)

sorted and used to create chitosan, furthering the efforts to re-loop the cycle. The efforts of this project have, so far, educated the audience it has entertained and have led to interesting discussions and ideas bringing all parties involved closer to changing the impact of plastic in the environment. By promoting these processes of nature, these efforts aim to change the narrative of pollution that is currently stifling other natural processes in hopes of creating a new narrative, one where human needs and agendas can pave a way for these natural processes rather than stand in the way of them.

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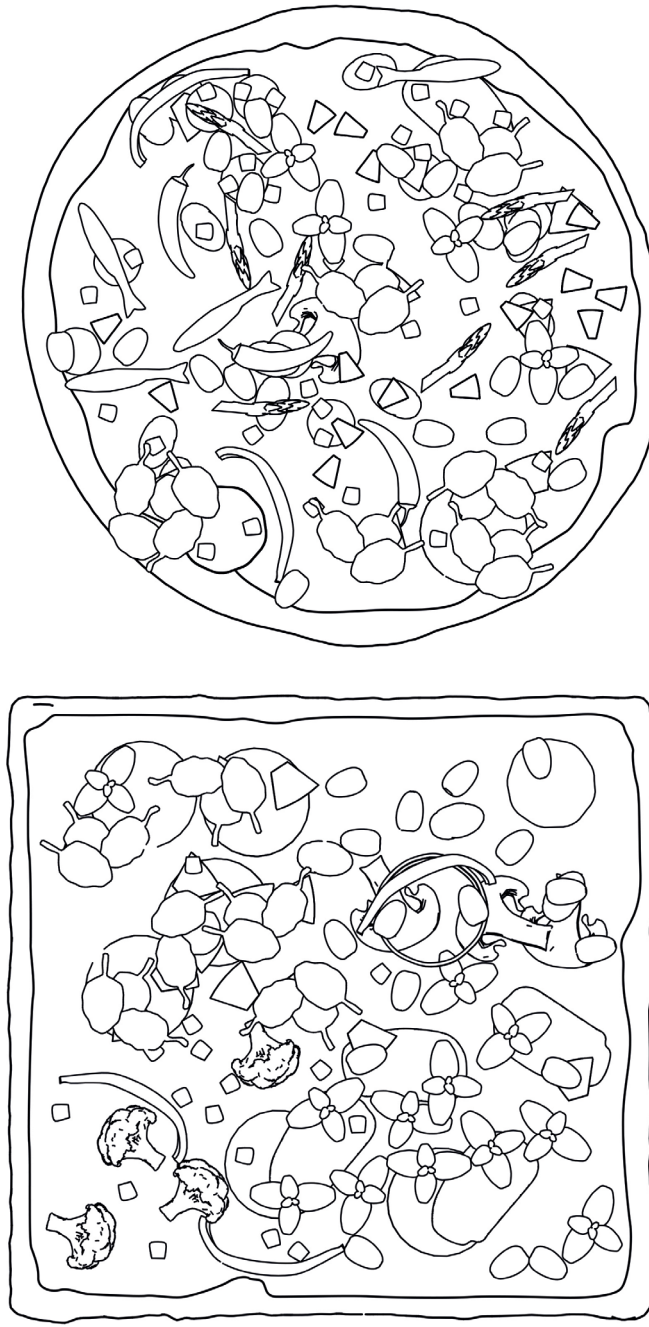

Figure 3. Pizza designed in Project Disco with shopping list © Drude & Sardenberg, 2020.

PIZZA TOPPINGS – MULTIPLAYER APPROACH TO PREPARING A PIZZA IN VIRTUAL REALITY

Jan Philipp Drude
Victor Sardenberg

The preparation of food usually follows a recipe towards a tasty dish. While such a recipe is usually just a guideline for the person cooking a meal for themselves or family, it was sometimes raised to the status of a chemical formula in Taylorist modernism, leading to repeatable dishes branded as trademarks of food franchises. (Preble, 1993) However, taste changes; today's consumer is more interested in options and customisable orders.
This is underlined by a survey published in the Wall Street Journal, whereas only one in five millennials ever tasted a Big Mac®.(Jargon, 2016) The former flagship burger seems to get less important under ever changing seasonal features and a wider menu then in Taylorist times. The desire for customisability in the food industry can be seen from Coca Cola's printing names on Coke cans, to ordering your custom cereals at mymuesly.com, or simply personalising your burger at the food delivery service of your choice. This paper tries to follow this trend to an extreme, proposing a computer game-like approach to collaboratively topping up a pizza[1] in virtual reality (VR) and preparing it using an augmented reality (AR) guiding mechanism.

virtual reality / augmented reality / pizza / food ordering / discrete

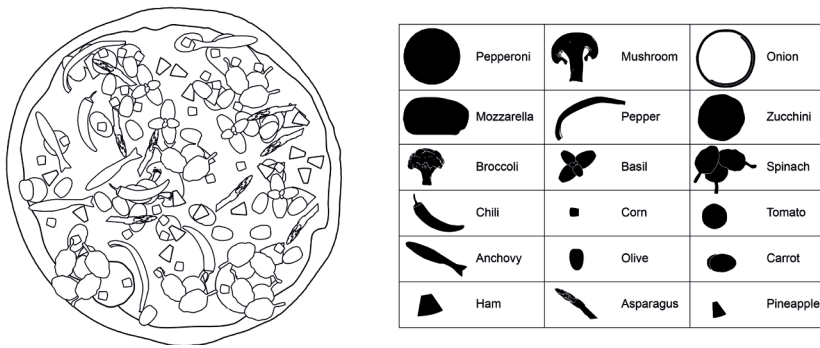

Figure 1. Catalogue of toppings and dough © Drude & Sardenberg, 2020.

THE RECIPE

Following a recipe is usually the means, by which all of the ingredients are measured, processed and either cooked or baked towards a finished dish. It is often used as a simile to explain the workflow of a planning process to laymen. In an architectural context, the recipe stands in for the project drawings, relaying the construction process to the workers on site. The workers gather all the ingredients at the appropriate time and assemble them, following the instructions on the drawings, towards a finished building. This puts the recipe in the preparation part of Food Cycles: the construction phase in a building's life cycle.

