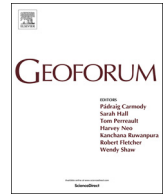




Contents lists available at ScienceDirect

Geoforum

journal homepage: www.elsevier.com/locate/geoforum

[Re]Valuing Surplus: Transitions, technologies and tensions in redistributing prepared food in San Francisco

Marion Weymes, Anna R. Davies*

Department of Geography, School of Natural Sciences, Trinity College Dublin, Ireland

ARTICLE INFO

Keywords:

Food waste
San Francisco
Food safety
Value
Food policy
ICT

ABSTRACT

Attention to value, exchange and circulation has long been a central feature of trade flow analyses. More recently, scholars have sought to extend these frames to examine the ongoing movements of end-of-life goods; essentially examining the waste mobilities of commodities. These flows have particular geographies and practices of valuing and revalorization depending on the material and relational qualities of the commodities in question. However, surprisingly little analysis has taken place of the movement of food surplus within these debates and even less has been conducted with respect to the movements of surplus prepared food. In response, this paper examines the particular value choreography of redistributing surplus prepared food in San Francisco. Four initiatives, which use information and communication technologies (ICT) to help put this particularly challenging form of food surplus to further use, are analysed. Specific attention is given to the transitions, technologies and tensions that shape the [re]valuing of surplus food in places and as it travels across space and time amongst diverse actors. In conclusion, it is argued that while commercial economic values and logics play a pivotal role in opening up particular types of food for redistribution, actual practices of moving food along are suffused with a much more complex and shifting architecture of values and valuers.

1. Introduction

Attention to value, exchange and circulation has long been a central feature of trade flow analyses. Increasingly, scholars are extending these frames to examine the ongoing movements of end-of-life goods; essentially examining the waste mobilities of commodities (Davies, 2012). That these flows have particular geographies and practices of valuing and revalorization depending on the material and relational qualities of the commodities in question is well established. However the movement of food surplus has been surprisingly invisible within these debates until recently (Davies, 2019) and even where analysis has been conducted the movements of surplus *prepared* food, a particularly tricky fraction of food surplus to engage with due to its short window of edibility, is absent. In response, this paper examines the particular value choreography of redistributing surplus prepared food in San Francisco.

While redistributing surplus food has been mooted as a ‘win-win-win’ for the economy (saving money), the environment (preventing the waste of resources) and for people who are hungry, the practice poses complex moral, social and technical challenges. What is deemed edible and therefore surplus is subject to diverse personal, cultural and regulatory regimes that are replete with value judgements. In response

there are growing calls for the value dimensions of food, food waste and food surplus to gain more critical attention, with Finn (2014: 992, emphasis added) arguing that “[o]ur values are out of balance; we need to *properly value* our food”. Beyond this call to reconsider individual values and processes of valuation with respect to food, food waste has been linked to flaws within broader social systems. In 2017, for example, the EU Commissioner for Health and Food Safety stated that food waste was immoral and used this as one of a suite of justifications for the development of EU guidelines designed to support increased donation of surplus food (Byrne, 2017). Addressing food surplus also presents technical challenges because establishing what fraction of current food waste is edible – i.e. food surplus – is problematic. This is partly because what is deemed to be edible is temporally and spatially determined, but also because data collection on food waste (and by extension food surplus) is inconsistent and fragmented. Despite questions over the nature and extent of food waste and surplus, both are gaining a greater cultural presence, experiencing what Campbell et al. (2017: 170–171) refer to as “a political awakening” and “a transition from invisibility to visibility”.

It is not just formal governing bodies that are addressing the tricky issue of food waste and surplus, the UK-based charity Waste and Resources Action Programme (WRAP), for example, has been at the

* Corresponding author.

E-mail addresses: weymesma@tcd.ie (M. Weymes), daviesa@tcd.ie (A.R. Davies).

<https://doi.org/10.1016/j.geoforum.2018.11.005>

Received 30 January 2018; Received in revised form 7 November 2018; Accepted 9 November 2018

0016-7185/ © 2018 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

forefront of efforts to quantify food waste, further seeking to “engage consumers to influence behaviours around food waste ... [to encourage] *valuing* where food comes from” and ultimately to “get more *value* from waste and surplus food and drink” (WRAP, 2015: emphasis added). At the same time a growing number of entrepreneurial initiatives are seeking to disrupt the common perception of surplus food as embodying only “rubbish value” (Gregson et al., 2010: 846). These initiatives are increasingly utilizing information and communication technologies (ICT) to redeem surplus food’s latent use and exchange value because of its capacity to speed up redistribution journeys (Weymes and Davies, 2018). The motivating forces behind this entrepreneurial activity are manifold, from seeking to improve environmental resource efficiency to concerns with food security, the right to food and the reduction of hunger (Davies, 2019). However, the volatile material properties of prepared food render it subject to the discipline of multiple cultural, regulatory and policy regimes that can create tensions between values and valuers when it is moved around. There is then an uneasy politics to surplus food redistribution, where politics is broadly defined to include “relations, assumptions and contests pertaining to power” (Appadurai, 1986: 57). Through redistribution, surplus food can make multiple journeys from commodity to waste to surplus and potentially back to commodity again, depending on its particular biography and associated temporal, spatial, material and discursive reconstructions. Following Appadurai, we argue that by attending to these trajectories, conceptually and methodologically, we can learn more about the transactions and calculations that enliven the potential of surplus food.

Building on Appadurai’s recognition that things are in motion and have social lives, this paper develops a better understanding of surplus food’s ICT-mediated redistribution journeys, specifically focusing on the redistribution of surplus food that has undergone some form of preparation (often being cooked as part of that preparation). This includes establishing a clearer picture of the values that are held and assigned to that surplus as it resides in places and as it gets moved along. The focus on surplus prepared food is significant because it is a particularly challenging fraction of surplus food to redistribute, often comprising small and unpredictable quantities as well as requiring additional means of management, such as refrigeration or rapid recirculation, to maintain its edibility long enough for it to be redistributed and safely consumed (Ciaghi and Villafiorta, 2016). The Bay Area of San Francisco provided an appropriate setting to conduct this research because it is at the forefront of ICT-mediated redistribution when it comes to surplus prepared food. The city is home to an abundant hospitality culture, particularly within hi-tech companies that increasingly offer free food to employees. In contrast to other locations this brings regularity and volume to surplus prepared food in San Francisco. The clustering of hi-tech companies alongside smart technology research institutes also provides a fertile environment for entrepreneurial individuals seeking to extend the use of ICT for social good. Surplus food redistribution activities are also facilitated by supportive federal and state regulations, such as Good Samaritan legislation, which limits liability for donors in relation to damages resulting from donated food (McNeill, 2015; Cohen, 2006; Morath, 2017). It is also the case that San Francisco is characterized by stark socio-economic inequalities (Lehman-Frisch, 2017; McNeill, 2015), with an estimated 23 percent of San Francisco residents struggling with hunger (Duggan, 2017) which generates significant demand for affordable and accessible food.

In order to progress understanding of surplus prepared food redistribution a conceptual framework for interrogating surplus food from a value perspective is developed. This draws on research that disrupts dominant understandings of waste and calls for greater nuance in the interrogation of things apparently at the end of their life cycles (Gregson et al., 2007; 2015; Gregson and Crang, 2010; Gille, 2012, 2010; Moore, 2012; Evans, 2017). The emergent role for ICT-mediated redistribution is then explored through in-depth examination of four

initiatives which focus specifically on prepared food. Their goals, processes and impacts are identified and three key themes emerge – transitions, technologies and tensions – which help navigate the [re]valuation of surplus prepared food during its after lives. Ultimately, it is argued that the redistribution of surplus food, particularly food that has been prepared or cooked, is likely to become a growing practice within urban areas as food waste becomes a higher priority for governments and smart technologies provide ever more sophisticated means of connecting people with food to people who are without. However, better systems of reporting and evaluation will be required to establish whether this increased flow is perpetuating unsustainable practices or reducing overall food waste and hunger.

