

Tackling food poverty: alternative food supply chain provisions for the disadvantaged

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Abstract

This paper explores how innovative food supply chain provisions could help to address food poverty and access inequality facing the disadvantaged communities. An understanding of existing food provisions were established via a focus group discussion with multiple stakeholders. Challenges to their operations were further explored. Following this, an in-depth case study of two emerging supply chain models was conducted providing empirical evidence on their economic viability and social impact. This research paves a new research paradigm for operations management research that puts the disadvantaged consumers at the centre of its enquiry, adding a new dimension to sustainability.

Keywords: Food poverty, alternative food supply chain, disadvantaged community

Topics: Sustainability in Operations and Logistics (including CSR), Retail Operations, Operations Innovation

Introduction

Although there has been a plethora of studies on sustainability in the past decades, most research on sustainable supply chain focuses on environmental issues, socially oriented topics are rarely studied (Gimenez et al., 2012). When so, it is typically done more under the umbrella of general Corporate Social Responsibility (CSR) practices, examining supplier issues such as labour and fair trade, putting an emphasis on the producers as disadvantaged actors in supply chains rather than dealing with disadvantaged end customers (Moxham and Kauppi, 2014).

This research focuses on the issue of food poverty in relation to access to healthy and affordable fresh food by the disadvantaged communities. Food poverty refers to the inability to acquire or eat an adequate quality or sufficient quantity of food in socially acceptable ways or the uncertainty of being able to do so (Dowler and O'Connor, 2012). Areas where people do not have easy access to healthy and affordable fresh food – and in particular, poor communities where people have limited mobility – are known as ‘food deserts’ (Wrigley, 2002, Walker et al., 2010). Food deserts represent a complex nexus of interlinkages between growing health inequality, disparities in access to food, compromised diet, undernutrition, and social exclusion (Walker et al., 2010). Though food poverty and food desert represents one of the grand challenges in society, little attention has been paid to tackle such issues in the operations management (OM) and supply chain literature.

Studies of food deserts stress that poor access to nutritious food may be linked to poor diets and, ultimately, to obesity and diet-related diseases (Zachary et al., 2013). These studies call for non-health-care intervention, and especially for effective intervention in

retail provision to ensure the availability of diverse and affordable fresh produce (Clarke et al., 2012, Zachary et al., 2013).

The primary aim of this research is therefore to explore how innovative food supply chain provisions could help to address food poverty and access inequality facing the disadvantaged communities. We collaborated with disadvantaged communities, farmers, government agencies, manufacturers, retailers, charity organisations in Wales, UK to assess current practices, understand existing barriers and explore innovative supply chain provisions that emerge from practice.

Literature on food poverty/insecurity and alternative food supply chains

At household level, food poverty is often synonymous with food insecurity. Food security has been conceptualized as resting on four pillars: availability, access, utilization and stability (of the other three pillars)(Gross et al., 2000). These concepts are naturally hierarchical, with *availability* (production and supply of food) necessary but not sufficient to ensure *access* (economic and physical access to food), which is, in turn, necessary but not sufficient for effective *utilization* (what and how people eat) (Barrett, 2010). The fourth pillar *stability* emphasise the time dimension of the other three pillars, i.e. people may still experience food insecurity if they have inadequate access to food on a periodic basis. For food security objectives to be realized, all four dimensions must be fulfilled simultaneously (FAO 2008).

This research focuses particularly on the pillar of *access* in order to make a meaningful contribution from our OM discipline. In early 2000s in the UK food desert was coined to denote the problem of access (Wrigley, 2002, Wrigley et al., 2003). In a food desert, fresh food is either more expensive than process food, not readily available and often both. As Wright et al (2016) point out “Food deserts, however defined, are always found to be heavily populated by persons of low and moderate incomes and by ethnic and racial minorities (page175)”.

