Recycling organic waste resources to land – communicating the issues

Conference or Workshop Item

Recycling Organic Waste Resources to Land – Communicating the issues

Christine Thomas, Andy Lane, Sue Oreszczyn, Frank Schiller and Mark Yoxon
Integrated Waste Systems, The Open University

CONTACT

Dr Christine Thomas
Integrated Waste Systems, The Open University
Milton Keynes, MK7 6AA
UK
Email: c.i.thomas@open.ac.uk
Tel: +44 (0) 1908 653460
Fax: +44 (0) 1908 652175

EXECUTIVE SUMMARY

Recycling organic waste, primarily through composting and anaerobic digestion, can reduce environmental impacts and help meet sustainability goals. Added to land, these resources can improve soil quality and nutrient balance. However, there could be risks involved and these need to be identified and managed. As a result of EU and UK legislation, increasing amounts of biodegradable material have to be diverted from landfill. Recycled organic waste applications to land will come under increasingly rigorous scrutiny by stakeholders, as the quantity and range of materials involved increases. However, as this paper argues, it is crucial to understand stakeholders' perceptions and attitudes to these materials in the shaping of policy and practice. Although attitudes will not necessarily drive the policy agenda in isolation, without acknowledgement and attention policy initiatives may stall and not achieve the necessary goals. And key to this, as the paper elaborates, is communication of risk and benefits of this sustainable waste management route.

This paper draws on recently completed primary research which explored stakeholder attitudes and perceptions towards the spreading of recycled organic resources on land. A key element of the research is an iterative participatory process which progressed through stages of systematic data gathering and systemic analysis using quantitative surveys and stakeholder workshops. The outcomes provide a fuller understanding of stakeholders' main concerns and how they perceive not only the current application of recycled organic resources on land but the potential for increasing use. The research explored stakeholders' attitudes to the issues, drivers, barriers, causes and consequences of applying recycled organic resources to land. In both the public and farmer surveys, the respondents expressed positive attitudes overall to the use of recycled organic resources on land. Farmers saw benefits from the use of recycled organic resources on soil quality, the environment, cost and waste prevention. Climate change issues and environmental concerns were often cited in the stakeholder workshops as important reasons in favour of recycling organic wastes to land. However, environmental, as well as health and safety, impacts (and their effective management) were the most widely cited concerns.

Attitudes focused strongly on knowledge and understanding. The paper explores how knowledge and its associated communication were seen as both a driver and a barrier to increased use of recycled organic resources on land. It provides evidence from both the farmer and public surveys

showing how those that know more about the use of compost or what happens to organic material collected for composting are more likely to express positive attitudes towards its increased use in future. The need for "*more research*" was raised although often the context was 'not knowing' what was already known and highlights the need for better communication of knowledge. The findings suggest that effective communication is not adequate at present throughout the recycled organic waste resource cycle. Communication is also vital in building confidence and trust in the ability of regulation, standards and their enforcement to adequately protect against potential contamination and health issues. Associated technical issues need to be resolved in a transparent way and communicated appropriately to players in the supply chain. There is little point in having standards if people are unaware of them. This paper highlights the importance of understanding how knowledge flows between stakeholders and between policy and stakeholders and in doing so illuminates effective ways forward.

INTRODUCTION

Recycling organic waste materials as useful resources, primarily through composting and anaerobic digestion (AD), is seen as a way to reduce environmental impacts and help meet climate change goals. EU and UK waste management legislative drivers concerned with issues of sustainability and land availability have led to pressure to reduce the amount of biodegradable waste going to landfill to substantially lower the carbon emissions associated with this unsustainable waste disposal route. Added to land, recycled organic resources can improve soil quality and nutrient balance –vital for sustainable agriculture. Balanced against this are issues concerning potential contamination and pollution from recycled organic waste materials applied to land. A recently published document from the UK Department for Environment Food and Rural Affairs (Defra, 2009) emphasises the Government's commitment to AD becoming an established technology in the UK "*for treating organic waste, particularly food waste*". At the same time growing numbers of local authorities in the UK are introducing collection schemes for household segregated food waste. Clearly, as a consequence, there will be increasing quantities of processed organic waste resources – both compost and anaerobic digestate – needing to find markets to go to land in future.