2. Examining the waste-surplus-value research nexus

As Moore (2012: 190) suggests, “geography ‘plays a determining role’ in the transformation of what is waste in one place into what is value elsewhere”, and practices of valuing and revalorization depend on their material and relational qualities. Values can be both the object of study (the signified), and the signifier for other conditions such as human-environment relations or economic worth. They can be scientifically measured, economically calculated, ethically reasoned, psychologically derived, politically influenced and culturally conditioned, and whether these different approaches to analysis can, or even should, be combined has long been a moot point (Davies, 2001). As the UK Royal Commission on Environmental Pollution (RCEP) has stated, there is “[n]o single correct format for articulating values: the mechanisms ... should be appropriate to the circumstances of the particular decision” (1998: 137).

Of course, economic value, exchange and circulation have long been central features of trade flow analyses, including the food trade (Pelupessy and Van Kempen, 2005; Coe et al., 2008; FAO, 2014), with concepts of global value chains and global production networks featuring prominently in these discussions (Hughes, 2005). The post-consumer phases of these chains and networks have historically received less attention in these studies (Gregson et al., 2010), but more recently, scholars have sought to extend frames to “[engage] with material properties and transformations to understand the capture and realisation of *value* from end-of-life goods” (Crang et al., 2013: 13 emphasis added); essentially attending to the waste mobilities of commodities (Davies, 2012). Methods and concepts focused on the flows, circuits or networks of, and around, commodities have been used in an attempt to bring exchange value (markets) and use value (meaning) within a single analytical framework that can accommodate their full “life-stories” (Bridge and Smith, 2003: 259). Integral to these developments is a rejection of a linear conception of matter travelling neatly from production to consumption and ultimately disposal.

However, considering how the multivalent values of food surplus co-exist and change over time and space remains relatively rare. For example, while Cicatiello et al. (2016) examine the economic value of food waste from the retailer perspective and Clark and Luque (2013) explore the role of chemical technologies for valorising food waste components, these and similar studies are tightly bounded. Taking a broader stance, others have highlighted how and where food waste fits into wider systems of classification and valuation, albeit primarily focused on household food waste (Evans, 2014; Devaney and Davies, 2016). With regards to food waste it is recognised that the same material might be simultaneously valued as food in some places and waste in others (Coles and Hallett, 2013); what Moore (2012), drawing on Žižek (2006), refers to as the parallax effect whereby the nature of an object viewed along two different (or indeed multiple) lines of sight can differ. However, in *The Parallax View* (2006), Žižek is not so much interested in the processes of visual displacement rather, and in a similar fashion to the RCEP quoted above, whether the resulting descriptions or theories of an object viewed from different perspectives are commensurable or not. Is food surplus, residing as it does in that liminal zone at

the threshold of becoming waste, also constitutive of society in similar ways to waste?

2.1. Conceptualising surplus food and its redistribution

Different streams of food surplus certainly tell particular stories about ways in which contemporary society is organised in different places; constituting what Moore (2012) refers to as an archive of material culture. Indeed, surplus provides a useful entry point to interrogate wider geographies of food production, consumption and disposal. In particular focusing on food surplus brings arenas of potential moral hazards and unequal power geometries (Allen, 2010) into sharper focus. This might be, for example, in relation to process inequities around food choice decisions (Power, 2011) or the material inequities of being the recipient of surplus food perceived to be “only one step removed from the dustbin” (Lambie, 2011: 27). However, whereas waste research has tended to adopt a hazard frame in order to study uneven distributions of waste and particularly the environmental justice of its resting places (e.g. incinerators and landfills), flows of surplus food have not yet been subjected to similar mapping practices, with data rarely captured accurately on anything other than a micro-scale.

As Midgley (2014) notes, the limited number of surplus food studies conducted have tended to focus on arisings and management rather than redistribution (Alexander and Smaje, 2008; Griffin et al., 2009; Parfitt et al., 2010; Milicevic et al., 2016; Alexander et al., 2017). Nonetheless, and following Yaeger (2003:114), surplus may well be considered as “a mess with a message”; a record of relationships that have led to matter being out of place and also the ordering acts that aim to correct this dislocation (Hetherington, 2004). Certainly, surplus food has the power to reveal uneven political and economic relations of the global agri-food system, disrupting what Gregson and Crang (2010) refer to as the smooth operation of capitalism across space. It is “much more than a simple commodity that is circulated through systems of exchange” (Moore, 2012: 790). Taking such a view of surplus would need to draw on insights from research which resists seeing waste as something to be removed from sight and instead sees non-human objects – such as food surplus – as indivisible from human society (Braun, 2008; Clapp, 2002).

As Moore (2012: 190) suggests, “geography ‘plays a determining role’ in the transformation of what is waste in one place into what is value elsewhere”. In some settings the cost of disposing organic waste to landfill, including edible food surplus, may be prohibitive such that other forms of moving that surplus along become financially attractive. In others it may be that donating food leads to valuable tax breaks for those donating (as in the USA and Italy). In situations where such economic benefits may not be available there may still be indirect ways of gaining materially from redirecting surplus away from the bin, for example through the positive public profile gained by companies who are seen to donate surplus food to those in need (Davies, 2019). Indeed, it is common to see food surplus conceptualised as a valuable resource in this way, particularly in policy and media discussions. This is often articulated as the value of food as nutritional sustenance – food as fuel – but it can also admit the value of surplus as political resource around which to destabilize and reveal the failures of current food systems. Such approaches are visible in studies of gleaning (see Lee et al., 2017) and skip-surfing where people who rescue food surplus “in the process, revalue – food from waste for human consumption” (Edwards, and Mercer, 2013:179). Such processes of rescue or recovery are seen as a means to redeem the rather instrumental value dimensions of waste. While these constructions of surplus may focus on the economic as a dominant and important generator of value (e.g. saving money by diverting waste from landfill disposal), viewing surplus as resource also allows researchers to identify other valuable co-benefits of reclaiming edible surplus, for example as a means to hold on to the value of inputs, such as water and energy, that were invested in the creation of the now

surplus food.

Conceptually, there are links here between research that frames surplus food primarily as resource and that which continues to see it as a commercial commodity, not least with respect to its regulation and governance. As Midgley (2014) argues, it is the regulatory context which formally determines the legal definitions of when food becomes something else (e.g. waste or hazard). This may be activated through mechanisms including use-by-dates or waste management hierarchies which seek to encourage particular ways of moving the surplus along over others e.g. feeding people before feeding animals, or composting rather than disposing to landfill. Such governance of surplus affects the economic value of the resource commodity (Henderson, 2004; O’Brien, 2013), but it still characterises it as a manageable object and open to technical and or institutional solutions.

Ultimately, the study of value and food surplus is beset with challenges of containment and definition. Epistemological diversity and disciplinary difference, combined with alternative scales of enquiry, creates contrasting value ‘products’, from abstract models, equations and levels of statistical significance to words, texts and images. Each approach defines its own context and sphere of analysis, creating a particular vantage point from which to view the value of surplus food leading to the possibility of different linkages and conclusions when studying the same phenomena. The values of food surplus are then constructed through the interaction of individuals and structures in different socio-institutional contexts; they have a geography which can create specific networks of knowledge, fragile interest coalitions and shifting affiliations. What is significant for this paper in terms of its empirical ambitions is that food surplus is a consummate parallax object, which “must be rearticulated in the local terms of all the figurations into which it can be extrapolated” (Jameson, 2006: 8).

3. Researching surplus food redistribution

Two main phases of research inform this paper. The first was the development of a database identifying and analysing ICT-mediated surplus food redistribution activities in the San Francisco Bay Area, distilled from a more extensive database of food sharing activities across 100 cities (Davies et al., 2017a, 2017b). ICT was taken to include websites, social media platforms and mobile apps, and initiatives were included in the database if they had an active presence in one or more of the cities San Francisco, Oakland, and Berkeley. Alongside an analysis of social, economic and environmental policies affecting these activities, the database provided an overview of the contextualised redistributive landscape in the region. To complement this, a second intense period of immersion research took place combining participatory observation, informal engagements with initiatives and more formal semi-structured interviews with key personnel from four initiatives that redistribute surplus prepared food – Food Runners, Replate, Copia and the Food Recovery Network (University of San Francisco chapter). These were the only initiatives actively redistributing surplus prepared food in the region, as other initiatives identified in the database either collected and redistributed non-prepared food such as fresh produce or packaged goods (e.g. Food Shift; SF-Marin Food Bank; Imperfect Produce), had limited or no activities in the area despite an online presence (e.g. Rescuing Leftover Cuisine) or had no active web presence during the period of study. Interviews were conducted with initiative founders, staff, and volunteers, as well as food donors, stakeholders from local government and regulatory bodies managing health, food security and waste. NVivo Qualitative software was used to analyse interviews and field notes, and an emergent coding structure was developed from which mutual and contrasting drivers, opportunities, barriers and impacts related to the food redistribution were identified. These were explored in relation to frequently articulated concepts of value and grouped and categorised across three themes: transitions, technologies and tensions. The following section outlines the research setting and case study initiatives, with the remainder of the paper examining these

Table 1
Key characteristics of case study surplus prepared food redistribution initiatives.

