

**“How much green space is enough in a context where there is pressure for land, where there is pressure for urban densification and for sustainable transport? How much is enough for human health, and what should its qualities be?”**

Professor Catherine Ward Thompson,  
Director of the OPENspace research centre at the University of Edinburgh

# Making connections

*How do urban environments, such as green spaces and where we live and work, influence our health and wellbeing?*

## At a glance

Starting in October 2016, our topic was ‘connecting health, wellbeing and sustainability’ and for two thirds of the year, we focused on generating questions which made these connections in the context of places where we live and work..

In the first term (October, November and December) of the academic year, the meetings examined internal and external environments and how they can be designed to benefit people’s health and the role that policy as well as communities could play in shaping places in ways that benefit both people and the environment. In the final term (May and June) the discussed the gap between theory and reality with respect to these environments.

This article provides an overview of these five discussions and some of the ‘wicked problems’ and questions they generated. The role that green spaces play in cities as a whole is explored in more detail in our ‘Cities of the Future’ report’, published on our website: [www.cfse.cam.ac.uk](http://www.cfse.cam.ac.uk).

## Framing the debate

Across all meetings, the benefits of green space for human wellbeing, happiness and sustainability were extolled, with evidence cited from fields such as neuroscience, epidemiology, economics, sociology and psychology to demonstrate the diverse impact green space has on our mental and physical health. It was suggested that the benefits of green space on our happiness may not dampen over time, and Tom Armour, Global Landscape Architecture Leader at Arup, said that the green environment is currently undervalued in urban design and should be an intrinsic part of our approach in order to build healthier cities. Similarly, Professor Matthew Gandy, Professor of Cultural and Historical Geography in the Department of Geography, encouraged a greater appreciation of urban biodiversity and called for further research into how to incorporate the spontaneous dynamics of nature into urban planning.

The definition of terms, their usefulness and our understanding of them was a key point of discussion across all meetings. The usefulness of wellbeing and happiness as metrics was also examined, with the latter considered a particularly subjective term that may detract attention from more concrete issues. Professor Catherine Ward Thompson,

Professor of Landscape Architecture and Director of the OPENspace research centre at the University of Edinburgh, triggered discussion regarding the concept of green space: How much is enough for human wellbeing? What qualities should green space have? How natural should green space be? Knowing the answers to such questions is vital so that we can preserve and replicate environments with the greatest positive influence on human wellbeing and happiness. Dr Ross Cameron, Senior Lecturer in Department of Landscape at the University of Sheffield, emphasised that green spaces need to be optimised for multifunctional uses, particularly for ecosystem services, but how this is done is dependent on the differing needs of the surrounding locale. All these questions highlight a recurrent thread through the meetings: the need for more data and research. This was emphasised by Dr Scott Hosking, a Climate Scientist for the British Antarctic Survey, who called for more specialised climate models informed by ground-truthed data.

## Catalyzing change

However, the need for such metrics was also identified as a way of framing a business case to policymakers and decision

## Key questions

**Through our discussions, we identified four key areas where more research is needed:**

- **How ‘natural’ does a green space need to be to have a positive impact on people’s wellbeing?**
- **How important is ‘greenness’ in providing these benefits? Are there commonalities between the effect of green spaces on our wellbeing and the effect of spaces we perceive to be beautiful or pleasing to us?**
- **How do we reconcile conflicts between aesthetic appeal and functional requirements of urban green spaces?**
- **How can we create educational systems that encourage children to interact with nature and what role could green spaces play for those living in cities?**

makers, and this was a common concern across the meetings. Catalyzing change in policy is difficult even when the benefits of an approach are obvious. However, there are opportunities for change. Dr Gillian Petrokovsky, James Martin Fellow in the Oxford Long-Term Ecology Lab, emphasised the need for multidisciplinary work and cross-sector partnerships by demonstrating the value of neglected silvacultural knowledge as a resource for agricultural and urban spheres. Additionally, the public's increasing awareness of terms such as wellbeing and sustainability and the current tumultuous political landscape is an opportunity to impress different ideas on policymakers and the public. Dr Ellie Robinson, Assistant Director of External Affairs at the National Trust, described some of the work done in this area by her organisation, which uses natural capital accounting to demonstrate the value of green space. However, the dangers of monetising value as a result of the push to influence policy were acknowledged, as were the risk of ratings tools preventing a holistic approach to project design. In addition, Dr Peeter Pärt, Advisor in Environment and Human Health Interactions at the Joint Research Centre of the European Commission, warned of the dangers of colliding policies and suggested that finding ways to combine sustainability and wellbeing needs further research.