This concept of relating a recipe to the erection of a building, of course, oversimplifies the processes on a modern construction site. On the other hand, it also misrepresents the reality of most cooking. A recipe is usually but a rough description of the dish, often relying on quantities like "a pinch" or the average size of an egg. The distinguished chef takes pride in relating the rough descriptions of quantities and time, given in a recipe, into a tasty dish. The similarities with the construction process work better when we consider oral or textual transmission of architectural ideas in the middle ages, which would need a master builder to translate them into a finished building. This makes cooking an artisanal form of making, while con-

Figure 2. Player view in Project DisCo © Drude & Sardenberg, 2020.

struction today follows an industrial mode of manufacturing. (Carpo, 2011)
The belief in Taylorism forms of manufacturing in the first half of the 20th century, led to a design language of the industrial economies. The highest praise any product could claim, was to be exactly like every other from the same run. This credo of modernism soon became applicable for food and beverages also, started by the Seagram's companies claim "Say Seagram's and Be Sure" for their whisky to have a permanent level of quality —a nice change after the experiences of moonshine whisky in the years of the prohibition. The connection to architecture is made clear when considering, that Seagram's was the client for one of modernisms most iconic projects —the Seagram's building by Mies van der Rohe. (Carpo, 2011) The process of taste branding as well as the appearance of a food product to such a high standard of recognisability, also enabled the rise of the modern fast food chain, has made obvious in the 1974 advertisement for the Big Mac®, listing all the ingredients of said burger: "Two all-beef patties, Special Sauce, lettuce, cheese, pickles, onions, on a sesame seed bun." (Clifford, 2008)

Recent developments in industry and marketing have been leading away from Taylorism. Consumers nowadays are more interested in distinguishable products, personalised to their needs if possible. In food consumption this has led to cus-

Figure 5. Pizza design (no basil) – topped-up pizza – baked pizza © Drude & Sardenberg, 2020.

tomisable dishes, being integrated in the drop-down lists of today's food delivery apps, such as Lieferando, Grubhub, UberEats. (Samsudin et al., 2011) This paper further follows these lines in giving a gaming approach to the collaborative design and production of pizza in mixed reality.

DIGITAL DESIGN APPROACH TO TOPPING UP A PIZZA

Pizza is already one of the most customisable dishes imaginable. Its modular layout with the dough, tomato sauce and cheese as a given, invites to topping it up with all kinds of different ingredients. Especially in online ordering, this is taken to an extreme, sometimes reinterpreting the dish, to include regional ingredients, far departing from Neapolitan origins. While customers can order any variation of toppings on their pizza, they usually don't have any influence on their distribution. Who wouldn't want to have their pizza "quattro stagioni" customized with their own seasons? One quarter mushrooms, onions and asparagus, one quarter zucchini, carrots and basil, one quarter spinach, ham, mushrooms and pepperoni and just to indulge in some perversion one quarter anchovies, pineapple and corn.

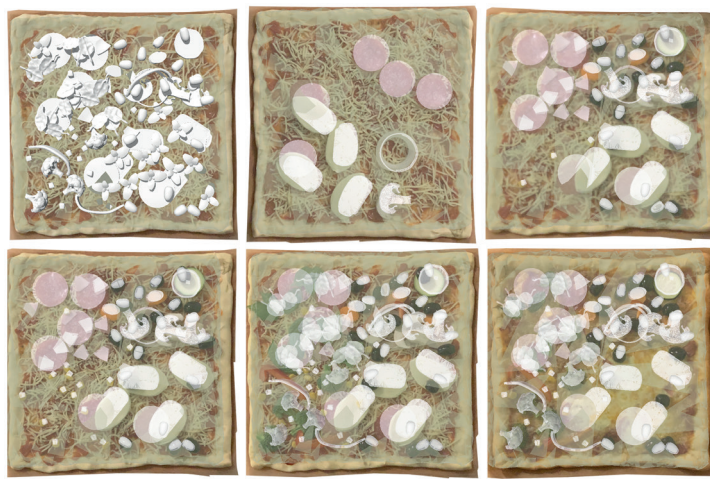

Figure 4. Topping up with AR overlay © Drude & Sardenberg, 2020.

A more practical aspect is the consideration of dietary requirements of a user: an online profile could contain information like vegetarianism, veganism, religious food limitations or ingredients that are not to the user's taste. While these can get overlooked easily in a restaurant, between ordering and the chef preparing the dish, AR controlled preparation of food could make certain that undesired ingredients are shunned. To try and imagine a way of designing a fully customised pizza, we take the existing platform of Project DisCo and build a layer of pizza topping on top of it, enabling users to collaboratively design a pizza in VR. This scenario is applicable to the online ordering market, where more customisability is a competitive advantage. Customers get the ability to design their pizza and order it to the specifications of their 3d-model. The model is streamed over the internet to the restaurant, offering the service and given to the chef, who uses it as a reference to top up the pizza. This leaves the customers with exactly the dish they wished for. In addition, a robotic process of topping up is imaginable, streamlining the whole process of pizza baking into a digital fabrication workflow, like tested at ETH Zurich for cake design. (Liu et al., 2017)

LET'S PLAY

Project DisCo[2] is a tool for intuitively assembling modular structures in VR in a bottom-up approach. Modular building blocks for the assembly can be designed in Rhino/Grasshopper and ported to Project DisCo, where users are prompted with a cloud of said blocks hovering about. They can then be agitated using a manner of choreographed interaction. The blocks snap together when brought in proximity with an aggregating structure.(Drude et al., 2020)
For the purpose of topping up a pizza, we disappropriate Project DisCo into having a catalogue of 18 pizza toppings as building blocks and an empty pizza as the starting point for the aggregation. (Fig. 1) The users then proceed to topping up their pizza in an environment scaled to approximately 20:1, were the pizza becomes the floor while users are immersed within the hovering toppings. (Fig. 2)

Several filters are accessible to the users, whereby they can decide to only top up certain parts of the pizza or only use certain ingredients. The toppings are set in motion by movements of the VR-controllers, which affect the direction and velocity of the hovering parts proportionally to their movements. The users can thus top up the pizza in a process moderated by game physics, leaving the user as the choreographer of the toppings without placing every piece by hand. The result can then be exported back to Grasshopper, which acts as an intermediate platform to bring the model into CAD to be used as a reference for the actual topping up of the physical pizza. (Fig. 3)

