

SHARE IT: Co-designing a sustainability impact assessment framework for urban food sharing initiatives

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ABSTRACT

Urban food systems must undergo a significant transformation if they are to avoid impeding the achievement of UN Sustainable Development Goals. One reconfiguration with claimed sustainability benefits is ICT-mediated food sharing – an umbrella term used to refer to technologically-augmented collective or collaborative practices around growing, cooking, eating and redistributing food – which some argue improves environmental efficiencies by reducing waste, providing opportunities to make or save money, building social networks and generally enhancing well-being. However, most sustainability claims for food sharing have not been evidenced by systematically collected and presented data. In this paper we document our response to this mismatch between claims and evidence through the development of the SHARECITY sustainability impact assessment Toolkit (SHARE IT); a novel Sustainability Impact Assessment (SIA) framework which has been co-designed with food sharing initiatives to better indicate the impact of food-sharing initiatives in urban food systems. We demonstrate that while several SIA frameworks have been developed to evaluate food systems at the urban scale, they contain few measures that specifically account for impacts of the sharing that initiatives undertake. The main body of the paper focuses on the co-design process undertaken with food sharing initiatives based in Dublin and London. Attention is paid to how two core goals were achieved: 1) the identification of a coherent SIA framework containing appropriate indicators for the activities of food sharing initiatives; and 2) the development of an open access online toolkit for in order to make SIA reporting accessible for food sharing initiatives. In conclusion, the co-design process revealed a number of technical and conceptual challenges, but it also stimulated creative responses to these challenges.

1. Introduction

The interconnected environmental, social and economic dimensions of food systems means that food is being proposed as a common thread linking all 17 UN Sustainable Development Goals (SDGs) (The Economist Intelligence Unit, 2018). Beyond this, there is broad agreement that achieving global food sustainability is a key societal priority, although there is less agreement on exactly how such sustainability might be achieved (Garnett, 2014). Certainly, understanding the impacts of practices across the food system, from production to consumption and redistribution, will be crucial to inform decisions about what kinds of existing activities should be supported and what kinds of changes are required. However, establishing ways to identify and assess sustainability impacts around food is no simple matter. To illustrate the

challenges involved, this paper outlines and reflects on insights from a co-design experiment to support enhanced sustainability assessment of an under-studied but growing set of activities with claimed sustainability potential - urban food sharing initiatives.

Embedded within the unsustainability of our global food system are worrying trends for urban food (Serraj and Pingali, 2018). As research identifies a movement towards planetary urbanisation (Brenner and Schmid, 2012), concerns are being expressed about abhorrent geographies of both urban food waste and food poverty (Edwards and Davies, 2018). However, recent research suggests there are grounds for measured optimism about the possibility of developing more sustainable ways of meeting our eating needs with ongoing reconfigurations reflecting policy, social and technical innovation (Davies et al., 2014; Devaney and Davies, 2017). Assessment frameworks are being

Abbreviations: CRFS, City Region Food System; DPSIR, Driving force-Pressure-State-Impact-Response; FAO, Food and Agriculture Organisation; ICT, Information and Communication Technologies; SAFA, Sustainability Assessment of Food and Agriculture Systems; SDGs, Sustainable Development Goals; SIA, Sustainability Impact Assessment; SHARE IT, SHARECITY sustainability Impact assessment Toolkit

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Table 1
A matrix of food sharing typologies (Adapted from Davies et al., 2017b).

What is shared	Mode of sharing				
	Collecting	Gifting	Bartering	Selling not-for-profit	Selling for-profit
Food stuff Including: seeds, plants, animals, unprocessed and processed foodstuff, utensils, food waste, compost	Sharing food that has been foraged or gleaned, e.g. 510 fruits, USA	Providing food for free e.g. FoodCloud, Ireland and UK	Swapping food and food devices, e.g. Adelaide Hills Produce Swap, Australia	Providing affordable food on a not-for-profit basis e.g. 4th Street Food Co-op, USA	Selling home cooked food that generates income beyond the costs of production e.g. Homemade, Australia
Food spaces Including: sites for shared growing, preparation and eating spaces as well as physical redistribution hubs	Guerrilla gardening of public open spaces e.g. Elephant and Castle roundabout, London, UK	Providing spaces for growing for free e.g. The Monroe Sharing Gardens, USA	Providing spaces where bartering can take place e.g. Community Shop, London	Providing spaces for people to grow food on a not-for-profit basis e.g. Milwaukee Urban Gardens, USA	Providing spaces for supper clubs e.g. The Underground Supper Club, Ireland
Food skills Including: sharing knowledge and experiences in relation to food growing, eating, redistribution or disposal	Sharing information about places where gleaned or foraging can occur e.g. Fallen Fruit, Los Angeles, USA	Providing skills around growing for free e.g. 3000 acres, Australia	Providing opportunities to exchange information about food swapping e.g. Grow stuff, Australia	Providing workshops around nutrition or growing, e.g. Hunger mountain co-op, Montpellier, USA	Providing opportunities for travellers to experience home cooked meals with locals, e.g. Viz Eat, Global

developed to establish whether these innovations are cumulatively re-orienting urban food systems on to more sustainable pathways (Chaudhary et al., 2018; Davies and Legg, 2018). Some of these assessments focus on specific scales from the global, supranational and the national level (Chaudhary et al., 2018; FAO, 2013; Zurek et al., 2018). Others present more granular frameworks designed to examine food impacts across urban environments (Blay-Palmer et al., 2018; Moragues-Faus and Marceau, 2019) and others still have developed assessments for individual food businesses and products (Pelletier, 2015). However, while there are common drivers behind many of these assessment frameworks, the complexity of the food system means a one-size-fits-all approach is often inappropriate (Johnston et al., 2014). Despite the increasing number of assessment frameworks, there are still activities around food that remain largely invisible to policy makers and publics, such as urban food sharing initiatives which utilise information and communication technologies (ICT).

This paper responds to the mismatch between the focus and demands of existing food-oriented sustainability assessments and the goals and capabilities of urban food sharing activities. It charts the development of a novel co-designed online sustainability impact assessment (SIA) framework (hereafter referred to as SHARE IT) constructed to identify, evaluate and communicate the impacts of ICT-mediated food sharing initiatives on urban food systems and map their contribution to the sustainability of urban areas more generally. Specifically, this paper describes how a participatory process with diverse food sharing initiatives in Dublin and London informed the design of a flexible sustainability assessment framework for food sharing. As part of this process the relevance of existing assessment frameworks for establishing the sustainability worth of ICT-mediated urban food sharing was analysed. Following this, the technically and conceptually challenging process of achieving two core goals: 1) identifying a coherent SIA framework containing appropriate indicators for the activities of food sharing initiatives; and 2) developing an open access online assessment tool which aims to increase engagement with SIA reporting, is elaborated. The methods adopted to achieve these goals are documented and the creative responses to the challenges we faced are outlined. The final sections of the paper set out the next steps for testing, evaluating and operationalising the SHARE IT framework. It also provides space for a critical reflection on the broader benefits and dangers of formalising sustainability impact assessments in hard to reach sectors such as urban food sharing. However, first it is necessary to outline the kinds of initiatives enacting ICT-mediated urban food sharing.

