

Liverpool knowledge quarter sustainability network: case study

Liverpool
knowledge
quarter

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Abstract

Purpose – This paper aims to study the development of the Liverpool Knowledge Quarter Sustainability Network (KQSN). It outlines the sectors included in the collaborative knowledge-sharing, the nature of the work it facilitates, and considers how the network can transform its existing objectives around the shared vision of the United Nations sustainable development goals (SDGs).

Design/methodology/approach – The KQSN operates in a collaborative cross-sectoral forum to support, facilitate or coordinate projects around sustainability, with core leads sitting in higher education and health care.

Findings – The KQSN supports projects through collaborative activity and enables members to access specialist advice available through the network. Through its membership, the KQSN is primed to develop metrics for demonstrating Knowledge Quarter SDG-aligned activity. The KQSN has scope to increase its level of implementation arising from its shared values, with a renewed focus around the SDGs.

Practical implications – This paper contributes to the 2018 EAUC Annual Conference theme of “Collaborations for Change” and the need for transformative partnerships that are prepared to align their mission to the SDGs.

Originality/value – Unlike discipline- or sector-specific networks, the KQSN has an inclusive membership, making it an original multi-disciplinary sustainability platform for neighbouring organisations in and around Liverpool’s Knowledge Quarter. This case study can support other knowledge cluster communities to replicate its model. This case study also presents a diverse range of small projects, which are easily replicable and hopefully will inspire others to do something similar.

Keywords Collaboration, Health care, Higher education, Sustainable development goals, SDG17, Sustainability networks

Paper type Case study

Introduction

This paper is written as a case study contribution to the 2018 EAUC Annual Conference, which centres on the theme ‘Collaborations for Change’. The overview and case study of how

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The authors thank the Liverpool Knowledge Quarter Sustainability Network and all its member organisations, whose work has been able to be shared within this case study. They are also grateful to KQ Liverpool, [2030hub \(2018\)](#), University of Liverpool, Liverpool John Moores University, Royal Liverpool and Broadgreen University Hospitals NHS Trust, and Feedback Global for the valuable context provided within this paper.



the Liverpool Knowledge Quarter Sustainability Network (KQSN) formed as a cross-sectoral collaborative forum, and the work being supported through this group, is intended to offer insight for replicating other voluntary sustainability networks, particularly those operating from within a Higher Education backdrop in partnership with other public (or non-private) sector organisations.

Sustainable development

Sustainability was primarily a response to the 1987 Brundtland Commission ([United Nations, 1987](#)) which comprehensively defined sustainable development and promoted the need for its global adoption. The Brundtland Report provided a mainstream response to the need to balance current and future resource usage and respond to growing evidence of anthropogenic climate change. Subsequent political documents, such as the UN's Agenda 21 ([UNCED, 1992](#)) and the UK's 2005 document *Securing the Future* ([Defra, 2005](#)) reaffirmed the need to reconcile the economic, social and environmental agendas under an embedded three pillar model ([Purvis et al., 2019](#); [IUCN, 2006](#)).

Since Brundtland Report, sustainability has experienced a gradual adoption as the global framework for future growth and development ([United Nations, 1992](#)). However, global progress on sustainable development is considered to have been slow, particularly in Europe ([Wall, 2018](#); [Brackley and Lee, 2017](#)). The UK Higher Education (UKHE) sector has presented an interesting paradox: while leading-edge sustainability and environmental research continues to be delivered from UKHE, institutions still have a way to go to operate as a sustainable business in and of themselves. The lack of resources falling out of a frigid economic climate, coupled with a poor national narrative for sustainability, arguably is reflected in a relatively low level of resourcing for sustainability in the sector ([EAUC et al., 2016](#)). Conversely, the National Health Service's (NHS) launch of the Sustainable Development Unit (SDU) in 2008, coupled with its recent integration of the sustainable development goals (SDGs) into annual sustainability assessments, demonstrates a more tangible response to sustainability as a framework for business continuity ([Wise, 2018](#)).

Sustainable development goals

The United Nations SDGs launched in 2015 following their approval at the 70th General Assembly of the United Nations ([United Nations, 2019](#)). The SDGs comprise 17 thematic areas, each complete with a set of targets and indicators. The SDGs build upon the progress of the 2000-2015 Millennium Development Goals; significantly, they present a global and inclusive scope in recognition that all countries require to be engaged in order to achieve a sustainable future ([Gigliotti et al., 2019](#)). Furthermore, the SDGs represent a framework of goals that are interrelated. This requires a governance model which operates around a collective and shared vision, across organisations and sectors (including the community sector), and which can thereby realise opportunities from these multi-stakeholder alignments. In a positive step forward, the SDGs presents a robust but intuitive and common sustainable development language that can be shared across organisations, sectors and countries, and can therefore facilitate partnership from across a range of sustainability interests and disciplines; it is, in sum, an excellent tool for encouraging collaboration for change around a shared vision ([Morton et al., 2017](#); [Gigliotti et al., 2019](#)).