To transform the digital model into a dish, we propose an AR approach. For this purpose, we use the Grasshopper plugin fologram[3] (Jahn et al., 2018) to overlay the dough with the digital model of our pizza, successively prompting us with the right places to put the toppings. (Fig. 4) This utilizes a well-tested form of assembly, where the user's senses are augmented by the device, enabling the placement of parts at pre-planned positions and rotations within the tolerances of the device and human limits of precision. The order wherein the toppings are placed follows an algorithm, that groups the ingredients according to type and successively lets the users place them considering overlapping. Finally, the pizza goes into the oven to be baked at the users' discretion and eaten in due course. (Fig. 5)

FINAL THOUGHTS

The paper takes a contemporary approach to design and fabrication in architecture, using a discrete design system and assembly in AR. Such an approach to digital design and fabrication is currently practised in several universities and employed in a few architectural firms. An example would be the project IBrick created at UCL Bartlett's BPro Research Cluster9 in 2018, where students created a furniture system out of discrete parts to be assembled with AR assistance. (Cherry, 2018) The work shown in this paper disappropriates this approach of discrete design and AR-fabrication to the realm of food preparation, placing it at the intersection between computation and food design.
While it showcases a workable solution for made-to-measure dishes, it wants to be understood as a hyperbole. Using a game-like approach to ordering a pizza, is an overly complicated method to receiving a meal and is but a speculative continuation of today's means of ordering. The restaurants with the widest variety of offers and the most sophisticated mechanisms for customisation are usually big chains, which get a lot of return on the investment in a refined system, by using it in a large number of retailers For the customer looking for a tasty pizza these large chains usually don't offer the best product, which is why it is the authors' appeal to the reader to skip overly complicated methods of customisation and trust their chef. Bon appetit.

FOOTNOTES

1 The computer games from the pizza connection series offer the player the ability to design their own pizza to be sold in their virtual restaurants. The design is mostly 2D and does not offer the ability to export the layout of ingredients. See: https://store.steampowered.com/app/588160

2 Project DisCo is an application to integrate bottom-up aggregation of modular building blocks and intuitive spatial design into Virtual Reality (VR). It allows the designer to choreograph large amounts of building blocks interactively through physics simulations as a means of form generation. It is developed by Jan Philipp Drude. See: https://www.project-disco.com

3 Fologram is an AR interface build on top of Rhino and Grasshopper. It allows users to stream 3D-models to their AR devices, like the Microsoft HoloLens or Smartphones and interact with them through grasshopper scripts. See: https://fologram.com/

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Taste ×no× Waste

Animated Video Recipes

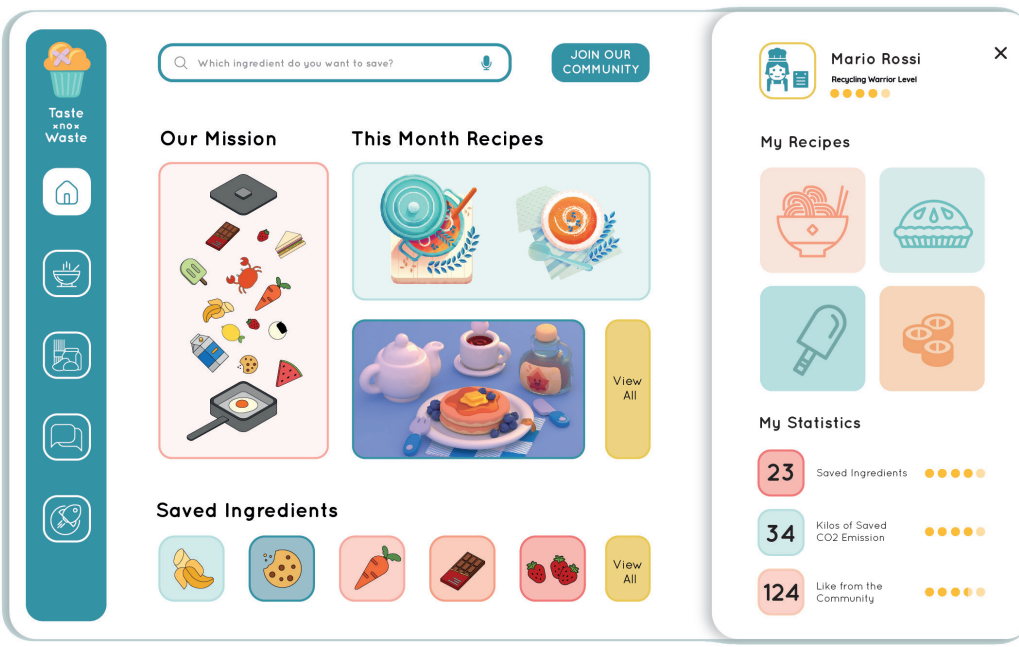

Figure 1. taste-no-waste logo © Giulia Panadisi, Vincenzo Maselli (2020)

Figure 5. taste-no-waste online platform interface. Concept design © Giulia Panadisi, Vincenzo Maselli (2020)

WASTE-NO-TASTE: ANIMATED VIDEO RECIPES TO PREVENT DOMESTIC FOOD WASTE

Giulia Panadisi
Vincenzo Maselli

In recent years numerous service and communication design projects have faced the problem of food waste and helped make the fight against it more efficient. How motion design tools can contribute to prevent this problem? The paper presents a project that consists in creating a shared platform of animated video recipes, prepared by using food at the end of its lifecycle. Participation, community, education, information and technology are the "ingredients" of the project, that operates through an online sharing platform. The platform has an attractive interface, and bring together ludic aspects, technological tools and animated contents. Addressed audience, indeed, collects animated video recipes in a "personal cookbook", leaves feedbacks and suggestions, and participates in activities such as quizzes and scoring games. Animated representation of food also evokes a meaningful tradition that charges the action of cooking with a strong symbolic value, and makes it an instrument of knowledge of culinary, cultural and social traditions. The goal of the paper is to test project's attractiveness, effectiveness, margins of development and variation before releasing the beta version.