2. The practice of food sharing

As explained extensively elsewhere (Davies, 2019), the sharing of food production, preparation and products has been documented across societies past and present as a mechanism through which sustenance has been secured and familial and friendship networks have been cemented (Gurven and Jaeggi, 2015). In essence, food sharing (as with other activities around food) involves much more than food itself and has significant personal, economic, social, political and cultural implications (Goodman, 2016; Martin et al., 2018). While the cultural diversity and evolutionary dynamism of food sharing amongst friends and family is relatively well-documented, ICT is 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 between strangers into focus (Davies et al., 2017a). Apps, maps, and other forms of online platforms are facilitating new connections between citizens, consumers, businesses, social enterprises and charities seeking to tackle issues such as food waste, food security, and unsustainable food production with the goal of building more resilient urban communities (Edwards and Davies, 2018; Marovelli, 2018; Morrow, 2018; Rut and Davies, 2018; Weymes and Davies, 2018). Yet there is no agreed definition of what counts as food sharing. For the purposes of clarity in this paper, the following definition of sharing is

adopted:

“having a portion [of food] with another or others; giving a portion [of food] to others; using, occupying or enjoying [food and food related spaces to include the growing, cooking and/or eating of food] jointly; possessing an interest [in food] in common; or telling someone about [food]”

(Davies and Legg, 2018: 237)

This definition emphasises the practices and experiences of having things in common and doing things together around food, including but moving beyond commensality (the practice of eating or drinking together). The kinds of activities involved stretch from the shared growing embodied in community gardens which operate in urban areas around the globe, through to the collaborative cooking and eating activities of community kitchens and cafes, and on to the redistributive work of surplus food initiatives that connect those with excess food to those who are in need of access to it (Davies et al., 2017b; Michelini et al., 2018) (see Table 1).

The SHARECITY100 database documented 4000 ICT-mediated food sharing initiatives globally across 100 cities and made visible the variety of food sharing initiatives and their activities, including the extent to which sharing was mediated by ICT (Davies et al., 2017b). Initiatives included online platforms that facilitate a large number of connections either peer to peer or business to charity. These connections enable users to share surplus food quickly and easily. There have been several recent case studies documenting the activities of such platform-based food sharing initiatives (Ciulli et al., 2019; Harvey et al., 2019). However, the database also documents many initiatives that would not be considered digital platforms but use other forms of ICT – websites, facebook, twitter and other social media – to facilitate their food sharing. In this paper we consider any initiative using ICT to facilitate its food sharing activities to be an ICT-mediated food sharing initiative. As documented elsewhere, there is a spectrum of ICT-mediated food sharing economies (Davies et al., 2017a). We aimed to create an accessible SIA framework, suitable for initiatives across this spectrum and that was reflected in the range of initiatives we chose for the co-design process, which is further elaborated in section 4.

Despite articulating goals which relate to economic, social and environmental aspects of sustainability, research has indicated that ICT-mediated urban food sharing initiatives of all kinds have struggled to identify and communicate their movement towards these goals (Davies et al., 2018). Indeed, the limited nature of public impact reporting is stark (Davies et al., 2017b). In response, we embarked on a process of co-design with a range of urban food-sharing initiatives to produce a

practical framework for these initiatives to better understand and communicate their impact on food sustainability. The first step in this co-design process was to review the existing relevant SIA frameworks and methodologies.

3. Existing SIA frameworks & methodologies

Sustainability assessment is one of the most complex types of appraisal methodologies (Sala et al., 2015), and it is widely acknowledged that there is little consensus on which metrics should be used as standard to assess the sustainability of food systems (Johnston et al., 2014; Prosperi et al., 2015). In other sectors of contemporary ICT-mediated sharing, particularly in relation to mobility or accommodation sharing, there has been increased attention to the impacts being created which disrupt and expand mainstream forms of exchange in goods and services (Martin, 2016). However, although numerous papers claim to focus on the sustainability of sharing (e.g. Frenken, 2017; Geissinger et al., 2019; Pouri et al., 2018), few of these provide more than a description of practices. They either focus more on what sharing initiatives do rather than the impacts they create or tend to emphasis one aspect of sustainability, for example environmental or economic impacts (Nijland and van Meerkerk, 2017; Rabbitt and Ghosh, 2016; Sanyé-Mengual et al., 2018), rather than attempt a holistic SIA analysis. With respect to urban systems generally, there has been greater focus on the environmental and economic pillars of sustainability with less attention paid to social outcomes (Petit-Boix et al., 2017). As such, developing a holistic SIA assessment framework to account for the specific and novel context of urban food sharing in relation to sustainability assessment represented a significant and important research challenge.

Within SIA sustainability indicators have long been identified as a useful way to signify the condition of food and urban systems and their relative sustainability (Feenstra et al., 2005; Ghosh et al., 2006). These sustainability indicators are based on the aggregation of specific data to provide useful information about the state of these systems, with respect to a particular aspect of their overall sustainability. In many cases, these indicators are aggregated to form frameworks for assessing the sustainability of a system across some or all of the sustainability pillars (e.g. social, economic, environmental, governance). In turn these frameworks can be used to inform actions taken to improve the sustainability of food systems (Huang et al., 2015). The main options for the types of indicators used in SIA of food systems and the ways they are commonly organised are summarised in Table 2.

The different approaches and indicator types summarised in Table 2

Table 2

Options for framework structures and indicator types within sustainability impact assessment (Sources: Huang et al., 2015; Moragues-Faus and Marceau, 2019; Prosperi et al., 2015).

Framework	Description
The Driving force-Pressure-State-Impact-Response (DPSIR)	Indicators are identified and clustered according to driving forces such as water scarcity or acute problems with air pollution in a particular region
Theme-based	Indicators are clustered around core pillars of sustainability – social, economic, environmental and governance
Goal-oriented	Goals are identified and desired outcomes and indicators are used to measure progress towards these goals
Indicator types	
Performance-based	Indicators are designed to quantitatively measure performance, in many cases against a target or benchmark, in order to motivate positive changes
Values-based	Indicators aim to set actions within the context of ethical values in order give worth to the rationale for actions aimed at improving sustainability rather than just focus on outcomes
Reflexive-based	Indicators are designed to reflect knowledge and the limits of knowledge, for example by favouring pathways or decisions based on the precautionary principle whereby actions with unknown consequences for sensitive eco-systems are avoided
Practice-based	Indicators are designed to highlight the tools, actions and systems required to bring positive change. These are process rather than outcome oriented. For example, through purchasing only fair trade products or adopting a specific farming techniques (such as planting hedgerows), which are likely to bring sustainability benefits

are adopted in SIA frameworks according to the specific objectives and target audience. With SHARE IT, we sought an SIA framework that could inform the actions of specialist initiatives who are directly engaged in urban food sharing so that they can improve their impacts on urban food sustainability. SHARE IT was also designed to support initiatives to communicate their impact to policy makers and the wider public. As our target audience was disparate geographically and diverse organisationally, the framework needed to be both comprehensive and flexible enough to capture the diverse nature of impacts created by food sharing initiatives. These objectives aligned with the strengths of a theme-based organisational structure, grouping indicators into the four most commonly recognised dimensions of sustainability. While it is common for theme-based assessment frameworks to expand on these dimensions (Moragues-Faus and Marceau, 2019), the need for simplicity in use and communication meant that the four core pillars were used. For DPSIR structures, a specific or local context needs to be defined in order to build the framework, for instance defining the most important sustainability issues facing a particular city or region (Prosperi et al., 2015). Our aim to make an internationally useful framework meant that this was not a suitable approach, as the burden of defining this context would be transferred to users of the framework. Similarly, the goal-orientated approach was not applicable as it is impossible to define one common goal for all food sharing initiatives.