Two barriers were consistently identified with regards to policy change. The first was that the political and democratic system often precludes long-term planning and over short-term thinking, particularly with regards to major projects in the built environment. The other was the need to improve public engagement with the environment and environmental issues. This is particularly important when it comes to protecting invisible or unglamorous assets such as biodiversity or insect species. Craig Bennett, CEO of Friends of the Earth (England, Wales and Northern Ireland), advocated a greater democratisation of resources, improved public consultations and increased levels of education to help both reduce inequality and overcome incumbencies in the way we think. Improved education and public outreach is also a core part of the work of Dr David Cope, Director of Strategy and External Affairs at the Royal Botanical Gardens, Kew. He advocated the need for resilient cities to connect people to nature by design, and in so doing help deepen the connection and awareness with green spaces and promoting environmental issues politically.

## From theory to reality

Two speakers provided practical examples of an urban setting which incorporates green space and environmental considerations. Ron Bakker, Founding Partner of PLP Architects, described his work on The Edge, which is an example of a private investment that recognised a business model that valued sustainability, incorporated long-term thinking and engagement with the public. As a building, The Edge is sustainable and efficient in its use of space and is adaptable, creating opportunities for its users to interact with and alter the environment through daily communicative connections, and Ron advocated this design approach for cities. In a similar vein, Andrew Grant, the Founding Director of Grant Associates, presented a vision for green spaces in cities through the Singaporean project 'supertrees' which, whilst functional, provides a diverse, natural experience within a city, allowing people to reconnect with nature.

As part of the pressing need to assess the value of green spaces, two speakers presented their innovative research into connecting happiness and wellbeing in relation to space. Dr Dimitris Ballas, a Senior Lecturer at the Department of Geography, explores the connection between wellbeing and social spaces by comparing objective measures with social survey data and then using multi-level modelling and

simulations to create a contextual picture that can help inform social policy regarding incorporating wellbeing into urban planning. Laurie Parma, a researcher based within the Policy Research Group at the Department of Psychology, examines the relationship between biodiversity and human wellbeing by gathering quantitative demographic and survey data through an app, Naturebuzz, and then mapping the results to help us understand whether some green spaces are more valuable than others. Professor Felicia Huppert, Director of the Well-being Institute in Cambridge, emphasised the need for more data in this area, particularly as wellbeing is not a static concept, and different populations will respond in various ways to the natural environment.

**The Cambridge Forum for Sustainability and the Environment** was established in 2013 in the University of Cambridge. Chaired by Lord Martin Rees, it meets once a month, bringing together thought leaders from the worlds of research, policy and industry to talk about some of the great sustainability challenges the world faces in the future and the research pathways which will help to prepare for and address those challenges.

**Secretariat:** Prof. Paul Linden (Director); Dr Rosamunde Almond (Deputy Director); Dr Konstanina Stamati (Head of Partnerships and Development); Simon Patterson (Content Writer and Editor)

**Forum members for this topic were drawn from 21 Departments, centres and institutes**, including: Prof. Alan O'Neill (Cavendish Laboratory); Prof. Alison Smith, Dr Mariana Fazenda and Prof. Howard Griffiths (Dept. of Plant Sciences); Prof. Andy Hopper and Prof. Ian Leslie (Computer Laboratory); Prof. Carol Brayne (Dept. of Public Health and Primary Care, Institute of Health); Prof. David Dunne (Dept. of Pathology and Cambridge Africa); Dr David Pencheon (NHS Sustainable Development Unit); Dr Emily Shuckburgh (British Antarctic Survey); Dr Erwin Reisner (Dept. of Chemistry); Dr Hildegard Diemberger (Dept. of Social Anthropology); Dr Jake Reynolds and Polly Courtice (Cambridge Institute for Sustainability Leadership); Dr Julian Huppert (Jesus College Intellectual Forum); Prof. Koen Steemers (Dept. of Architecture); Prof. Nick Wareham (UKCRC Centre for Diet and Activity Research); Prof. Peter Guthrie (Dept. of Engineering); Dr Rob Doubleday (Cambridge Centre for Science and Policy - CSaP); Prof. Roderic Jones (Dept. of Chemistry); Dr Shailaja Fennell (Centre of Development Studies); Dr Simon Beard (Centre for Existential Risk - CSER); Prof. Simon Redfern (Dept. of Earth Sciences); Dr Stephen Cave (Leverhulme Centre for the Future of Intelligence)

