Health, wellbeing and sustainability

Places

Cambridge Forum
for Sustainability and the Environment

6

Cambridge Forum for Sustainability and the Environment

A rising world population, declining resources and a changing climate are all reshaping where we live and how we live. So how do we respond?

This key question is the focus of a Forum in the University of Cambridge which aims to stimulate cross-disciplinary conversations about some of the planet's most pressing global sustainability challenges and to bring fresh ideas and perspectives to research which will help to prepare for and address those challenges.

On a global scale, we need to find a way in which 7 billion people, expected to rise to 8 billion by 2030 and 9.6 billion by 2050, can live a high quality of life that is less demanding on our planet. And to adapt, be efficient and sustainable, we need to know where to place our energies – nationally and globally – to meet the challenges the future will bring. Unfortunately there is no silver bullet: The solutions will need to be 'multi-pronged' and multi-disciplinary, requiring knowledge from many different sources.

'Sharing the knowledge' and catalysing those connections are two of the goals of the Cambridge Forum for Sustainability and the Environment, a forum in the University made up of 25 of the University's leading experts in areas ranging from energy, biodiversity and food security to anthropology, architecture, history and economics.

Professor Lord Martin Rees is the Chair of the Forum and Professor Paul Linden is the Director. We meet in Downing College on the third Tuesday of every month between October and June.

One of the Forum's aims is to bring people together who would not usually meet each other but who are working in areas which overlap enough to stimulate an interesting discussion. Each month, three expert 'witnesses' are invited to help us to explore different aspects a particular area and to generate new trans-disciplinary research questions.

The general theme of the discussions is 'sustainability in an uncertain future' and we change topics each October.

Since the Forum was founded in January 2013:

47 **Core members of the Forum and…**	**160+** **People from the University who have been drawn from…**	**60** **Departments, centres and institutes have come to…**
45 **Forum meetings involving…**	**77** **Expert witnesses and…**	**120+** **External guests**
12 **Public events and seminars hosted and co-hosted by the Forum**	**1500+** **People have come to our public events and seminars**	**£4.1m** **The value of a successful research grant catalyzed by the Forum for new 5 year EPSRC cities research programme focused on 'Managing Air for Green Inner Cities' (MAGIC)**

UNIVERSITY OF CAMBRIDGE

Forging new connections

Starting in October 2016, our topic is 'connecting health, wellbeing and sustainability' and we will explore a number of themes related to this over the course of the year.

In the first term of the academic year, we talked about places. This summary provides an overview of these three discussions and some of the 'wicked problems' and questions they generated.

Between October and December 2016:

3 **Forum meetings focused on connections between health, wellbeing and the environment in places where we live and work**	**9** **New members from the NHS Sustainability Unit, the Institute for Public Health, the MRC Epidemiology Unit, the Centre for the Future of Intelligence, the Centre for Existential Risk and the Cambridge Centre for Science and Policy**	
48 **People have taken part in the discussions drawn from….**	**23** **Departments, centres and institutes represented and…**	**14** **External organisations including the National Trust, Arup, Friends of the Earth, What Works Wellbeing and Cambridge City Council**

Meeting themes

Living and working

On the 18th October, an architect with a passion for technology joined an economist who is interested in metrics of happiness and an advisor on health and environment interactions for the EC Joint Research Centre to help us to generate research questions related to where we live and work.

Space for people and nature

On the 15th November, we turned to outside spaces in cities. A landscape architect joined a researcher who is interested in the relationship between biodiversity and wellbeing and an urbanist who writes about cities, landscapes and nature to help us to explore the way in which these spaces can be designed to benefit people's health, bring communities together and have a positive effect on the environment.

Catalyzing change

At our final meeting of the term on the 13th December, the CEO of Friends of the Earth joined the founder of the landscape architectural practice at Arup and the leader of the National Trust's national work on urban green spaces to explore the role that policy and communities could play in shaping cities in ways that benefit people and the environment.

Theme Summary

The overall theme for this term was connecting health, wellbeing and sustainability with places. Whilst the three meetings are summarised individually in more detail over the following pages, this section highlights some of the key themes that came up over the course of the entire term.