Another key step in the development of SHARE IT was ensuring that the types of indicators that would be most suitable for its objectives were included. Two main considerations were important for this. First, many food sharing initiatives are relatively small-scale organisations operating on tight-budgets and with limited resources and often volunteer labour (Davies, 2019; Davies et al., 2017b). As such, it is unrealistic for many initiatives to engage with sophisticated reporting tools that are demanding in terms of data collection or analysis. Second, many initiatives are increasingly facing external pressures (for example to secure funding) and in some cases have internal ambitions (for self-evaluation purposes) to engage in greater levels of impact reporting. Based on these requirements it was clear that both performance- and practice-based indicator options would be required for each of the impact areas within the SHARE IT framework.

An initial review of the existing SIA frameworks for food systems and in particular urban food systems was conducted in order to establish the existing resources available for constructing SHARE IT. This included recent literature reviews focusing on SIA frameworks for urban food systems (Blay-Palmer et al., 2015; Coppo et al., 2017; Moragues-Faus and Marceau, 2019). Subsequently, consideration was given to impact assessments which have focused on supporting initiatives from the third sector, such as civil society groups, charities and other not-for-profit initiatives, to demonstrate the impacts of the work that they conduct (Ellis and Gregory, 2008; Harlock, 2013; Walker et al., 2000) and which provide specific insights into the scope and capacities of such organisations.

3.1. Existing SIA frameworks for food and urban food systems

There have been many SIA frameworks created specifically for food systems, to provide information for planning, policy development, self-assessment and certification purposes (Schader et al., 2014). These frameworks and approaches led to calls for internationally standardised approaches in order to harmonise SIA practices for food systems. As such, Sustainability Assessment of Food and Agriculture Systems (SAFA) by the Food and Agriculture Organisation (FAO) has become a particularly important reference to harmonise the evaluation of organisations operating across the food supply chain (Landert et al., 2017; Moragues-Faus and Marceau, 2019). SAFA is a holistic SIA framework developed to assist organisations in the sector in understanding the constituent components of their sustainability impact and to identify improvement strategies. The framework comprises 21 sustainability themes, which are linked to defined SDGs and contains a total of 118

default indicators categorised into 4 sustainability dimensions: economic resilience, environmental integrity, good governance and social wellbeing (FAO, 2013). Users of SAFA can build an assessment using a combination of the performance- and practice-based indicators relevant to them in order to build a bespoke baseline assessment of their farm or food business at the organisation level. In these respects, the objectives and requirements of SHARE IT are in many ways aligned with SAFA, but our need to account for sustainability considerations specific to urban food systems and food sharing meant that the SAFA framework alone was not sufficient to meet our objectives.

A number of indicator frameworks have been set up to measure the progress of sustainable urban food strategies in individual cities including; Bristol, Brussels, Calgary, Cardiff, Milan, New York, San Diego and Vancouver (Coppo et al., 2017; Prosperi et al., 2015). When conducting a comparative analysis of these approaches, Coppo et al. (2017) found that local or organic food consumption, employment activities, food and health, environmental preservation and local food production were the broad areas of indicators most commonly included in urban food sustainability strategies. The emphasis on urban food production was also identified by Moragues-Faus and Marceau (2019) with a particular focus on the potential impacts for urban food security, the health of urban citizens and environmental impacts. Indicators in the areas of community-led trade and related to the total amounts of food purchased were least frequently included in such frameworks.

A far smaller number of SIA frameworks have been established to assess urban food systems across multiple sites (Blay-Palmer et al., 2018; Landert et al., 2017; Moragues-Faus and Marceau, 2019). In the case of Landert et al. (2017) this meant adapting the existing SAFA indicators to form a specific framework for assessing the sustainability of urban food governance. While certain indicators from SAFA were excluded due to being identified as inappropriate for urban systems, no new indicators were added to account for any urban specific sustainability issues. The SIA framework recently developed by Moragues-Faus and Marceau (2019) took a slightly different approach using workshops as well as existing literature resources to produce a large set of indicators from which relevant stakeholders (such as city officials) could select relevant indicators and take positive actions towards improving the sustainability of their food system. The City Region Food System (CRFS) toolkit meanwhile is an international initiative by the Food and Agriculture Organisation (FAO) and RUAF, a global partnership on sustainable urban agriculture and food systems, which was established to help drive sustainability improvements, identify potential strategy and policy changes across city regions. Like the work of Landert et al., (2017) it is primarily aimed at policy makers and those seeking to establish urban food strategic plans (Blay-Palmer et al., 2018). The framework itself comprises 210 indicators in total, with a suggested process for users to select appropriate indicators according to the specific circumstances of the urban area under consideration (Carey and Dubbeling, 2017).

While both the SAFA and the CRFS frameworks were extremely useful, it was clear that any indicators adopted from them would need to be rescaled from the city level down to capture the contribution of individual initiatives. Equally, core goals and impacts of food sharing initiatives such as reducing loneliness or enhancing community cohesion, were not captured by the range of indicators involved in the frameworks. Ultimately, it was clear from the review of existing assessment SIA frameworks of food systems that no single tool or methodology was available which could fulfil our objective of evaluating and communicating the impact of food sharing initiatives. However, it was also clear that there are many indices available for assessing food sustainability of which specific components could be utilised within the SHARE IT framework.

3.2. Identifying indicators beyond food-based SIAs

Food sharing involves much more than the sharing of food itself and

has significant personal, economic, social, political and cultural implications (Goodman, 2016; Martin et al., 2018; Davies, 2019). Specific objectives amongst our co-design partners, for example, sought to increase community cohesion and improve the self-confidence of young people and shared eating is known to alleviate loneliness and increase levels of life satisfaction, happiness and trust in local community (Dunbar, 2017). Indeed, dining habits themselves, and more specifically the number of meals consumed by an individual that are shared with others in a community, are a modern indicator of social capital (Julier, 2013). In fact the frequency of social dinners has been shown to be correlated with the size of an individual's close support network (Dunbar, 2017). Eating together has also been flagged as an important factor influencing eating habits, with shared meals seen as a promising activity within healthy eating campaigns (Higgs and Thomas, 2016).