Initiative	Redistributed foods	Donors	Organisational structure	ICT-mediation	Year established
Food runners	Prepared, packaged & processed food	Businesses & households	Non-profit	App for volunteers to organise themselves	1987
Copia	Prepared, packaged & processed food. Fresh produce	Businesses, households & universities	For-profit	Web platform to match donors & recipients, and to track surplus	2012
RePlate	Prepared food	Businesses	Non-profit	Web platform to match donors & recipients, and to track surplus app for community sharing	2016
Food Recovery Network (USF chapter)	Prepared food	Businesses & universities	Non-profit (network) Informal (chapter)	Social media	2014

themes. While the initiatives agreed to be named in any publication emanating from the research, individual respondents are not identified and direct quotes from the initiatives' public documents, online profiles and interviews are indicated by the use of italics within single quotation marks.

3.1. Surplus food redistribution in San Francisco

San Francisco and the surrounding Bay area have become a hub for ICT supported food surplus redistribution, with 20 initiatives identified as intercepting surplus food at multiple points along the food supply chain and redirecting it in diverse ways, including gleaning surplus fresh fruits and vegetables from fields and gardens, and collecting short-dated tinned and packaged food products from supermarkets. Compared to other cities, the region has a strong focus on the redistribution of prepared and cooked food (Davies et al., 2017b), indicating unique local characteristics which supported this development.

Located in a fertile state responsible for almost half the fruits, vegetables and nuts produced in the US (Parsons, 2014), the multi-cultural Bay Area has a well-developed and celebrated food scene and abundant hospitality culture. The area is more renowned, however, for being an exceptionally expensive place to live and for having one of the largest and most rapidly increasing wealth gaps in the US (Berube, 2014). Home to numerous global tech firms and a hub of start-up culture, many young professionals with high disposable incomes are flocking to the city, driving up house prices and the cost of living (Maharawal, 2017). Creating a tech-industry fuelled gentrification process. Indeed, the 2015 Census indicated that 12 percent of the population in San Francisco County were living below the poverty line (US Census Bureau, 2015), and in 2017 it was estimated that nearly one in four San Franciscans struggle with hunger (Duggan, 2017). Such statistics of food insecurity and poverty are stark when compared with the opulence and abundance found within the burgeoning urban hi-tech scene in the region (Florida, 2012, 2013). A distinct and visual contrast has been created between inner city areas such as the Tenderloin, infamous for its homeless population, and the neighbouring Financial District which is home to many technology firms and start-ups. This unavoidable contrast of wealth and poverty and the paradox of food being thrown out while people go hungry has motivated a number of socially and environmentally conscious individuals to seek charitable and commercial solutions. Two-thirds of all initiatives operating in the Bay Area were founded since 2011 when the so-called 'tech boom 2.0' took off and housing prices began to accelerate (Maharawal, 2017; Whittle et al., 2015).

A further contributing factor to the growth in surplus food redistribution is the existence of the Bill Emerson Good Samaritan Food Donation Act (1996) which absolves those who donate food to a non-profit or charitable organisation from civil and criminal liability. The State of California goes beyond this basic federal protection, with the California Good Samaritan Food Donation Act (2017) including food donations given directly to the end recipient. The State is also working towards reducing food waste through a bill which aims to clarify confusing language around expiry dates, widely acknowledged to be a contributor to the wasting of edible food, largely at the consumer level (Rosengren, 2017). In addition, within San Francisco, a supportive local framework for redirecting food from landfill and reducing food waste exists and it was the first city in the United States to introduce mandatory recycling and composting in 2009 (Sullivan, 2011).

Overall, this context is crucial in understanding how and why activities and initiatives around surplus prepared food emerge, exist and operate, as questions of food surplus are inextricably embedded in places (Coles and Hallett, 2013). Using the Bay Area of San Francisco as a case study it is possible to explore how surplus food comes to be seen in multiple ways, as simultaneously both waste and resource, as risk and active archive of societal processes.

3.2. Surplus prepared food redistribution: case study initiatives

The key characteristics of the four initiatives examined in this study are detailed in Table 1 and described below.

Food Runners have been redistributing surplus prepared food since 1987, making them the oldest and one of the most established redistribution initiatives in San Francisco. Working with the dual goals of ‘[a]lleviating hunger and preventing waste in San Francisco,’ this grassroots non-profit is run almost entirely by volunteers and in 2017 claimed on its website to redistribute 10,000 meals per week to charities. Although it is not the sole or even prime form of communication, volunteers with Food Runners have access to an app with which they can designate and organise pick-ups and deliveries. Food donors also contact the initiative via more traditional forms of communication, namely by phone or email. Food Runners identify a range of donors on their website, including wholesalers, retail groceries, cafes, caterers, farmers markets, restaurants, hotels, takeout stores, bakeries, hospitals, schools, corporate cafeterias, special event planners, and food photographers (which is a big industry in San Francisco). In addition, on their website Food Runners provide illustrative case studies for prospective donors, naming companies who have donated to them in the past. For example:

‘Have you ever wondered what happened to the excess molasses glazed cocktail ribs at the last gala or catered event you attended? Companies like Melon’s Catering, Fork & Spoon and Taste Catering and many more call Food Runners. Paula Le Duc Fine Catering called Food Runners following the San Francisco premier of Pixar’s “Ratatouille.” Food Runners picked up over five hundred mouth watering Croques de Monsieur sandwiches that would have otherwise gone in the garbage.’

Copia, established in 2012 (previously named Feeding Forward), uses a web-based platform and advanced technology to match surplus food with nearby charities. In contrast to Food Runners it is established as a for-profit company and charges donors for surplus food collections, advertising ‘[y]our food is too valuable to be wasted. So is your money’, and claiming on its website that the donor can make annual savings of \$30–35k for connecting with Copia. While the website does not exclude any business from donating, during an interview with an initiative employee they identified their core market as:

‘... food manufacturing, distribution, consumer-facing businesses and then homes, we’re in the consumer-facing businesses. So restaurants, hospitals, universities, grocery, retail, catering ... we’ll take anything. You know, because of how the technology works it doesn’t matter what’s in the car as long as we have a recipient that will take it’ (Copia Interviewee 1).

Copia is the only for-profit initiative in this sample. The justification for this model is given in the quotation below:

‘The reason customers pay us is because of our inventory tracking. We can give them data and analytics on what’s going to surplus or what’s excess and some pretty cool visualisations tools on understanding trends so they can reduce waste. [Also there are] tax reduction receipts ... In our system, because we’re tracking it all the whole way through, it’s a closed loop. So when it gets to the recipient it’s digitally signed at that moment in time. It reduces disposal costs when they can maybe cut out a day, a pickup, or whatever the case may be. And then the top line side we provide marketing and other sustainability reporting basically, right, so external and internal reporting. So that’s why we charge and why we’re for-profit, because of the value that’s created around what we’re doing.’

Replate, a Berkeley-based non-profit initiative, also uses an advanced technology platform to match ‘extra food with communities in need instantly’. Donated food often comes from tech industry offices and is redistributed to emergency shelter and food providers. For example in 2018, Replate’s website listed Facebook, Twitter, Airbnb, LinkedIn and amazon amongst its donors. As one interviewee suggested:

‘... when we talk businesses we mean food suppliers, like caterers, restaurants, cafés ... the other portion of our clients, which is typically – and I would say more than two-thirds of them – corporate offices, tech firms (Replate Interview 1).

Established in 2016, they claim to have redistributed over 1 million pounds of food or 833,000 meals. They are in the process of developing an app which allows for direct giving and sharing of food within a set community which is currently being trialed within the Berkeley campus community. Like Copia, Replate collates data on the food surplus they collect and report this back to the donors as part of their service.

