



Values, practices and waste

Session 17

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Pro-environmental 'spill-overs' in community settings three years on

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(1) Behavioural change in sustainable and innovative practices; water, waste and energy efficiency; environmental identity; post occupancy of green buildings; community engagement.

The dominant paradigm in organisations and in programs aimed at households has been based on psychosocial behavioural interventions that have evolved from approaches to changing bad habits such as smoking. In contrast, more recent practice-based approaches have emphasised the role of established routines and 'social practices' embedded in different social contexts, which become in themselves important determinants of existing behaviour.

This pilot study focuses on the contextual social processes that hinder or foster a 'spill-over' from pro-environmental practices established through an intervention in three community clubs three years ago, and then transferred (or not) through a 'spill-over' effect into household organic waste practices. The aim of this project was to learn about the long-term effects of such targeted interventions.

These interventions ranged from initiating water, and energy efficient practices to changing waste management systems in a communal kitchen. Overall, the results demonstrate the complexity and highly contextual nature of adaptive processes when implementing pro-environmental behaviours at considering the longevity of these practices. This case study also reveals that communal settings where multiple actors were attempting to implement a set of pro-environmental behaviours agreed to by their managers, their own inadequate knowledge of the requirements could lead to a failure of not only the correct implementation but also of any potential spill-over at an organisational level. This is particularly so when

Keywords: *Spill-over; organic waste management; community engagement; environmental practices; longitudinal organisational environmental practices;*

Introduction

In response to increasing environmental pressures, many countries are exploring ways of reducing environmental waste more effectively (OECD 2011, Palatnik et al. 2014, 7; Millock 2014). Even though the amounts of organic waste from households are low in comparison to organisational waste, there is a considerable potential for increased waste reduction, and for composting organic household waste¹.

Research on greening household behaviour in waste management currently concentrates on six variables that seem to offer some room for improvement. These are: the effects of user fees, the effects of recycling programs and their attributes (*e.g.* door-to-door, drop-off, frequency of pick up), the effects of general attitudes towards the environment and membership of an environmental organisation, culture and the potential impact of economic incentives and/or other forms of governmental intervention (Barr 2007; Crociata et al. 2015; OECD 2011, 83; Olli et al. 2001; Swami et al. 2011; Thanh et al 2010; Walls 2011). However, another factor that should be considered is waste management practices employed in organisations and their potential behavioural spill-overs.

Social context is a recognised variable that significantly effects, and can augment, environmental behaviours in these and other areas (Evans et al. 2012, 114; Lundie et al. 2001; McKenzie-Mohr 2013; Nye & Hargreaves 2010; Richard et al. 2014). The individuals in an organisation that embrace pro-environmental practices, for instance in waste, water or energy efficiency, may start to align their behaviours in other areas of their life with these practices (Hargreaves 2011; Kemmis 2008; Schatzki 1996, 2011; Shove 2010, Tudor et al. 2007; Warde & Southerton 2012). This suggests that a behavioural 'spill-over' can occur from one domain to another (Andersson et al. 2012; Dolan and Galizzi 2015).

However, research on how pro-environmental organisational practices influence such 'spill-overs' is still not well understood (Andersson et al. 2012, Littleford et al, 2014), as spill-over can happen in different directions (Dolan and Galizzi, 2015). The first set of behaviours does not necessarily work directly to change behaviours in another domain. Indeed, it can backfire and cause avoidance of pro-environmental behaviour in other domains, or there can be forms of resistance that undermine the expected behaviour within the organisational context.

Most research so far has focused on waste management practices and their 'spill-over' in the area of solid waste (Barr, 2007; Barr et al, 2007; Broitman et al. 2012; Tudor et al. 2007; Kollikkathara et al. 2009). What is apparent from this research is that evidence for such 'spill-overs' is attractive and deservedly influential, since it appears to overcome the main shortcomings of prior more narrowly focused psychological studies of fostering pro-environmental behavioural change (McKenzie-Mohr; 2012). The problem is that we still do not know if such 'spill-overs' result in long-term change, or what factors hinder or promote a positive spill-over of behaviours from one life domain to the other.

The project this paper reflects upon examines this problem in more detail through three case studies in three community organisations, a sports club, a Natural Resource Centre and a support organisation for disadvantaged people. In 2011, all three

¹The matter of organic waste collections in households is important considering that the Council in which one of the focus group participants lives collects around 4,500 tonnes of organic material annually, which is equivalent to approximately 125 kilograms for every resident (City of Norwood, 2015)

organisations adopted a pro-environmental intervention involving either water, waste or energy efficiency.

One local community organisation, a popular bowling club in western Adelaide, introduced Bokashi buckets in their kitchen. The other, located in the inner city area of Adelaide introduced an energy efficiency program for the organisation and their residential clients, many of whom had been homeless. The third organisation, a rural South Australian Natural Resource Centre, introduced the composting of organic waste. This stemmed mainly from a monthly farmer's market and a small but growing community garden.

Energy-saving and a spill-over into green waste management

In the case of the organisation for disadvantaged persons located in Adelaide's city centre, a positive spill-over occurred from an intervention that established a set of energy saving practices three years ago. This earlier intervention in power-saving led to the residents of this 56 bed facility sorting waste streams and composting their considerable green waste.

The implementation of energy efficiency practices occurred over the last three years, with one staff member appointed as the 'champion' for this organisational change both amongst the staff and the organisation's clients, who are frequently formerly homeless individuals for whom this staff member also acts as a case manager.

When one of the residents, a woman who had attended a presentation on the effects of organic waste in landfill sites on the environment, approached this staff member to implement sorting waste into three waste streams, organic, recycling and landfill, a spill-over of behaviour started to occur.

The woman had been a resident throughout the previous three years and witnessed and experienced pro-environmental transition processes towards energy savings in the organisation, including presentations on energy saving measures one could do at home. These included changing ordinary light bulbs to LED ones, altering the operating temperatures of cooling or heating systems, and using curtains or insulation to keep heat in or out and similar measures.

She had approached the staff member because he had presented himself as a change agent for pro-environmental practices within the organisation three years before. His visibility in the energy efficiency intervention three years earlier, and his personal stance at that time that the energy saving interventions are not only for the sake of saving on electricity bills but also saving the environment from CO² emissions, allowed this woman to approach him years later with her idea to change waste management practices in the organisation.

From an interview with the staff member, it became apparent that other staff members were sceptical and rather reluctant to go ahead with this initiative, out of fear that residents would not sort their waste streams properly. However, to the surprise of everyone, this organisation now pays AUS\$ 100 less every week due to the successful implementation of the three waste bin system. It became clear from the interview with the staff member that the success of the energy saving intervention triumphed over the reluctance of staff and executives to try out waste management in their organisation.

The initial intervention introduced three years before was sustained at the organisational level and had also been successfully implemented in the homes of clients. For this reason, 'spill-over' into a second pro-environmental behaviour had a

chance to occur. Moreover, the resident who initiated this spill-over could clearly identify someone on the staff likely to initiate a change.

Spill-overs of one particular behaviour (practices of organic waste management) from within an organisation to the homes of volunteers can also occur.

Green waste spill-overs in a rural organisation

Another organisation, a Natural Resource Centre located in the rural area of South Australia showed how a green waste management scheme initiated three years ago at the Centre, could spill-over from the organisation into the home of volunteers who work there.