While missing from food SIAs, a review of broader assessment frameworks established that indicators to capture impacts in relation to objectives such as community cohesion and loneliness have been incorporated into the assessments of charities, public health organisations (Heinrich and Gullone, 2006; Simmonds et al., 2016; Tahmassian and Moghadam, 2011) and educational establishments (Burger and Samuel, 2017; Schwarzer and Warner, 2013). To flesh the issue out a bit further, a common objective of community gardens and kitchens is to provide opportunities for people to spend time with others within their communities. This goal has emerged as living in urban areas is increasingly correlated with increased odds of social isolation and feelings of loneliness (Menec et al., 2019). More broadly, research in the UK and the USA has found that loneliness can lead to increased incidences of depression (Griffin, 2010). Indeed, other studies have found that loneliness generally is correlated to negative health outcomes equivalent to smoking around 15 cigarettes a day, and an increased mortality risk of around 26% (Holt-Lunstad et al., 2015). While the most effective predictors of mortality risk with respect to social relationships are multifaceted indices (which account for familial arrangements, marital status and other factors), friendships and the perceived level of support available from these friendships are also very important (Chopik, 2017; Cohen et al., 1997). As well as reducing loneliness, shared growing and eating, as well as volunteering with initiatives that redistribute food, have been shown to increase feelings of belonging to a community and understanding between social groups (Dunbar, 2017; Meier and Stutzer, 2008; Rogge et al., 2018).

In mathematical sociology, interpersonal ties are defined as information-carrying connections between people, which are generally classified into three categories: strong, weak or absent (Granovetter, 2005). The strength of a tie is shaped by a "combination of the amount of time, emotional intensity, intimacy (mutual confiding), and the reciprocal services that characterize the tie" (Granovetter, 1973: 1361). However, rather than forming fixed and discrete categories, interpersonal relationships often change over time and across space which makes establishing impact from them hard to capture and communicate. Generally, strong ties refer to the relationships with people that that are known well, who are interacted with frequently, and with whom information is shared freely. Weak ties represent more casual relationships, which may develop between acquaintances where interactions are less frequent and information is shared less freely. Absent ties are relationships without substantial significance, such as "nodding" relationships between people living on the same street, this can include instances where people know each other by name (Granovetter, 1973). Research examining the value of different types of ties suggests that both weak and strong ties are important and a lack of sufficient ties of any kind has been found to be detrimental to an individual's well-being (Sandstrom, 2013). As such, engaging participants in activities that increase their networks of strong and weak ties can be taken as a valid indicator of social impact for food sharing initiatives.

The co-design partners involved in the development of SHARE IT had goals focused on changing the food related behaviours of those who shared with them. In some cases these changes were focused on

providing supports to enable people to cook for themselves using more fresh fruit and vegetables rather than buy ready meals, in others it was to enable people to get more active and lead a healthier lifestyle by gardening together. In addition the potential for community gardens to alter attitudes and behaviours to lower the carbon footprint of food consumption has been demonstrated empirically (Kim, 2017). As a result, it was important to consider how to systematically attend to the kinds of impacts food sharing initiatives can have through changing personal behaviours within the SHARE IT framework. Other frameworks, such as CRFS and the toolbox presented by the sustainable food cities project (Carey and Dubbeling, 2017; Moragues-Faus and Marceau, 2019), consider personal behaviours implicitly within metrics on specific issues such as meat consumption or food waste at the city level. However, they do not explicitly or systematically consider the contribution of personal behaviours to the sustainability of urban food systems. Food is one of four areas included in the sustainable consumption behaviour cube (SCB-cube), a framework established to define the most important individual consumption behaviours based on their socio-economic and environmental consequences. The SCB-cube considers three consumption phases: acquisition, usage and disposal, and identified 16 important individual consumption behaviours for the sustainability of food systems (Fischer et al., 2017; Geiger et al., 2018). These categories were adapted and consolidated for the purposes of SHARE IT during the co-design process so that food sharing initiatives can systematically track their influence on important food related behaviours of their participants.

For food sharing initiatives with a significant educational or skills development component, the impact and value of their activities lies not only in the direct impacts that they have in changing the attitudes and behaviours of individuals with respect to food, but also their indirect impact in altering participants' perceptions about themselves and others in a broader sense. The educational activities of these initiatives have been shown to improve feelings of self-confidence, self-worth and happiness amongst participants according to qualitative data collected by the initiatives themselves; essentially, they seem to be supporting a greater sense of self-efficacy and individual agency (Bandura, 1986). Individuals with high levels of self-efficacy tend to trust their abilities when faced with adversity and tend to conceptualize problems as challenges rather than as threats or uncontrollable situations. As a result they experience less negative emotions when completing demanding tasks and think in self-enhancing ways, motivating themselves and showing perseverance when confronted with difficult situations (Bandura, 1997; Luszczynska, Gutiérrez-Doña, & Schwarzer, 2005). As self-efficacy is solely related to an individual's belief in their abilities it is much easier to capture this with established metrics than personal agency (Tapal et al., 2017). Moreover, levels of self-efficacy alone have been empirically linked in a multitude of studies to important outcomes for well-being, particularly in young people (Clarke et al., 2014; Tahmassian and Moghadam, 2011). Broadly, levels of self-efficacy in young people tend to be correlated negatively to levels of depression and anxiety and positively with life satisfaction, with increased self-efficacy linked to several positive long term behaviours in young adults, for example around healthy eating (Jarpe-Ratner et al., 2016; Muturi et al., 2016; Nastaskin and Fiocco, 2015).

4. Co-design methodology

Co-design is a creative practice with roots in public sector participatory approaches to governance developed in Scandinavia during the 1970s (Steen et al., 2011). When these participatory co-design approaches were first employed they were a radical departure from the top-down, professional processes of planning that had previously dominated (Davies, 2001a, 2001b). A much more familiar approach in the 21st century, co-design is frequently used as an umbrella term to refer to multiple forms of participatory, co-creation and open design processes. Despite its broad reach, the fundamental tenet behind co-

design is that users of goods or services are experts of their own needs and experiences and therefore can usefully contribute to their [re]design. Essentially, co-design assumes that a wide range of people can make a creative contribution to establishing the parameters of a problem as well as approaching alternative resolutions. As such it is a long-used tool for experimental and exploratory collaborative research (Zamenopoulos and Alexiou, 2018). Similarly, in our research we began with the assumption that ICT-mediated urban food sharing initiatives were best placed to identify their own goals, detail their current practices and reporting needs, and explain their capabilities.