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, 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. 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. 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.

However, the need for such metrics was also identified as a way of **framing a business case** to policymakers and decision 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** given the public’s increasing awareness of terms such as wellbeing and sustainability and the current tumultuous political landscape. 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.

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. 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. 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. Nonetheless, 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 finding ways to combine sustainability and wellbeing needs more research.

As part of the pressing need to assess value, 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.

Living and working

Research gaps

The three witnesses explored internal environments and generated research questions concerning where we live and work. In their introductions, they discussed issues pertaining to the indoor built environment and its effect on the wellbeing of occupants as well as how improvements in this area can be made in conjunction and coordination with sustainability goals. The different ways of measuring and understanding wellbeing were also examined.

Ron Bakker reminded us of the benefits of feeling connected to nature through buildings before introducing The Edge, a large commercial building in Amsterdam which gained a BREEAM rating of 98.36%. As in the case of the stakeholders for this project, people are starting to attach real monetary value to demonstrably sustainable buildings: sustainability need not be just for saving energy but also for creating value. The Edge technologically maintains a daily communicative connection between itself and the building's users. Amongst many other sustainability features, the building uses a third of the space a traditional building would use through intelligent systems, design and collaborating with the users' needs. Such an ethos should be expanded to cities; by using space, materials, transport and energy more efficiently and flexibly you can assign more value to quality designs. To achieve this you need long-term thinking and public and private cooperation.

Dr Dimitris Ballas discussed his research on the personal, geographical and socio-economic contexts of happiness and wellbeing and how these related to social spaces and psychosocial processes. Objective measures that relate to happiness, such as natural (climate, proximity to nature, etc.), urban (green spaces, entertainment buildings, etc.) and human-created amenities (crime, education, social capital, etc.) can be assessed by combining social survey and geographical data and then using multi-level modelling and micro-simulations, although the optimal state will vary depending on personal circumstance. Social comparison of positional goods is a key factor and this process exists on different scales (building, neighbourhood, city, social media, etc.). However, more research is needed on its importance, its relationship with horizontal and vertical segregation within the built environment and social cohesion. Understanding such factors will aid social policy regarding wellbeing as well as urban planning and design.

Dr Peeter Pärt focused on the indoor environment and stressed the danger of colliding policies. Constructing sustainable buildings or saving energy does not always create an optimal and healthy indoor environment. The noise environment, such as from ventilation systems, increased microorganism levels stemming from humid buildings and exposure to chemicals and radon are all factors that affect our wellbeing and may cause sick building syndrome. We need better insight regarding the relationship between human behaviour, policy and the planning of the built environment or unintended and unforeseen consequences for sustainability can occur. The political system also tends to veer towards short-term thinking with regards to the built environment, meaning that materials and resources can be wasted on buildings with a short lifespan.

Wicked problems and questions generated by the open discussion

Is happiness a useful term? Although certain key indicators, such as social connections, opportunity and physical and mental health, appear to be globally consistent, happiness can be subjective and affected by cultural and linguistic variance. Additionally, happiness may be different depending on whether it is assessed from an internal or external perspective. It is possible that a focus on happiness may not be intrinsically good

and is detracting from attempts to stem inequality and social deprivation. Wellbeing may be a better and more inclusive term, focusing more on external factors such as social and environmental influences.

How do we quantify happiness and wellbeing? There is an uneasy balance between the need to influence policy and policymakers by clearly quantifying and demonstrating the cost-effectiveness of an intervention and the dangers of monetising something as fundamental as wellbeing. Wellbeing and sustainability are increasingly on the radar of the electorate and, therefore, policymakers so there is opportunity to catalyse change.

What is the best way of understanding the value of sustainability and wellbeing? There are a number of different rating tools and metrics for urban planners and policymakers but these are not always appropriate: they may lead to box-ticking or may prevent a holistic outlook. Nonetheless, it is important to find ways to express the value of both terms to raise awareness, both for planners and the public.

How can we improve urban design to improve wellbeing? With regards to the built environment, adaptability is crucial for creating a durable building for an unknown future. There are opportunities to make better use of space and challenge assumptions about the standard workplace environment. Building 'less but better' in cities may help us devote more resources to sustainability. This approach may also have applications to wellbeing and life quality. Instead of focusing simply on prolonging life we should focus on prolonging and improving the period where people are happy and healthy.