A number of supporting factors can be seen to have played a role in this particular spill-over. Firstly, one of the main purposes of a Natural Resource Centre is to demonstrate to the public how individuals and organisations can live more sustainably. When this organisation established a community garden and experienced increasingly larger amounts of organic waste from this garden and also from holding regularly monthly Twilight Farmers Markets, it became necessary to implement and maintain a green waste management system.

It became clear during the focus group discussion with volunteers and one organisational administrator, that the capacity of volunteers was vital for the maintenance of composting practices at the centre. The development of the community garden was viewed as connected to the need for expanding their current composting system and the possible adoption of a couple of worm farms. Exposure to these green waste management practices at the Centre, and expert advice to be had from one particularly knowledgeable and accessible volunteer, how to solve problems of that nature, were mentioned as reasons for the adoption of similar green waste practices at the homes of volunteers.

In the focus group previous experience of green waste composting, for example through living on farms, or living in the Adelaide Hills, or from having access to a garden, was also mentioned as a significant factor for many of the volunteers who adopted composting at home.

The organisation attracts many volunteers and also hundreds of visitors, and others through a garden produce swap program. In that program people gather over morning tea, sharing home-grown produce. They cook, and swap plants and information. In this way many more people other than the volunteers are exposed to their composting methods. Motivational factors such as concern for the future was voiced by those who adopted these green waste management practices at home, as was a widespread knowledge of the impact of the greenhouse gas methane in landfill sites, a more potent greenhouse gas than CO₂.

Overall, this and the previous example of spill-over demonstrate and confirm the literature's emphasis on the complexity and contextual nature of adaptive processes when implementing such green waste management practices at an organisational level (Dulac et al. 2001; Hargreaves 2008; Lundie et al 2005; Zurbrügg 2004).

Bokashi bucket intervention and a spill-over 'push back'

In a large Bowling Club in suburban Adelaide a Bokashi bucket composting system was introduced into the Club's kitchen, at the behest of the Club Secretary. Three years

later, we conducted a focus group with three members of the Bowling Club, of one of whom was the Secretary who had been directly involved in the decision to introduce the Bokashi system. He had been involved in the Club for the previous eight years. The two other members were regular bowlers but had volunteered in the kitchen during the previous three years. They had been club members for nine and fifteen years respectively.

The bulk of the organic waste was produced at the Club during a monthly barbeque (i.e., water melon rinds, the waste from eight lettuces, and cucumber peelings and three bags of carrots) and the cleaning of organic wastes and dishes after more regular club events.

Three years after the initial adoption of Bokashi buckets for organic waste in the kitchen, the volunteers disclosed that they believed that there was little chance for this system to have a positive 'spill-over' outcome. Factors contributing to this outcome were multifaceted and included the top down approach of the management group introducing this particular waste management system, which had failed in the interim. Although it seemed a good idea at the time to have the bucket in the kitchen, 'none of us really knew enough about it to start with'.

This lack of training in how to use the bucket, especially the necessity of adding compost starter powder to the organic waste matter in the bucket represented another significant obstacle, with a lot of the volunteers being unaware of this requirement. This incorrect use by the volunteers reinforced the existing perception that organic waste sitting in a bin in the kitchen was unhygienic. The Bokashi bucket caused bad odours and this was made worse because many of the volunteers had some problems opening and closing the lid properly.

The predominantly elderly women in this club, (the youngest individuals are around 60 years old), experienced difficulties in opening or closing the lid of the bucket through lack of strength in their fingers and wrists. The perception of hygiene issues and failure to use the compost starter powder led maggots to appear in the bin, reinforcing their negative views, and a backlash against the use of the Bokashi bucket.

Moreover, since these women were under time pressure in the kitchen, they found it impractical to have to deal with the bucket. Additionally, it seemed odd to them to have a large amount of organic waste going into a bucket once a month and for it not be used again for almost another month until the next barbeque took place. As this suggests, a lack of regularity in the supply of the organic waste, from large amounts following the big barbeque nights, to smaller amounts for the rest of the month, made the bin system seem just too much trouble.

When asked about what could be an alternative to the use of a Bokashi bucket to deal with the larger and smaller amounts of organic waste, it turned out that the respondents were in favour of the previous system, which was to use the local Council green waste bin for their organic kitchen scraps. These had needed to be placed close to the exit of the kitchen, to ensure they were used and that most organic waste did not end up in the normal rubbish bin. Unfortunately, this was now the case, since the green bins had been moved and the convenience of access to them from the kitchen had been lost.

Another issue that became apparent throughout the focus group discussion was that individuals have different thresholds in coping with bad smells and green waste. Indeed, one of the kitchen volunteers was keen to get the other two interested in using the system she had used at home for the previous two years. This involved the use of

green compostable plastic bags that are provided by her council to place the organic waste in before it is thrown into the green bin. These bags largely eliminate the smell emanating from the green bins, which is a problem with loose organic waste in the green bin during summer.

Interestingly, although the Bokashi bucket was rejected outright, that is unless their design could be altered, all three focus group participants managed their organic waste at home conscientiously, and were keen on solving the situation in the Club. Previously working systems at the Club, including giving organic waste to a person who had chickens, were viewed favourably over the Bokashi system. But since the person no longer kept chickens, the focus group was genuinely interested in how this problem could now be solved.

An additional factor in the management of organic waste at the time of the focus group was time pressure, due to the reduced numbers of volunteers taking on kitchen related tasks. However, what also became apparent was that the main reason for not wanting the Bokashi system was a dislike of having the buckets inside the kitchen.

At the end of the focus group a discussion ensued about how plastic bags cannot be recycled in the yellow council bin and only a few supermarkets would take them back, and how devastating these are for the environment, especially for birds and marine life. To the surprise of everyone, one kitchen volunteer suddenly asked the Secretary about the correct use of the Bokashi bucket.

“While I think of it, could you give me a copy of the instructions for the Bokashi bin? (Kitchen volunteer) They are pinned up there. (Secretary) I like to read them at home. (Kitchen volunteer). I will make you a copy. (Secretary)”

This curious dialogue suggests that the Secretary’s communication strategy during the focus group discussion worked, where he would keep pointing out how bad odours could be prevented through the correct use of the starter powder in the Bokashi buckets, and the advantages of using the resulting waste liquid as a fertiliser. The Secretary also agreed with the kitchen volunteers’ account of their difficult experiences with the lid and the incorrect use of the bucket.

In sum, no ‘spill-overs’ occurred at this bowling club from the organisational domain to volunteers’ homes, and in fact the introduction of Bokashi buckets resulted in the opposite effect to that originally envisioned, after three years of its use the organic waste ended up in the general waste bin after it was previously at least discarded in the Council’s green bins. Therefore, the initial intervention introduced three years before had backfired completely at the organisational level and ‘spill-over’ had no chance to occur.

Conclusion:

As Dolan and Galizzi (2015) write: “No behaviour sits in a vacuum, and one behaviour can greatly affect what happens next. ...The first behaviour leads to another behaviour which can either work in the same direction as the first (promoting spill-over), or push back against it (permitting or purging spill-over).” This study shows the complexity and context-dependence in spill-over processes three years after some carefully documented pro-environmental interventions took place. Each case study demonstrates an aspect of the complexity of implementing strategies in community organisations and the factors that may affect spill-over of behaviours from one domain to the other.