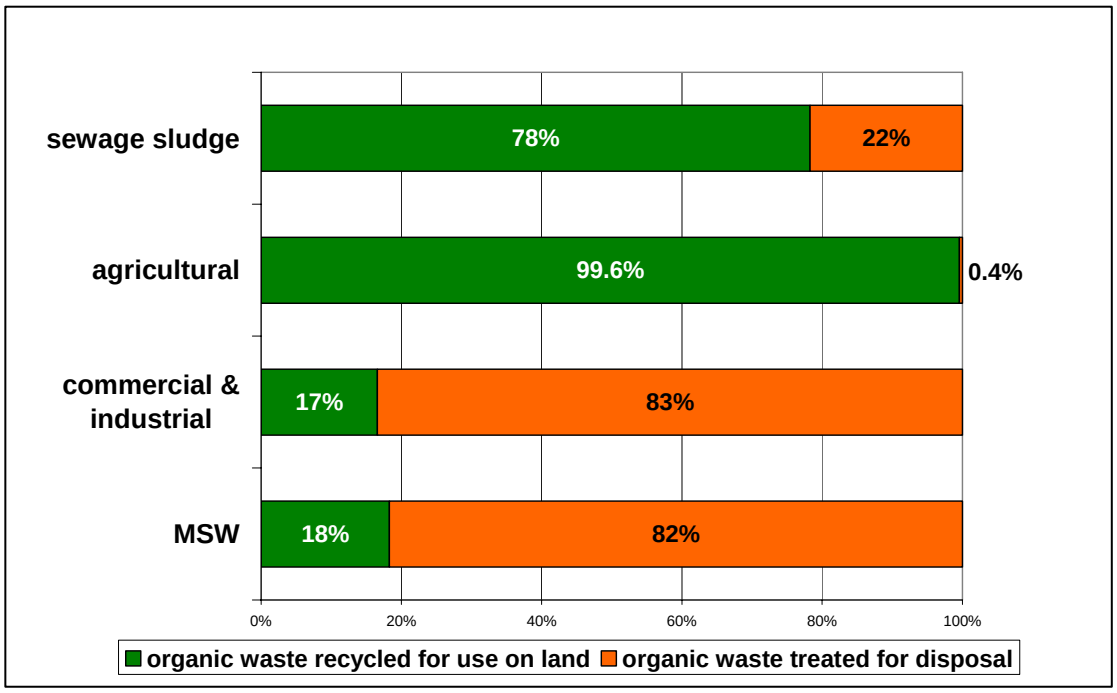

Figure 1: Potential for increased use of recycled organic waste resources on land

Currently in the UK over 90 million tonnes of recycled organic waste resources are used on land, although about 95% of the total comprises agricultural manures and slurries. However, as Figure 1 shows, less than 20% of organic waste from the municipal (MSW), commercial or industrial solid waste streams is currently applied to land, making this the organic wastes stream with the greatest potential for expansion. Currently there is in the region of 20 million tonnes of municipal, commercial and industrial organic wastes disposed of annually in the UK that could potentially (if segregated and processed) produce resources suitable for land application (ERM & Golder Associates, 2006 and Defra, 2007). Diverting this potential resource away from disposal is the major sustainable waste management challenge.

For increasing amounts of digestate and compost to be used on land a number of factors need to be addressed. Technical issues of soil quality, nutrient management, levels of contamination and environmental impact, as well as land availability, location, transport and costs will need to be negotiated through regulation, standards and protocols. These will vary with the type of application (for example, requirements for growing crops will differ from land remediation) and the resource characteristics (for example compost produced from garden waste will differ from anaerobic digestate from food wastes). However, it is crucial also to understand the stakeholders' perceptions and attitudes in the organic resource chain to these materials and their potential use. Whether expressing concern, passive acceptance or active support of these practices, stakeholder attitudes are critical in shaping policy and practice. Although attitudes will not necessarily drive the policy agenda in isolation, without acknowledgement and attention to stakeholders' perspectives, policy initiatives may stall. Key to this, as this paper elaborates, is communication of the risks and benefits of this more sustainable waste management route.