How do we deal with scenarios where policies of wellbeing and sustainability collide? These two policies have a clear relationship but are often in conflict when it comes to policy decisions. If we can change this perception then we may be more willing to invest in win-win scenarios. Being able to quantify these values in an understandable way is critical.

Witness profiles

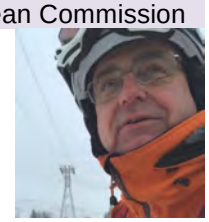
Ron Bakker
Founding Partner, PLP Architects

Ron is a Partner at PLP Architecture, a London-based group of architects, designers and thinkers who value the transformative role of ideas and the capacity for architecture to inspire. He has a particular interest in the architectural techniques that influence the qualities of gathering places in our cities and buildings and an excitement about the role of new technologies in the built environment. His recent projects include The Edge, the world's most sustainable office building developed by OVG Real Estate for Deloitte in Amsterdam

Dr Dimitris Ballas
Senior Lecturer, Department of Geography, University of Sheffield

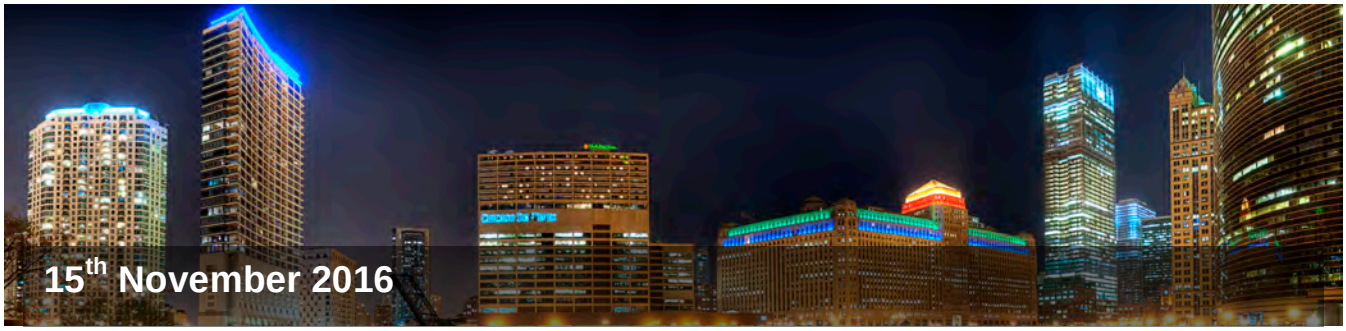
Dimitris is an economist by training and has extensive experience in using GIS and spatial microsimulation for the evaluation of the socio-economic and spatial impact of national social policies, as well as area-based policies. He has recently completed an ESRC mid-career research fellowship project (in the context of the "Understanding Population Trends and Processes" programme). This project aimed to critically review past studies and theories of happiness and to add a geographical dimension to recent innovative work of economists, psychologists and other social scientists in this relatively new research area.

Dr Peeter Pärt
Advisor in Environment and Human Health Interactions, Joint Research Centre (JRC), European Commission



Peeter has worked for the European Commission's DG Joint Research Centre since 1997, most recently as Advisor in Human Health and Environment Interactions in the Institute for Environment and Sustainability. In this function he has been following Environment, Human Health and Ecotoxicology related issues in the Commission, including chemicals (specifically endocrine disruptors), air and water pollution, noise, electromagnetic field, etc. His scientific background is in comparative physiology, aquatic toxicology and ecotoxicology.

Spaces for people and nature



Research gaps

The three witnesses examined green space in urban environments and its relationship to human health and wellbeing as well as people's ability to access and appreciate green space. Discussions focused on the precise aspects of the natural environment that have positive effects in addition to the mechanisms by which this occurs and the extent of its impact.