Against this backdrop of sustainable development, this paper introduces the Liverpool KQSN, a thriving knowledge partnership in which members are mutually supported, have access to practical or advisory expertise, and which can uphold the visibility of sustainability during a renaissance of the Liverpool Knowledge Quarter. This special issue contribution to the 2018 EAUC Annual Conference outlines how the KQSN collaborates for

change, and posits that the SDGs offer the network an opportunity to recalibrate its objectives and output going forward.

The KQSN has been meeting for four years, collaborating on and facilitating projects to progress sustainable development in an area of a city that has a long history in innovation and knowledge industries. This paper case studies the development of this self-starting network, which can be replicated by other cities in the UK, and highlights some of the projects that have been facilitated and which have been included in the network's Highlights Report, produced to display the benefits of the network and to promote sustainability work being undertaken across its membership. This case study demonstrates the cross-sectoral nature of the network, and shows how two anchor organisations can share best practice in working to the SDGs. Moreover, the presence of the UN-approved "2030hub" in Liverpool – and its membership of the KQSN – encourages an enhanced focus on the SDGs, and the network is anticipating a recalibration of its terms of reference later in 2019 to support collaboration for the SDGs.

Context

Liverpool city region

Liverpool is a city in North West England, UK. The broader Liverpool City Region is an economic and metropolitan political area extending to six surrounding local government districts. Liverpool City Region has a population of more than 1.5 million and an economy of £28.3bn ([Liverpool LEP, 2016](#)); in December 2018 Liverpool City Region's gross value added was the seventh largest out of 25 combined authorities, city regions and other economic and enterprise regions of the UK ([ONS, 2018](#)). The Liverpool City Region Combined Authority published a report outlining probable climate and sustainability risks to the city; not unlike other major UK cities, these risks include adverse weather patterns, power disruption, challenges specific to coastal locations, and economic impacts on local industries ([Liverpool City Region Brussels office, 2017](#)).

Knowledge Quarter Liverpool

KQ Liverpool is a formal partnership of key organisations based within the Knowledge Quarter of Liverpool, an area historically comprising of several Higher and Further Education institutions. KQ Liverpool's purpose is to 'create and promote the dynamic and innovative industries operating within the Knowledge Quarter' and to 'reposition Liverpool at the forefront of global innovation' ([KQ Liverpool, 2016](#)). Key lead partners include [Liverpool City Council \(2009\)](#), the University of Liverpool, Liverpool John Moores University and the Royal Liverpool and Broadgreen University Hospitals NHS Trust.

KQ Liverpool's vision focuses on three areas, each of which supports sustainable development:

- (1) making the place;
- (2) improving connectivity; and
- (3) attracting investment.

KQ Liverpool has successfully attracted investment into the area, with announcements in 2017 and 2018 that include the development of a new home for Liverpool International College, a cancer centre and adjoining diagnostics centre and the prestigious new 'RCP North', which will be a training centre and office for the Royal College of Physicians. RCP North aims to be one of the healthiest and most sustainable buildings in Europe ([Franklin, 2018](#); [RCP, 2017a, 2017b](#)). This investment has been supported by designation of the

Knowledge Quarter as a Mayoral Development Zone, which intends to strategically focus development activity across the city (Figure 1).

Additionally to KQ Liverpool’s vision for development, key growth sectors for the City Region have been identified, which support sustainability and directly link to institutions within KQ Liverpool. Growth sectors include Low Carbon, Innovation and Health and Life Sciences (Liverpool LEP, 2016).

KQ Liverpool receives KQSN meeting minutes, and KQ Liverpool’s strategic vision specifically references the network, stating that KQ Liverpool intends to assist projects identified by KQSN, including local food growing, creating green corridors and responsible waste management (KQ Liverpool, 2016).

Liverpool knowledge quarter sustainability network

Establishing the knowledge quarter sustainability network

KQSN is a voluntary network of professionals from a range of local organisations operating in and around Liverpool’s Knowledge Quarter, and working across a broad range of sustainability disciplines. The background below describes the establishment of the network, through the experiences and accounts of the network’s four leads. This is supported through the KQSN’s Terms of Reference and meeting minutes, which are made available via the KQSN’s closed LinkedIn group.