RESEARCHING STAKEHOLDER ATTITUDES

This paper draws on recently completed primary research led by The Open University and funded by the UK Defra as part of the Waste and Resources Evidence Programme (Thomas et al, 2009). This work explored stakeholder attitudes and perceptions towards the spreading of recycled organic resources on land. The project's research structure used an iterative participatory process which reflected and built on each stage feeding forward to the next.

Figure 2: Stakeholders in the organic resource use chain

The initial scoping stage of the project examined existing literature and key experiences within the UK and beyond. This was followed by two large scale quantitative attitude surveys of farmers and of the general public carried out by telephone by our partners Ipsos MORI in late 2007 and early 2008. A representative sample of 500 farmers stratified by farm size and type to reflect the profile of farms in the UK was interviewed. The general public survey was incorporated into a regular

monthly omnibus survey of 1106 residents stratified by age, gender, socio-economic status and region to reflect the population profile of the UK.

The next phase of the project helped to gain a deeper understanding of attitudes and perceptions of the identified stakeholders including those who produce the wastes, process it, apply it to land, purchase and/or consume products or services from that land, and those who regulate these activities. Stakeholders participating in the study represented those sectors and organisations at all stages of the organic resource use chain as shown in Figure 2 and were chosen using a stakeholder analysis approach (Start and Hovland, 2004). This phase involved a cumulative series of workshops involving over 100 participants. These employed a range of qualitative research methods and systems techniques including visual mapping techniques such as issues mapping, and force field analysis and scenario development (see Thomas et al, 2009 for more detail and also Lane, 2002 & 2009; Lewin, 1951; Start and Hovland, 2004). The outcomes provided much greater insight into stakeholders' key concerns and how they perceive not only the current application of recycled organic resources on land but the potential for increasing use in future.

KEY ISSUES FOR STAKEHOLDERS

The research explored stakeholders' attitudes to the issues, drivers, barriers, causes and consequences related to applying recycled organic resources to land. A range of views emerged and these are briefly summarised in this section. Some participants focussed on risks, whilst others saw opportunities and huge potential for increased use. Many stakeholders though were uncertain about the consequences and focused on the need for more and better knowledge.

The activities that were perceived to be most influential on the organic resource use cycle or are most influenced by it, or both, are summarised in the influence map shown in Figure 3. This shows the relationships between the key themes emerging from the issues raised by stakeholders and the system of interest – the organic resource use cycle (where we link up the ends of the organic resource use chain shown in Figure 2). In every case influence can flow both ways, but the perceived balance of influence varies greatly between the themes. The map deliberately shows only the dominant relationships.