Although not a silver bullet for resolving complex challenges such as urban food sustainability, for example co-design cannot erase uneven power geometries amongst participants (Pirinen, 2016; Sanders, 2002), the benefits of employing a co-design approach have been widely documented (see Calvo and De Rosa, 2017; Moser, 2016; Steen et al., 2011). In the short-term, these benefits include: generating original responses to challenges; improving understanding of user's needs; providing greater efficiency in decision-making; and enhancing co-operation between collaborating partners. It has also been suggested that co-design provides longer-term benefits such as increased levels of support and enthusiasm for innovation and change and higher levels of commitment to actions that have been co-designed. Co-design approaches have received explicit attention and utilization within the food arena, particularly in relation to food production and through collaborative research with farmers (Berthet et al., 2018; Chambers et al., 1989; Lesur-Dumoulin et al., 2018). Co-design involving wider groups of actors and other phases of the food chain is a more novel endeavour but one exemplified by the CONSENSUS project, which utilised co-design with respect to developing scenarios for sustainable eating in 2050 within households (Davies, 2013a, 2014) and in terms of testing and evaluating interventions to support sustainable eating in the home (Davies et al., 2014; Davies and Doyle, 2015; Devaney and Davies, 2017). Co-design approaches have also been used to develop alternative pathways to more sustainable food systems at the city, regional and national scale (Baek et al., 2014; Marin et al., 2016). However, to date none of these food related co-design experiments focus on the practice of food sharing initiatives. The development and application of our co-design intervention to create an SIA framework for urban food sharing initiatives is detailed below.

4.1. Identifying co-design partners

The co-design partners for the development of the SHARE IT framework were selected from the target audience for the toolkit, ICT-mediated urban food sharing initiatives. They were identified as a result of research which first identified and then mapped and examined the practice of these initiatives (Davies, 2019; Davies and Legg, 2018). This included the development of a database of more than 4000 initiatives (Davies et al., 2017a, 2017b) across 100 urban areas around the globe and in-depth multi-sited ethnographic fieldwork in nine cities (Davies and Evans, 2019). In total thirty-eight initiatives from these nine urban areas participated in ethnographic research and it was analysis of their online profiles that first revealed a paucity of public reporting and an absence of clear impact to goal mapping (Davies et al., 2018).

Co-design partners were sought from community gardens and cafes to surplus food redistribution initiatives which utilised varying forms of ICT (from website and apps to social media platforms), and which operated at different scales from very local operations in one location to initiatives which operate in localities internationally. The cross section of initiatives involved (see Table 3) provided important insights into the range of goals, needs and capacities of food sharing initiatives, which was crucial to the SHARE IT co-design process described below.

4.2. The SHARE IT co-design process

The core co-design steps adopted to develop SHARE IT are detailed

Table 3
Summary of important characteristics of the Co-design partners.

Initiative identifier	City	Core shared activities	Scale of activity	Level of ICT adoption ^a	Existing public sustainability impact reporting
Initiative 1	London	Growing, cooking and eating	Multiple-sites in one city	Medium	Qualitative evidence of impact presented through stories in blog on website and twitter
Initiative 2	London	Cooking and eating	Multiple-sites in one city	Medium	Qualitative evidence of impact presented through stories in blog on website and twitter
Initiative 3	Dublin	Growing	Single site in one city	Low	Little impact reporting of any kind visible
Initiative 4	Dublin	Food redistribution	Multiple sites in multiple countries	High	Quantitative impact assessment reported online on website in real time. Also produce an annual report which contains quantitative and qualitative impact evidence.

^a ICT adoption categories: High = driving innovation in the sector, Medium = active engagement with ICT developments, Low = not essential to day to day operations.

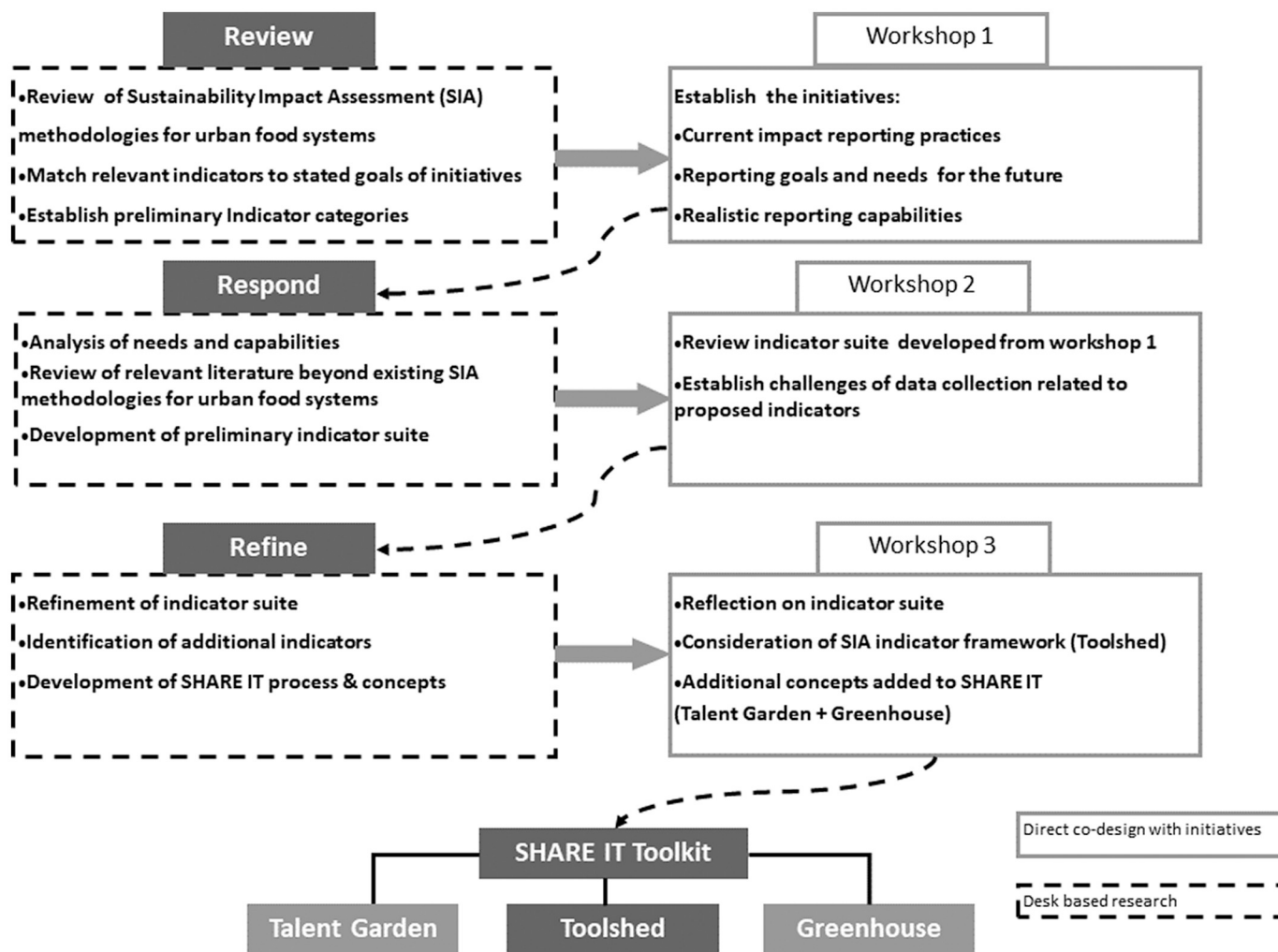


Fig. 1. Schematic of the SHARE IT co-design process for SHARE IT.