**Witnesses:** Andrew Grant (Grant Associates); Prof. Catharine Ward Thompson (University of Edinburgh); Craig Bennett (Friends of the Earth); Dr David Cope (Royal Botanical Gardens Kew); Dr Dimitris Ballas (University of Sheffield); Ellie Robinson (National Trust); Prof. Felicia Huppert Wellbeing Institute in Cambridge and the Institute for Positive Psychology & Education at Australian Catholic University); Dr Gillian Petrokovsky (Oxford Martin School, Oxford University); Laurie Parma (Dept. of Psychology); Prof. Matthew Gandy (Dept. of Geography); Dr Peeter Part (Joint Research Centre, European Commission - JRC); Ron Bakker (PLP Architects); Dr Ross Cameron (University of Sheffield); Dr Scott Hosking (British Antarctic Survey); and Tom Armour (Arup)

**University guests:** Claire Higgitt (Research Strategy Office); Prof. Alan Short, Prof. Marcial Echenique, Theodora Bowering, Linda Nkatha Gichuyia and Mingfei Ma (Dept. of Architecture); Dr Maria Abreu (Dept. of Land Economy); Dr Megan Davies Wykes (Dept. for Applied Mathematics and Theoretical Physics - DAMTP); Dr Rob Foster (Centre for Natural Materials Innovation); Prof. Eric Wolf (Dept of Earth Sciences); Prof. Larry Sherman (Dept of Criminology); Sarah Steele (Jesus Intellectual Forum); Tinnie Videler (Public Health@Cambridge Network) and Eleanor Winpenny (MRC Epidemiology Unit).

**Guests from outside Cambridge:** Andrew Limb (Cambridge City Council); Annelisa Grigg (UNEP World Conservation Monitoring Centre); Ingrid Abreu Scherer (What Works Centre for Wellbeing); Kirsten Henson, (KLH Sustainability); and Dr Roger Mitchell (Cambridge Conservation Forum).



“The challenge for us as a research community is to develop a nuanced understanding of the food industry, how it appears to importantly influence our diets and how we can influence what the food markets offer in the interests of public health.”

Professor Martin White  
Centre for Diet and Activity Research, University of Cambridge

## Diets in a changing world

*How may our diets change in the future and what does an environmentally sustainable and healthy diet look like?*

### At a glance

Our third topic explore connections between health, wellbeing and sustainability and between January and March 2017, expert witnesses from the worlds of policy, research and industry helped us to explore questions related to the food we eat.

At the first meeting in January, we started by looking at how our diets may change in the future and ways in which these changes could impact the environment. In February, we turned to what drives the choices people make and in March, we discussed 'catalysing change' and the role that policy and advocacy could play in changing what people eat. This article provides an overview of these three discussions and some of the 'wicked problems' and questions they generated.

### Taking a global view

There was general agreement across the three forums that when it comes to what constitutes a 'good' diet and its importance with regard to health, wellbeing and sustainability there is a large, albeit evolving, evidence base. There remain some outstanding areas to explore, such as determining exactly what nutritional factors are best for human health. Diet is a multidisciplinary and multicriteria problem, which Tim Lang, Professor of Food Policy at City University London's Centre for Food Policy, related to food quality, health, environment, social and cultural issues relating to diet, economics and governance. Charles Godfrey, Hope Professor and Director of the Oxford Martin Programme on the Future of Food at Oxford University, emphasised that health and the environment overlap and can have co-benefits, but exactly how these interrelate and how negative rebound effects can be avoided was a frequent discussion point.

There was also agreement that, overall, rapid change of the food system is needed for health and environmental reasons, although it was noted that in some instances maintaining the

status quo in areas of good practice will be just as challenging. Dr Marco Springmann, from the Oxford Martin Programme on the Future of Food, asserted that animal-based diets are unhealthy and unsustainable, and that food production will exceed emissions targets if land change is also considered.

### Catalyzing change

Dr Michael Obersteiner, the Program Director of the Ecosystems Services and Management (ESM) Program at IIASA - Institute for Applied Systems Analysis - in Austria, and others considered whether policy interventions should occur at the point of consumption or point of production. At the moment interventions are often at the supply end and changing our demands could have a greater impact. There was disagreement across the Forums as to which of these intervention points were most important; however, it was agreed that both were vital and could serve different purposes.

### Key questions

Through our discussions, we identified four key questions where more research is needed:

- How can we reach an understanding about what constitutes a sustainable and healthy diet? Should our approach be to create a global vision of this concept or to have regionalised versions that factor in local contexts?
- How can we communicate research in a way that influences individual behaviour and what people choose to eat? How do you unpick which factors ultimately have the most significant impact?
- What is the best policy approach to influence the choices people make?
- Can we apply lessons from marketing to public health interventions?