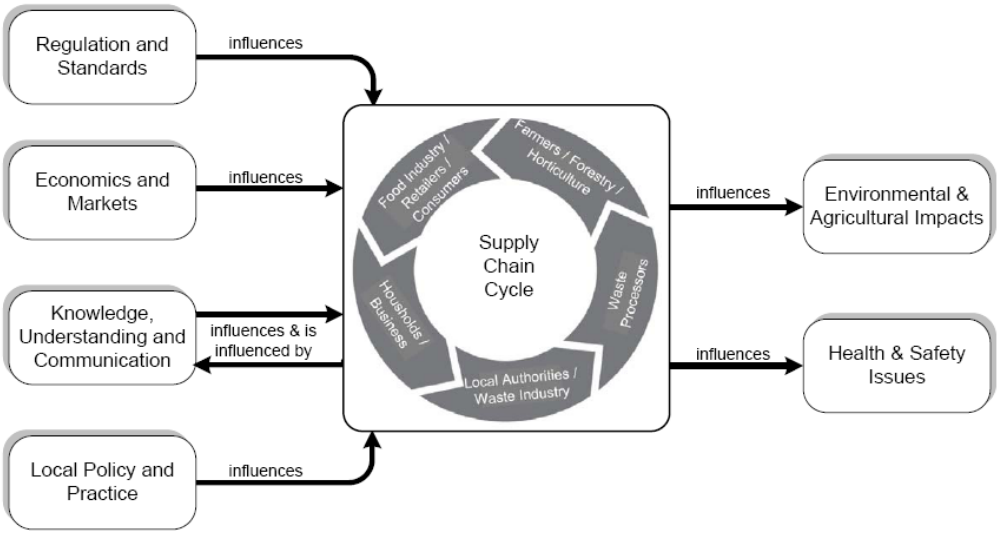

Figure 3: Influence map of themes linked to the organic resource use cycle

The public survey found a very positive attitude overall to the use of recycled organic resources on land with 83% agreeing that more should be applied to land in future. Respondents saw more benefits than concerns, with only 38% of those surveyed expressing any concerns. The farmers surveyed also expressed positive attitudes and were more selective in their concerns and attitudes.

Overall the farmers in the survey saw benefits from the use of recycled organic resources on soil quality, the environment, cost and waste prevention. This was supported in the workshops by the participant farmers who considered environmental and soil benefits and cost to be important drivers for more recycled organic resources to be applied to land.

The most important drivers for increased use of recycled organic resources on land were identified by stakeholders as effective regulation and quality standards, climate change and environmental concerns and increasing cost of chemical fertilisers. The strongest barriers were considered to be lack of knowledge, health risks, need for research and negative perceptions.

Regulation was the most strongly rated driving force by most stakeholders and in particular linked to EU and UK recycling targets, UK soil strategy, landfill tax and the Landfill Allowance Trading Scheme (LATS). Although there was some disagreement about what was appropriate regulation and standards. Some key aspects of regulation raised by stakeholders included adequate enforcement, as well as the need for consistency of approach and the current lack of joined-up policy and practice. Local authorities are seen as key players in collecting then delivering high quality household organic waste for processing. In this respect some stakeholders were concerned about the consistency of approach to the source segregation of organic waste materials and waste collection at present in the UK. The importance of confidence in standards, regulation and subsequent enforcement was viewed as essential for establishing and maintaining trust.

Environmental benefits and climate change issues were the second most strongly rated drivers after regulation and standards and often given as important reasons in favour of diverting recycled organic waste materials to land. Stakeholders mentioned in particular carbon storage issues, generating renewable energy through AD, reducing waste going to landfill, reducing CO_2 and methane emissions and reducing flooding risk. Negative environmental consequences were also raised by some stakeholders who were uncertain about the mitigating effects on climate change and concerned about the potential for land and soil contamination. However, environmental, as well as health and safety impacts were the most widely cited concerns. It was also clear from the research though that knowledge and understanding of these issues was often uncertain or patchy.

Many of the stakeholders expressed the belief that more recycled organic waste resources going to land would be beneficial in the long term in relation to its effects on the soil. Agricultural impacts and land issues, particularly in relation to soil benefits, were mentioned frequently by all types of stakeholders but especially by farmers and waste processors.

Health and safety was particularly associated by stakeholders with issues of risk and managing risk. Many stakeholders expressed concerns about risks associated with health and the environment. They felt that contaminants in recycled organic waste resources could destroy confidence in these materials unless they were well controlled and managed.

The findings indicate that it is the use of recycled food waste on agricultural land – part of the food chain cycle – that gives rise to most concerns to a wide range of stakeholders. Concern was expressed especially by those in the food sector about health risks emanating from what they felt could be a potentially unsafe supply chain particularly in an expanding market. There was also significant concern over the safety of meat products related to animal diseases or ground contamination. Some stakeholders were concerned that the inclusion of meat waste in processed food waste could potentially lead to contamination and health issues – both human and farm livestock. Risk was acknowledged as something that needed to be managed.

Economics and market issues featured strongly in many of the stakeholders' discussions. Some felt that it was the most likely thing to drive change. In this context they cited fuel prices, fertiliser

prices, synthetic fertiliser prices, charging for waste collections and waste disposal costs. Farmers particularly considered cost an important driver, especially in relation to high fertiliser prices. However cost could also become a barrier in relation to the cost of regulatory compliance.