in Fig. 1, which illustrates the phased nature of the approach. Despite its apparent linearity the co-design process involved ongoing processes of review, reflection and online communication that continued throughout the experiment which took place over a period of nine months in 2018. The initial systematic review phase, presented in Section 3, was included to avoid unnecessary replication by drawing on existing and tested toolkits as a foundation for exploring their relevance for ICT-mediated urban food sharing. The first co-design workshop took place following this review with the key figures in the initiatives and sought to establish their long-term goals and medium-term objectives with respect to their impact on urban food sustainability. This workshop also documented the initiatives' current impact reporting practices, detailing their data collection strategies, and identifying a set of reporting needs.

Each workshop was followed by a period of intense back-office research work. Following the first workshop, common and initiative-specific needs from the co-design partners were distilled and a search of the reviewed toolkits was conducted to establish whether indicators already exist which might respond to these reporting needs. If they did not exist novel indicators were developed and a draft bespoke indicator suite prepared for each co-design partner. This was sent through to the initiatives for their reflection and a second workshop set up to discuss the design and coverage of the suite developed. This second workshop gave initiatives an opportunity to see whether the initial identification of impact areas was sufficient and to fully explore what the resource implications would be of collecting data for the indicators identified.

This resource and capacity issue was identified as a key reporting constraint across all co-design partners. The back-office work following the second workshop went beyond filling gaps and modifying data collection options for indicators, and included the first attempt to develop a process of pathways through the prospective online tool – named the Toolshed. During the second workshop co-design partners called for alternative means to share information about their activities, which they felt was not adequately captured by indicators alone or which might provide an entry-level means of engagement with sustainability reporting for new and emerging food sharing initiatives. This resulted in the design of an online space called the Talent Garden where activities and impacts can be publicly illustrated through images, videos and narrative descriptions of sharing moments. It was during this workshop that co-design partners also explored ways in which food sharing initiatives might be facilitated to embark on peer-to-peer learning. This led to the conceptualisation of a match-making portal called the Greenhouse where interested parties could connect virtually to explore ideas and exchange experiences.

To communicate the online nature of the ultimate tool, the three areas of SHARE IT – Toolshed, Talent Garden and Greenhouse – were initially developed using online tools such as Google Forms and YouTube, along with draft designs of the intended output reports from the Toolshed in Microsoft Publisher. These preliminary visualisations provided the basis for the third and final workshop, which enabled co-design partners to consider revisions to the indicator suite and to trial and test the mock-ups.

Table 4
SHARE IT impact pillars and sub-categories (adapted from: Carey and Dubbeling, 2017; FAO, 2013).

Impact pillar	Economic	Environmental	Governance	Social
Subcategories	<p>Jobs – Contribution to creating decent jobs and access to decent jobs in the city food system</p> <p>Affordability - Contribution to improving the affordability of fresh nutritious food for all</p> <p>Production- Contribution to utilising land in the city region to produce food and food products</p> <p>Education, awareness and behaviour - Raising awareness with a view to influencing behaviour and improving the sustainability of the city food system</p>	<p>Agricultural practices – Contribution to enhancing biodiversity, soil and ecosystem health of the city</p> <p>Greenhouse gas (GHG) emissions - Contribution to reducing GHGs in the city food system</p> <p>Food waste - Contribution to reducing Food loss and waste in the city food system</p>	<p>Risk Control -The extent to which risks to the continued operations of the initiative are controlled/managed</p> <p>Strategic planning and engagement with relevant stakeholders</p> <p>Civic responsibility – contribution to broader initiatives to tackle societal and policy issues</p>	<p>Accessibility - Contribution to improving the accessibility of fresh nutritious food for all</p> <p>Citizen health and wellbeing – Contribution to improving health and well-being outcomes</p> <p>Community integration -Contribution to increasing community integration through food sharing</p>

5. The SHARE IT indicator framework

The development of the SHARE IT indicator framework was based on outcomes from the review of existing assessment frameworks, as well as insights gleaned from extensive research and the co-design workshops conducted with food sharing initiatives. Table 4 outlines the structure which was established from the relevant themes contained in CRFS and SAFA (Carey and Dubbeling, 2017; FAO, 2013) augmented by specific impact areas around sharing that are missing from the food frameworks. The final indicator framework is shown in Table 5. Each potential indicator was reviewed individually and classified according to whether it was suitable for inclusion in SHARE IT based on the following criteria:

- The indicator was applicable to the activities of at least one of the core target users
- The indicator could be adapted to, or practically applied at, the initiative level
- The required input data for the indicator is realistically obtainable for at least some food-sharing initiatives based on feedback from the first round of co-design workshops
- It was not replicating another similar indicator selected from the above process

For many of the indicator areas shown in Table 5 there are multiple options for performance- and practice-based indicators provided in the full SHARE IT framework in order to be relevant to the range of activities and data collection capabilities of urban food sharing initiatives. All indicator options for SHARE IT are listed in the supplementary material for this article. Where an indicator suggests impacts that relate to specific SDGs this is indicated in Table 5. It was an important principle of the SHARE IT framework that it was to be inclusive, with all sorts of food sharing initiatives able to use it by selecting the indicators areas and methods of reporting for each which best matches their goals, activities and data collection capabilities. In some impact areas, (particularly those relating to policy and governance) meaningful quantitative impact assessment is not possible at the scale of individual initiatives and so indicators are not included in this regard within the SHARE IT framework. The wide variety of circumstances and realistic capabilities for data collection in food sharing initiatives also meant that for several environmental impact indicators (particularly relating to biodiversity and urban soil quality) it was not possible to prescribe one fixed method for initiatives to capture their impacts. For these indicators the framework allows for a description of an initiative's application of their chosen quantitative method for assessing their impact in these areas. An example of this approach showing the options users have to input data for indicator 7 - increasing levels of meal sharing is given below:

Indicator 7 - Boosting levels of meal sharing.

This indicator is for initiatives which make a contribution to increasing the number of meals people eat together with others. There is a significant body of research showing that sharing meals with others has a positive impact on levels of well-being.

Quantitative indicator (level 1) – option a.

Number of people who shared meals at events run by your initiative in the last twelve months:

Quantitative indicator (level 1) – option b.

Number of meals your initiative has distributed to other organisations to be consumed at shared eating events in the last twelve months:

Quantitative indicator (level 2).

Number of people eating shared meals at least once per week due to the activities of your initiative in the last twelve months:

Qualitative evidence.

Please enter here any other relevant information about this indicator you wish to include in the impact report. This could include testimonies from participants on the impact that sharing meals with

Table 5
Final Indicator suite for SHARE IT, showing the sustainability pillar, impact area and relevant sustainable development goals (SDGs) for each indicator.