The network reports directly into the KQ Liverpool Board and aims to use this case study and a new Highlights Report to engage more widely with its partners and stakeholders by featuring partnership and innovation that has been supported or promoted through the network, and introducing its objectives moving forward.

Sustainability professionals at the University of Liverpool, Liverpool John Moores University, Royal Liverpool University Hospital, and a Regional Food Economy (North

Knowledge Quarter Mayoral Development Zone

Key sites and buildings:

- 1 The University of Liverpool Health & Life Sciences Campus, including the Liverpool Bio Innovation Hub and Biobank
- 2 Paddington Village
- 3 The Royal Liverpool & Broadgreen University Hospital and The Clatterbridge Cancer Centre
- 4 Liverpool School of Tropical Medicine
- 5 Sensor City
- 6 The Victoria Gallery and Museum
- 7 Materials Innovation Factory
- 8 Liverpool John Moores University, Mount Pleasant Campus
- 9 University of Liverpool, The Foundation Building
- 10 Liverpool Institute for Performing Arts (LIPA)
- 11 City of Liverpool College
- 12 Liverpool Science Park
- 13 Liverpool John Moores University, City Campus
- 14 Liverpool Life Sciences Accelerator
- 15 Liverpool Hope University Creative Campus

Places of interest:

- A Liverpool Cathedral
- B The Metropolitan Cathedral of Christ the King
- C The Echo Arena & Convention Centre
- D Lime Street Station
- E Liverpool Philharmonic
- F Liverpool One
- G The Royal Liver Building
- H Albert Dock
- I Everyman Theatre
- J The Town Hall
- K Central Library
- L China Town
- M Exhibition Centre Liverpool
- N Walker Art Gallery
- O The World Museum
- P Unity Theatre

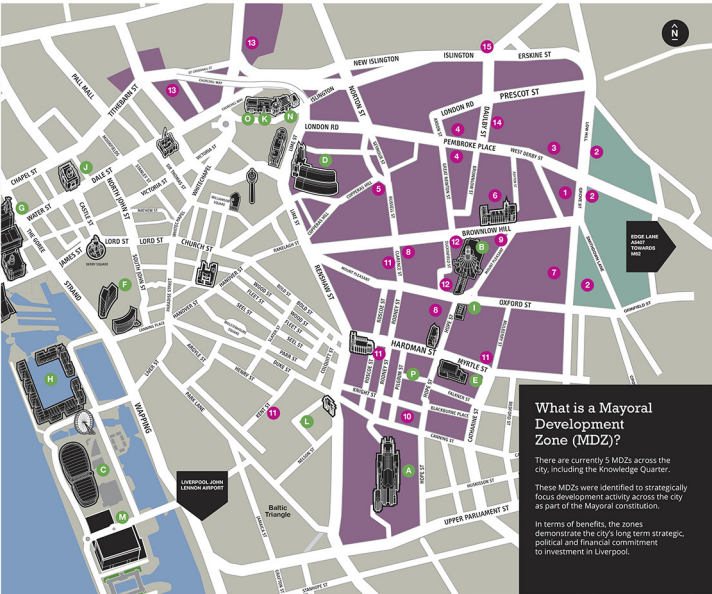


Figure 1. Knowledge Quarter Mayoral Development Zone (KQ Liverpool, 2016)

West) Project Manager share co-chair responsibilities for the network. The co-chairs originally identified relevant organisations from public, cultural and social sectors across the Knowledge Quarter, and subsequently arranged the first networking meeting. The initial meeting of the KQSN was held in December 2014 and was attended by seventeen representatives. The breakdown of the attendees is set out in [Figure 2](#) and demonstrates the membership as having breadth beyond the traditional context of what may be expected from a knowledge group (i.e. attendees represented voluntary and cultural sectors in addition to education and health care).

At the meeting, attendees provide an overview of the sustainability work that they were undertaking. 'Other public sector' members comprised Liverpool City Council and Merseyside Recycling and Waste Authority. 'Community' members were split between citywide organisations operating in the sustainable food and green spaces agendas, and two local organisations representing the residents of the historic Georgian and Victorian residential area of the Knowledge Quarter and the green space around Liverpool Cathedral.

These types of attendees remain similar across the time that the network has been meeting, although an analysis of the attendees from the October 2018 meeting shows that it has expanded from its traditional public sector and community base. The new 'other' section includes organisations such as the local Chambers of Commerce, charitable organisations, and representatives from local construction projects ([Figure 3](#)).

Following the initial meeting, a form was circulated to all attendees asking them to indicate their main area of focus or interest, so that this could be used to inform future meetings. The areas of focus are set out in [Figure 4](#).