Dowler and O’Connor (2012) further divided accessibility into physical and economic accessibility. Physical *accessibility* refers to locational access to adequate food sufficient in quantity and quality to satisfy dietary and social needs. *Economic accessibility* suggests that the financial costs associated with the acquisition of food should not constrain the attainment and satisfaction of other basic needs. In essence, food has to be both affordable and physically accessible. Research has shown that lack of access to affordable fresh vegetable and fruits creates diet related inequalities in affluent and poor communities, which could have negative impact on one’s health. For instance, obesity level tends to be disproportionately high in disadvantaged communities (Rummo et al., 2015). Unequal access to fresh produce also leads to social exclusion, which then reinforces health inequality (Choi and Suzuki, 2013). However, caution is necessary that simply providing access to affordable food does not automatically lead to healthy eating and diet, nor does it fulfil the social needs of food access. It is important to recognise that any initiatives targeting food desert problem must address both the tangible material and intangible social needs of the disadvantaged . Providing access to fresh produce is an essential step for encouraging people to eat healthily. Access needs to be integrated with other factors, such as culture, cooking skills, and nutrition knowledge in order to promote people actually adopting a healthy diet (Dammann and Smith, 2009).

Typical responses to the food insecurity and food desert problem include production-oriented approaches, policy interventions , and localistic schemes such as building permanent structures, remodelling existing stores, and introducing additional channels of food distribution (Ramirez et al., 2017). Production based approach has been the mainstream to address poverty and hunger, while there are also emerging paradigm that

calls for a system as well as a more localistic approach to food insecurity (Sonnino, 2016). Coupled with this trend, arise the term “alternative food networks (Sonnino and Marsden, 2006)” or sometimes known as “short food supply chains (Watts et al., 2005)”. Hereafter we refer this term as ‘alternative food supply chains (AFSCs)’.

AFSC can be considered as “a broad embracing term to cover newly emerging networks of producers, consumers, and other actors that embody alternatives to the more standardised industrial mode of, often supermarket-led food supply (Renting et al., 2003). AFSCs differ from conventional food supply chains in terms of types of products, production processes, distribution networks, and forms of market governance (Forssell and Lankoski, 2015). Reduced distance and reconvened trust between producers and consumers, small scale and diversity, quality, social embeddedness, and new forms of governance (e.g. cooperative ownership or social enterprise) are often typical characteristics of an AFSC. Representative forms of an AFSC include farmers’ market, organic vegetable box schemes, farm shops, and community-supported agriculture. For debates about the nature of “alternativeness”, one can refer to the work of (Renting et al., 2003, Forssell and Lankoski, 2015). Studies suggest those AFSCs could be viable spatial alternatives that can bring food into places (i.e. food desert) poorly serviced by conventional food supply chains (Watts et al., 2005).

Though actively discussed in disciplines such as economic geography and regional developments (Aubry and Kebir, 2013), those alternative forms have not received much attention from our discipline. Consequently, we know little about how AFSCs are configured and challenges to their operations, as well as about how they address the fresh produce access needs of those who are mostly vulnerable. Treating the disadvantaged at the centre of the supply chain design seems to be, at least for the time being, the blind spot for both marketing and OM scholars - a gap this research attempts to shed some lights on.

Research methodology

This research is exploratory and consists of multiple data collection methods. Major activities include: a) one focus group (FG) with multiple stakeholders who involve in food provisions for the disadvantaged, and b) an in-depth case study of two AFSCs using techniques such as interviews, sit visits and observations. The focus group session was designed in order to understand current food provisions for the disadvantaged and existing challenges. The case studies were carried out in order to explore how emerging and innovative food supply chains have helped to address both the social and material needs of the disadvantaged.