Prof Catharine Ward Thomson asked the forum to consider how much green space is enough for human health and what should its qualities be? Green space can have a wide meaning including green and natural, managed or unmanaged and public and private spaces, as well as blue spaces (bodies of water). There is a relationship between green spaces and health and this is stronger in deprived communities. Neuroscience, epidemiological and experimental studies have shown that green space can positively influence, amongst other things, our mortality, cardiovascular and respiratory disease, mental health, sleep patterns and birth outcomes even before one considers indirect benefits such as improved air quality. There are differences in how we use and perceive green spaces depending on our age, culture, life stage and childhood experiences. We need to know how to best utilise this knowledge to combat health inequities through the provision of green space in urban environments.

Laurie Parma introduced her work studying which types and individual characteristics of green space are more beneficial for human wellbeing and happiness. Human beings benefit from more diverse environments which provide variety to keep us cognitively engaged. Hence Laurie specifically focuses on the relationship between biodiversity and human wellbeing. Green spaces have been shown to beat hedonic adaptation (the process by which, after a period of time, the effect of positive or negative stimuli usually dissipates and happiness reverts to a stable level). Thus, the hypothesis is that a more biodiverse environment will help overcome hedonic adaptation. Quantitative data will be gathered via an app, Naturebuzz, which gathers basic demographic information before surveying its users to help understand the moment-by-moment relationship between wellbeing and the environment before mapping its results geographically against biodiversity. The study will help us to understand why we preserve the environment and whether all green spaces are created equal.

Prof Matthew Gandy works on the project "Rethinking Urban Nature" and highlighted six themes, particularly related to spontaneous, unmanaged urban nature. First, we must consider what urban ecology encompasses, its dynamism and the ideological implications of a cosmopolitan ecology with many adventive species. Second, how do we conceptualise the independent agency of nature and its interaction with human agency? Third, what are the intersections between water, epidemiology and entomology in the urban environment? Fourth, how can we valorise wastelands or spontaneous urban nature? Fifth, how can the spontaneous dynamics of nature be integrated into innovative design in urban areas? Finally, how do communal urban spaces become important in collective memory and culture? A key issue is that biodiversity in cities is often underappreciated. Despite some detailed research in urban areas, some involving citizen science, many of the largest cities have no comprehensive database for urban flora, and we must consider how best to rectify this.

Wicked problems and questions generated by the open discussion

How 'natural' does a green space need to be to have a bearing on human wellbeing? This area requires more research. Childhood experience seems to influence our relationship with green spaces so new ideas of urban environments may not have as strong an effect on our wellbeing.

How important is greenness? Is it greenness or is there some deeper understanding of beauty or the sublime that can be replicated by an urban environment? The response to different types of landscapes appears to vary over cultures and over time. Nonetheless the natural environment seems to provide 'soft fascination', i.e. it engages attention without people having to make an effort.

How can engagement with green space be encouraged? There can be a disparity between the perception of potential users of green space and that of independent measurements. For example, sense of safety can be a key barrier to the use of green space and this is in turn influenced by secondary factors such as cultural background, local knowledge and the quality of the green space. Public spaces need to be designed in a welcoming fashion with clear sightlines and inviting entrances but this need to be supported by social programming and engaging local communities. Education that allows people to read the landscape may help them to derive greater pleasure from green space.

How do we encourage active transport? Active transport may represent a way of being exposed to nature without a conscious effort. There is evidence to suggest that exercise in a natural environment is better for your health than the same amount in a gym. We need safe and secure green spaces for people to walk and cycle.

Is there a disjunction between people who can appreciate visible and aesthetically pleasing environments versus appreciating more abstract ideas such as biodiversity? Moving beyond just the study of the visual and aesthetic experience of nature is important. Studies have started to examine the 'embodied presence' of nature and suggest that – probably at the microbiome level – we are affected by biodiversity regardless of our like or dislike of nature.

How do you generate the political momentum to protect less glamorous flora and fauna? Getting any engagement with statutory bodies to even inspect certain sites or data is challenging particularly for brown field sites. We need to encourage public appreciation of and engagement with nature in urban areas otherwise concepts like biodiversity can be perceived as too abstract.