Sustainability pillar	Impact area	Indicators	SDGs impacted ^a	Sources
Social	Community integration and sharing	1. Increasing appreciation of different cultures across and within communities	11	Co-design workshop (Frost, 2012; Garcia et al., 2016)
		2. Improving communication skills	11	Co-design workshop (Harris et al., 2014)
		3. Fostering a wider food and sharing culture	9, 11, 17	Co-design workshop
	Accessibility of food	4. Increased access to and consumption of fruit and vegetables	2, 3, 10	CRFS
		5. Increased access to and consumption of fresh food	2, 3, 10	CRFS
	Health and well-being	6. Connecting and creating new support networks within communities	3, 11	Co-design workshop (Chopik, 2017; Dunbar, 2010; Holt-Lunstad et al., 2010)
		7. Boosting levels of meal sharing	2, 3, 11	Co-design Workshop (Dunbar, 2017; Julier, 2013)
		8. Increasing well-being through volunteering	3, 11	Co-design workshop (Meier and Stutzer, 2008; Volunteer Ireland, 2017)
		9. Improving self-confidence and resilience	1, 3, 10, 11	Co-design workshop (Bandura, 2006; Garcia et al., 2016; Muturi et al., 2016)
		10. Increasing movement and exercise	3	CRFS & Co-design workshop
	Environmental	Education and food choices – social	11. Increasing access to health and well-being services	3
12. Thinking about issues beyond price when buying food			12	Co-design workshop (Fischer et al., 2017)
13. Increasing engagement in growing food			11	CRFS (Fischer et al., 2017)
Agricultural practices		14. Increased confidence and participation in cooking	3	CRFS & Co-design workshop (Garcia et al., 2016) (Fischer et al., 2017)
		15. Discovery of new fresh foods	3, 10	Co-design workshop (Farming Concrete, 2015)
Food waste		16. Diverting organic waste from landfill	11, 12, 13, 15	CRFS, SAFA
		17. Water recovery	11, 12, 13, 15	CRFS, SAFA
		18. Maintaining and improving soil quality	11, 12, 13, 15	CRFS
		19. Maintaining and improving biodiversity	11, 12, 13, 15	CRFS
		20. Food waste reduction	11, 12, 13	CRFS, SAFA
Economic		Carbon footprint	21. Reducing the carbon footprint of the food system	12, 13
	22. Increasing preference for vegetarian meals		3, 12, 13	CRFS, Co-design workshop, (Fischer et al., 2017; Poore and Nemecek, 2018)
	Jobs	23. Reducing food packaging	11, 12, 13, 15	CRFS, SAFA (Fischer et al., 2017)
		24. Training and jobs	4, 8, 9, 10	CRFS
Urban food production	25. Fairly paid work	8, 9, 10	CRFS, SAFA	
	26. Contribution to food production	8, 9, 11, 12	CRFS	
	27. Reducing pressure on food budgets	1, 2, 10	CRFS, Co-design workshop	
	28. Sharing specific skills and knowledge about the food system	3, 11, 12	CRFS, Co-design workshop	

(continued on next page)

Table 5 (continued)

Sustainability pillar	Impact area	Indicators	SDGs impacted ^a	Sources
Governance	Civic engagement	29. Formal qualifications	4, 9, 10	CRFS, Co-design workshop
		30. Contributing to policy development	16, 17	Co-design workshop
		31. Sharing knowledge and good practice	16, 17	Co-design workshop
Strategic planning	Strategic planning	32. Strategic planning and sustainability	17	SAFA
		33. Stakeholder engagement	16, 17	SAFA
Risk Control	Risk Control	34. Risk control	17	CRFS, SAFA

- Goal 1 End poverty in all its forms everywhere.
- Goal 2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
- Goal 3 Ensure healthy lives and promote well-being for all at all ages.
- Goal 4 Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
- Goal 5 Achieve gender equality and empower all women and girls.
- Goal 6 Ensure availability and sustainable management of water and sanitation for all.
- Goal 7 Ensure access to affordable, reliable, sustainable and modern energy for all.
- Goal 8 Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
- Goal 9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
- Goal 10 Reduce inequality within and amongst countries.
- Goal 11 Make cities and human settlements inclusive, safe, resilient and sustainable.
- Goal 12 Ensure sustainable consumption and production patterns.
- Goal 13 Take urgent action to combat climate change and its impacts.
- Goal 14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
- Goal 15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
- Goal 16 Promote peaceful and inclusive societies for sustainable development provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
- Goal 17 Strengthen the means of implementation and revitalize the global partnership for sustainable development.

^a List of sustainable development goals.

your initiative has had on their lives:

6. Discussion

As this paper demonstrates, the linear review-respond-refine schematic co-design process set out in Fig. 1 belies a much more reflexive and contested reality. Indeed, a number of concerns about technical challenges and conceptual uncertainties arose during the research process and these are pulled out in this section for further discussion.

The challenge of creating an SIA framework suitable for a wide range of food sharing initiatives around the world echoes experiences of researchers examining social impact reporting for social enterprises (Grieco, 2015). To ensure SHARE IT was useful for initiatives of different scales and organisational forms, as well as being relevant for initiatives focusing on different elements of food sharing in diverse locations there were trade-offs made from a technical perspective. As a result, the SHARE IT framework does not include some of the more complicated aspects of SIA sometimes adopted in frameworks established for a more specific context, such as the weighting and normalisation of indicators (e.g. Paracchini et al., 2015; Talukder et al., 2017). The reasons for this were threefold: firstly, a fundamental principle of the SHARE IT framework is that users are experts of their own experience, goals and practices, and therefore to impose a pre-established indicator weighting would be to define as researchers which of these were most important for their sustainability impacts and thus undermine this principle. Secondly, the framework was designed to be applicable to initiatives in cities around the world. This means that users will have a wide variety of local contexts, which could not be accounted for in any predefined weighting or normalisation. Furthermore the lack of resources available to many of the initiatives in the target group for SIA reporting, and in many cases a lack of relevant available data, meant it was impractical to expect users to quantitatively define this local context for their reported impacts (for example the overall levels of food waste in their city). Finally, the wide variety in the organisational structure of food sharing initiatives (Davies et al., 2017b) meant that no existing methodology to normalise indicators against the relative size of an organisation, such as those used in SIA commercial organisations (Medel-González et al., 2013), could be applied in SHARE IT. The choice to allow users to report their impacts using absolute quantitative indicators without weighting or normalisation has advantages of flexibility, transparency and simplicity for users, but it also means that the framework cannot be used for SIA comparisons between food sharing initiatives.