The case study involving the Natural Resource Centre shows that several factors can lead to the adoption of pro-environmental behaviours and their transmission. The capacity and skills of their volunteers influenced the ability of the organisation to implement interventions in the first place, and later in maintaining them. These skills were also identified as crucial in offering support to others in the endeavour of implementing new practices in their homes, practices which had been witnessed in the organisational setting. It also became apparent that a history of exposure to the targeted spill-over behaviour had an influence on the uptake of green waste management at home, as had a prior knowledge of the impact of green waste in landfill sites, along with existing concern for the next generation in regards to Climate Change.

The second case study of the inner city organisation shows the importance of key actors in such interventions, and the result of a successfully maintained pro-environmental intervention on energy efficiency three years earlier. This encouraged the adoption of pro-environmental behaviours at the individual level and had then fed back into the adoption of a second pro-environmental behaviour within the organisation. This created a spill-over from one particular set of practices, associated with energy efficiency, into a different and secondary set of practices, associated with sorting waste streams.

The study involving the bowling club demonstrated the importance of the design of the devices used, and of the volunteers understanding how the system worked. It became clear that the design of the Bokashi bucket and a lack of training on how to use it were underlying factors in the failure of the intervention system in the first instance. Incorrect use and inability to open the lids affirmed the pre-conceived notion of the kitchen volunteers that any kind of organic waste sitting in the kitchen is unhygienic. These factors caused the failure of this waste management system early on, as volunteers were exposed to excessive odour, and midges and maggots in the kitchen of their club.

However, the focus group discussion also demonstrated that feed back communication loops about interventions are vital as the focus group discussion incidentally provided this organisation with one. Indeed, it became apparent that all focus group participants had working green waste systems at home before the intervention, even if they had not understood how the Bokashi system was to be used.

Thus individual decisions to adopt spilled-over practices are influenced by a web of aligning or conflicting factors at any given time. All three case studies underline the challenges researchers face understanding different contexts and competing contextual influences under which behavioural spill-overs take place.

However, this study has demonstrated that organisations can make a difference, depending on the way communications work, the organisational culture of environmental champions, and the knowledge base of the membership and volunteers. Organisations that already generate public support from members of the community towards pro-environmental practices may have a ready source of knowledge present. Combining management support, good communication and utilising existing knowledge in the membership base is an essential part of establishing a virtuous loop of pro-environmental behaviour within community organisations and through spill-over pathways to the broader community, especially the private domain.

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Exploring 'pro-environmental' actions through discarded materials in the home

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The household is a crucial focus of both waste and wider environmental policy, being seen as a central site of socio-economic-environmental change, a space in which people may perform their civic responsibilities and where individual and wider imperatives are brought together. Yet policy makers have shown limited appreciation and understanding of what happens *inside* the home. So in contemporary waste policy, for example, households remain a 'closed entity' in which every-day routines and practices remain hidden. Increasingly, though, it is acknowledged by social scientists that the *lived experiences* of environmental and waste management in the home are significant issues requiring further study, but *how* we might go about trying to study them is proving a challenging question. Conventional pro-environmental behaviour research has often tended to study behaviours in ways abstracted from the social contexts in which these take place. This has prompted recent research involving repeat in-depth interviews with householders and more ethnographic approaches, the use of reflexive diaries and narrative methodologies. Curiously, however, there has been little research considering environmental management(s) in the home which has focussed on waste itself.

This paper seeks to add to the discussion, by focusing on everyday processes *within* households, using a qualitative approach of 'getting in the bin' of households - that is, an interview approach which takes respondents' discarded waste as a starting point from which we ask them to discuss the lived experience(s) and activities of everyday life. More broadly by developing insights from what has been termed a 'realist governmentality' perspective the paper seeks to offer a more nuanced and finely grained analysis of governing *in situ*, exploring the extent to which governmental ambitions in relation to waste are accommodated, resisted or [re]worked at the household level.

The paper draws illustratively on case studies from a Leverhulme-funded research project based in Kingston-Upon-Thames, an outer London borough in the UK. The approach used a focus on the contents of household waste bins to develop a narrative approach driven by householders centred on stories about pro-environmental practice. The paper will deal with three elements of the research approach: texturing narratives of waste, generating narratives of recycling in practice, and producing narratives of understanding. The outcome is development of a more thoroughgoing understanding of how processes *within* the home shape waste governance, moving beyond treating the home as a closed entity.

Keywords: waste, households, recycling, narrative approach

Introduction

Management of waste by households invariably translates targets set by government into expectations that households and the individuals comprising them will behave in such a way as to enable those targets to be attained. This is seen clearly in the case of the United Kingdom (UK) where the *Waste Strategy for England 2007* set targets to reduce the amount of waste sent to landfill by 50% per person by 2020 through the principles of reduction, reuse and recycling (the three 'R's). This enlists the co-operation of the citizenry who are expected to respond positively to the waste management procedures instated for households by the various local authorities. These procedures usually involve households in separating recyclable materials into receptacles collected on behalf of the local authority or recyclables are taken by householders to local council-managed 'bring' sites. Householders with gardens are encouraged to compost and there may be incentives for reusing materials and other environmentally friendly practices.

Waste policy implicitly makes assumptions about the uniformity of citizens' lifestyle aspirations and behaviour, ignoring "what happens *inside* the home" (Horne et al., 2011, p.89 emphasis added) and thus failing to enlist wholehearted support from many households for the three 'R's' (Rutherford, 2007). Researchers have recognised this in numerous studies investigating factors promoting recycling by householders, and barriers to recycling and other pro-environmental behaviour (Barr et al., 2013). However, households have remained largely a 'closed entity' in which every day routines and practices remain hidden (Bulkeley and Gregson, 2009).

Giving attention to these processes *within* the home is important on several fronts. Large-scale quantitative surveys cannot fully detail the intricacies within households that inform resource use and divestment (Klocker *et al.*, 2012, p.2243) and "while statistics about households may be central to the representation of census data or economic growth, this technique does not capture the complex cultures of domesticity and identity that sense of home generate" (Hawkins, 2011, p.69). Household dynamics are embedded within sets of social and cultural relations and without paying attention to themes of consumption, identity, values and social relations, we "risk missing the key processes through which waste is generated within and discarded by households, and their relation to questions of social ordering" (Bulkeley and Gregson, 2009, p.930).

Hargreaves (2011, p.80) takes this discussion further in relation to pro-environmental behaviours by arguing that: "close examination of behaviour change processes as they occur *in situ* reveals many more aspects and complexities of daily life than existing approaches capture". What is needed, it is argued, are approaches which allow us to get closer to the contexts and particular material settings of everyday life in which these actions take place.

Getting in the Bin

The research reported herewith used a methodological approach drawing upon recent insights from qualitative pro-environmental behaviour (PEB) research (Hargreaves, 2012). The paper draws illustratively on research undertaken in a Leverhulme-funded research project based in Kingston-Upon-Thames, an outer London borough in the United Kingdom. A total of 27 households were used as case studies, with detailed participant observation employed in endeavouring to capture the route of waste materials through the home. This is similar to work by Evans who utilised cupboard rummages and fridge inventories suggesting: "the analytic thinking behind this

approach was that it would ‘thicken’ the interview data by allowing for a focus on talk as part of situated action” (Evans, 2012, p.46). We wanted to engage directly with waste and used this to elicit conversation with householders in their own home. We also wanted to ensure that the affective qualities of waste were taken account and harnessed. This acknowledges the phenomenological reality of waste (Hawkins, 2006, p. 80) or as Rathje and Murphy (1992, p.14) in their championing of ‘garbology’ stated, we used waste “to investigate human behavior ‘from the back end’ as it were”. This approach was also influenced by the ‘visual turn’ in the social sciences, which has highlighted how objects may be useful within research in encouraging memories and allowing the elaboration of stories about experience. In this case, by referring directly to household waste *in situ*, this can create a dynamic encounter between the residents and the researcher, discussing household waste together with the ‘evidence’, that is the waste itself, in front of them (Metcalfe et al., 2013).