food waste / consumption phase / animated recipes / shared platform / education

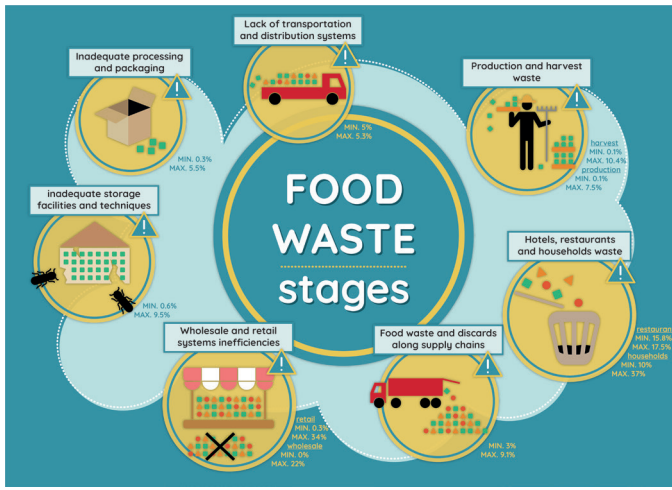

Figure 2. Food Waste stages and percentages (2000-2016). Data have been collected from http://www.fao.org/platform-food-loss-waste/flw-data/en/. © Giulia Panadisi, Vincenzo Maselli (2020)

Food waste is a serious issue in contemporary society, and can have destructive consequences on the environment. A report carried out by FAO acknowledged that approximately 1.6 billion tons of food produced for human consumption gets wasted every year (Gustavsson et al., 2011). Others studies confirmed that almost 50% of the food produced in the world ends up in the garbage, although it is largely edible (FAO, 2019a, 2019b; Institution of Mechanical Engineers, 2013). Food waste occurs for numerous reasons and at different stages of food lifecycle, both during cultivation and harvesting stages, and during industrial processing, distribution, and final consumption (FAO, 2019c; BCFN & National Geographic, 2012)(fig. 2). Especially in developed nations food experiences a great loss in the domestic consumption phase, as it becomes abundant and gets discarded although it still fits to be consumed.

In recent years numerous projects have faced the problem by making organization of production more efficient, by optimizing dialogue between subjects involved in the process, by looking for new uses of deteriorated material, by encouraging awareness actions and correcting people's bad habits. Projects and social campaign aimed at recovering unsold goods still appropriate for consumption in favour of charities or non-profit organizations (e.g. Last Minute Market, 2003; Buon Fine,

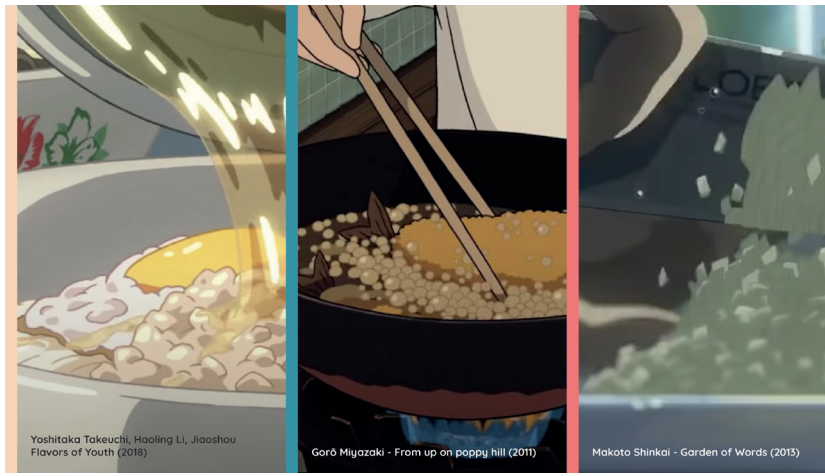

Figure 3. Anime references' still images © Yoshitaka Takeuchi, Haoling Li, Jiaoshou, Comix Wave Films (2018); Gorō Miyazaki, Studio Ghibli (2011); Makoto Shinkai, Comix Wave Films (2013)

2006; Leftovers 2016), at providing information and creating awareness about good behaviours (e.g. BCFN foundation, 2009), at encouraging the consumption of "imperfect foods" (e.g. Melasì, 2008; #LoveTheUgly, 2013; Cosìpernatura, 2020) or at connecting stores and restaurants that have unsold food to customers who can buy these products at a more convenient price (e.g. Too Good To Go, 2015) have been developed. These activities are only a few examples of existing participatory and online initiatives set to creatively intervene in the consumption phase of the food life cycle, to demonstrate how design and digital technologies have helped make the fight against food waste easier, by using online sharing platforms, social networks and mobile Apps. None of described projects bring together ludic aspects, technological tools and audio-visual contents.

The project taste-no-waste, was born with the aim of educating children to reduce food waste, by using fun and unconventional tools, through the creation of a platform that hosts animated video recipes that use food at the end of its cycle of life. Animated language and interactive experience are the ideal tools to attract the interest of the selected target of children aged 10 to 18 (Xiao 2013; Islam et al. 2014) who have already had some basic information on the theme of recycling and sustainability. According to Emma Calvet (2017, 6) Cartoons "are powerful hooks es-

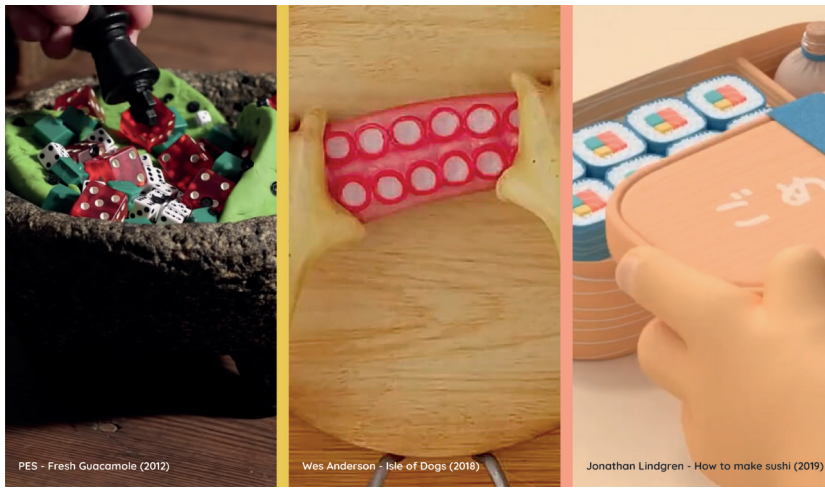

Figure 4. Stop-motion and 3D animation references' still images © PES (2012); Wes Anderson, American Empirical Pictures, Indian Paintbrush, Scott Rudin Productions (2018); Jonathan Lindgren (2019)

pecially popular with young children, who process visual images more easily than verbal messages." The impact of such products has been amplified over recent years, as animated representations spread through the internet. Gaming activities, as well, are crucial elements for audience development since they are part of an entertainment and loyalty strategy. Animated representation of food has an exotic appealing and the animated artefact has frequently staged food preparation in perfect detail.