Environmental awareness was another aspect that stakeholders felt was important in driving the agenda of organic waste resources to land. Increasing awareness by the public of environmental issues whether of climate change or waste issues were felt to influence policy at national and local levels. However, stakeholders were concerned about the resilience of public attitudes, particularly in relation to current lack of knowledge of organic waste recycling amongst the public and potential mass media influence. There was also a strong belief that once bad practice is experienced either directly or indirectly it can have a very negative and persistent impact on people's perceptions and reactions.

Issues concerned with how much is known and how it is communicated were prevalent in many of the stakeholder discussions and the key aspects raised are the focus of this paper and discussed in the following section.

COMMUNICATION AND KNOWLEDGE FLOWS

Attitudes focused strongly on knowledge and understanding, whether the stakeholder's own or a perceived lack of knowledge by other stakeholders. Knowledge and its communication were seen as both a driver and a barrier to increased use of recycled organic resources on land. Communicating information and understanding were seen a potent tools to create a climate where confidence and trust could be built around the use of these resources. Some stakeholders described communication as "*dispelling myths and explaining benefits to everybody"*. This perspective which placed education as a driver for more recycled organic resources to be applied to land, as well as the lack of education as a barrier, suggests the stakeholder's belief in the benefits and their concern that 'others' were not sufficiently aware. However, in expressing these concerns stakeholders were often making general assumptions about other people's attitudes, which may or may not hold true.

Stakeholder knowledge of the organic resource use cycle

It was clear from the workshop outcomes as well as the survey results that most stakeholders had incomplete knowledge of all aspects of the organic resource use cycle. As might be expected most had good knowledge of their sphere of interest but often expressed a lack of knowledge about other parts of the cycle and often lacked understanding of other stakeholders perspectives. Stakeholders also commented on the need for improved knowledge by other actors in the organic resource use cycle and some perceived "*ignorance and misinformation"* as crucial barriers to progress. This mostly concerned a lack of knowledge of recycled organic materials, whether in relation to the benefits and risks associated with their use or how to use them.

From the survey results, farmers' self-reported knowledge of organic waste resources was only high for manures and slurries. More than 80% of farmers said they lacked knowledge about the use of composts and sewage sludge; and more than 90% for anaerobic digestates. During the workshops those stakeholders concerned with applying recycled organic waste resources to land said they considered this lack of knowledge (about applying organic resources to land) an important issue.

It was also clear from the public survey, that knowledge and understanding of organics waste recycling was often uncertain. Less than 20% of the public said they knew what happens to food and garden waste collected for recycling after it is collected. This led many stakeholders to question the resilience of public attitudes and the potential for disruptive mass media influence. Attention to public education and transparent communication they felt were needed to build confidence and resilience. Farmers in the survey were not confident in the publics' or the buyers'

(such as retailers or food manufacturers) confidence in these materials. Less than half felt that using more compost on farmland would have a positive effect on these groups, although only around a quarter said it would have a negative effect.

Many stakeholders were also concerned about the attitudes of food retailers and the food sector in general. Stakeholders from food processing and quality assurance sectors were particularly concerned with issues of adequate knowledge and controls over health and safety risks and the importance of retailer trust and confidence in food products arising from land treated with recycled organic waste resources. However, in common with all stakeholders they acknowledged both the benefits and risks from increased use of recycled organic resources on land. Stakeholders from most sectors saw a need for more "*retailer awareness*" of the issues and joined-up thinking in the resource use chain. They also commented that, in regard to closing the loop of consumption, it was very important to gain the support of food retailers, in particular those from the major supermarket chains, as they were perceived as potentially a key barrier to increased application. This, despite the fact that most major UK food retailers have made important promises in their CSR reports and in public statements towards greater sustainability in relation to their carbon footprints and their targets for reducing waste sent to landfill. For example, in their CSR report, Sainsbury confirmed its long-term strategy of pursuing "*composting and anaerobic digestion, which reduces organic waste to methane and a soil enhancer, as a means of dealing with our food waste*." (Sainsbury, 2006) Also, Waitrose have claimed to be the first supermarket in Britain to run trials of anaerobic digestion with waste from five of its stores (Letsrecycle 2008).