Table 1 – An overview of data collection activities

Research activities	Participants	No of participants	Data collection Methods
FG1	Charity organisations (8); Social enterprise (1); Local councils (1) ; Academics (1) Consultants (1); Food cooperatives (1); Local city food partnerships (2); the Association of Convenience Stores (1); Chain retailers (1); Large food manufacturers (2)	18	Focus group discussions
Case 1	National development manager (1), store manager (1), store staff (1), randomly selected consumers (10)	13	Interviews, site visits, archival reports/documents
Case 2	Management director(1); operation director (1); team leader (2); team operators (3); randomly selected consumers (10); senior government officer (1)	18	Interviews, site visits, archival reports/documents

The two selected cases represented two emerging AFSC forms. Case 1 redistributes surplus food donated by large retailers or food manufacturers, and currently operates 4 social enterprise retail outlets in various deprived areas in England, UK. Case 2 is a commercial initiative, and operates a peripatetic model of retail provision that brings fresh produce to local community areas in Beijing China. Although operating in very different local context, both cases have strong social value orientation in their business and are novel solutions to the food insecurity/food desert problem.

Findings

This section firstly explores existing instruments addressing the access and affordability issues of food insecurity/desert problem as well as related barriers and challenges. Following this, I further examine two novel supply chain provisions: the social supermarket model (Case 1) and the floating marketing model (Case 2). I discuss how the applications of those innovative business models have resulted in a substantial increase of fresh produce availability to disadvantaged groups and at the same time provide an effective vehicle for social interactions.

Existing provisions

Discussions under this subsection are mostly derived from the FG session and was supplemented by secondary research. At the beginning of the FG session, examples of the existing supply chain provisions for the disadvantaged were presented to the participants. Participants were then asked to add whether there are any other practices that were not included. Once existing options were exhausted (summarised in Table 2), participants were then encouraged to discuss challenges, which may prevent existing initiatives from going to scale or having a bigger impact. Finally using nominal group technique, participants were asked to identify one or two supply chain provisions they see having greater potential to address the challenges identified, and are effective to alleviate the food desert problem.

Table 1 – Existing food provisions for the disadvantaged

Supply	Processing	Distribution (retail)
<i>Purchase</i> <ul style="list-style-type: none"> • local farms/growers • Wholesale • City farming • Veg voucher scheme <i>Self-production</i> <ul style="list-style-type: none"> • Community farming • Community garden Allotments <i>Donation</i> <ul style="list-style-type: none"> • Food bank • Surplus food from retailers and manufactures 	<ul style="list-style-type: none"> • Meals on wheels • Community café/kitchen • School meals • Ready to cook meals (direct sale from local farmers) 	<i>For profit</i> <ul style="list-style-type: none"> • Convenience stores • Farmers markets • Online retailers • Supermarkets • Veg box scheme • Wonky veg box by retailers Floating markets <i>Not for profit</i> <ul style="list-style-type: none"> • Social supermarket • Local food cooperatives • Rural community coops • Mobile grocery store • Online peer to peer food sharing • Crowd sourcing of food

Challenges to existing provisions

A number of challenges were raised by participants which can be categorised into institutional, policy, structural, supply and individual challenges. Those challenges were illustrated as follows by a narrative analysis.

Although playing a vital role in serving the most vulnerable, a major challenge facing those AFSC initiatives is their economic viability (which is labelled here as an institutional barrier). Representatives from both public and charity organisations highlighted this issue as their main concern - *“Local authorities are increasingly interested in how they can build resilience into current food systems, through, for example, community enterprises, community growing but realising that those kind of initiatives need to be self-sustaining because funding is completely gone (representative from local council)”*. Economic sustainability barrier has also been experienced by a charity organisation operating veg box scheme, *“We did have healthy start vouchers as an option on our veg box scheme, but immediately you faced the whole sustainability issue.”* Indeed the need for more sustainable options is also raised by a senior representative from food policy development *“I have been at roundtables discussing this agenda for many, many years. I think we need to be looking at commercially viable solutions... Fundamentally, what we need is to address market failure and we need to be looking for things that are going to be sustainable in true sense, economically sustainable. ... I absolutely think we need to be working with the industry”*.