Very often Japanese animated characters, for instance, are staged during mealtimes or while cooking delicious and interesting dishes. A few representative and well know examples of full-length films and tv series staging food-cooking moments are: From Up on Poppy Hill (2011), Garden of Words (2013), Food Wars! (2015), Gourmet Girl Graffiti (2015), Your Name (2016), Flavors of Youth (2018), Adorable Food Goddess (2018) (fig. 3). Japanese anime are not the only animated products, staging food and food-cooking scenes. Several stop motion animation films staged detailed recipes and characters who cook. A few examples are: LAIKA's Coraline breakfast scene (2009), Wes Anderson's astonishing Sushi Scene in Isle of Dogs (2018), and several videos produced by the American director PES, such as Western Spaghetti (2008), the Oscar nominated short film Fresh Guacamole (2012)

and Submarine Sandwich (2014) (fig. 4). PES' films are humoristic representation of recognizable and everyday real objects replacing food. In his western spaghetti, for instance, "Pick- up sticks replace the spaghetti, bubble wrap becomes boiling water, foil paper turns into oil and, most unusually, Post- it Notes become the butter" (Robinson 2010, 66).
Starting from these premises, our idea is to design a shared platform of animated anti-waste recipes that can contribute to the education of the new generations: our vision is that the captivating and dynamic language of motion design can lead to the acquisition of healthy eating habits that prevent the waste of domestic food from a young age. Furthermore, an interactive component will be inserted within the animated videos. Through this ludic element, the user-players initiate and receive feedback about their actions, which affects their game play experience (Ritterfield et al., 2009).

The project, therefore, is not just a container of animated videos but aims to deal with the issue with a participatory and interactive approach, typical of contemporary media, performed by the hypothesized target who is already fully capable of it. Through the help of social media (i.e. Instagram stories), a real community of no-wasters will be created, that will choose the ingredients of the next recipe, and share recipes, questions and points of view on the topic ,while customizing a virtual "cookbook" with a selection of recipes, both personal and posted by other users. The project is, therefore, based on the shared platform of animated video recipes posted by both platform administrators and users in customized "Personal cookbooks". The online platform represents the exhibition, storage and sharing space of taste-no-waste contents: the website and the app for mobile devices that host video contents, the community, the information collected, the users' feedback and questions. The intuitive and minimal interface design aims to give value to the animated contents and the community, the true and the most important "ingredients" of the project; the user has a profile in which he accumulates scores relating to his recipes and his activity in the community. The home page shows the recipes of the month and the list of the last ingredients saved from waste (fig. 5). The project has a "backdoor" to the real world, and collected points become credits to pay for services and products in affiliated shops and restaurants.
The organization of the project foresees the release of two recipes per month: every two weeks the recipe will come out with a main ingredient proposed by users, in line with the possibilities offered by the season and with the feedback from the community. The recipe will use simple techniques and tools, within the reach of the hypothesized target, with easy-accessible ingredients to be found in every home,

in order not to exclude anyone in the preparation. Traditional recipes from different countries will be proposed to give users the opportunity to learn about other cultures through cooking. Between one release and another, different "tips" on social media will be provided to help understand how to best preserve food, what to buy according to seasonal choices, diets and to keep the community active.
Once the target has been identified and the tools defined (i.e. shared platform, animated videos, viral social tips, set of questions for users), three main phases will take place, to ensure viral diffusion and effectiveness of the contents: (1) guerrilla marketing campaign though social media to anticipate the language and contents of the video recipes, and the organization of ambient marketing events; (2) the online platform and the app will be launched and implemented weekly; (3) community participation and interaction with the platform to animate gameplay and customizing a "personal cookbooks".

Videos will be produced on the basis of data collected, given users feedbacks and comments, regarding: the ingredients that users want to use, the style of representation, the associated storytelling.
In particular, the second and third phases will be essential to bring the platform under the attention of investors or cultural associations that are already operating with local food projects, such as Last Minute Market, and the Danish group TooGoodToGo. The project is now in the concept design phase and online platform's layout, structure and graphic language need to be defined before realising a beta version, that is expected to launched in the autumn 2020.

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Figure 3. Students at work inside the Greenhouse © Rural Studio, 2019

RURAL STUDIO FARM

Elena Barthel

Rural Studio Farm was established in 2010 to raise the question: "How should we eat in rural settings?" The project is the brainchild of Rural Studio, an off-campus design and build architecture program, part of Auburn University School of Architecture, Planning and Landscape Architecture, in Alabama. Located in Newbern, a village 150 km north-west of Montgomery, Rural Studio initiated its activity in Hale County, one of the poorest regions in the United States. The focus is set on students' education, while assisting the underserved local community, suggesting that everyone, deserves the benefit of good architecture, sustainable design and permaculture. By designing, building and working at the farm, students learn to be critical architects and educated consumers, while giving the local community an alternative vision to the large-scale American food system. The idea is to plant a philosophy, beyond planting food. (Barthel & Freear, 2014)

self-efficiency / passive architecture Design and build / community based architectural program

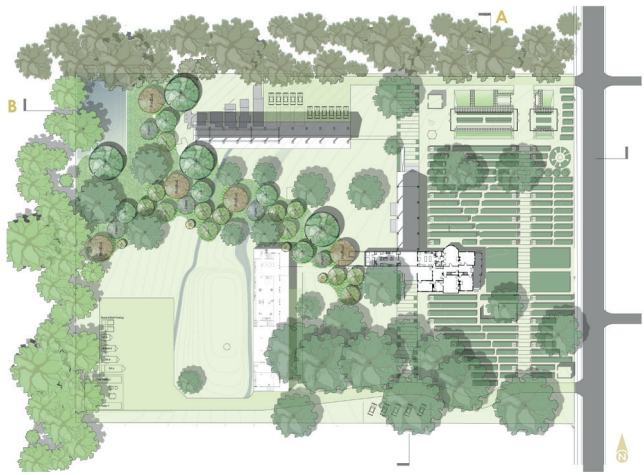

Figure 1. Rural Studio Farm Layout Plan and farming organization © Rural Studio, 2010