Uncertainty over impacts and benefits

Stakeholders also expressed a lack of understanding and some confusion regarding climate change impacts, soil benefits, environmental and health and safety risks and benefits. Questions arose as to whether potential benefits such as reducing CO_2 emissions and the long-term environmental benefits to the soil accepted by some were understood by others. There was also concern about clarity around existing standards and their regulation. The research highlighted communication as vital in building confidence and trust in the ability of regulation, standards and enforcement to adequately protect against potential contamination and health issues. Technical issues need to be resolved in a transparent way and communicated appropriately to the whole resource use chain. There is no point in having standards if people are unaware of them.

In discussions some stakeholders' expressed uncertainty in whether an increased use of recycled organic materials on land would lead to an increased or decreased impact on climate change. It was clear that this reflected the differing understandings of stakeholders. They suggested that climate change benefits might arise from reduction of waste going to landfill, energy generation from AD, benefits from reduced artificial chemical fertiliser use and indirect efficiency increases, such as organic-rich soils taking up chemical fertilisers better than soils with low organic matter content. They were also concerned that climate change 'cost' could arise from increased use of fossil fuels in the recycling processes and the transport costs of their application. They were concerned that their lack of knowledge meant that they were not sure where the balance of benefits and costs lay.

Impact of knowledge on attitudes

In both the farmers and public surveys, those that knew more about the use of compost or what happens to organic material collected for composting were more likely to express positive attitudes towards their increased use in future.

The public attitude survey showed some connection between respondents' behaviour and knowledge and their attitudes to using recycled organic waste resources on land. Those who participated in the recycling or composting of organic waste materials and had some knowledge of what happens to these materials once collected for recycling were more likely to consider recycled

organic material suitable for land used to grow crops or on gardens and to think that more should be applied to land in future, as Figure 4 shows. Also from the farmers' survey it seems that those farmers currently using compost were slightly more likely to consider it to have a positive impact on the publics' and buyers' confidence in farming.

The use of terminology was clearly important for the stakeholders and warrants careful consideration, for example, organic resources vs. organic waste. Concern was expressed that negative perceptions of recycled organic waste resources, such as compost, could be a barrier to increasing their use if they were referred to as a *"waste and not a resource"* and it was felt that this was linked in some way to education or public relations and needed to be addressed.