The Food Recovery Network is a nationwide student movement fighting ‘food waste and hunger by recovering perishable food that would otherwise go to waste from their campuses and communities and donating it to people in need’, with individual chapters ranging from informal groups of students to official societies integrating with campus facilities. The University of San Francisco Chapter is the particular wing of the Food Recovery Network initiative examined in this paper. In 2016 they noted on their website that 1500 pounds of surplus food was redistributed the previous semester. They work with university food outlets and other catered events on campus as well as with a limited number of food businesses, such as one of North California’s largest produce distributors, San Francisco Wholesale Produce.

The next section focuses on the empirical work with the four initiatives and distils three themes: transitions, technologies and tensions, which help understand the values that surround and infuse food which has failed to meet its intended destination and how those values change during the social lives of food surplus.

4. Valuing surplus prepared food: transitions, technologies and tensions

4.1. Transitions

As already established, what is viewed as valuable is culturally and politically contingent and can change through time, space and from different vantage points. It is no different with respect to surplus food which also undergoes multiple value transitions during its social lives. Indeed, it is a key transition in value that produces the food surplus in the first instance. Though numerous reasons for the large quantities of food discarded at the retail, service and consumer levels have been put forward, it is argued that the fundamental root of the food waste problem is that those for whom food is cheap, plentiful and accessible no longer place appropriate value on it (Finn, 2014; Campbell et al., 2017). Appropriate, that is, with respect to the value of the labour and other resources such as water and energy that have gone into making the food, but also with respect to the value that food has for others. Additionally, there are few repercussions to over purchasing, poor planning, or throwing away surplus food, with waste management often representing a relatively small cost to many businesses and consumers. Indeed, such wastage is often seen as an unavoidable consequence of contemporary production and consumption systems based on growth models and assumptions of abundance (FAO, 2011; Steedon, 2017).

A culture of abundance in industrialised countries is nowhere more evident than in the multinational and ‘start-up’ technology companies which are a growing part of San Francisco’s economy. Businesses are increasingly using in-house or external catering teams to provide free employee meals. This practice is viewed by employers as a tool to attract and retain the best talent in the field, ensure staff are well-fed, productive and engaged, and encourage employees to be at their desks longer by setting morning and evening meal times (Bull, 2016). Such practices are on the increase, with the Society for Human Resource Management finding that the number of firms providing free snacks has increased by 12 percent since 2013 and that around a third of American companies now provide them (SHRM, 2018). There are concerns that this provision of free food may have unintended negative health

consequences for employees. In 2018 the Division of Nutrition, Physical Activity, and Obesity at the U.S. Center for Disease Control and Prevention, found that the free food people are eating at work is contributing to obesity with most of the food provided being high in salt and refined grains, such as biscuits, sandwiches and cakes (Onufrak, 2018). Focusing on food waste for the moment, the surplus redistribution initiatives examined in this research argued that it was in particular a desire to satisfy employees with variety-filled and exciting menus that made estimating demand and planning more challenging and which resulted in regular and substantial amounts of surplus. Indeed, the quantities of surplus food from this sector are so substantial that according to Replate ‘[M]ore than two-thirds of our clients are corporate offices and tech firms that cater breakfast, lunch, and dinner on a daily basis.’ Food is often prepared and pre-plated in advance of serving, and it was explained by Replate that the regular production of surplus is seen as preferable to insufficient or less-than-fresh meals. ‘It’s a big deal for them if they don’t have enough food at a certain event or for their employees – a really big no.’ This format of ‘pre-plating’, explained a Zero Waste officer in the San Francisco Department of the Environment ‘is a huge problem. You’ll walk into your conference and all your food will be there, including the dessert, including the salad. But not everybody wants to eat dessert, not everybody wants to have a salad.’

Considerable volumes of food then regularly transition from an enticing meal with commercial or social value, to being excess or surplus to requirements and ready to become waste. This is the moment when Food Runners, Copia, Replate and the Food Recovery Network (USF chapter) seek to revalorise the surplus by identifying it as a useful resource and extending its lifecycle through relocation. Though differing in their organisational forms, long-term goals and methods of operation, all four redistribution initiatives follow the same basic structure of collecting the food from the donor (who can schedule regular or once-off collections) and delivering it to a charitable organisation where the food is needed, useful, and valued. By bringing volume and regularity to prepared food surplus, the four initiatives make it worthwhile for charities to use and rely upon this stream of food to feed their clients. According to the founder of the Food Recovery Network (USF chapter):

‘[The pastor] actually contacted me asking me for food and we’ve been partnering with them for at least two-and-a-half years. We typically come at the end [of the sermon] and people are waiting lined up for us because they know we’re coming. ... [The students] are taking on a really big responsibility. They’re using vans and thinking ‘wow, people are really counting on us to eat’, and so they do whatever they can. They buy and make food if there’s no [available surplus] food.’

The transition in value is thus primarily occurring through the provision of a service by the redistribution initiatives that facilitates the spatial and social relocation of food. This movement brings the surplus food into new contexts and into the purview of new valuers with different needs and value regimes. ICT provides the technological means to rapidly identify surplus and need, optimizing the potential for consumption of prepared surplus food within its narrow edible window.

4.2. Technology

In many sectors such as transport and accommodation ICT is playing a key role in the revalorisation of that which is underutilized or surplus to requirements. Commonly lumped together into the broad category of sharing economies (see Davies et al., 2017c), this technologically-mediated utilization of surplus has gained significant interest and investment in relation to the exchange through sharing or commodification of surplus stuff (e.g. Freecycle), space (e.g. Airbnb), time and skill (e.g. TaskRabbit) and also, albeit to a lesser extent, surplus food (Davies and Legg, 2018). The potential added value that ICT can bring to the redistribution of surplus prepared food has been realised by many socially-minded and tech-savvy individuals, many of whom see food

waste and food insecurity as a problem of access and logistics which can be solved by improving and facilitating connections. As such there has been an emergence in ICT-mediated surplus food redistribution in the last decade as both platform and smartphone technologies became more accessible, and the issue of food waste became a topic of public and political discussion (Farr-Wharton, 2014). As explained by Copia:

‘What we realised early on is that in order to move food effectively and to really provide value to the food donors, and also reduce waste, you need to understand the inventory throughout the system – what the food donor is providing, what’s in the vehicle, and then what’s dropped off at the recipient. So what our technology does is provide an infrastructure that sits underneath all three. The customer has a way to input inventory into the system using mobile apps, the driver then comes and scans that inventory into his or her vehicle, and then at that point our backend says what type and how much food you have. And on the non-profit side they provide a profile where they say the size of the organisation, when they are open, the type and how much food they can take based on how many people they can serve, whether they have refrigeration capacity. Based on that information we route that driver to the most appropriate drop-off location as effectively we can.’

However, it is the material properties of surplus prepared food which make its value as food stuff particularly fragile (Coles and Hallett, 2013). The narrow window prescribed by food safety authorities for eating prepared food safely makes it markedly different from other waste goods revalorised through selling, sharing or redistribution. There is limited time for forming and assessing new connections or for an extended negotiation around value or transfer logistics, and the food cannot rest for weeks or months before being redistributed. Redistribution of surplus prepared food depends on immediate collection and recipients in immediate need and the technologies used by Replate and Copia facilitate the rapid identification of surplus and matching of donors and beneficiaries. The timeframe for edibility is so crucial that RePlate have introduced an automated, time-delimited system for profiling prepared food on its website.

‘One of the issues with food safety is about time, how long can the food stay out and things like that. So what we’ve done is we’ve given people time windows. For example, I want people to come pick [the surplus food] up between 1 and 3. Then after 3 o’clock the posting is automatically removed, so you can’t come to pick it up anymore. This is what the FDA recommends for how long you should leave food out, and also based on our experience. When we pick stuff up and take it out of the fridge at an office it goes to a fridge at a shelter [in] less than two hours. And everything is tracked, like how long the driver [is] taking. That’s the beauty of it. Everything is transparent.’

To the donor the true added value of the technology is the convenience factor, allowing them to use an online platform to post once-off or regularly scheduled quantities of surplus and avail of a managed service. They can track the driver and food in transit, minimising employee inconvenience (often office receptionists and administrators have to arrange entrance into the offices for the redistribution initiatives), and ensuring the food is responsibly managed and promptly delivered. This technology also offers the ability to track trends and spikes in food surplus, information which can be fed back to the donors and potentially used to improve efficiency and reduce costs.