This approach prioritises respondents’ own forms of expression; they can select information they see as most relevant rather than using pre-defined categorisations of the researcher. It also emphasises the individual’s own experience, employing open-ended interview questions to enable respondents to elaborate on what they feel are significant issues, events and background material. This narrative inquiry allows for a more holistic approach so that “stories about pro-environmental practice might refer to other life-events, explaining how these relate to the practices concerned” (Hards, 2012, p.3).

All respondents in these households were positive during interviews when asked if the contents of their household waste bins could be looked at and discussed. They agreed to empty out their various household bins to be then picked over and analysed. Bin contents were usually emptied onto newspaper, with photographs of whole contents and individual items. Respective items were then used to develop narratives about the object itself, why it was placed where it was, who put it there, when was it used and by whom. These questions inevitably drew out discussion about household relations, daily routines and broader consumption practices, such as shopping, use of particular items, and food consumption. The main focus tended to be the kitchen bin, which invariably was the principal conduit for non-recyclable objects and gave access to the greatest range of materials. Once completed the interviews were transcribed and analysed literally, interpretively and reflexively (Mason, 2002). The interpretive and reflexive elements produced themes, issues and ideas that were central to the analysis. Transcripts were combined with the photographs of the items to give lists of materials discarded and a range of object narratives.

The following analysis draws on a small selection of more intimate snapshots of the households encountered, with the aim of both exploring what insights working with bin contents might provide and reflecting, more broadly, on waste governance. This is a far from conventional approach, but it is a logical outcome of a theoretical orientation to the micro-scale, as well as reflecting the methodological concern for specific, artefact-centred, discussion and is the most appropriate strategy for considering the everyday activities of waste management in the home (Evans, 2012).

Narratives from the Bin

A highly pro-environmental couple, Martin and Veronica, illustrate the type of detailed understanding of household waste practices that can be developed by this research. They have built and installed multiple bins and drawers for the storage of materials, and neatly fit Paterson and Stripple’s (2010) description as “self-regulating, carbon-

conscious citizens". They have appropriated the food caddy supplied by the council for their own compost production and this stands in the small middle bowl of the kitchen sink unit where they can easily access it to place peelings and food scraps as well as occasional egg boxes and pieces of newspaper.

The elaborate bin and container system created can arguably be seen as government successfully 'crossing the threshold' (Bulkeley and Gregson, 2009) and entering into daily lives within this household. However, interviews with Martin and Veronica, focusing on the actual contents of their bin, added a further layer to the discussion. It suggested more than just compliance (with the local government scheme for recycling) and environmentally-motivated actions at work, but rather embodied a sense of self-government and of control and order. In effect the government's current waste regime places emphasis on households to enact pre-disposal 'interventions' (through acts such as classifying, cleaning and sorting waste materials). This is then performed in various ways, with Martin and Veronica's household representing one type of response, involving powerful notions of order, self-control and the maintenance of cleanliness.

The interviews allowed recognition of discordance between reported actions and those evidenced by materials in the 'wrong' bin, e.g. recyclables in a receptacle for non-recyclables, or consumption of 'ready' meals (convenience foods) by a family who had stated they only ate fruit and vegetables and freshly cooked produce. The interviews involving examination of bin contents allowed a more holistic insight to waste practices, with each artefact requiring a piecing together – often quite literally on the floor during interviews – of how, where and by whom this material has arrived in a particular bin. In many cases a stated intent in favour of environmentally responsible behaviour could be suborned by the realities of everyday life, e.g. being too tired or insufficiently time rich to cook a meal with fresh ingredients.

Examination of the contents of household waste containers also enables a greater appreciation of intra-household dynamics and the generation of narratives of *who* did what within this process. For example, in a household in which Hereward, a recent retiree, expressed the prime responsibility for managing the contents, it was revealed that the bin for landfill items actually contained several recyclables. Hereward acknowledged that this material was in 'the wrong bin', but explained that he and his wife had three children under the age of twelve, and "the children were asked to tidy up, and they can't be bothered to take it to wherever."

This is illustrative of the fact that in most households there is not a unified, controlled, system determining what goes into the bin. So the commonly used term, 'household waste management' masks the intersecting everyday practices of multifarious household members, illustrating how they may not all perform the requisite subjectivities. Intra-household dynamics mean that waste management may fluctuate and vary. Further probing revealed that Hereward's wife, Sue, is a committed environmentalist and it was she rather than her husband who had insisted on waste for recycling being placed in the recycling receptacle. Hereward complied with this essentially because "it's mainly to make the wife happy!"

This is an example of 'actually existing sustainabilities', which Krueger and Agyeman (2005, p.411) refer to as "practices not explicitly linked to the goals of or conceived from sustainable development objectives but with the capacity to fulfil them." Hereward's actions are not just as a direct result of concern for the environment, but more through a sense of moral obligation to the aspirations of his wife. Uncovering such interrelations is of significance for understanding environmental governance in the home. It also highlights the precarious nature of pro-environmental actions in some homes. Further

investigation of the contents of the landfill bin enabled the narratives associated with discarded items to be traced and allowed us to see their placing is more complex than being a simple function of attitudes (be they pro-environmental or not), but instead disposal is set within the context of social relations, emotions and everyday activities.

In another household consisting of three recently arrived South African immigrants in their 20s, responses revealed that disposal, particularly for smaller incidental items such as receipts, was often an unthinking activity, with disposal made into the nearest bin without full consideration of its appropriateness in relation to governmental rules. As Shannon from this household said, "For me it's just a ..., it's a laziness thing!" The result was that material placed in the bin in her bedroom was then tipped into the bin for landfill in the kitchen even though material that could be recycled was present. Re-sorting rarely occurred and definitely not for items placed in a bin in the bathroom: "You don't know what's been in them, razors or anything" (Gareth). Communal spaces, such as bathrooms and living rooms, were ones where fixed routines of waste sorting were rarely observed and where, often, no one member of the household took responsibility for sorting the waste. This is part of what Nansen et al., (2011) refer to as 'logics of materiality' in the home and in particular how dynamics of the home may become naturalised over time as particular cultural norms are inherited.

Narratives of understanding

Waste policy generally assumes that information flows in a linear, top-down way from governments and local authorities through to the individual. Yet, discussing the materials in household waste bins gave an insight into the realities of the intricacies and fragility of understandings and information flows. Publicity campaigns may target information *at* the home (Robinson and Read, 2005), but this information does not necessarily flow uniformly *through* it. Information may be misinterpreted, miscommunicated between household members or simply refuted in different ways by different individuals. Second, it reveals one of the potential fragilities of governing at a distance, which is the reliance on expert discourses being privileged over other forms of understanding and networks of knowledge that may be prevalent in individual households.

Helen's comment is typical, "there's loads of things I don't know whether I should be recycling or not". This problem is compounded because different local authorities may use slightly different approaches in terms of collection and recycling practices. Understandings of waste management are continually evolving in the crucible of the household and, importantly, these understandings may be fragile and easily disturbed. New household members, reconsiderations of new and pre-existing information amongst household members, and interventions from social contacts beyond the household mean that information from local authorities often faces reinterpretation, misinterpretation or refutation.