Witness profiles

Professor Catharine Ward Thomson

Professor of Landscape Architecture at the Edinburgh School of Architecture and Landscape Architecture (ESALA), Director of the OPENspace research centre and Associate Dean for Research, Knowledge Exchange and Impact for the College of Humanities and Social Science, University of Edinburgh

Catharine's research focuses on inclusive access to outdoor environments, environment–behaviour interactions, landscape design for older people, children and teenagers and salutogenic environments. She also has expertise in the history and theory of urban park design and conservation, the history of landscape design and landscape aesthetics and perception. Her current research projects include a study funded by the National Institute of Health Research (NIHR) on the effectiveness of Forestry Commission Scotland's programme, 'Woods In and Around Towns' (WIAT). She also leads the £1.6m EPSRC-funded project, Mobility, Mood and Place (MMP), an interdisciplinary project developing co-design as a research tool.

Laurie Parma

Researcher based within the Policy Research Group, Department of Psychology, University of Cambridge

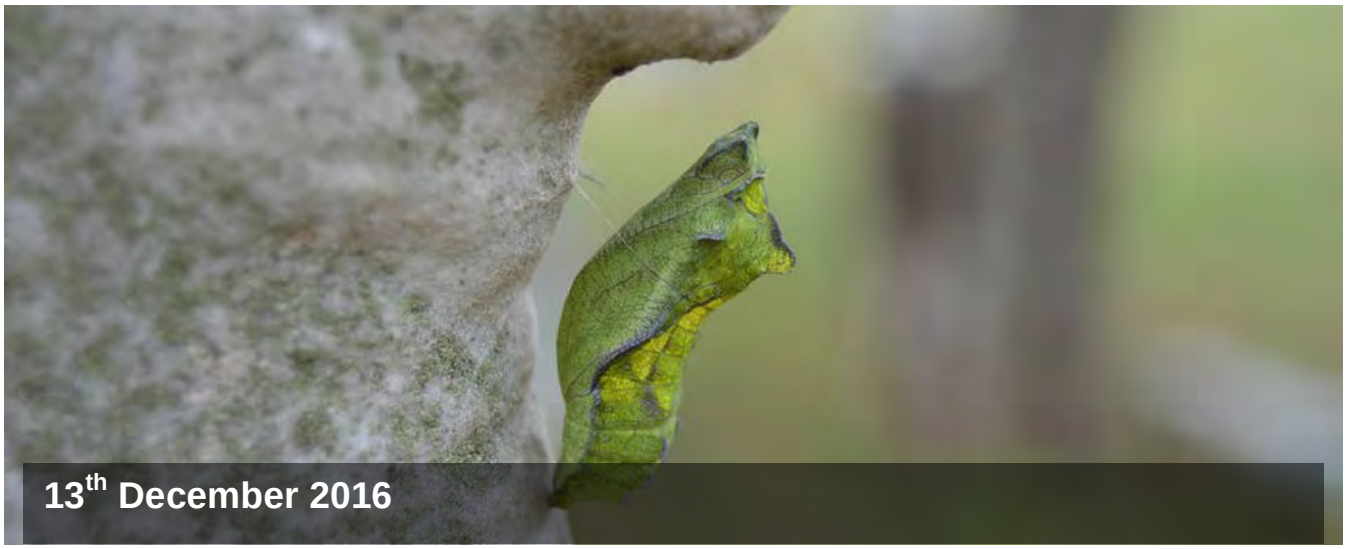
Laurie is a wellbeing researcher with interests ranging from environmental psychology to behavioural economics. She focuses on defining, measuring and monitoring wellbeing, aiming to generate insight to foster wellbeing and effective behavioural change. She is particularly interested in developing evidence-based wellbeing guidance and monitoring online platforms. She is currently co-leading a project with the Cambridge Conservation Initiative, which investigates the relationship between wellbeing and biodiversity. This project has developed a new smartphone app, called NatureBuzz (available on iTunes and Google Play), to capture the relationship between human wellbeing and the environment they are in moment-by-moment.

Professor Matthew Gandy

Professor of Cultural and Historical Geography, Department of Geography, University of Cambridge

Matthew Gandy is a cultural, urban and environmental geographer with particular interests in landscape, infrastructure and more recently bio-diversity. The historical scope of his work extends from the middle decades of the nineteenth century to the recent past. His research ranges from aspects of environmental history, including epidemiology, to contemporary intersections between nature and culture, including the visual arts. He has written the award-winning *books Concrete and clay: reworking nature in New York City* (2002) and *The fabric of space: water, modernity, and the urban imagination* (2014).