Modelling the impacts of food sharing at the initiative rather than the system level means that SHARE IT cannot fully account for spill over effects, such as the impact on other stakeholders in urban food systems or further up the food supply chain caused the activities of food sharing initiative. Although, in some cases, the framework does explicitly account for indirect forms of impact such as when donated food is used to support new activities which would not have existed previously. For example, surplus redistribution initiatives reported that some community groups they work with were able to add a food offering to their activities where previously they would not have been able to afford to do so. In other cases where food offerings were already in place, the savings made to the existing food budget by availing of donated surplus food were then free to support additional activities. Across the broader food supply chain however, there may be negative consequences to food sharing activities. For example, the widespread use of food discarded from commercial supply chains to alleviate food poverty may simply entrench food poverty in the long term rather than address the root cause (Caraher and Furey, 2018). Further, it was flagged during the co-design process that it may also provide a sticking plaster for the wasteful practices of supermarkets and large retailers which discourages further upstream efforts to reduce food waste. The implications of such interactions between actors in urban food systems can be accounted for through system level dynamic modelling (e.g.

Zimmerman et al., 2018) or a consequential impact assessment approach (e.g. Weidema et al., 2018). However, such methods are complex and data-driven making them incompatible with the objective of SHARE IT to engage urban food sharing initiatives in cities around the world in a flexible SIA reporting framework.

While SHARE IT presents a framework linking food sharing directly to impact, there are limitations with the tool, particularly in relation to the durability of derived benefits. For example, while there are positive correlations between shared meals and many of the reported individual and social benefits associated with this activity (Dunbar, 2017), significant knowledge gaps remain regarding the required frequency and regularity of shared meals to derive enduring benefits. The longevity of any benefits derived from a single food sharing experience remains relatively unexplored to date; a subject raised several times by partners during the co-design process, with some convinced that the most meaningful impacts could only be derived through on-going and long-term interactions with their participants. How to answer questions regarding the temporal nature of impact with respect to sharing – which includes the durability of a wide variety of impacts from knowledge and learning through to physical and emotional well-being – represents an intersection of the technical and ethical challenges facing SIA researchers and practitioners. On the technical side, there are possibilities to move beyond a reliance on participants to self-report the benefits derived. Wearable sensors can capture relevant data such as heart rate, blood pressure and sleeping patterns for example, with such experiments already providing insights into the physiological benefits of contact with urban green spaces (Lanki et al., 2017). However, the financial costs of running such experiments, with large numbers of participants can be very high. Perhaps more problematic are the ethical issues of using such technologies. The use of wearable technology to collect large amounts of personal data from potentially marginalised, disadvantaged or in some way vulnerable populations requires consideration of the kinds of informed consent that should be attained from participants, as well as important matters of privacy and data security. There are inevitably uneven power dynamics involved (Lucivero and Jongsma, 2018; Schukat et al., 2016; Segura Anaya et al., 2018). Would someone who relies on the food and social interaction they get from these initiatives feel able to say no if they were asked to participate in such a data collection practice? Such questions actually highlight the value of designing appropriate indicators and metrics within SIA and utilising evidence based proxy measures to avoid the need for intensive and invasive data collection.

Beyond recognising the uneven power relations that exist in everyday life, attention also needs to be paid to the fact that there are conflicting systems of assessing, auditing and evaluating value (Davies, 2013b; Davies and Mullin, 2011; Kraft and Wolf, 2016; Wang et al., 2017). The divergent systems for delineating worth that are employed by different interests when identifying and prioritising salient dimensions of sustainability, raise fundamental questions about whether all values articulated are commensurable and whether they should be evenly weighted in decision-making (Boltanski and Thévenot, 1991; Davies and Demeritt, 2000; Morrison-Saunders and Fischer, 2006; Potschin and Haines-Young, 2008). In particular, there is growing interest in how metrics of sustainability are designed and how this shapes the resulting performance of accountability and ultimately the impacts such evaluations have on outcomes. Most obviously there can be tensions when benefits which are important to initiatives (and their participants) are not considered similarly by those who will review and judge impact evaluations, such as funders and regulators. This is more than merely missing impacts from a technical or methodological deficiency perspective and raises more ontological questions regarding the nature of what sustainability benefits are and epistemological issues concerned with how we come to know sustainability, its possibility, scope and general basis (Osorio et al., 2009). Certainly, there are many different theories of value and sustainability and many different ways of understanding both (Davies, 2002).

There are also concerns about developing a rigorous tool, one that gives appropriate voice and visibility to food sharing initiatives whilst retaining robustness and defensibility in its metrics. At the other end of the spectrum, there are concerns that initiatives will be unfairly penalised and their benefits discounted if only quantified measures are considered legitimate in SIA frameworks or because their impacts for individual indicators are small-scale when compared with those of incumbent actors, such as the dominant multinational food producers and retailers. For example, there has been considerable discussion about the need to scale-up sustainability innovations. However, such scaling-up may lose the personal, social and community benefits that being localised provides and begin to replicate the limitations of existing systems (Davies and Mullin, 2011; Fam et al., 2015); a process of scalecraft which has been identified in other sectors such as waste management (Boyle, 2002; Davies, 2008).

Responding to feedback from initiatives during the co-design process, the SHARE IT tool goes beyond providing an indicator-based SIA reporting framework for food sharing initiatives and facilitates collective learning and knowledge exchange for food sharing initiatives through the Talent Garden (a public forum to post stories about food sharing activities and their impacts) and the Greenhouse (a match-making service to connect food sharing initiatives with common activities and objectives who are seeking to exchange knowledge). The success of this tool will depend on a number of key factors, from the accessibility of the language, and the technical efficiency of the tool, to the quality of the documentation produced and the resources available to support use of the tool and to revise it in the light of feedback from users. Once the Beta version is launched, the co-design process will continue with a dedicated period of testing and evaluation with the original co-design partners and with wider food sharing initiatives.

7. Conclusion

SHARE IT has been co-designed with users who are experts in their own activities, goals and practices, if not in the practical norms of impact assessment reporting. The framework developed responds to the lack of appropriate supports for food sharing initiatives to consider, capture and reflect on their goals and impacts. It provides a novel and unique framework, which has been explicitly designed to incorporate all the intended goals and impacts that food sharing seeks to foster including community cohesion, social integration, mental and physical wellbeing. While frameworks to assess the sustainability impacts of specific forms of food sharing such as community gardens have been presented previously, SHARE IT is the first framework designed to be applicable to the broad range of urban food sharing throughout the food supply chain. Ultimately, the co-design process itself was inevitably bounded in terms of diversity and the context-specific histories of Dublin and London are not precisely replicated in other places. Further testing directly with initiatives and refinement following feedback from users using an online beta version of the toolkit will be the next crucial step in making the SIA framework accessible to food sharing initiatives. The approach taken and the reports produced from the framework also need to be tested with policy makers and funders to ensure SHARE IT is seen as a credible and useful framework. Ultimately, the success of SHARE IT in understanding, communicating and increasing the impacts of food sharing initiatives for urban food sustainability will depend on overcoming conflicting challenges: ensuring the framework is both accessible and informative for initiatives while also being considered rigorous enough for its outputs to be valued by funders and policy makers.

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Appendix A. Supplementary data

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