However working with private sector is not without challenge. Representative from a large food manufacturer pointed out that current mainstream food supply chain is not designed specifically for the disadvantaged - *“The food systems is highly integrated and it is an evolved system which is there to do a job. That job is to sell full price product through regular chains to regular customers. That’s what we do. If you ask it to do jobs that are slightly outside the norm, it falls over very quickly.”* There are also potential conflicts among stakeholders. It is because mainstream food manufacturing and distribution were worried that setting up alternative food supply chains would compete with them in the marketplace. Consequently it might have a negative impact on their businesses such as loss of revenue, *“When we were talking about new routes to sell food to people that means somebody will not be selling the fruit and veg or somebody will be taking a share of somebody else’ veg. When we were talking about winners that implies losers as well (food manufacturer representative).”*

Representatives from charity organisations further raised the issue of aesthetics of various schemes and reminded us the danger of institutionalising the disadvantaged where good intentions lead to negative impact - *“Some of food projects would put certain people off as they remind them of being institutionalised... There is a lot of things that don’t work. It could be the graphics on a page, it could be the way people are entitled. It could be their attitude, the way people talk, the place where you have it, you know whether it is somewhere really nice, whether you are selling stuff that looks nice...”*.

A number of policy related barriers were discussed among participants. For example, representative from a local food partnership programme pointed out that there were many restrictions when they tried to set up a street corner market selling fruit and vegetables *“When I grew up in London and out in the suburbs there, we had street corner market stalls quite widely... we don’t have those now in areas where I live. We’ve tried to set one up for example outside the library with a fruit and veg retailer gets a site for free. There is a tremendous amount of red tape around that, which is locally driven to the point that it’s actually not happening at the minute”*. Participants also mentioned that business rates are the same whether you open a takeaway shop or a shop selling fresh produce, therefore there is a lack of incentives to encourage retailers entering the fruit and veg businesses.

Supply challenges are most related to current convenience stores and supermarkets. Driven by motivations of maximising profit, they created supply disparities in a food desert. However representative from convenience store association contested that improvements are being made (albeit acknowledging that more can be done), for instance

they have started to urge their convenience store members to sign up to sell veg and fruit, *“With those which did sign up, we see an increase of 25% of fruit and veg in store”*. Good practices were highlighted, such as one large chain retailer started to sell three different lines of veg each week at discounted price. Some independent retailers also launched voucher scheme to provide free fruit and veg.

There is a large number of barriers that are individual related – which can be further broken down into capacity and skills, transport, income, cultural and behavioural barriers. Unsurprisingly transport and income barriers were seen as most significant. For example, a representative from food poverty commission commented, *“Accessibility to fresh fruit and veg is a postal lottery. Where I live you can only access poor quality expensive fruit and veg. I often cut open onions and potatoes and they’re rotten inside. Yet only 10 minutes drive in an affluent area is higher quality and cheap fruit and veg. The cost of transport stops me going there.”*

Capability and skills issue were also significant challenges. For instance, older people and people with long-term illness problems or mental problems may not be able to cook, even if access and affordability issues have been addressed – *“A lot of the people we support live with many different long term conditions and have many challenges in their daily lives. Diet often falls quite low down on their priority list... Many people who won’t ever have seen a vegetable, never mind know what to do with it (a social care charity representative)”*. Participants from social care charities further pointed out that food provision schemes have a far-reaching impact other than just ensuring accessibility and affordability, but will help those vulnerable to become more independent and improve both their physical and mental welling as well. Yet certain group of the vulnerable has been neglected, for instance young men, *“A lot of them are living in bedsits or in spaces with no cooking and they don’t fit into any of the neat categories for help that you might get with young woman and also families. They slip through and that’s an issue.”* This led to another challenge - these are the group of people who might be capable of cooking yet are constrained due to lack of cooking facilities.