The technologies essentially open up new conduits (Evans, 2017) for the continued life of surplus prepared food, which is then able to transition between different cultural categories, hierarchies and regimes of value (cf. Appadurai, 1986). According to Replate, being seen as tech-oriented and able to ‘speak the language of LinkedIn and Uber and Google’ increases access to high quality surplus, and the use of advanced ICT further appears to increase scalability. Copia currently operates across the Bay Area and they are expanding to new areas by sharing their advanced technology to power other food redistribution initiatives. Meanwhile, Replate operates in over 300 cities across the US

and Canada, managing drivers and transactions from their Bay Area base. The activities of initiatives which do not incorporate advanced ICT-mediation are more geographically limited. Food Runners operate solely in the city of San Francisco, and although the Food Recovery Network has 230 chapters across the US, the USF chapter predominantly collects its prepared food from the university.

Adopting technology requires capital and investment, and while this may be easier to generate in San Francisco, as one of the technology and start-up capitals of the world, ensuring financial and operational sustainability is still a challenge, often creating a “collision of morality, materiality and market logics” (Gregson et al., 2015: 225). Tensions between environmental, economic and social values were clearly articulated by all stakeholders involved in the arena of surplus food redistribution in the Bay Area, as initiatives attempt to meet dual goals of reducing food waste and feeding those who are food insecure in a highly commercialised environment.

4.3. Tensions

Collecting, holding and redistributing surplus food in the Bay Area, where the cost of both living and space is high, requires significant labour despite the facilitating technologies being employed by surplus food redistributors. Although the redistributed food has been liberated of its rubbish value by being made available to charities and the people they provide meals for, there are still costs that need to be covered in order to realise this extended value, and surplus food cannot usually be commodified according to traditional value chain economics. For example, in order to be covered by Good Samaritan legislation and avail of tax rebates the surplus food must be donated, free of charge, to a charitable organisation who cannot then resell the food. Additionally, the people to whom the food has most immediate use value are not in the position to purchase the food, and so the intermediary must find other ways to maintain financial viability and sustainability of operations. As such, the redistribution of surplus prepared food is replete with tensions. In this section the tensions between meeting financial, environmental and social goals and the tensions around food safety which were most clearly articulated through empirical research are discussed.

The initiatives participating in this research adopted two different models to generate financial viability. The first focuses on minimising costs by relying on volunteer labour and open access technology. The second operates as a for-profit or social enterprise, offering a valuable technology-enhanced service to food donors and charging them for collections. According to Copia:

‘There’s a business model where there’s a bunch of value being created for these customers, who should be paying for that. To really solve this problem there needs to be a national systematic view which requires a certain amount of capital that is pretty challenging to raise as a non-profit. We can raise a couple of million dollars in venture capital relatively quickly.’

Adopting a fee-for-service approach, both Copia and Replate are essentially seen by businesses as an efficient and convenient waste management service in an area where waste removal costs are particularly high and can be a substantial burden. Financial savings through reduced waste costs are accompanied by tax rebates corresponding to the weight of the donated food. At roughly \$1 per pound of food donated, this can be a considerable cost saving, totaling tens of thousands per year for large companies. Corporations are also able to demonstrate active social responsibility through donating food to those in need, generating additional reputational value and indirect economic value for the organisation. In order to attract paying customers (i.e. food donors) additional services have been developed to enhance the commercial value of participating. Copia’s unique selling point is that alongside the surplus food collection their advanced technology-enabled waste tracking system can be used by the donors to refine their

purchasing practices and reduce spending on food. As detailed earlier, they suggest that *‘[t]he reason customers pay us is because of that inventory tracking’*. However, it is not clear whether the donors have actually utilised this data to reduce the amount of surplus they generate. As Replate not only collects the food surplus which is suitable for redistribution, but also removes all food, single-use utensils and other waste materials from catered meals they effectively become a niche waste management service provider as opposed to only a dedicated surplus food redistributor.

Despite similar operational models and use of technology, Replate, whose founders were involved in early iterations of Copia, have adopted a social enterprise structure rather than a for-profit model. This brings alternative benefits and challenges as described in an interview with a founder below:

‘The beauty of being a non-profit is you can always keep focused on the end user and make them happy. That will not only serve you and stay loyal to your mission, but also will serve you being better at your business because donors are paying you money, because they trust that you’re going to be helping people with that money. Now, being a non-profit there’s other challenges [that] come with it, like acquiring talent or also funding. That takes a long time.’

By offering discounts or even free collections to producers of particularly high quality produce Replate felt they were able to improve access to nutritious food without investor or shareholder concerns over profit margins. Furthermore, not all food businesses have the desire or capacity to pay intermediaries such as Copia or Replate to manage their surplus food. Many businesses produce only small or irregular quantities of surplus and have limited, if any, interest in learning about or reducing their own waste. In these instances, they are more likely to donate to a non-profit or informal initiative like Food Runners or the Food Recovery Network who do not charge to collect surplus food. This free service is achieved through the minimisation of costs by realising the value of free labour and capitalising on a wide network of volunteers managed by a single paid staff member (Food Runners) or a small group of dedicated students who manage redistributions in their spare time (Food Recovery Network), to the point of needing no income stream. This model provides opportunities for people to demonstrate an ethic of care in relation to food security and reduce food waste voluntarily and without monetary gain. It also indicates how surplus food has an emotionally-embedded use value for volunteers, as well as donors and recipients.

Reliance on volunteers does, however, have limitations, and businesses with large or regular volumes of surplus require assurance that collection will take place at a certain time with minimal inconvenience or disruption, and that the food will be responsibly managed. Using regular, paid drivers, Replate and Copia offer this surety, and as a result they have become familiar and trusted intermediaries to both donors and recipients. As a zero waste officer in the San Francisco Department of the Environment argued:

‘Big events need a very reliable source to pick their food up at this time. You’re not going to leave a message and cross your fingers a volunteer rolls up. ... We have so much surplus in this country that it needs to go beyond the non-profits, and we need to realise that actually, we need for-profits to come in and help – like the Copia model. I’ve already heard people say, ‘oh, that’s ridiculous that it’s a for-profit model’. But no, it needs to be built into the business structure. It makes business sense.’

While the University of San Francisco has a well-established Chapter of the Food Recovery Network, it still spends significant energy on volunteer recruitment and experiences high turnover rates as members graduate. Dynamic student groups may not always have the capacity to provide a dependable, long-term service, and without any form of financial income students working with the initiative often find themselves paying for transport, serving trays and other utensils, and even purchasing food themselves for redistribution if there was no surplus

from universities supplies. With only one paid staff member to manage logistics, Food Runners do not have the capacity to do much beyond the collection and delivery of food and are generally unable to provide detailed information regarding types and volumes of surplus to donors. As a result, the non-profit and informal initiatives examined in this research, whilst successfully moving surplus food around the city and becoming depended upon to provide food for people in need, are unlikely to put pressure on donors to reduce their surplus generation.

Tensions over food safety were also iterated by multiple stakeholders involved with redistributing surplus food, as the act of moving surplus prepared food brings it into the reach of well-established regulatory regimes and policies relating to hazard analysis, health and social welfare. Although Good Samaritan legislation protects donors from civil and criminal liability (and no cases of food borne illnesses occurring from redistributed food were known to any interviewees), safety concerns were frequently articulated by businesses with surplus to donate, particularly in relation to keeping food cold enough to prevent spoilage (e.g. maintaining a cold chain). Whilst efforts are made to redistribute food in a timely manner and technology can be used to track this, often it could not be established by the initiatives how long the food had sat unrefrigerated prior to collection, whether the food was transported in a refrigerated vehicle, and whether it was handled properly after redistribution. Redistribution initiatives also faced transportation challenges related to limited parking and heavy traffic congestion in areas of downtown San Francisco, which sometimes led to them sometimes incurring parking tickets or facing significant delays in terms of both collection and redistribution. Nor is it clear from any of the initiatives covered in this paper what fraction of the redistributed food is subsequently thrown away by the charities and the not-for-profit groups that are the major recipients. This is important in terms of following the after lives of surplus food but it is challenging for two key reasons. The first relates to capabilities with the more informal, volunteer run initiatives such as the Food Recovery Network have very little capacity to follow the surplus food beyond the point of exchange. The data tracking capabilities of Copia and RePlate alongside their employee structure certainly makes such an activity more feasible, however both are currently focused on monitoring and analysing food surplus and waste from donors only. This raises the second challenge for further following the flows of surplus food which relates to uneven power structures within the food system. The majority of efforts of the initiatives and indeed policy makers, as illustrated by the recent European guidelines on surplus food donation, have been on getting commercial operators to agree to send surplus their way. Identifying need for food is unfortunately a less onerous task in San Francisco. These power asymmetries within the sharing of food surplus while unsurprising, do deserve further interrogation.