For example, comments from one resident (Phil) highlight the problems faced when dealing with certain materials: "The collection of plastic I think is a mess, right. All these different symbols and different things, so over the years I've probably given up on this, 'cause I've tried to put lots of different bottles out, some's been rejected; next week the same stuff's been taken and then back and I haven't got my head round the five or six categories of whatever they are. So now, mentally I've just fallen into, this is either soft plastic or it's hard. If it's soft they'll take it and they do. If it's hard, which is like rigid bottles or buckets that kind of stuff [...and] things like old butter containers or jars, plastic jars, which they won't take." However, under Phil's categorisation, things such

as butter tubs were classified as 'hard plastics' and thus not recyclable, when in fact they could be recycled under the rules of the local authority.

In contrast, individuals recognise glass easily, and it can accordingly be placed readily in the correct, recycling, bin without the need for cross-checking of local authority information sheets or by consulting recycling officials. In short, this knowledge has become a more performative, tacit, understanding. Plastics, however, present a different case in that their variety, as well the slightly different rules surrounding their recyclability in different local authorities, mean that there is a more constant need for recourse to information sheets as well as the need to cross-check PET (Polyethylene Terephthalate) numbers. Thus the process does not easily become a routine, unthinking action, and accordingly is more inconvenient and cumbersome. Responses ranged from those who overcame this inconvenience by placing all plastics in the same bin (either landfill or recycling) and thereby misplaced a certain percentage, or those such as Phil who attempted a quicker former of discrimination, based on the immediate characteristics of the item.

Conclusions

The approach employed in this research offers several insights not only to how we might study and understand waste and pro-environmental actions in the home but also to what recommendations we might make for waste management policies. The method goes some way toward closing the value-action gap, which relies on householders' self-reporting, as it allows a physical reflection on how what appears in bins correlates with what interviews and questionnaires tell researchers. There appear to be sufficient discordances between reported and actual actions to recommend caution be exercised when assessing the figures presented in self-reporting surveys. Furthermore, the contents of waste bins acted as a multi-sensual aide memoire and cue to discussion. It enabled the researcher to access those particular moments which may be seen as too insignificant to mention in surveys or interviews.

The research reveals that there is a need for more thoroughgoing understanding of how processes *within* the home shape waste governance, and thereby moving beyond regarding the home as a closed entity. Environmental discourses are just one set of moralities which are combined with other everyday domestic imperatives within the social and cultural specificities of the home. The discourses involve three main recurrent elements. First there is order and control. The provision of relevant bins provides a 'choice architecture' for households, but individuals look to maintain a sense of control. Second, the process of cultivating a particular self in relation to waste is not a uniform process across all household members. It intersects with both the moral and social commitment to other members of the household as well as their material presence in the home. These observations offer a challenge to the deployment of the information deficit model which presumes that the end target, the household, will respond and react to various stimuli in a uniform manner. Third, but interrelated, the configuration of the home and its attendant moralities shapes how respondents react to government imperatives to manage waste in a certain way.

This approach presents two principal ramifications for waste policy. The discordance between desired objectives of government and actions at household level needs to be recognised (see Hobson and Hill, 2010). Second, there is evidence that even where there is a strong level of self-reflection by individuals in relation to the discourses associated with waste policy, 'correct' waste management may not always be enacted, especially where methods of accommodating complex rules of what can and cannot be

recycled become misinterpreted or challenged through preference for other networks of information.

Recognising this more intricate picture of individuals in their home contexts illustrates the instability of environmental citizenship as a position enacted, with both the mundane and ordinary rhythms of everyday life, set alongside competing moralities of order, home and family. Such observations raise a broader challenge to the supposition in contemporary waste policy that the position of self-reflecting environmental citizens once reached by individuals is one where they will remain consistently positioned over the long-term.

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Individual, Social and Material Constraints on Sustainable Behaviour Change: Relevance to Food Consumption and Production in Australia

Gavin MELLEES

Food provisioning, waste and consumption constitute major inputs to the carbon footprint of cities. Consumption and production practices focused on low cost, high volume industrialized agro-industry products delivered to consumers via supermarket and other retail chains may not incorporate environmental, social and economic costs (including the relevant externalities) of food production and consumption into pricing. Such high volume approaches contrast with other efforts, e.g. farmers markets, food co-ops, community gardens, to promote sustainable low carbon living (LCL) at a variety of scales in residential urban settings. From a strong sustainability perspective, principles, models and examples of achieving alternative food provisioning in communities are reviewed in this paper with a view to identifying the constraints and parameters for developing systemic alternatives for Australian urban settings. Such alternatives will require political will and multi-stakeholder engagement to generate demand driven change. Despite progress in a range of areas, what is required is a theory of change that identifies the social, individual and material constraints. Reviewed is a new tool for behaviour change and engagement – the ISM (individual, social, material) Tool focussing on such concerns.

Sustainable food consumption and production: a holistic system revision

Sustainable food consumption and production makes a holistic evaluation of activities in the food system from the farm to the table with a view to reducing CO₂e outputs to the environment while also attending to social, e.g. employment, and economic, e.g. costs and benefit (CBA), dimensions of the triple bottom line (TBL). Where lowest retail prices strongly determine consumer decisions, supermarket oligopolies with increasing vertical integration through the food supply chain can dictate lowest prices, and simultaneously respond by diversifying into organic and regional products to drive SME competition back. Without a full internalization of social and environmental costs (and benefits) of alternative versus conventional food systems, e.g. transportation costs or 'food miles', little progress can be made towards sustainable food systems as larger agro-industrial entities (Seyfang, 2007).

A proper assessment of negative and positive externalities between food systems is essential; what production economics sometimes refers to as the difference between marginal private and social costs. Pretty et al (2012) in one of the few systematic reviews of negative externalities to a typical basket of 12 commodities in the UK conclude major benefits and positive externalities can be made through organic farming, localised farming and sustainable transport. That consumption and production changes must be integrated is emphasized in a follow up study by Coley et al (2009) who show that conventional car transport (6.7km) to a 'local' option can negate the CO₂e savings. In assessing alternatives it is also critical to distinguish between the production and consumption costs and benefits of local and organic as distinct categories for consumer preferences (Denver & Jensen, 2014). The two terms are not always distinguished and both *may* contribute to sustainable consumption and production.

Low carbon communities have become something of a focus for looking at individual behavioural change in local social contexts. Such communities may be defined by geographic, interest, sector or even on-line boundaries (Mulugetta, Jackson, van der Horst, Heiskanen, et al., 2010). The agenda for low carbon communities will require infrastructure, policy and behavioural changes that will lead to a better informed citizenry (Fudge, Peters, & Jackson, 2010). One key question is the extent to which such initiatives can drive individual and social change and at what scale (Mulugetta, Jackson, van der Horst, Middlemiss, & Parrish, 2010). Combining such communities with alternative food networks (AFN) as we discuss below, brings several dimensions of sustainable consumption and production together in an era of climate change.

In all local food contexts it is however essential to have realistic measures and not just a persuasive rhetoric of sustainability. Thus, generating fewer food miles through regional and organic production does not *necessarily* translate into a lower carbon footprint when transportation costs and externalities are included (Coley et al., 2009). At the same time, it is essential to take a holistic view of the potential benefits beyond just economic gain. Thus, the strategic development of local (sustainable) food systems to revitalize community can generate real ecological, social (equity and democracy) and economic benefits, including reconnecting urban and rural communities (see Feenstra, 1997).