Culture and individual’s behaviour could pose challenges too. Representatives from social enterprises mentioned that some of their customers in London are of Caribbean descent and their cuisine heavily focused on fresh fruit and veg, whereas up in other areas such as Athersley, people’s diet tends typically to be just one meat and two vegetables. Individual food decision plays a big role in one’s diet, for example, representative from a convenience store pointed out, *“Everyone’s got that five-a-day stuck in their head but that sort of “four will-do-attitude”*. Issues such as people’s narrow choices, in particular towards vegetables with sweet taste, were also raised by representatives from manufactures, farms and local food partnership programme.

Our FG seems to indicate that out of the four pillars of food security, food supply was not perceived as a major issue as there seems to be a plethora of food available. Yet these are not necessarily affordable and accessible to those who need them most. The aforementioned challenges demonstrate that food insecurity and food desert issue is a complex social problem with multiple dimensions. The issues of accessibility and utilisation are closely intertwined, and should not be treated separately if any supply chain initiative attempts to tackle the food desert problem.

Innovative supply chain provisions – two case examples

Recognising the aforementioned challenges, our FG participants were asked to explore either to strengthen or extend current food provisions, and/or identify new initiatives that are commercially viable and holds promises for long-term sustainability. Strengths and weaknesses of each AFSC provision was examined, and eventually two initiatives were

identified as most promising. An in-depth study of the two examples were conducted post FG and their supply chain structures are depicted in Figure 1.

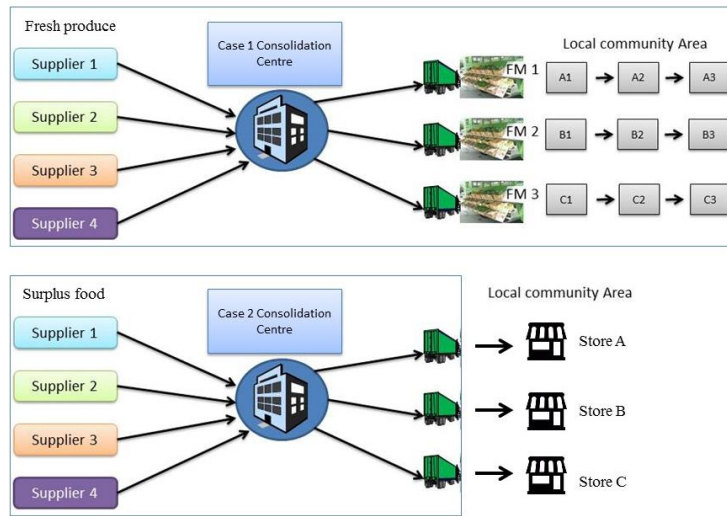


Figure 1. The supply chain structure of Cases 1 and 2 (source: author)

In order to fully understand the context of the two cases, including the actors involved and the environmental constraints, this paper followed the established soft system methodology (SSM)’s CATWOE framework for systemic enquiry (shown in Table 3). SSM emphasises the use of *root definition* to succinctly describe a purposeful activity as a transformation process by considering the elements of C (customers), A (actors), T (transformation process), W (Weltanschauung, i.e. worldview in context), O (owners), and E (environment constraints) (Checkland, 2000). The CATEWO mnemonic is particularly useful in conducting a structural analysis of a complex notional system of human activity, such as our cases of social supermarket (Case 1) and floating market (Case 2).