HALE COUNTY: A POWERFUL PAST BUT A FRAGILE PRESENT

Since the demise of King Cotton, the regional economy withered and become reliant on low-wage agricultural industries. Today, one third of the population lives below the poverty line, facing the consequences of inhabiting one of the country's largest food desert. In two decades, if nothing changes, 80% of the local population is expected to become obese (Norwood, 2014). The same residents mostly rely on large-scale food systems, representing a diverse form of contemporary poverty, with irreversible impacts on the community's health, environment and economy.
In the last 80 years, Hale County's fresh food availability has deteriorated in lockstep with its landscape, inevitably devolving into unsustainable sub-rural sprawl: small towns to retire or to commute, with no economic strength. Alabama's rural areas are more than places for holiday homes, and critically, more than resources to sustain cities through extraction with little return. Extraction of local resources, leaves in its wake endemic poverty as well as a sense of abandonment. This contemporary occupation of rural settlements tragically alienates the original nature and identity of most of the southern regions.
Since the beginning, Rural Studio has been an advocate for the development and protection of rural areas, designing and constructing public buildings along with

Figure 2. Rural Studio Farm Horticultural Garden and Solar Greenhouse © Rural Studio, 2019

affordable homes and community open spaces. Its work demonstrates that a public University, once located inside a small rural community and supported by the local democratically elected officials, can facilitate significant improvements.
Rural Studio brings young designers face to face with rural challenges with the "can do" and "use what is around you" attitudes, together with an unwavering commitment to the place. It's 30-year-deep roots in Hale County and its history of sustainability gives the Studio a unique voice to help shape an ethical future for Hale County.

RURAL STUDIO: THE PROJECT DEVELOPMENT

In 2010 Rural Studio, started the construction of a small-scale homestead named Rural Studio Farm. Today the Farm feeds 50 students, three days a week, giving the Studio the opportunity to be self-efficient in food production. The Studio understands self-efficiency as a way to think and act locally, with a holistic attitude where the synergy between its parts is greater than their sum.
Rural Studio Farm, is an interdisciplinary laboratory for organic agriculture, passive architectural strategies and construction methods, with low-energy consumption and emissions. The Farm's prototypes as the solar greenhouse, the horticultural

Figure 4. Greensboro Farmers Market © Timothy Hursley, 2010

garden, the gravity fed irrigation system, and the farmers market stands, are all transferrable and adaptable within other social, economic and environmental conditions of West Alabama.

By designing, building and working at the farm, students learn to be critical architects and educated consumers while giving the local community an alternative vision to the large-scale American food system. The idea is to plant a philosophy, beyond planting food. The farm explores sustainable farming techniques. It is a demonstration farm and an interdisciplinary laboratory to instigate graduate and undergraduate architectural students to think, design and build with sustainable methods and in support of the local community. (Barthel & Freear, 2014)

The farm production is based on permaculture design strategies, no tilling farming techniques along with healthy cooking methods . The self-built infrastructures, designed as prototypes by students, aim to progressively investigate how to develop such systems, based on onsite resources as variables of a cohesive ecosystem. Each project aims for the most appropriate use of the existing landscape conditions, sunlight exposure, above and below ground water resources and soil qualities. In the long term, the role of Rural Studio demonstration farm will be assisting local farmers to implement these strategies, ensuring the best practices in Alabama's Black Belt region.

Figure 5. Greensboro Farmers Market © Timothy Hursley, 2010

PASSIVE TECHNOLOGIES AND SELF-CONSTRUCTION METHODS

The whole process from self-design to self-construction allow the Rural Studio staff to closely observe and adjust each phase of the prototypical farm as it grows, while teaching young architecture students. The various facilities are the manifestation of the educational programme, where cultivating, building, and co-designing are intended as parallel symbiotic systems, driven by the same holistic ethic: to live off of the land, while creatively using it, as a precious resource. To secure the farm with limited cost in operation and maintenance, the students design, test, and construct systems based on modular functions, passive energy power sources and recycled construction materials, all to be implemented in different phases, according to seasonal needs.

The solar seed and greenhouse are designed to be replicated in modules based on four components: 200 litres drum thermal mass wall; a metal roof structure with tempered roof glass panels; an enclosure system with prefabricated metal windows and French doors. In winter, the thermal mass, warmed by the daily sunlight, provides the temperature needed to sustain the warmth of the greenhouse and seed house at night. In summer, the enclosure system keeps the building tempera-

ture low, by using natural cross ventilation and a roof shading device.
Rain catchment and storage in cisterns represents an important low impact development practice. Taking advantage of gravity, the water is collected off the roof, through a large gutter and stored inside underground cisterns. A solar pump pushes the rainwater from the tanks into a water tower that gravity feeds the raised bed drip irrigation system. The only power input in the system is solar energy and gravity. The rain catchment system is designed to be replicated and expanded accordance with the size of the farm's roof surface.

COMMUNITY ENGAGEMENT AT FARMER'S MARKET

In collaboration with the Alabama Department of Public Health, and the city of Greensboro, Rural Studio Farm has supported, since 2010, small food systems facilitating the establishment of a local farmer's market and the design and construction of mobile farmers stands to be replicated regionally. The prototypes include a cooking demonstration stand and an on wiles enclosed stand to provide local fresh food year-round to West Alabama's rural territories. Because the markets generally only operate in the summer the stands can be left on site even when the market is closed. They become a constant and stabile presence in town all year long, provide municipalities with a more permanent infrastructure that entices more growers to participate in local markets, and ultimately encourage better community health.