Global food trends, especially for economies in transition, show a growing energy demand and negative health consequences, e.g. obesity, due to increasing meat consumption and production (Kearney, 2010). However, much of the technology (e.g. drip feed irrigation, sustainable packaging, minimal food waste) and practices, e.g.

sustainable farming, to create change are already available. For example, technology improvements and reduction in high energy intensive livestock production (e.g. beef, pork) has been shown to contribute to major environmental and health savings and benefits (Friel et al., 2009). Political will and behaviour change among consumers more so than technical innovation are critical (Godfray et al., 2010). Ultimately, at the downstream end of the food system, sustainable consumption at the household level – including a focus on reducing food waste – can, it is argued, promote ecological citizenship (Seyfang, 2006), i.e. a broader awareness of environment, social and environmental interactions, as both an impetus and an outcome of encouraging alternative food systems.

In his critique of the disconnect between economics and environment, Orr (2004, pp. 172–184) suggests ways towards an ‘honest’ food system: the wider spread adoption of ecological economics; an approach which fully accounts for environmental costs, including farm and food policies that require full cost-accounting, and recognizes environment-agricultural interdependencies. Describing the current agri-food industry as ‘unjust, wasteful and utterly unsustainable’, Sage (2012) meanwhile points to the need for thorough restructuring of the food system (fig.1 below) towards sustainability. He identifies changing the prevailing exclusive preoccupation with intensive agricultural productivity focussed on high-input industrialized production towards low input, low waste sustainable agriculture. Only a full portfolio of legislative, economic and social measures will be able to drive such an agenda.

Ideological sustainability continuum: strong sustainability argument

Specific definitions and practices of sustainability, including for food consumption and production, vary according to the underlying eco or anthropocentric ideology driving approaches to growth and development. Ideological commitments to preserving or sacrificing natural capital, privileging economic growth over human development (e.g. capabilities) underlie different approaches to reducing waste, increased farm input efficiencies, reducing Co2e outputs through lifestyle change (e.g. reduced meat consumption) and other strategies. Models, methods and discussions of sustainable food consumption and production that ignore this ideological base and the fundamental dichotomy of strong and weak sustainability bypass a deep constraint and reality.

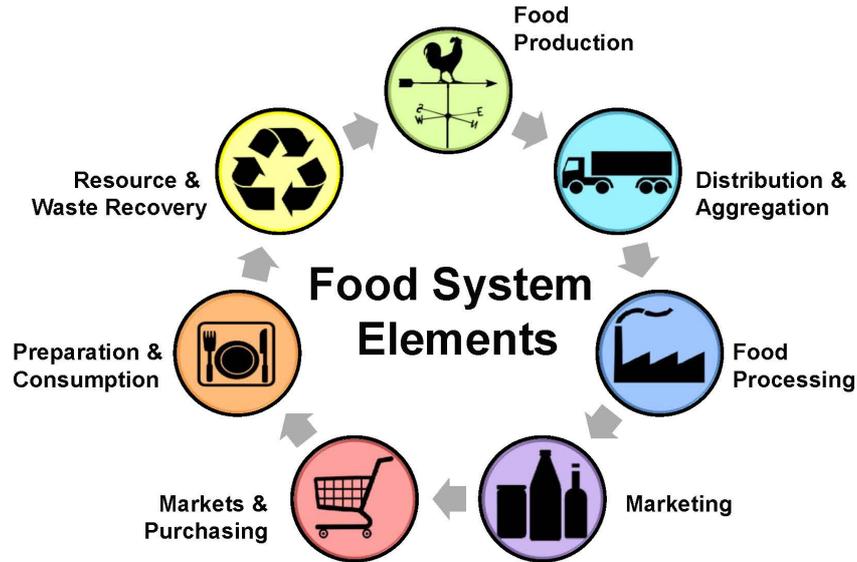
Susan Baker (2006) differentiates four broad approaches to sustainable development that she places on a continuum from very weak end-of-pipe solutions to ideal ‘deep’ green ecological solutions. Weak sustainable development is typified by ecological modernization, i.e. focused on regulation of market with environment in mind, including penalties and compensation for abuse, and market environmentalism, e.g. green wash; standard market economics and growth are taken as given (Adams, 2009). Strong sustainable development meanwhile takes a holistic cross-sector view of policy and regulation of environmental resource access, encourages ecological economics, resists the depletion of natural capital for growth ends, and promotes alternative models of development and well-being (Jackson, 2009). While deep green approaches privilege the ethical and moral dimensions of conservation as a justification for action on Co2e reductions in the food chain, there are other more human drivers which mean a solution cannot wait for an unlikely global attitude change in that direction. This paper takes strong sustainability as an underlying framework and goal.

Untraceable food chains in the third food regime

Particularly relevant to this paper is the call to reconnect production and consumption for sustainability by reducing both the physical and psychological *distanciation* of food production from consumers, which has been promoted by the current agro-industry complex with its long supply chains. 'Hiding such information, making traceability difficult to establish, serves the interests of those who intermediate on behalf of consumers: the large processing, retailing and food service companies' (Sage 2012, p.264). Until recently, the multinational (distributed) nature of supermarket chains also makes transparency with regard to CO₂e costs and sustainability difficult, which tend to be 'black-boxed' (Konefal, Mascarenhas, & Hatanaka, 2005). Greater transparency with respect to production and consumption costs and their consequences is essential – leadership from government and industry is critical here.

More recently some of the larger suppliers and retailers have attempted to redress this perception, including through the adoption of fair-trade and organic products, as a customer alternative. These upstream consumer strategies are a response to attitude shifts in certain market segments in the current third food industry regime, which is characterized by a mix of 'fresh/healthy', packaged dinners and entry of MNC backed supermarket chains into financial services (Burch & Lawrence, 2009). This 'third food regime' as it has come to be called, is driven more by consumer demand, food scare perceptions, e.g. BSE, and other factors, and supermarkets have responded by simultaneously trying to own the space while producing ready-made meals and low-cost own brands. Closer analysis of some of these claims have now cast doubt on the purported benefits especially for the intended rural beneficiaries (Getz & Shreck, 2006). Such responses are therefore not a systemic response.

Both demand and supply factors drive the current practices of supermarket chains to source, stock and sell goods and services with high associated costs. The transnational reach of supermarket chains and their ability to dictate to the agro-industry, while backgrounding their actual practices with some government complicity, is a concern (Konefal et al., 2005). Developing sustainable food supply chains and healthier consumption practices requires fuller cooperation and communication among all stakeholders in the supply chain to the end user, and will begin with changes to food production and intensive agriculture (Smith, 2008). As illustrated in the figure below there are multiple points for sustainability interventions, including at the post-consumption phase, for waste management.



*Adapted by Christy Shi, Center for Environmental Farming Systems.
From: Wilkins, J. and Eames-Sheavly, M. Discovering the Food System; An experiential learning program for young and inquiring minds.
Cornell University, Departments of Nutritional Science and Horticulture. <http://www.discoverfoodsvs.cornell.edu/>*

Figure 1: <http://www.carolinafarmstewards.org/enews-may-2014/>

There is global consensus that sustainability at the household level can achieve major economies by focusing on efficiency oriented behaviours, e.g. reduction of food waste in the household without the introduction of regulatory measures (Dietz, Gardner, Gilligan, Stern, & Vandenberg, 2009). Food waste is certainly a key ingredient for sustainable food systems. Dorward (2011) notes that waste across the food supply chain can be subcategorized into four categories of food waste related emissions: pre-consumer embedded, pre-consumer waste disposal, consumer embedded and consumer waste disposal emissions. The author argues for a mixture of technological and behavioural change to be tailored to the economic, cultural and technological conditions in each country to promote change.