Table 3 – A structural analysis of AFSC Cases 1 and 2

ROOT DEFINITION	Alternative food supply chain solutions to provide affordable fresh produce to local communities in order to improve their diet, health, and social well-being.	
CATWOE	Social supermarket (Case 1)	Floating market (Case 2)
<i>Customers</i>	People who receive benefits and are temporarily in food poverty potential victims: local shops	All customers, particularly the disadvantaged; potential victims: local shops
<i>Actors</i>	Food donors (manufacturers and retailers), social supermarket retailer, parent company as supplier, logistics service providers, community service provider	Intermediary company as service provider, farmers and wholesalers as suppliers, municipal government, residential community committee, individual affiliate FMs
<i>Transformation process</i>	A social supermarket supply of surplus food at discounted price to people from deprived neighbourhood and providing value added services such as community kitchen and other community services such as debt support	A floating market supply of fresh produce at discounted price to local communities while providing a platform for people to socialise.
<i>World view</i>	Addressing the material and social needs of the disadvantaged: health inequality and social exclusion	Addressing the material and social needs of the disadvantaged: health inequality and social exclusion
<i>Owner</i>	The social supermarket retailer	The service provider of the floating market

<i>Environment constrains</i>	Uncertainty in supply, membership criteria, lack of volunteers as staff member, people may have difficulties accessing the store, operating and capital cost	Space and infrastructure constraints, weather, legislative policy and the cost of bulk sourcing and operation
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The first social supermarket opened by Case 1 was in 2014 in England, UK, which retails all the household essentials including fresh produce for about 30% of recommended retail price. Case 1 was set up as a social enterprise by its parent company that specialises in redistributing surplus food for profit. Unlike its parent company, Case 1 has strong social orientation that aims to empower individuals and building stronger communities. In addition to its retail operation, Case 1 also provides other value adding services such as community cafe (which sells lunch at loss with a charge of £1.5 per meal) and community hub (providing free personal and professional support programmes). The company realises that just providing a cheap food shop will not help to address the root causes of food poverty. Nevertheless, they could use food as an access point to provide local communities further opportunities. *“If we want to move people to an independent autonomous life, to give the community an opportunity to support one another, to build up really strong social networks within that community that don’t allow people to return back to a period of food poverty, and then we needed those other two spaces (community cafe and community hub). That’s where all that good stuff happens (Operation Director of Case 1).”*

The main beneficiaries in Case 1 are those who live in the most deprived areas and on benefits. They operate a closed membership scheme. People need to sign up with proof of evidence to confirm that they receive benefits and live in the local area. Membership is six-month in length and is reviewed at the end of the period. Case 1’s operation model relies on the surplus food donated by large food manufacturers and retailers. Most of its supply are from its parent company, which they then reimburse at a no-loss basis. This way they will not drain the financial resources from its parent company as that is not a sustainable model. The buying off from parent company rather than directly dealing with lots of donors reduces administrative burden, allows economy of scale in operation and helps to bring cost down. As a typical store serves 750 people, purely relying on local supply is not realistic and tapping into the central resources of procurement and distribution gives them the advantages of cost and operation knowledge. This is vital to sustain its operation otherwise, *“simply it wouldn’t work without that. The only way that we have grown and have developed is off the back of (our parent company). (National manager)”*. Case 1 is also mindful not to cannibalise other local shops by setting up a top limit of members they would take. Our interviews with consumers in store largely reveal positive evidence of the social impact Case 1 brings to local communities. People recalled how they have saved money from shopping at Case 1 and on average people save about £19.60 per week. In addition Case 1 shop also serves as a social hub that brings people together and have positive impact on their social wellbeing. One interviewee commented, *“I feel a lot safer and a lot happier – I did not do much and I stayed at home ... I can meet people again. I sometimes eat here and I can afford that. My health improved and I’ve got proper home made fresh food. It is surprising what a difference it has made to my life (an elder consumer).* The major constraint is obviously the uncertain of supply in Case 1, as it is impossible to predict what will be donated and when. Therefore, it does not fully address the ‘stability’ aspect of food security. Nonetheless, its competitive advantage lies in the unusual cost structure compared to conventional supermarket. Because of that, it serves as a valuable complementary source of supply of fresh produce to the

disadvantaged as well as an important catalyst for social change. This integrated approach in tackling food insecurity and food desert problem brings valuable insights to OM scholars as well as practitioners and policy makers.