The nutritional qualities of the surplus food donated and redistributed have also been questioned. In addition to uncertain timelines, prepared food tends to come with limited labelling, which affects the ability to provide allergen warnings or the source of ingredients. With the proportion of elderly and unwell people on low incomes growing in the Bay Area (Maharawal, 2017, Fagan and Knight, 2015), the recipients of the food are likely to be vulnerable and requiring specialised diets catering to specific health needs, something that is difficult to respond to with the unpredictability of surplus food. Additionally, there are moral questions and potential hazards around redistributing surplus food that resonate with discussions of morals and markets more broadly (Sayer, 2015) and in relation to food (Wilson and Jackson, 2016). However, establishing whether redistributing surplus prepared food is helping to create a more moral food economy, or whether it is simply propping up an immoral one is hard to discern as end-to-end analyses of impacts are rarely undertaken. In many cases this is due to a lack of capacity rather than poor practice, as following the full extent and duration of impacts around food is notoriously challenging (Davies et al., 2018). In response, some researchers have argued strongly that donated food of questionable nutritional value is being offloaded on the

providers of emergency food relief rather than resolving the structural problem of food insecurity (Caraher and Furey, 2017). As one expert working in food insecurity and health in San Francisco said, nodding to matters of what counts as justice in relation to food surplus mobilities (Davies, 2019):

'I think we've got to tackle the food waste issue as a separate issue to food insecurity. To me it gets problematic when everybody with half a chicken in the refrigerator thinks they need to get it to a poor person and wants to take a picture through an app of their refrigerator, because then you're bringing in a lot of food safety and handling issues. ... For a person who doesn't have money for food I think they should have choice, especially for their health needs.'

Further critical voices have argued that the redistribution of donated food is perpetuating rather than transforming unsustainable and inequitable food systems (Fisher, 2017), and that tax breaks for donated surplus may in fact work against source reduction. This paradox was repeatedly articulated by initiatives whose business model essentially depends on the production and redistribution of material they wish did not exist. As Replate, explained *'basically, we would love to drive ourselves out of business, and I think it's a success for us if we are actually out of business at some point'*.

The initiatives studied in this paper were not claiming, or even aiming, to make radical changes to the broader, capitalistic agri-food system, rather they were seeking to make an immediate and tangible difference to food waste according to established criteria of food sustainability which identifies feeding people as the way to retain the maximum amount of value. As food donation guidelines from the European Commission (EC) state, "[w]hen food surpluses occur, the best destination, which ensures the highest value use of edible food resources, is to redistribute these for human consumption" (EC, 2017: 2), as well as noting that, "food donation not only supports the fight against food poverty, but can be an effective lever in reducing the amount of surplus food put to industrial uses or sent for waste treatment and ultimately to landfill" (EC, 2017: 2). Nonetheless, while not necessarily transformative, the ICT-mediated surplus food redistribution initiatives do successfully revalorise substantial quantities of surplus prepared food, adding a more satisfactory concluding chapter to its social life. They are at least helping to move some edible food away from landfill and meeting some of the nutritional needs of at-risk populations if not resolving the root causes of those problems. Beyond the feasibility issues, it is certainly questionable whether it is the responsibility of such initiatives to resolve such structural problems alone.

5. Conclusion

The technical challenge of redistributing surplus prepared food located in a liminal zone between waste and food, stems from its particularly vital molecular mobilities and volatile materialities. Concurring with other studies of diverse economies and alternative provisioning systems (Holmes, 2018), this paper has shown how redistributive initiatives find ways to extend the life and hence value of surplus prepared food by using ICT to rapidly relocate it to actors who can provide a food service for people. It has demonstrated how the particular context of the San Francisco Bay area provides a fertile incubator for the development of these activities, providing consistent and significant volumes of surplus prepared food, coupled with a widespread acceptance of technologically-enhanced solutions and persistent food insecurity. Given that initiatives which redistribute surplus prepared food are creating new exchange models that rely on the existence of wasteful practices and hunger, it would be easy to conclude that the initiatives in this paper do little more than preserve the use value of surplus food, essentially functioning as logistics operations rather than disrupting power relations or reducing structural inequalities and injustices of contemporary food systems and economies. However, their activities are not restricted to material movements. Informational flows on

surplus food are developing and being communicated to those who produce them which, with appropriate regulation and enforcement, could provide the stimulus for remedial action further up the supply chain. More broadly, the activities of initiatives are gaining a higher public profile and improving general awareness of complex food systems which have evolved to factor in waste as part of their business models. There is no guarantee that such heightened awareness will translate into actions to change these models to reduce wastage and the creation of surplus, but it remains a necessary if insufficient part of any such a transition. Further work is certainly required to comprehend the full impact of being involved in redistribution activities as donor, intermediary, volunteer and recipient, although the diversity of initiatives, contexts and participants means identifying universal experiences is unlikely (Davies et al., 2017c). A key challenge for redistribution initiatives is that their very purpose requires them to engage with multiple actors who prioritise different values, and use different orders of worth and worlds of justification that embody competing discourses, rationalities and logics (Boltanski and Thévenot, 2006). Redistribution initiatives function as intermediaries, or boundary objects, which provide different functions for different communities spanning commercial and civic worlds. Examining them, as this paper does, can help to understand how various actors co-operate despite having different and sometimes conflicting interests, addressing the apparent paradox common to many emergent ICT-mediated sharing practices (Richardson, 2017).

This paper has explored the ways in which food surplus and its unpredictable social lives might be thought of as a parallax object that “disturbs the smooth running of things”, in the same way that Moore (2012: 793) argues in relation to waste more broadly. Whether viewed as hazard or risk, fetish or commodity, object or affect, food surplus evokes conversations about values and valuation, development, justice, sustainability, and progress. Following food surplus in the ways this paper has demonstrated also reveals the politics and socio-cultural norms that have enabled waste to be given rubbish value and rendered invisible in everyday life or disciplined through the formation and enactment of food safety and waste management regulation. Following on from Appadurai (1986) and Moore (2012), this paper suggests that continued intra- and interdisciplinary engagement with surplus food is needed as it escapes and exceeds any one perspective; indeed it is an exemplary topic for cooperative research. Attending to the multivalent values and volatile social lives of surplus food has the material and affective potential to identify and address the power geometries embedded in food systems. As Žižek (2006: 298) argues, “[a] certain excess ... is in capitalism elevated into the very principle of social life ... The key question thus concerns the relationship between these excesses: the “economic” excess/surplus which is integrated into the capitalist machine ... the “political” excess of power inherent to its exercise ... the constitutive excess of representation over the represented” (Žižek, 2006: 298). It remains that hunger is a very real and immediate problem, and these initiatives are at least actively increasing access to food and beginning dialogues on excess and waste reduction. ICT is certainly creating new zones of traction for the redistribution of surplus food, but food safety regulations constructed with other food systems in mind and social norms around the moral hazards of recirculating leftovers also create ongoing zones of friction.

The redistribution of food surplus discussed in this paper goes by a number of names, including food rescue and food recovery (Reynolds et al., 2015; Garrone et al., 2014). While such naming may be received unreflectively in everyday interactions, it is rarely innocent. Rather, it is a more or less explicit socio-cultural and political act of framing and placing, which often reflects the perceived value of the food in question from a particular valuer at a given moment and in a specific context. Such designation of matter in this way does matter. It locates the food from a social, economic and political perspective, not least rendering it open to the discipline of certain regulatory and policy regimes which are inherently political and infused with uneven power relations. In

conclusion, attending to those who control the motion of food surplus – its trajectory, speed, transparency and indeed its very possibility – provides an entry point in to debates about the politics of value around surplus prepared food. This is important, but it is only the beginning. Further voices, particularly of those who receive surplus prepared food certainly deserve more consideration if the work of the initiatives discussed in this paper is to be more than stop-gap measures for a broken food system.