Policy makers often know the changes that can make people's diets healthier, but how to catalyse those changes is much less clear. There are very few existing models for large-scale interventions at the population or even community-level. Examples from other European countries and the US have shown that food and drink-related taxes are politically sensitive; subsidies can have unintended adverse consequences for the environment; certifications can lack a solid evidence base; and clear, effective food labels are hard to achieve. Modelling studies can examine the theoretical effect of policy changes and these also need to be 'ground-truthed' with information about how people behave in real life. Even when the correct policy approach is known, public opinion needs to be galvanised so that policy makers can be emboldened to enact interventions that can affect behavioural change. Professor Theresa Marteau explained that communicating evidence concerning the intervention can make it more acceptable to the public and suggested that the public sector could encourage behavioural change in advance of cultural shifts.

Whether policy interventions should occur at a population or individual level was also discussed. Dr Brent Loken, from the EAT Initiative in Oslo, suggested that the urgency of the issue meant that population-level changes were more effective and vital, but could be supported by interventions at other levels. Each population, and its demographic subsets, will require a different approach.

## Making information easier to digest

It is hard for the public to access and absorb the complex information regarding diet, and as a result they become sceptical and revert to default practices. Although digitisation offers opportunity to convey information more effectively, health and environmental messages alone will not change our food culture: a holistic, systems approach is required. Bee Wilson, a food writer and historian, suggested that a change in approach is required. For example, people's malleable flavour preferences could be changed so that they actively enjoy healthy food over sugary treats. She and others recognised the importance of education as all levels, but especially at a young age, in changing our relationship to the environment and food production.

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***“Instead of telling people to eat broccoli, make us like broccoli and then we won't have to be told.”***

Bee Wilson, food writer, journalist and historian

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Looking at industry, there is scope to optimise agricultural practice, and this could cause beneficial indirect land-use change. Professor Martin White, from the UKCRC Centre for Diet and Activity Research (CEDAR) suggested that regulation was probably necessary in this area as voluntary commercial change had not been forthcoming, but this can have negative consequences if the cost is passed on to other areas. He argued that as things stand, the food and drinks industry has too much power, and the mechanisms by which public pressure on industry can be created needs investigation. Crucially we need to know more about how the food industry influences dietary choices.

There are many layers between researchers and the individual consumer, and research is needed into how messages can be communicated clearly so as to influence behaviour. Professor Sumantra Ray, the Founder and Executive Director of the NNEdPro Global Centre for

Nutrition and Health in Cambridge, advocated the need for effective and trusted knowledge brokers, such as healthcare professions, that would help people to understand the evidence behind diets, and the research community needs to take an active role in this process.

With the rapid pace of urbanisation, these problems need to be addressed before they become unmanageable. A final thought considered whether policy change directly focused on the global food system was enough to catalyse significant change by itself or whether the status quo of other large-scale economic forces can lead to inertia in food policy.

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We would like to thank everyone who took part in Forum meetings, especially the expert witnesses and guests who joined us from across and outside Cambridge and who contributed their time, knowledge and expertise:

**Witnesses:** Dr Michael Obersteiner (International Institute for Applied Systems Analysis - IIASA); Dr Marco Springmann (Department of Population Health, Oxford University); Prof. Sumantra (Shumone) Ray (MRC Elsie Widdowson Laboratory, University of Cambridge); Prof. Martin White (CEDAR); Bee Wilson (Food writer, journalist and historian); Prof. Charles Godfray (Oxford Martin Programme on the Future of Food, Oxford University); Prof. Tim Lang (Department of Sociology, City University of London); Dr Brent Loken (EAT Foundation, Oslo); Prof. Theresa Marteau (Behaviour and Health Research Unit, University of Cambridge)

**Guests:** Prof. Andrew Balmford (Dept. of Zoology); Dr Charlotte Sausman (Public Policy Strategic Research Initiative); Dr David Reiner (Judge Business School); Jacqueline Garget (Strategic Research Initiative in Global Food Security); Dr Jean Adams (CEDAR) and Nicola Buckley (CSaP).

**From outside Cambridge:** Prof. Charlie Kennel (Visiting Research Fellow, CSaP) and a number of CSaP Policy Fellows, including John Curnow (Defra); Julie Pierce, (Food Standards Agency); and Tom Hook, (London Borough of Barking and Dagenham).