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Figure 2. MAIO housing system © Maio Architects, 2016

PLATFORM SYNTHESIS: THE AUGMENTED DOMESTICITY

Melinda Bognar

Architectural creation is always affected by technological development and availability of resources. The aspects of globalisation, urbanisation, planetarization are demanding creative reactions from humanity. ICTs can promote better informed decision-making by reducing digital divide and actionable intelligence for our future urban sustainability. This could improve the efficiency, operation and transparency of physical infrastructure and flexible distribution of resources in urban, district and home habitat.
This paper examines two distinct examples of twenty-first century housing model: The Kitchenless project of Anna Puigjaner and the Automated Living System of Design Computation Lab. Both projects are building on the effects of a certain kind of industrial revolution on housing with a distinct approach.

augmented domesticity / kitchenless / automated living / platform synthesis / sharing

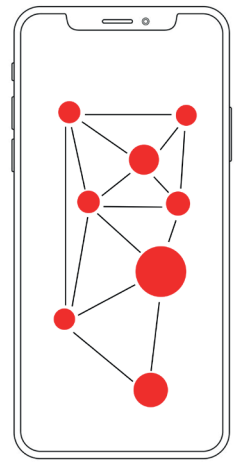

Figure 1. Augmented Domesticity sharing concept © Melinda Bognár, 2020

Technological revolutions are fostering changes in the way of living, consuming and inhabiting territories and cities. Following the cycles of industrial revolutions, smart paradigms, information and communications technologies (ICTs), many households evolved progressively in the way in which live urban and domestic spaces. The appliances used in the domestic environment provided different living conditions, not only the way of production altered but the consumption as well. These phenomena, through the evolution of Kitchenless homes, is evolving in the research of the 2016 Wheelwright prize winner Anna Puigjaner's research. The fourth industrial revolution brought automation, and digital technologies might bring the next significant change in housing projects. The investigation of the UCL Design Computation Lab, not only proposes the omission of the kitchen, but the whole flexibility of living, with no spaces dedicated to always the same process.
This whole adaptability supposes an entirely outsourced consumption and a new understanding of domesticity. Both projects are moving towards a minimalist approach to living, where shared spaces have significant roles. How living affects food cycles and vice versa? The sharing model covers not only physical areas, but also the production, consumption and recycling of food. Augmented domesticity leads toward a way of living where - supported by digital platforms - consumable goods and spaces are both parts of the community life. (Fig. 1.) The domestic is not

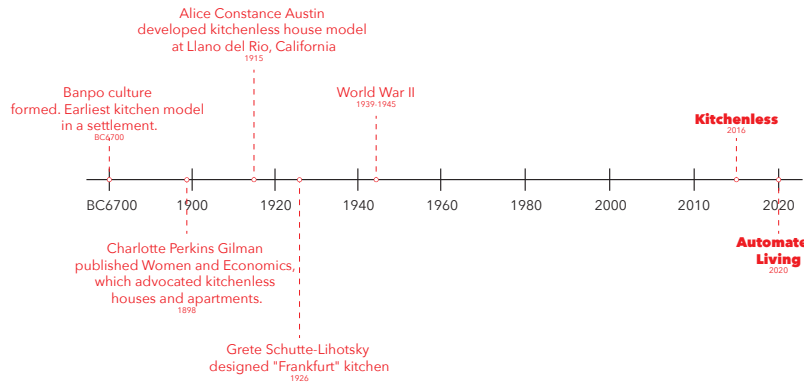

Figure 2. Kitchenless concept development in history © Melinda Bognár, 2020

limited to one household, but hides the opportunity of privacy, such as the distribution of goods, services and spaces. Creative Food Cycles embedded in the housing models can fosters sustainable and alternative ways of living.

THE EVOLUTION OF SHARING FROM KITCHENLESS TO ALIS PROJECT

The judgement of food preparation and consumption in households changed over time. During 19th century the upper-class kitchen was located in the remotest part of the house and was dedicated only to food preparation; meals were then transported to the dining room, where the family reunite to eat together, as a shared experience. An enormous breakthrough, in the development of the kitchen was when plumbing and natural gas were introduced in the late 19th century giving shape to new furniture and appliances, such as the sink and the gas stove. This indicated the early starts of the revolution of industrial food processing. Following the World Wars, when several companies after weapon production shifted to domestic appliances and these appliances were being mass produced, another revolution in the kitchen habits was taking place: pre-cooked, ready mixed, canned and frozen foods started to appear in the market. (Calderón 2017) These changes were not

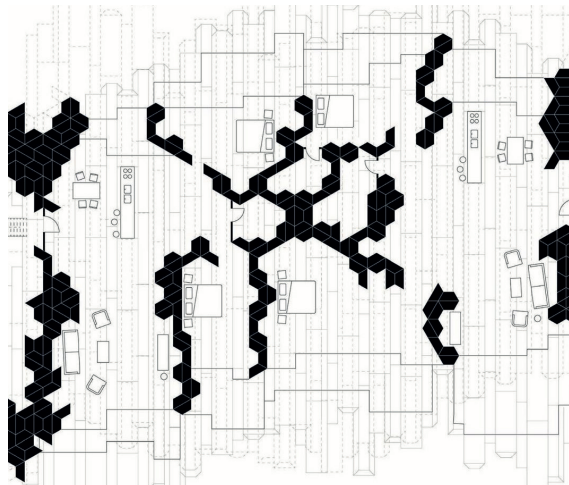

Figure 3. ALIS organic floor plan of discrete elements UCL Design Computation Lab © Yuk et al., 2020

only resulting of industrial development, but were also strongly connected to socio-economic alterations.

Anna Puigjaner's proposal, Kitchenless City: Architectural Systems for Social Welfare, takes as its starting point a historic housing type—housing blocks with collective kitchens, as well as other shared amenities, such as dining rooms, lounges, service areas. The research explores examples of collective housing in Brazil, Sweden, Russia, Korea, and elsewhere, which reflect a variety of approaches to organizing and distributing domestic spaces. This research shows a way to new housing development models as well as the rise of alternative sharing and resource-pooling economies. (Puigjaner 2016) The study is based in particular on American examples, where housing history grew differently from Europe. In the 19th century having a kitchen at home was especially unhygienic and the investigation of distribution and organizational aspects for indoor environment where not so common. The author, analyzing collective services borrowed from hotel typologies, such as Waldorf Astoria in New York, focuses her interest on the role of shared housekeeping spaces and how these have been implemented in traditional domestic typologies during the 20th century. (Puigjaner 2014)

Kitchen besides its functional role has also had a socio-cultural meaning. From the space for food preparation and cooking, occupying a later position in the hierar-