Case 2 operates a mobile retail scheme which sells fresh produce to local residents at prices typically 15-30% lower than supermarkets. Different from Case 1, Case 2 does have a constant and steady supply of fresh produce, and is a for-profit organisation but with a clear social mission. Its first operation was launched in September 2010 servicing only a few local residential areas and the business has since expanded to cover over 300 communities in Beijing. Although Beijing is different from UK in many respects, the same problem of food deserts exists. The difficulty that local Beijing communities face in accessing to affordable fresh produce has been a top priority of the local municipal government. Previously, the government tried to address this problem by encouraging the establishment of small convenience shops in condensed residential areas. Although somewhat effective, many of these shops received criticism for their high prices (due to the fixed cost of setting up and maintaining the shops) and the lack of variety and freshness of food. An alternative approach was undertaken – a ‘mobile direct-sale market (we refer to it as floating market, or FM)’ – that soon gained momentum.

The main beneficiaries of the FM model are those who have difficulties shopping for fresh produce – in particular, the elderly, busy working mums, the disabled, and the unemployed. The transformation process in this case was initiated and led by a commercial organisation Case 2. The company took the central role in creating and operationalising the FM supply chain model to meet the needs of people from local communities. The company is also the owner of this transformation process. Its responsibilities lie in centrally sourcing fresh produce from farms and wholesale markets, managing the storage of centrally sourced produce, liaising with municipal government office and local residential community for setting up individual FMs. While the upstream operation of the supply chain is managed centrally by the company, the downstream distribution is decentralised (shown in Figure 1). The company operates an affiliate model of managing its individual FMs. Affiliates need to pay a small management fee to the company and are responsible for their own profit and loss. These individual FMs can lease a vehicle provided by the company or use their own vehicles. Functioning as a social hub, the FMs also provide a focused area for socialising and interacting with others in the community, thereby fostering a sense of social and psychological well-being. Our interviews learned that disadvantaged people welcome this initiative as it does not only fulfil their material needs of accessing to fresh produce, but also provides an effective vehicle for social interaction. For instance, two retired interviewees commented: *‘After retirement, my social network shrinks and I feel quite lonely. Rather than going to a large supermarket where all I meet are strangers, this mobile market provides a platform for me to chat with my neighbours and friends and exchange gossip.’*

Conclusion and contribution

This research demonstrates that food provisions for disadvantaged is a complex social issue – known as ‘wicked’ problem. A portfolio of initiatives currently co-exist in practice. Many of those interventions are led by government agencies or charity organisations hence exhibiting various challenges and often lack of long-term sustainability. Yet, this research has identified two novel types of AFSC, which have demonstrated their potential for long-term viability. These alternative models also deliver their social value by creating a much-needed platform for social interaction and thus contribute positively to the disadvantaged people’s social wellbeing. This in turn has had a positive impact on social and health inequality.

This study is the first of its kind to treat disadvantaged people as the focal subject of supply chain design and provisions. This research could potentially lead to the development of a new paradigm for the supply and demand chain to address diet and health issues such as obesity and diabetes in disadvantaged areas. It also demonstrates how OM and supply chain scholars could tackle complex grand challenges such as food poverty – providing avenues for further research in this underexplored area.