Existing regulatory measures and processes, e.g. food labelling, however, remain confusing, and would require considerable improvement before having a positive effect (Gadema & Oglethorpe, 2011). Although their accuracy is not always good, on pack labelling, carbon calculators online and as apps for consumer also offer (personal) decision making tools to lower carbon footprint (Kim & Neff, 2009). Ultimately, it is important to see the pressure points in the food system as opportunities for more sustainable behaviours, including the generation of employment, health benefits, increase in social capital within communities, and so forth. Alternative Food Networks offer a strategy in this direction.

Alternative local food networks

Alternative food networks (AFN), which focus on relocalisation, offer short food supply chains, direct marketing, focus on regional tradition and artisanry and food quality. In a favourable institutional and policy environment they can succeed but face obstacles in scaling up (Seyfang, 2007). Examples of AFN are farmers markets, urban agriculture initiatives, e.g. community gardens and home gardening. ‘AFNs are defined in four major ways: (1) by shorter distances between producers and consumers; (2) by small farm size and scale and organic or holistic farming methods, which are contrasted with large scale, industrial agribusiness; (3) by the existence of food purchasing venues

such as food cooperatives, farmers markets, and CSA and local food-to-school linkages; (4) by a commitment to the social, economic and environmental dimensions of sustainable food production, distribution and consumption' (Jarosz, 2008, p. 232).

O'Kane (2012) provides a useful if somewhat simplified graphic summary of the differences between conventional and local food systems in terms of outcomes, with a focus on human (public) health (see figures 2 and 3, below).

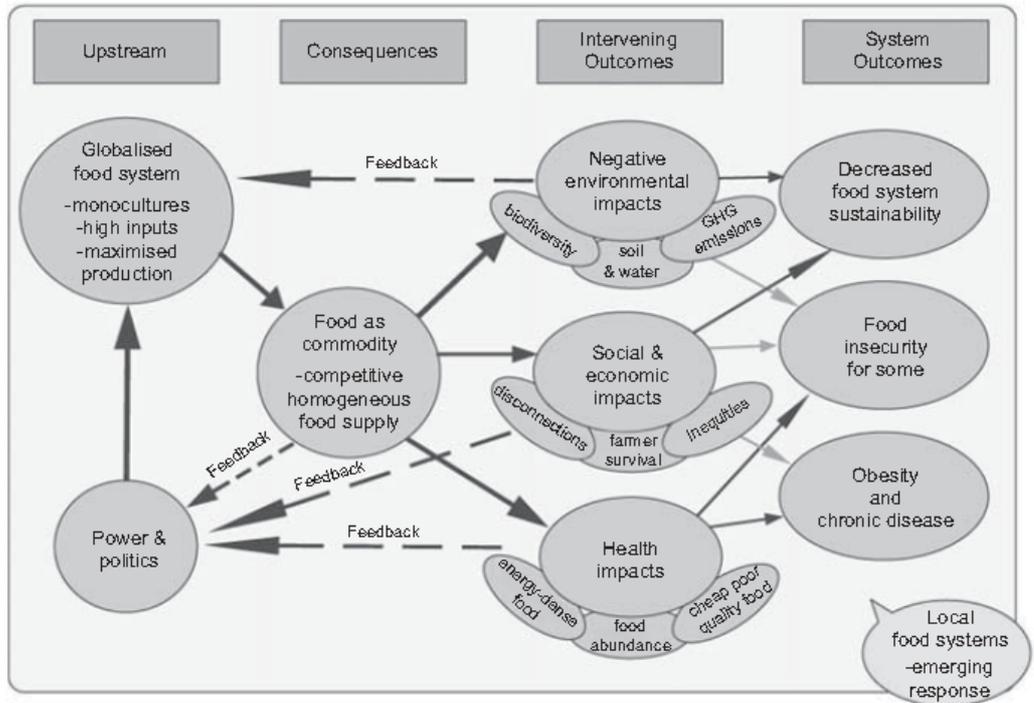


Figure 2: The current food system (O'Kane 2012, 273)

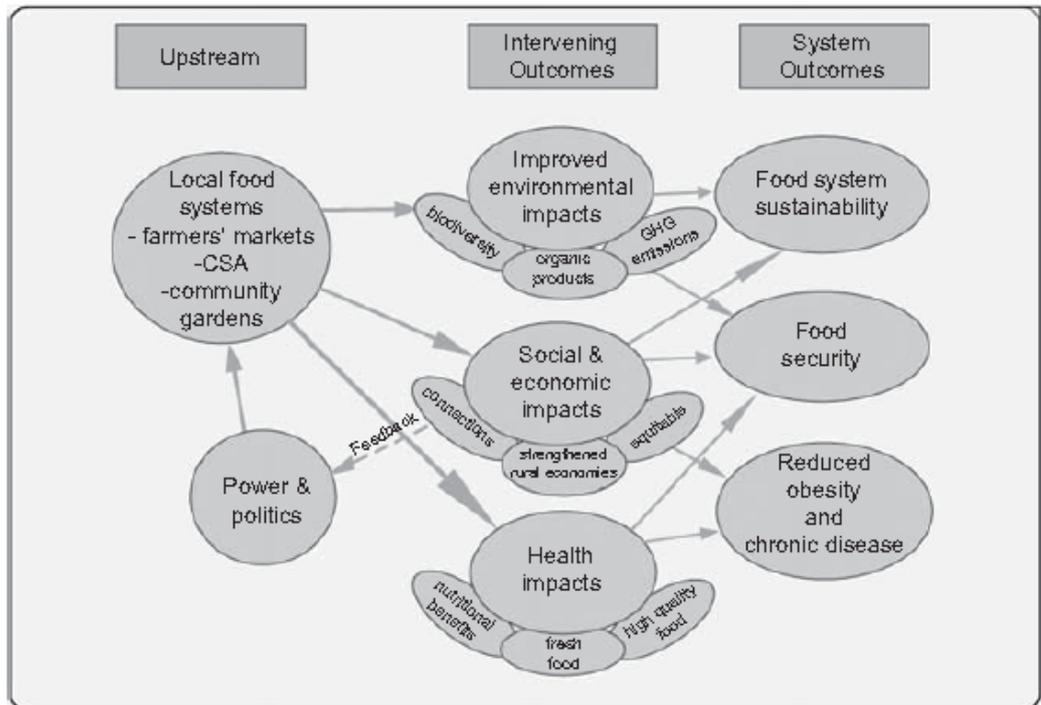


Figure 3: Local Food Systems (O'Kane 2012, 273)

Thus, there are considerable socioeconomic, environmental and health benefits for AFN, which would however require real leadership from government and legislative intervention.