Figure 4. Housing block from "Autozoid" UCL Design Computation Lab © Yuk et al., 2020

chy of domestic spaces, it became the recipient of the fire-space, the heart of the house. Which not only can serve one household, but also provide a shared gathering place for multiple families. In her thesis Yupeng Lian (2019) based on the study of domestic developments distinguishes three types of shared settlements. The Communal Sharing Household, the Commercial Collective Household and the Collective Dining and Street-food Culture. The first two is mostly based on the sharing of equipment with different economic approaches, while in the third case the prepared food is being shared. The approach of living without in-situ kitchen fosters the creative distribution of food. Starting from the phenomena of shared meals cooked together, for the broader community can reduce food waste. In parallel, the study of Annika Carlsson-Kanyama investigates whether it is more efficient sharing meals in co-housing compartments, compared to regular individual meals, in terms of energy use and food waste. The theory is that a potential energy saving is practicable when the typologies reach an economy of scale and the act of cooking and storing food is implemented collectively. (Carlsson-Kanyama 2004).
Production, preparation and consumption are all shared events of the food cycles. Especially if certain Kitchenless homes involve community gardens as well, even if these initiatives already emerged before the digital turn, they can become more effective by the involvement of online platforms and communities. Anna Puigjaner

and MAIO studio in their 2016 apartment prototypes, further investigates the idea of building a system of shared-rooms, rather than an arrangement of fixed floor-plans. The idea was to create a "system of rooms that can be used as desired with a not determined program" anticipating tenants' needs and changes, with a degree of flexibility based on Real-Estate online market demand. Each apartment could be expanded or reduced by adding or subtracting rooms, according to family size or functions to be implemented. The building has 110 rooms, presuming 5 rooms per dwelling, for 22 dwellings in total.
For instance, a typical floor could be divided into four dwellings. Rooms about each other and are connected with large openings rather than corridors. Centering each cluster of rooms is a kitchenette, with bathrooms strategically placed on either side. Tenants may decide for themselves how to assign each room's use. Puigjaner notes that the repetition of same-sized rooms, common in 19th century urban housing, disappeared in the last half-century despite the usefulness of open rooms and plans with regards to contemporary families and lifestyles. (MAIO, 2016)(Fig.2.)

Even more radical example of the Kitchenless house is the Automated Living System (ALIS). ALIS is a housing prototype created by the UCL Design Computation Lab, in response to the Global housing crisis. Inefficient housing, scarce and expensive land have been identified as core contributing factors to this crisis, and ALIS aims to address these by proposing spaces that do not have fixed functions, contents or ownership. Powered by an App, individuals can select the time and function (bedroom, office, café) of the spaces they need, 24/7. A system of robots changes the configuration of the walls, utilities and personal items are stored in an automated storage system for when they are needed next. (Buildingcentre, 2020) (Fig. 3.)

The idea is based on the opportunities fostered by digital revolution, robotic production and discrete building elements. Digital syntax, based on serially repeated building blocks with a digital connection logic, these building blocks act the same way as Digital data, which means that they can be recombined, are reversible, universal and versatile. (Retsin, 2016) According to this logic, there is no room for kitchen, and not even for a communal kitchen, the nutrition is solved out of the house, provided by delivery or eat-out options. By this extent, it involves an even larger community of food cycles; sharing food among one household, through the sharing of one living community, to the sharing of one housing zone. The two studies of less-ness are achievements of different industrial revolutions. However, it is clear that both transformations of living spaces have significantly affected the

area of food preparation, the kitchen, and enforces the creation of a sharing community of different scales.

DIGITAL PLATFORMS

Food sharing initiatives are one way to reduce food waste while also providing access to local food in convivial, inclusive settings. Through the use of social media, smartphone apps and websites, many of these volunteer-led projects have grown rapidly yet remain insecure as they often do not fit neatly into current public policy and planning regulations. A recent international research project called ShareCity, led by Anna Davies, professor of geography, environment and society at Trinity College Dublin, assesses the viability of city-based food sharing initiatives around the world. (Share City, 2020) The objective of Share City is that information and communication technologies are stretching the territories over which people can share, increasing the numbers of people who can be brought into sharing initiatives and bringing new forms of sharing amongst strangers into focus. Apps, maps, and other forms of online platforms are facilitating new connections between citizens, consumers, businesses, social enterprises and charities to jointly tackle issues such as food waste, food security, and sustainable food production, and to build better communities.

The ShareCity 100 database houses information for over 4000 ICTs, enabling food community initiatives that meet the SHARECITY criteria for ICT-mediated urban food sharing. The initiative has created a map from this database to locate these sharing activities at the city level. By the provided filters the user can search by city, what is shared and how it is shared. (Fig. 4.)

Through real-time smart food tracking, consumers can become producers, at the same time, and be aware of the whole production chain, tracing processes and qualitative details, the entire process becomes transparent. Today the sharing economy takes advantage of connected mobile technology to allow people renting things temporarily that they either don't need to own permanently or can't afford. Everything from cars, central city parking spaces, designer clothes to accommodation are easily accessible by transactions made available through smartphones, apps or websites. Digitalism triggers differences and variety in global production.

As in the object production industry, FabLabs become more and more popular, and local food production cycles can also be affected by this digital fabrication revolution. Fab Labs are an open creative community, sharing the goal of democratizing access to the tools of technical invention. (Fabfoundation, 2020) Fab Economy is about creating a novel economic paradigm for everybody, where local fulfilment

and customization of households, take the place of mass production and global distribution. (Fabeconomy, 2020) While being virtually global, and staying connected in the planetary scale, by our physicality and consumption, we need to be more local, automated in regional production and connected by real-time evaluation platforms.

The digital revolution can lead to the rise of smart distribution, where participative internet stimulates participative communities. The realisation of the circular economy and collaborative cities is up to the inhabitants, which is well encouraged by digital platforms. The equilibration of demand and supply can result in a society without food-waste by producing the appropriate amount of food reacting to real-time demand. Augmented domesticities, where the consumer is aware of the full production chain tracked by digital platforms can guide towards a Creative Food Cycle, where the interests of the environment are paramount. This goal is supported by housing models, such as the Kitchenless project or Automated Living Systems, where the physical environment of flexible space is augmented by digital platforms providing a transparent real-time Creative Food Cycle chain.

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