The topics include the 'traditional' focus of sustainability, in waste, energy, biodiversity and transport. It also indicated a high desire for collaborative working, which went some way to support and validate the requirement for this type of network. This has been borne

Sector attendees at initial meeting

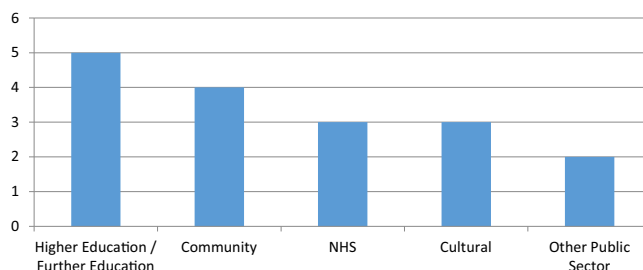


Figure 2.
Breakdown of
organisation type
from initial meeting
in December 2014

Sector attendees at October 2018 meeting

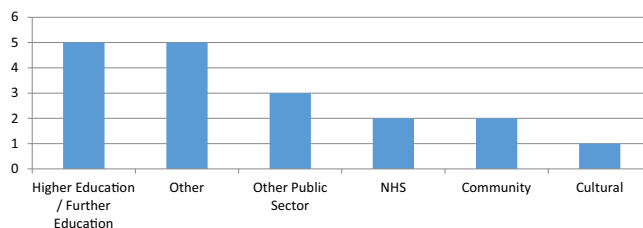


Figure 3.
Breakdown of
organisation type
from October 2018
meeting of the KQSN

out by the consistent numbers of attendees in the following four years; attendance has remained stable between 14 and 22 representatives for each spring/autumn meeting of the KQSN.

The focus areas informed the terms of reference, drafted following the initial meeting. The aims and objectives stated in the first terms of reference, drafted in February 2015, were:

- to identify projects and collaborations to improve the sustainability of the KQ;
- to promote green infrastructure and projects to enhance green space;
- to promote local food growing and health promotion projects;
- to promote sustainable transport and enhanced public realm;
- to promote the low carbon economy;
- to create sub-groups able to progress specific projects to meet the above aims;
- raise awareness of sustainability amongst local community and stakeholders;
- promote the outcomes of the projects to interested parties and internally; and
- to report progress to the Knowledge Quarter Steering Group.

The above aims and objectives show the focus of the group on collaboration and on the main facets of sustainability, in green space, transport and low carbon. It is interesting to note that waste management has not been specifically noted in the first draft terms of reference, despite being rated highest of attendees' interests. This may be because the initial meeting involved two members from Merseyside Recycling and Waste Authority (MRWA) but, as the MRWA did not have co-chair status, it did not draft the first iteration. However, the aims formally agreed by the members in April 2015 include a specific reference to responsible waste management as part of the low carbon circular economy objective. This indicates that the co-chairs involved wider members of the network when agreeing the terms of conditions, to ensure all parties were referenced.

The agreed terms of reference state that:

The core aim of the KQSN is to enhance the sustainability of the Liverpool Knowledge Quarter and be a model for the wider City Region. The KQSN promotes sustainability and environmental issues through Liverpool's Knowledge Quarter and encourages active collaboration and partnership. Its members comprise a vast range of experience in sustainability and are well-placed across leading organisations and community groups alike to realise change and drive Liverpool's sustainability agenda.

Topics favoured at initial meeting

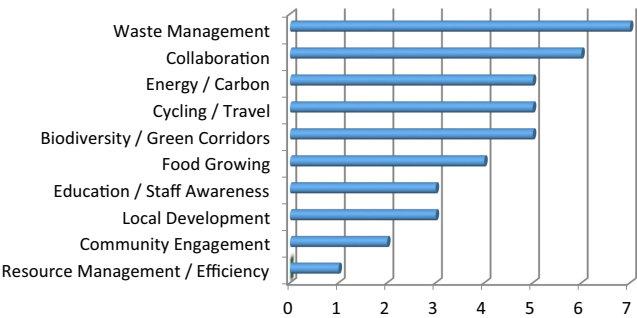


Figure 4.
Responses from
survey of attendees of
December 2014
meeting of the KQSN

The network meets each spring and autumn, with meetings generally consisting of presentations by the host or a visitor and a section where all attendees have an opportunity to provide an update on their work. Members host meetings and there is no membership or attendance cost. In 2018, case studies were collated to produce a Highlights Report to feature the collaboration that has taken place since the network launched, and examples of best practice in the Knowledge Quarter.

Knowledge Quarter Sustainability Network collaborative output

The projects included in the Highlights Report can be split into two groups: those that have been directly and originally developed through the network; and those that have been facilitated or promoted through the network, to share innovation and best practice. These are detailed below to example how the network supports projects through its collaborative ethos.