Australia – barriers and enablers of sustainable urban consumption and production

The particular challenges for Australia to achieve sustainable consumption and production have been alluded to above in other contexts. Yencken & Wilkinson's (2001) agenda for resetting Australia's compass towards sustainability pointed to the fundamental need for political will and engagement, dematerialisation of the economy, improving the information base for assessment of resource and waste flows, and using models and techniques, e.g. ecological footprint analysis, Life Cycle Analysis (LCA). Despite having an enviable human and economic development global ranking, the 2013 Sustainability Report for Australia (see <http://www.environment.gov.au/sustainability/publications/sustainable-australia-report-2013-conversations-future>) highlights a number of trends including a growing provisioning divide between the inner and outer suburbs, an ageing demographic, rising inequality, food waste issues and starker regional disadvantage since 1990. This report assumes a mainstream sustainable development agenda focussed on continued economic growth and consumption with voluntary regulation contributing to change. Given Australia's large ecological footprint this does not seem enough to honour its global responsibilities.

Sustainable consumption has, however, not been a major success in Australia. Despite growing media attention, sustainable consumption has failed to become a political or public issue in Australia, and there are numerous barriers to change evident throughout society (Hobson, 2003). Thus Bhaskaran et al (2006) note value-chain intermediaries are unlikely to voluntarily adopt environmental standards because of low demand for such foods and the high costs of adopting and monitoring environmentally sustainable production and marketing regimes.

Any articulation of a sustainable food system in Australia also needs to build on nutritional and health benefits in addition to economic and ecological advantages. Using available evidence for Australia, Friel et al (Friel, Barosh, & Lawrence, 2014) have shown that a sustainable and healthy diet based on a typical food basket and a holistic farm to table accounting is possible in Australia. Such diets include dietary change in meat consumption away from beef and other high energy products towards alternatives such as kangaroo meat. However, such urban-rural networks and practices require favourable leadership, governance and institutions, which may be in short supply in Australia (Mulugetta, Jackson, van der Horst, Moloney, et al., 2010).

Community Behaviour Change: individual, social and material (ISM) contexts

A behaviour change approach to sustainable food production and consumption that is informed by a strong sustainable development commitment will need to be both practical and comprehensive. Theories of behaviour change abound and some address sustainability behaviours, even so they may be too far from practical to be useful. A complex network of individual, social and material (infrastructure, economics) constraints together dictate where the focus should lie for the major stakeholders (farmers, retailers and consumers) across the food system. Assuming initially that

consumer demand is a sufficient prompt to change behaviour change initiatives can be developed with single or multiple foci.

With collaboration from Manchester University (Darnton & Horne, 2013), the Scottish Government developed the ISM tool to address the practical issues of having a framework for change. It divides drivers into individual, social and material contexts (figure 4 below). The sub-elements at each level are specified in the diagram.

FIGURE 1
FACTORS THAT INFLUENCE BEHAVIOUR IN THE INDIVIDUAL, SOCIAL AND MATERIAL CONTEXTS ('THE ISM MODEL')

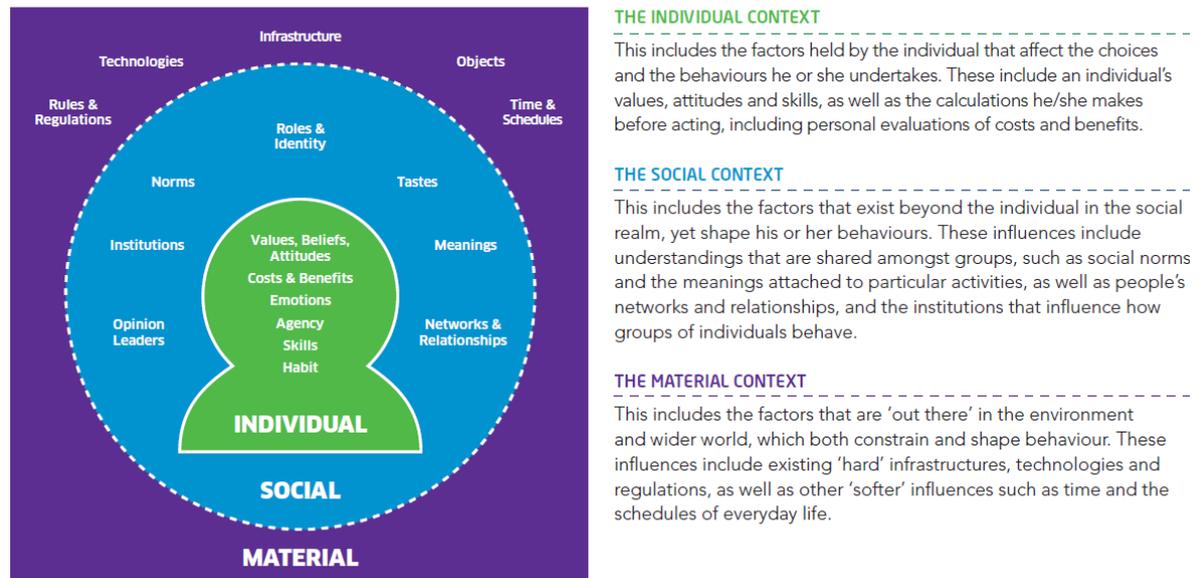


Figure 4: the ISM model (Darnton and Horne 2013)

The guide goes on to note, exemplifying, how interventions can target any of the three levels. So, for example, at the individual level one can challenge or address the values, beliefs and attitudes of individuals, e.g. 'acting ethically' or focus on costs and benefits, i.e. economic benefits, in driving change. Typically more than one level and more than one characteristic is embedded in any intervention.

Where policy making is the issue, the model also proposes a systematic ten step approach to deploying the ISM tool in specific contexts, especially in stakeholder workshops, i.e. with mixed local government, industry, civil society, etc. with a focus on gaps in existing policy and practice and niches for interventions – that ultimately lead to change. This is the preliminary to taking action based on identifying ISM factors not considered or perhaps not considered enough. The final step 'take action' can in fact be itself unpacked into a staged intervention deploying multiple tools and strategies. The outcome of the policy formulation process is an input into action. Here a portfolio of options exists to engage society in change and address gaps. At the project level from farm to table the same individual, social and material constraints or foci can be integrated. The approach is perhaps not unique in seeking direct citizen engagement and multi-stakeholder input into wicked policy formulation (Australian Public Service Commission, 2007).

The three ISM dimensions are relevant to all stakeholders in the food system chain – farmers, entrepreneurs, and consumers. A portfolio of project level initiatives needs an underlying framework of behaviour change factors, which the ISM model offers.

Discussion and conclusions

Any discussion of more sustainable lower carbon food production and consumption systems at precinct, neighbourhood, regional or other scale cannot ignore the general problem of achieving sustainable development objectives in general. In the year (2015) in which the MDGs have achieved a mixed scorecard and the post-2015 agenda is being set by the new sustainable development goals (SDGs) one must ask questions at the global scale about food systems. At urban and regional scales stakeholder involvement, political leadership, community and professional education and other, e.g. economic, drivers can be combined to help drive sustainable change. Supermarket chains and the agro-food industry in general are not the only if perhaps major contributors to unsustainable food systems. The complicity of civil society in its behaviour and attitudes and government through its lack of leadership and legislation in maintaining the status quo must be recognized.

The strategic question becomes one of asking what combination of mechanisms can help solve this eminently wicked policy and practice problem. Strong sustainability demands transparency in food systems, government leadership, and a strong focus on behaviour change. The ISM model identifies factors and some processes towards such an agenda and the model has some demonstrated purchase in this space. Initiatives which tinker with aspects of the system while ignoring the ideological commitments inherent in mainstream and alternative food systems lack the vision necessary to promote radical change at scale. The ISM tool helps identify the multiplicity of factors that will be in play in modifying policy and practice, and promoting ecological citizenship in society is the relevant broader goal.

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