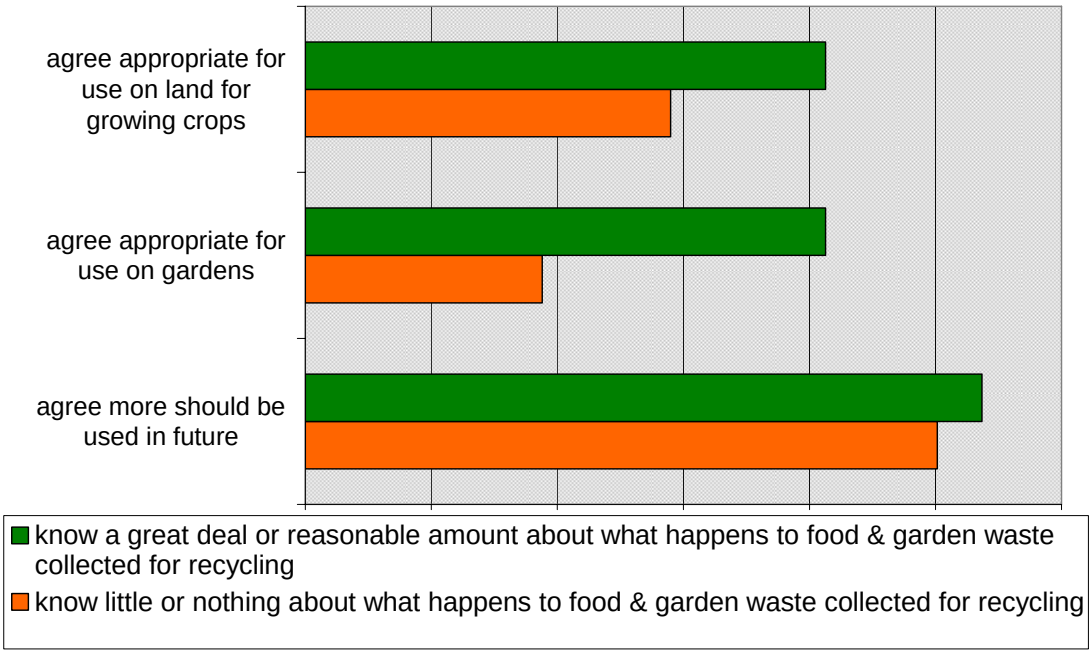

Figure 4: Public attitudes to the use of compost on land

Need for research and better knowledge

The need for "*more research*" was raised although often the context was 'not knowing' what was already known and highlights the need for better communication of knowledge. Comments in the workshops demonstrated that knowledge and understanding of current research findings was not widely held amongst stakeholders, reflecting the scale and complexity of this issue. Nonetheless stakeholders called for more research to demonstrate proven technology and also on the safety of products (to the environment, people and animals).

Some stakeholders emphasised the need for research into innovations, whereas others felt that demonstrating and testing existing technologies was important. The majority of farmers in the survey considered more product information as a very important factor for increasing the use of recycled organic waste on land. Again this raised the issue of communicating existing information more effectively as well as the need for more knowledge.

Public understanding and communications

All stakeholders felt that public opinion can have a strong impact on whether more recycled organic waste resources will be used on land. In a climate of increasing environmental awareness, many stakeholders commented that public environmental concern and support for environmental issues could be a key driver for more recycled organic material to go to land in future. People like the idea

of recycling, but "*caring about it comes from knowledge about what they are doing it for"* so that effective communication is vital here.

There was a lot of uncertainty around what public attitudes might be and despite the public support expressed in the survey results stakeholders were concerned about the resilience of these attitudes and the consequent effect that public attitudes have on the retail sector. Many stakeholders feared a negative amplification of the risks involved in applying recycled organic waste resources to land by the media and its consequent impact on public attitudes. All stakeholders in the workshops shared a perception that the mass media's sensationalism, dramatisation, and factual omissions or errors could well amplify risks. This was demonstrated in the force field maps where more than one group suggested that public perception may be considered a low ranked barrier at present but had the potential to increase quickly to a highly ranked one, particularly if there was a media scare around this issue. The survey provides a snapshot of public attitudes but cannot show how resilient or open to change those attitudes are.

In connection with attitudes and changing them, stakeholders felt that *"a continual education process to reaffirm people's commitment"* was needed, and also recognised that education is not enough on its own. One group pointed out that public education has to go hand-in-hand with a properly working organic waste recycling system that does not endanger health because if something happens "y*ou would lose all the confidence you had got"*.

CONCLUSION

The findings from this research on the attitudes and perceptions of stakeholders suggest that communication and associated knowledge flow is not adequate at present throughout the organic waste resource use cycle. Stakeholders often expressed uncertainty and a lack of knowledge or attributed a lack of knowledge to other stakeholders. Many of the discussions in workshops involved some disagreement concerning the potential benefits and risks associated with this waste management route. Stakeholders repeatedly emphasised the importance of good regulation, high standards and adequate enforcement but were also often unaware of what regulations and standards already existed unless these were directly applicable to their realm of interest.

This research highlights the importance of knowledge and of understanding how knowledge flows between stakeholders and between policy and stakeholders. Government statements are peppered with comments about the need to engage with stakeholders and take into account stakeholder views and much policy making involves consultation processes. It is recognised that involving stakeholders in policy development is more than a communications activity and to effectively engage and work with stakeholders requires more than just informing. Moving beyond initial engagement, ongoing, focussed communication and information are also critical as engagement can only be effective if knowledge is communicated to stakeholders and they are sufficiently informed to understand and connect with the policy process.

Through researching stakeholders' perceptions and attitudes this research has sought to understand peoples' experiences and perceptions and identify areas of agreement, misunderstanding or conflict. In this, communicating knowledge and understanding to stakeholders was identified as an important element in taking policy forward in this area of organic waste management.

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