Projects delivered by the network – collaboration directly cultivated through the Knowledge Quarter Sustainability Network

Food resourcing empowered distribution in Liverpool. During 2017, key members of the KQSN collaborated on a European funding bid ('FRED'). The Urban Innovative Actions bid focussed on supporting a circular food waste economy, using the Knowledge Quarter as a Living Lab. This supported the initial aims of the KQSN in using the Knowledge Quarter as an innovation district to trial new ideas.

Merseyside Recycling and Waste Authority led the bid with other KQSN partners, including Liverpool Food People, Liverpool John Moores University, the University of Liverpool, Royal Liverpool University Hospital and Groundwork.

The bid totalled more than €4mm, to address a complex challenge to make food systems more sustainable in a city with multiple deprivation, multi occupancy dwellings and a large transient population. The funding would have supported projects to address the challenge of a lack of fresh food produced in Liverpool, including a circular economy bakery at a hospital site; the social and economic impact of surplus food and how it could be redistributed; and the challenge of saving food and water from wastage at home and in businesses.

The application reached the penultimate stage of the bidding process. The judging commented on the strength of expertise and capacity within the bidding partnership. This debut bidding exercise for the KQSN enabled a group of costed projects to be developed, demonstrating the potential value in bringing together sustainability professionals from across the Knowledge Quarter to pursue further opportunities to bid for funding and, if successful, deliver sustainable benefits to the area.

Royal Liverpool university hospital catering contract. Royal Liverpool University Hospital's Head of Sustainability worked closely with Liverpool's Sustainable Food Cities Coordinator on increasing the social value in its outsourced hospitality contract. This included referencing a local Social Value Strategy, and requesting the catering section to respond to the UK government's Public Sector Food Procurement Balanced Scorecard, launched in Summer 2014. This work raised the profile of sustainable food within health care and within Liverpool. The Head of Sustainability and Sustainable Food Cities Coordinator presented at the inaugural AgroEco Cities Conference in Zaragoza (Spain) and at the Sustainable Food Cities Scotland Conference in Edinburgh. In addition, they presented individually in Bremen (Germany), Copenhagen (Denmark) and at events across the UK. Due to the inclusion of the Balanced Scorecard, both co-chairs accepted invitations to the UK Government's Public Sector Food Procurement Implementation Taskforce. Both continue work with Department for Environment, Food and Rural Affairs (Defra) to promote the

Balanced Scorecard. This collaboration was key in supporting the Liverpool FRED European funding bid.

Projects facilitated or promoted through KQSN – initiatives delivered through collaborative facilitation, and existing projects that the network has promoted to its members to increase levels of engagement and share innovative practice.

Sustainable food workshop. In October 2018, the KQSN hosted a Sustainable Food Workshop on behalf of a regional sustainability and health network. Royal Liverpool University Hospital's Head of Sustainability and Feedback's Regional Food Economy (North West) Project Manager are both members of the steering group for this northern network and jointly delivered the event. Workshop attendance included national and public health representation.

The event included a tour of the food growing and composting areas of the Liverpool Guild of Students and the main workshop was held at Liverpool Science Park (both KQSN members). Morning speakers were national in scope, but the afternoon consisted of three mini-workshops hosted by Royal Liverpool University Hospital, Feedback and Health Equalities Group (the latter is a Liverpool-based public health campaigning body). Lunch was provided by a local healthy-eating café based on sites owned by the University of Liverpool and Royal Liverpool University Hospital.

This event helped to promote the innovation in the Knowledge Quarter to a wider audience and was also used as an opportunity to show the benefits of the KQSN as a network.

Liverpool circular economy club. Merseyside Recycling and Waste Authority launched the Circular Economy Club Liverpool City Region in September 2018. The Club aims to:

- accelerate circular economy activities across the City Region;
- share experiences and expertise; and
- develop and deliver resource management projects that will create a region that reduces what is thrown away, retains value and creates employment in a growing part of the economy.

Club membership supports businesses to deliver cost effective, sustainable products and services and maximise an organisation's triple bottom line through more efficient use of resources. It works to help those businesses access circular economy experts and best practice locally and globally, and drives the implementation of the circular economy, with a collaborative and innovative approach to competitiveness and job creation in the City Region.

Many members of the network attended the launch event, and further engagement into the Club has been promoted at subsequent meetings of the KQSN.

Sustainable food cities conference 2016. The Sustainable Food Cities Network operates across the UK to explore ways to improve food-based sustainability. One of the KQSN co-chairs previously held the position of Sustainable Food Cities Coordinator for Liverpool and, subsequently, the Knowledge Quarter hosted the Sustainable Food Cities Conference 2016.