Acknowledgements

This paper is based on research that has received funding from the European Research Council (ERC) under the European Union’s Horizon 2020 research and innovation programme (grant agreement no. 646883). The authors would also like to thank all research participants for sharing their knowledge, experiences and support during this research.

References

- Alexander, P., Brown, C., Arneth, A., Finnigan, J., Moran, D., Rounsevell, M.D.A., 2017. Losses, inefficiencies and waste in the global food system. *Agric. Syst.* 153, 190–200.
- Alexander, C., Smaje, G., 2008. Surplus retail food redistribution: an analysis of a third sector model. *Resour. Conserv. Recycl.* 52 (11), 1290–1298.
- Allen, P., 2010. Realising justice in local food systems. *Cambr. J. Reg. Econ. Soc.* 3 (2), 295–308.
- Appadurai, A., 1986. *The Social Life of Things: Commodities in Cultural Perspective*. Cambridge University Press, Cambridge.
- Braun, B., 2008. Environmental issues: inventive life. *Prog. Hum. Geogr.* 32, 667–679.
- Bridge, G., Smith, A., 2003. Intimate encounters: culture–economy–commodity. *Environ. Plan. D: Soc. Space* 21 (3), 257–268.
- Berube, A., 2014. All Cities are not Created Unequal [online]. The Brookings Institution. Available from: <<http://www.brookings.edu/research/papers/2014/02/cities-unequal-berube>> (accessed 15/01/2018).
- Boltanski, L., Thévenot, L., 2006. *On Justification: The Economies of Worth*. Polity, Cambridge.
- Bull, M., 2016. These tech companies probably have a better office cafeteria than you [online]. March 1st. Bon Appétite. <<https://www.bonappetit.com/entertaining-style/article/tech-company-cafeterias>> (accessed 15/01/2018).
- Byrne, L., 2017. Commissioner refers to Famine as he calls food waste ‘immoral’. The Irish Independent. May 22 2017. Available from: <<https://www.independent.ie/irish-news/commissioner-refers-to-famine-as-he-calls-food-waste-immoral-35739901.html>> (accessed 10/10/18).
- Campbell, H., Evans, D., Murott, A., 2017. Measurability, austerity and edibility: introducing waste into food regime theory. *J. Rural Stud.* 51, 168–177.
- Caraher, M., Furey, S., 2017. Is it appropriate to use surplus food to feed people in hunger? Short-term Band-Aid to more deep-rooted problems of poverty. Food Research Collaboration Policy brief. Retrieved from: <<http://foodresearch.org.uk/wp-content/uploads/2017/01/Final-Using-food-surplus-hunger-FRC-briefing-paper-24-01-17-.pdf>>.
- Ciagli, A., Villafiorta, A., 2016. Beyond food sharing: supporting food waste reduction with ICTs. IEEE International Smart Cities Conference, Trento, Italy.
- Cicatiello, C., Franco, S., Pancino, B., Blasi, E., 2016. The value of food waste: an exploratory study on retailing. *J. Retail. Consum. Serv.* 30 (C), 96–104.
- Clapp, J., 2002. The distancing of waste: overconsumption in a global economy. In: Princen, T., Maniates, M., Conca, K. (Eds.), *Confronting Consumption*. MIT Press, Cambridge, MA.
- Clark, J.H., Luque, R., 2013. Valorisation of food residues: waste to wealth using green chemical technologies. *Sustain. Chem. Process.* 1, 10.
- Coe, N., Dicken, P., Hess, M., 2008. Global production networks: realizing the potential. *J. Econ. Geogr.* 8 (3), 271–295.
- Cohen, J., 2006. Ten years of leftovers with many hungry still left over: a decade of donations under the Bill Emerson good samaritan food donation act. *Seattle J. Soc. Justice* 5 (1), 455–496.
- Coles, B., Hallett, L., 2013. Eating from the bin: Salmon heads, waste and the markets that make them. *Sociol. Rev.* 60 (2), 156–173.
- Crang, M., Hughes, A., Gregson, N., Norris, L., Ahamed, F., 2013. Rethinking governance and value in commodity chains through global recycling networks. *Trans. Inst. Brit. Geogr.* 38 (1), 12–24.
- Davies, A.R., 2019. Redistributing surplus good: interrogating the collision of waste and justice. In: Cook, N., Butz, D. (Eds.), *Mobilities, Mobility Justice and Social Justice*. Routledge, London.
- Davies, A.R., 2012. Geography and the matter of waste mobilities. *Trans. Inst. Brit. Geogr.* 37 (2), 191–196.
- Davies, A.R., Edwards, F., Marovelli, B., Morrow, O., Rut, M., Weymes, M., 2017a. Creative construction: crafting, negotiating and performing urban food sharing landscapes. *Area* 49 (4), 510–518.
- Davies, A.R., Edwards, F., Marovelli, B., Morrow, O., Rut, M., Weymes, M., 2017b. Making Visible: interrogating the performance of food sharing across 100 urban areas. *Geoforum* 86, 136–149.