References

- AUBRY, C. & KEBIR, L. 2013. Shortening food supply chains: A means for maintaining agriculture close to urban areas? The case of the French metropolitan area of Paris. *Food Policy*, 41, 85-93.
- BARRETT, C. B. 2010. Measuring Food Insecurity. *Science*, 327, 825-828.
- CHECKLAND, P. 2000. Soft systems methodology: a thirty year retrospective. *Systems Research and Behavioral Science*, 17, S11.
- CHOI, Y. & SUZUKI, T. 2013. Food deserts, activity patterns, & social exclusion: The case of Tokyo, Japan. *Applied Geography*, 43, 87-98.
- CLARKE, I., KIRKUP, M. & OPPEWAL, H. 2012. Consumer Satisfaction with Local Retail Diversity in the UK: Effects of Supermarket Access, Brand Variety, and Social Deprivation. *Environment and Planning A*, 44, 1896-1911.
- DAMMANN, K. W. & SMITH, C. 2009. Factors affecting low-income women's food choices and the perceived impact of dietary intake and socioeconomic status on their health and weight. *Journal of nutrition education and behavior*, 41, 242-253.
- DOWLER, E. A. & O'CONNOR, D. 2012. Rights-based approaches to addressing food poverty and food insecurity in Ireland and UK. *Social Science & Medicine*, 74, 44-51.
- FORSSELL, S. & LANKOSKI, L. 2015. The sustainability promise of alternative food networks: an examination through "alternative" characteristics. *Agriculture and Human Values*, 32, 63-75.
- GIMENEZ, C., SIERRA, V. & RODON, J. 2012. Sustainable operations: Their impact on the triple bottom line. *International Journal of Production Economics*, 140, 149-159.
- GROSS, R., SCHOENEBERGER, H., PFEIFER, H. & PREUSS, H.-J. 2000. The four dimensions of food and nutrition security: definitions and concepts. *SCN News*, 20, 20-25.
- MOXHAM, C. & KAUPPI, K. 2014. Using organisational theories to further our understanding of socially sustainable supply chains: the case of fair trade. *Supply Chain Management: An International Journal*, 19, 413-420.
- RAMIREZ, A. S., DIAZ RIOS, L. K., VALDEZ, Z., ESTRADA, E. & RUIZ, A. 2017. Bringing Produce to the People: Implementing a Social Marketing Food Access Intervention in Rural Food Deserts. *Journal of Nutrition Education and Behavior*, 49, 166-174.e1.
- RENTING, H., MARSDEN, T. K. & BANKS, J. 2003. Understanding alternative food networks: exploring the role of short food supply chains in rural development. *Environment and planning A*, 35, 393-411.
- RUMMO, P. E., MEYER, K. A., GREEN HOWARD, A., SHIKANY, J. M., GUILKEY, D. K. & GORDON-LARSEN, P. 2015. Fast food price, diet behavior, and cardiometabolic health: Differential associations by neighborhood SES and neighborhood fast food restaurant availability in the CARDIA study. *Health & Place*, 35, 128-135.
- SONNINO, R. 2016. The new geography of food security: exploring the potential of urban food strategies. *The Geographical Journal*, 182, 190-200.
- SONNINO, R. & MARSDEN, T. 2006. Beyond the divide: rethinking relationships between alternative and conventional food networks in Europe. *Journal of Economic Geography*, 6, 181-199.
- WALKER, R. E., KEANE, C. R. & BURKE, J. G. 2010. Disparities and access to healthy food in the United States: A review of food deserts literature. *Health & Place*, 16, 876-884.
- WATTS, D. C. H., ILBERY, B. & MAYE, D. 2005. Making reconnections in agro-food geography: alternative systems of food provision. *Progress in Human Geography*, 29, 22-40.
- WRIGHT, J. D., DONLEY, A. M., GUALTIERI, M. C. & STRICKHOUSER, S. M. 2016. Food Deserts: What is the Problem? What is the Solution? *Society*, 53, 171-181.
- WRIGLEY, N. 2002. 'Food deserts' in British cities: policy context and research priorities. *Urban studies*, 39, 2029-2040.
- WRIGLEY, N., WARM, D. & MARGETTS, B. 2003. Deprivation, diet, and food-retail access: findings from the Leeds 'food deserts' study. *Environ Plan A*, 35.
- ZACHARY, D. A., PALMER, A. M., BECKHAM, S. W. & SURKAN, P. J. 2013. A framework for understanding grocery purchasing in a low-income urban environment. *Qualitative health research*, 23, 665-678.