The theme of the conference was The True Cost of Food and 180 representatives from 56 UK cities gathered to debate this issue. Delegates were welcomed to the conference by local government leads for Social Inclusion, Fairness and Equalities; and welcomed to the awards dinner by Merseyside Recycling and Waste Authority. Delegates were encouraged to travel to the conference by public transport and all catering was sourced as locally and ethically as possible. The conference was facilitated by KQSN members through the following:

- Merseyside Recycling and Waste Authority provided financial support to the conference and welcomed delegates.
- University of Liverpool hosted the conference at their Institute of Integrative Biology, subsidising the conference and providing accommodation within student residences for conference delegates.
- Liverpool Guild of Students provided the locally sourced catering for lunch and refreshments.
- Liverpool John Moores University students presented academic posters on food poverty research
- A local and independent bar-restaurant hosted the evening reception and awards dinner, serving local food and dishes to conference attendees.

The environmentalists. The Environmentalists was a play produced in 2016 by the award-winning Young Everyman Playhouse (YEP) Theatre. The play aimed to be the UK's first carbon-neutral show and had the largest YEP audience to date ([Everyman and Playhouse, 2016](#)). To support the production team to achieve these carbon ambitions, KQSN members provided expert and practical guidance on carbon-offsetting, sustainable travel and carbon reduction. Initiatives employed in the play's production included audience concessions for the use of Liverpool's pool bicycle scheme to journey to the theatre; local government councillors leading 'walking buses' as an alternative to car travel to the theatre; engaging a climate change charitable organisation to monitor and track carbon footprint of the rehearsal period; and a pledge initiative for staff and actors involved in the production to facilitate carbon-reduction behaviour change to offset show-related emissions.

Food composting at Liverpool guild of students. Following a major refurbishment, the Liverpool Guild of Students (the University of Liverpool Students' Union) introduced a new waste scheme, particularly for packaging and food waste arising from the production kitchens.

Given numerous cultivation areas on site, including a roof garden, the Guild purchased a composter and a food processor/de-watering plant, funded through the National Union of Students under their 'Students' Green Fund' programme.

In December 2014, a service contract was introduced to collect packaged food waste for anaerobic digestion leading to biogas and fertiliser production. Processing with aerobic composting of uncontaminated food waste and collection with anaerobic digestion of contaminated food waste has proved effective in the management of food waste at the Guild, and the initiative has contributed to overall improvements in recycling rates whilst yielding a plentiful supply of compost for use both onsite and in the community.

This project has provided other KQSN members with an intimate insight into how a food-recycling project can be delivered, supporting members such as the University of Liverpool, Royal Liverpool University Hospital, and City of Liverpool College to explore similar initiatives. Additionally, a tour of the facilities was included within the Sustainable Food Workshop of October 2018 to promote best practice regionally.

Micah project. Micah is a joint project between Liverpool Cathedral, Liverpool Metropolitan Cathedral of Christ the King and a local church, St Bride's. In addition to providing a community shop and food banks at St Bride's and the Parish Church of St Vincent de Paul, it also incorporates an employability programme. The project arose from the desire of local churches to engage with their immediate neighbours and be a pillar of society.

The initial ten-week programme engaged with 225 people between December 2014 and December 2017. Of these, 187 completed the course and 107 entered employment. In 2018, approximately 40 per cent of those that completed the course entered employment. The programme now runs for nine weeks and participants can choose roles in events, finance, retail, maintenance or the kitchens. Participants are offered support through four key pillars: the volunteering itself; 1-2-1 support with issues such as childcare or job applications; qualifications, including food hygiene and emergency first aid; and employer engagement.

Knowledge Quarter partners support the programme: University of Liverpool application forms include a box for candidates to tick if they have completed the Micah programme and, if so, they are guaranteed an interview; the Royal Liverpool Philharmonic works with Micah when applicable roles become available; and Liverpool Cathedral employs participants directly. Since this project being brought to the KQSN as a best practice case study, the Hospital's catering, cleaning and portering contractor has also entered into talks with Micah. This shows how the KQSN is able to highlight best practice and identify further collaborations.

Aquaponics systems. Aquaponics has become a thriving speciality in the Knowledge Quarter. After a debut installation at the Liverpool Guild of Students, new systems have been installed at the Life Sciences University Technical College and at Alder Hey Children's Hospital. Further aquaponics are anticipated for installation at the City of Liverpool College.