- Davies, A.R., Weymes, M., MacKenzie, S., 2018. Communicating goals and impacts of urban food sharing. *Urban Agric. Mag.* 34, 38–40.
- Davies, A., Legg, R., 2018. Fare sharing: interrogating the nexus of ICT, urban food sharing, and sustainability. *Food, Cult. Soc.* 21 (2), 233–254.
- Davies, A.R., Gray, M., Donald, B., Knox-Hayes, J., 2017c. Sharing economies: moving beyond binaries in a digital age. *CJRES* 10 (2), 209–230.
- Davies, A.R., 2001. What silence knows – planning, public participation and environmental values. *Environ. Values* 10 (1), 77–102.
- Devaney, L., Davies, A., 2016. Disrupting household food consumption through experimental HomeLabs: outcomes, connections, contexts. *J. Consumer Cult.* 17 (3), 823–844.
- Duggan, T., 2017. Nearly 1 in 4 San Franciscans struggle with hunger. *San Francisco Chronicle*. May 24th 2017. Available from: <<http://www.sfchronicle.com/food/article/Nearly-1-in-4-San-Franciscans-struggle-with-hunger-11171678.php>> (accessed on 12/12/2017).
- EC, 2017. EU Guidelines on Food Donation (2017/C 361/01). European Commission, Brussels.
- Edwards, F., Mercer, D., 2013. Food waste in Australia: the Freegan response. *Sociol. Rev.* 60 (S2), 174–191.
- Evans, D., 2014. *Food Waste: Home Consumption, Material Culture and Everyday Life*. Bloomsbury, London.
- Evans, D., 2017. Rethinking material cultures of sustainability: commodity consumption, cultural biographies, and following the thing. *Trans. Inst. Brit. Geogr.* 43, 110–121.
- Fagan, K., Knight, H., 2015. S.F. homeless population getting sicker, older, survey says. *SF Gate*. Available from: <<http://www.sfgate.com/bayarea/article/S-F-homeless-population-getting-sicker-older-6387308.php>> (accessed 15/01/2018).
- FAO, 2011. *Global Food Losses and Food Waste – Extent, Causes and Prevention*. FAO, Rome.
- FAO, 2014. *Developing Sustainable Food Value Chains – Guiding Principles*. FAO, Rome.
- Farr-Wharton, G., Choi, J.H.J., Foth, M., 2014. Food talks back: exploring the role of mobile applications in reducing domestic food wastage. Proceedings of the 26th Australian Computer-Human Interaction Conference on Designing Futures: The Future of Design. Sydney, New South Wales.
- Finn, S., 2014. Valuing our food: minimizing waste and optimizing resources. *Zygon* 49 (4), 992–1008.
- Fisher, A., 2017. *Big Hunger: The Unholy Alliance between Corporate America and Anti-hunger Groups*. MIT Press, Cambridge.
- Florida, R., 2012. San Francisco's urban tech boom, *San Francisco Chronicle*, September 8th 2012. Available from <<http://www.sfgate.com/opinion/article/San-Francisco-s-urban-tech-boom-3850039.php>> (accessed 12/12/2017).
- Florida, R., 2013. Why San Francisco may be the new Silicon Valley. *City Lab*. August 5th 2013. Available from: <<https://www.citylab.com/life/2013/08/why-san-francisco-may-be-new-silicon-valley/6295/>> (accessed 12/12/2017).
- Garrone, P., Melacini, M., Perego, A., 2014. Surplus food recovery and donation in Italy: the upstream process. *Brit. Food J.* 116 (9), 1460–1477.
- Gille, Z., 2010. Actor networks, modes of production, and waste regimes: reassembling the macro-social. *Environ. Plan. A* 42 (5), 1049–1064.
- Gille, Z., 2012. From risk to waste: global food waste regimes. *Sociol. Rev.* 60 (S2), 27–46.
- Gregson, N., Crang, M., 2010. Materiality and waste: inorganic vitality in a networked world. *Environ. Plan. A* 42 (5), 1026–1032.
- Gregson, N., Crang, M., Ahamed, F., Akhter, N., Ferdous, R., 2010. Following things of rubbish value: end-of-life ships, 'chock-chocky' furniture and the Bangladeshi middle class consumer. *Geoforum* 41 (6), 846–854.
- Gregson, N., Metcalfe, A., Crewe, L., 2007. Moving things along: the conduits and practices of divestment in consumption. *Trans. Inst. Brit. Geogr.* 32, 187–200.
- Gregson, N., Crang, M., Fuller, S., Holmes, H., 2015. Interrogating the circular economy: the moral economy of resource recovery in the EU. *Econ. Soc.* 44 (2), 218–243.
- Griffin, M., Sobal, J., Lyson, T., 2009. An analysis of a community food waste stream. *Agric. Hum. Values* 26 (1), 67–81.
- Henderson, G., 2004. 'Free' food, the local production of worth, and the circuit of de-commodification: a value theory of surplus. *Environ. Plan. D: Soc. Space* 22 (4), 485–512.
- Hetherington, K., 2004. Secondhandedness: consumption, disposal, and absent presence. *Environ. Plan. D – Soc. Space* 22, 157–173.
- Holmes, H., 2018. New spaces, ordinary practices: circulating and sharing within diverse economies of provisioning. *Geoforum* 88, 138–147.
- Hughes, A., 2005. Geographies of exchange and circulation: alternative trading spaces. *Prog. Hum. Geogr.* 29 (4), 496–504.
- Jameson, F., 2006. First impressions. *Lond. Rev. Books* 28 (17), 7–8.
- Lambie, H., 2011. The Trussell Trust Food Bank Network: Exploring the Growth of Food Banks Across the UK. Coventry University, Coventry.
- Lee, D., Sönmez, E., Fan, X., 2017. Combining two wrongs to make two rights: mitigating food insecurity and food waste through gleaning operations. *Food Policy* 68 (2017), 40–52.
- Lehman-Frisch, S., 2017. San Francisco, ville injuste? La capitale du progressisme états-unien à l'épreuve de la croissance des inégalités. *Annales de géographie* 714 (2), 145–168.
- Maharawal, M., 2017. San Francisco's tech-led gentrification: public space, protest, and the urban commons. In: Hou, J., Knierbein, S. (Eds.), *City Unsilenced: Urban Resistance and Public Space in the Age of Shrinking Democracy*. Routledge, London.
- McNeill, D., 2015. Governing a city of unicorns: technology capital and the urban politics of San Francisco. *Urban Geogr.* 37 (4), 494–513.
- Midgley, J., 2014. The logics of surplus food redistribution. *J. Environ. Plann. Manage.* 57 (12), 1872–1892.
- Milicevic, V., Colavita, G., Castrica, M., Ratti, S., Baldi, A., Balzaretii, C.M., 2016. Risk assessment in the recovery of food for social solidarity purposes: preliminary data. *Ital. J. Food Saf.* 5 (4), 234–238.
- Moore, S.A., 2012. Garbage matters: concepts in new geographies of waste. *Prog. Hum. Geogr.* 36 (6), 780–799.
- Morath, S., 2017. *Regulating Food Waste*. 48 Texas Environmental Law Journal, University of Houston Law Center, No. 217-A-18. Available from: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2945600> (accessed: 22-10-2018).
- O'Brien, M., 2013. A 'lasting transformation' of capitalist surplus: from food stocks to feedstocks. *Sociol. Rev.* 60 (S2), 192–211.
- Onufrak, S., 2018. Foods and beverages obtained at worksites in the United States, E16-03, June 11th 2018, Nutrition 2018. Abstract available from: <<https://meeting.nutrition.org/updates/>> (accessed 20/10/2018).
- Parfitt, J., Barthel, M., Macnaughton, S., 2010. Food waste within food supply chains: quantification and potential for change to 2050. *Philos. Trans. R. Soc. B* 365 (1554), 3065–3081.
- Parsons, 2014. California farmers: How the state feeds a nation [online] LA Times. Available from at: <<http://www.latimes.com/food/dailydish/la-dd-california-its-whats-for-dinner-20140312-story.html>> (accessed 15/01/2018).
- Pelupessy, W., Van Kempen, L., 2005. The impact of increased consumer-orientation in global agri-food chains on smallholders in developing countries. *Compet. Change* 9, 357–381.
- Power, E., 2011. Canadian food banks: obscuring the reality of hunger and poverty. *Food Ethics* 6 (4), 18–20.
- RCEP, 1998. *Setting Environmental Standards Cm4053*. The Stationary Office, London.
- Reynolds, C.J., Piantadosi, J., Boland, J., 2015. Rescuing food from the organics waste stream to feed the food insecure: an economic and environmental assessment of Australian food rescue operations using environmentally extended waste input-output analysis. *Sustainability* 7 (4), 4707–4726.
- Richardson, L., 2017. Sharing as a postwork style: digital work and the co-working office. *Camb. J. Reg. Econ. Soc.* 10, 297–310.
- Rosengren, C., 2017. California governor signs new date label bill to reduce food waste, Waste Dive [online]. Available from: <<https://www.wastedive.com/news/update-california-governor-signs-new-date-label-bill-to-reduce-food-waste/506956/>> (accessed 15/01/2018).
- SHRM, 2018. Employee benefits 2018. SHRM, Washington DC. Available from: <<https://www.shrm.org/hr-today/trends-and-forecasting/research-and-surveys/Documents/2018%20Employee%20Benefits%20Report.pdf>> (accessed 23-10-18).
- Sayer, A., 2015. Time for moral economy? *Geoforum* 65, 291–293.
- Steedon, K., 2017. Generation waste: Why are millennials throwing away so much food? Sustainable Food Trust. Available from: <<http://sustainablefoodtrust.org/articles/generation-waste-why-are-millennials-throwing-away-so-much-food/>> (accessed 15/01/2018).
- Sullivan, D., 2011. Zero Waste on San Francisco's Horizon [online]. BioCycle. Available at: <<https://www.biocycle.net/2011/07/18/zero-waste-on-san-franciscos-horizon/>> (accessed 15/01/18).
- US Census Bureau, 2015. *San Francisco Census 2015*. US Census Bureau, Washington, DC.
- Weymes, M., Davies, A., 2018. Disruptive technologies? Scaling relational geographies of ICT-mediated surplus food redistribution. SHARECITY working paper 3, Trinity College Dublin. Available from: <<http://sharecity.ie/outputs/publications/>> (accessed: 19/10/18).
- Whittle, H.J., Palar, K., Hufstедler, L.L., Seligman, H.K., Frongillo, E.A., Weiser, S.D., 2015. Food insecurity, chronic illness, and gentrification in the San Francisco Bay Area: an example of structural violence in United States public policy. *Soc. Sci. Med.* 143, 154–161.
- Wilson, M., Jackson, P., 2016. Fairtrade bananas in the Caribbean: towards a moral economy of recognition. *Geoforum* 70, 11–21.
- WRAP, 2015. *Courtauld 2025*. WRAP, London.
- Yaeger, P., 2003. Trash as archive, trash as enlightenment. In: Hawkins, G., Muecke, S. (Eds.), *Culture and Waste: The Creation and Destruction of Value*. Rowman & Littlefield, Lanham, Maryland.
- Žižek, S., 2006. *The Parallax View*. MIT Press, Cambridge, Massachusetts.