Dave Wheatley of the Guild explains:

The Aquaponics installation is located on the roof of the Guild. The site includes a number of fish tanks containing a range of carp species. The waste products from the fish are filtered and microbial activity converts toxic wastes such as ammonia into nitrates, which are taken up by plants rooted in the circulation water providing the necessary nutrients for growth.

The installation demonstrates an alternative farming method that can cultivate food crops, and is particularly well suited to the urban environment where available land is at a premium. It therefore serves as a valuable educational resource. In doing so, it also provides a rare opportunity for our student volunteers to gain an insight into this method of sustainable cultivation whilst gaining practical skills alongside other important skills such as teamwork”.

In 2018, the Guild received further funding from a Liverpool City Region outreach programme. The project will reach 6000 students and address issues on current food security challenges. Groups of students selected by the schools will compete in an inter-school enterprise competition, creating their own eco-start-up focussing on aquaponics.

Low carbon eco innovatory. The Low Carbon Eco-Innovatory (LCEI) encourages research, innovation and knowledge transfer through offering businesses direct access to the leading research and development institutions of Liverpool John Moores University, University of Liverpool and Lancaster University, including access to new houses built in partnership with Building Research Establishment.

LCEI has assisted up to 200 local small and medium enterprises to help them focus on their specific challenges and identify opportunities for them to benefit from low carbon development and support. This collaborative research and development approach has brought about benefits in profitability and strategic decision-making for the businesses, and economic and environmental benefits for Liverpool City Region.

The universities have several years' experience in delivering this and similar programmes, bringing millions of pounds of benefit to the economy, increasing the effectiveness of businesses in a variety of sectors and reducing carbon emissions by thousands of tonnes.

The KQSN is attended by LCEI representatives, who have utilised the network to highlight innovative projects and to identify potential partners and purchasers for some of the projects they are supporting.

Discussion – challenges and opportunities

Much of the literature around cross-sector collaboration highlights the critical importance of partnership for achieving sustainability (Trencher *et al.*, 2013; Caiado *et al.*, 2018; Dienhart, 2010). However, it also notes the challenge of reconciling the various interests represented by all contributing partners. These may be agendas from their respective organisations, as well as disciplinary differences in skills and competencies, and differing levels of commitment (Murphy *et al.*, 2010; Caiado *et al.*, 2018). Balancing these presents a substantial challenge to both the leadership and efficacy of such partnerships, and subsequently the implementation can be lacking as collaborative ventures struggle to mobilise sufficiently around an agreed objective (Hamann and April, 2013; Florini and Pauli, 2018). Overcoming these challenges relies on an adequate ability to self-organise and sustain a commitment to the core motive (Snow *et al.*, 2016). Fostering a sense of power sharing is important in ensuring all parties have joint ownership on the direction and output of the group (Hamann and April, 2013).

The KQSN can be described as a bottom-up partnership, which has retained momentum not through formal funding or reporting but through sustained interpersonal capability. The network has achieved relative value alignment and a balancing of members' priorities, demonstrated through the agreement of a Terms of Reference and sustained engagement and activity from member organisations. The October 2018 meeting discussed additional benefits that members consider to have arisen from the network. This was in addition to having the Highlights Report as a tool to show the collaboration through the network. Members stated that expert knowledge had been shared around food and recycling, that the network helped to move sustainability up the local political agenda and that the network had been referenced within the KQ Liverpool vision, which lent added credibility. The network discussed work to promote the concept of anchor institutes and their support of the local area. The meeting discussed whether the network itself could be considered an anchor institution, although it lacks the staffing and budget that would traditionally be ascribed to the term. The Head of Sustainability for the Royal Liverpool University Hospital has been part of the Expert Advisory Group for a Health Foundation report on national health-care organisations as an anchor institution (The Health Foundation, 2018). The Health Foundation is due to publish its findings later in 2019.

In reviewing the output of the KQSN, however, the balance of collaborative output has weighed towards those existing projects that have been additionally supported or facilitated through the network. While this is to be celebrated as an example of sharing knowledge and solutions, possibly this modest level of implementation reflects the multiple agendas and commitments represented at the network. There is scope to increase the level of collaborative work that is conceived directly from within the KQSN. Equally, the network may consider which frameworks would suit better assessment of outcomes (Florini and Pauli, 2018). The UN SDGs may be such a framework.

The establishment of the KQSN (in October 2014) slightly preceded the SDGs and therefore the subsequent objectives written into the network's Terms of Reference did not include any mention of the SDGs. Since 2015, some key anchor institutes who have representation at the KQSN have adopted integration of the SDG model into their respective strategies and reporting. Additionally, Liverpool is home to the world's first UN-endorsed 'Local2030 Hub'. The hub's primary objective is to raise awareness of the SDG framework and it has led events that bring together private and public sectors to share knowledge on

SDG reporting and international sustainability. A director of the 2030hub has had membership at the KQSN since its beginning. Subsequently, with this growing SDG narrative, the KQSN noted a consensus at its meeting of October 2018 to update its Terms of Reference to include a greater emphasis on the SDGs moving forward. The group has already begun the process of signalling alignment to the SDGs through its Highlights Report; moving into 2019 the KQSN intends to develop a more specific set of metrics to broadly measure the Knowledge Quarter's sustainability performance and frame this within a SDG context. Through this transformation, the KQSN intends to encourage further SDG alignment amongst its member organisations, and thereby effectively progress in the spirit of SDG 17: partnership for the goals.

Leading with best practice

Three of the KQSN's four co-chairs are representatives of anchor institutes within the Liverpool Knowledge Quarter and are in a position to support transformation of the network to a more SDG-focussed partnership. At the time of writing this paper, the Royal Liverpool University Hospital and University of Liverpool, in particular, are able to share best practice to the broader network.

Royal Liverpool University Hospital's annual sustainability reporting has included the SDGs for the last two years; the Sustainability Plan 2017-2018 provided an overview of how each SDG linked to the organisation's work, including best practice examples of work from four other health-care trusts. The Sustainability Plan 2018-2019 included an overview of how the Hospital's work supported some of the 169 targets that sit underneath the SDGs. These had been approved by the Hospital's internal Sustainable Development Group in September 2017.

In addition to Royal Liverpool University Hospital's internal reporting, the annual sustainability assessment (developed for the national and public health care by the Sustainable Development Unit in 2017) links health-care sustainability performance to the SDGs (Hewitt *et al.*, 2018). The Sustainable Development Assessment Tool (or SDAT) consists of ten sections and four cross-cutting themes (SDU, 2019). Each section is linked to the relevant SDGs and the reporting of the assessment states whether an individual organisation is 'clearly contributing' or 'starting to contribute' to those goals. By using this tool, individual NHS trusts and public health organisations can report their progress against the SDGs, whilst the Sustainable Development Unit can collate the outputs to report on progress for the health and social care system in England as a whole. Royal Liverpool University Hospital fed into the review of the SDU sustainability assessment and shared its draft sustainability plan (which indicates activity aligned to the SDGs) as part of this process.

The University of Liverpool is currently engaged in assessing its sustainability performance across the categories laid out in the EAUC's Sustainability Leadership Scorecard. The Scorecard framework has been engaged as the foundation of the University's Sustainability Report 2017-18 that, for first time, references the 17 SDGs, showcasing how activities across the institution are contributing to the goals. Scorecard evaluation will contribute to discussions around the role of sustainability within the wider university, issues of reputation, student engagement and satisfaction, teaching and research performance and graduate outcomes. For example, a preliminary mapping of the University of Liverpool's Estates Strategy shows the core relationship between the estate and Goal 11 'Sustainable Cities and Communities'. The Strategy also actively seeks to support several other key goals at a campus level (which mirror the University's key strategic priorities) whilst supporting

the wider global impact through research outputs, graduates as change makers and global citizens and through the role of the University as an anchor institution.

Conclusion

This paper provides a case study of a cross-sector network for enhancing sustainability in the Liverpool Knowledge Quarter; specifically, this network is led by a higher education/health-care relationship. While cross-sector collaboration is not a new concept, this paper demonstrates how collaborative working for sustainability can be achieved, even in the absence of formal funding or commissioning, when the partnership centres on a shared vision and seeks to be inclusive of a multidisciplinary knowledge cluster membership.

The KQSN has evidenced a number of projects that have arisen directly through collaborative working, and additional projects that it facilitated through provision of access to the specialist skills and knowledge that the network accommodates. It would be fair to propose that a new community of sustainability practice has been cultivated within (and around) Liverpool's Knowledge Quarter. As the KQSN's visibility grows, so too may the local sustainability agenda.

Furthermore, this paper indicates how an existing partnership can prepare to transform its objectives to align with the UN SDGs. While KQ Liverpool continues to welcome the expertise and insight of the KQSN as the latter matures and continues a steady level of collaborative and facilitative work, the authors of this paper speculate that the KQSN is well-positioned to influence a greater awareness of the SDGs across the Knowledge Quarter during its period of transformation. The KQSN's key characteristics – representation that is cross-sectoral (including tertiary education, health care, voluntary, cultural, arts and local government sector bodies), membership that comprises a broad range of sustainability skills, a self-starting ethos and voluntary reporting to a key strategic development partnership in the city – can be effectively replicated by other cities with a similar knowledge economy.

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