Catalyzing Change



Research gaps

Tom Armour highlighted that the green environment in cities is undervalued, particularly with regard to urban planning and design. It is important to remember humanity's strong connection to nature and begin urban planning by focusing on people rather than infrastructure. Currently, there are numerous problems with cities, such as air pollution, heat, effects of climate change and various physical and mental health issues linked to poor environments. Conversely, the green environment has diverse benefits which can be environmental (e.g. improving biodiversity, microclimates, air, water and soil quality and reducing flood risk and noise pollution), economic (e.g. increasing property prices, encouraging inward investment and reducing healthcare costs) and social (physical and mental health benefits). The green environment should be an equal partner when building healthier cities and this requires courageous thinking and further research to justify the business case.

Ellie Robinson focused on the fact that the funding and management model for urban green spaces is collapsing as a result of local authority funding difficulties. There are currently no strategic alternatives for managing a portfolio of green spaces in a large area and access to green space may become severely compromised in the next 25 years. However, times of economic turmoil also provide opportunity for change. Again, the need for a business case to highlight the numerous benefits of green space was highlighted. The National Trust have started to use natural capital accounting to amalgamate research in various areas and create a coherent and simplified argument that persuades decision makers that green space is an asset rather than a liability. There are still a number of gaps in the data, particularly when it comes to confidence assessments on health and usage of green space. Moreover, we need to embed research into the urban design process and to empower the various end-users with the ability to influence green environment design.

Craig Bennett discussed three big ideas for catalyzing change in cities. First, the concept of sharing cities has huge potential that can be unlocked by digital technologies. The sharing of resources, skills and expertise will help reduce inequality and overcome incumbencies of old technology and thinking. Second, there needs to be greater self-determination to aid local decision-making and a less haphazard UK devolution strategy. Lastly, we need to deepen democracy. Four areas need to be tackled to achieve a more effective democracy: involving people at the start of decision-making processes (upstream engagement); encouraging greater community-led participation and improving consultation systems; genuinely redistributing power so that communities can shape budgets; creating an education system that empowers people with the critical thinking required for reshaping the world. The concept of community is changing in the 21st century, moving beyond definitions by geographic placement, and these new communities need to be recognised.

Wicked problems and questions generated by the open discussion

How can you enact changes in policy when even clear benefits do not necessarily lead to change? A lot of these benefits require long-term thinking whereas we live in a world of short-term political thinking. Thus large-scale infrastructure projects, which present opportunity for change, have a tendency to do the minimum. Also, the secondary benefits of a policy or project may not be directly received by the financiers, thus philanthropic thinking needs to be encouraged.

Are there other cities which could provide a model for the urban green environment? Philadelphia, Freiburg, Rotterdam and Finland were all mentioned as areas that had innovative approaches. However, there is no shared hub of information that provides examples of successful models and their impact when compared

with a baseline scenario. **Could the UK become a leader in this area?** More research is needed to create guidelines for how to create quality urban green space, such as parks, and to examine the historical and cultural reasons as to why innovations occur in certain areas. Traditional structures that connect public, private and voluntary voices are being eroded due to the lack of funding for local authorities, but this does present the opportunity to create new innovation pathways linking sectors such as health and the environment.

How can we encourage community/citizen-led engagement and decision-making regarding urban green space? Many of the above examples from other countries had good citizen engagement tools for planning and changing urban spaces; but in the UK there is political inertia when it comes to public consultation. Digital technology has huge potential to affordably and efficiently engage the public, and more research is needed on ethnographic research methods. However, to avoid being overlooked, the environmental argument must be reframed in a way which is accessible and links with other core issues such as health or crime. Public engagement is a vital part of the process that mitigates disenfranchisement and helps raise people's awareness of environmental issues.

What is a community? Whilst traditional communities based on geography are still important that are so many more ways of constructing identity which are often overlooked, be it as part of a profession, an ethnicity or a common interest or hobby. To engage with all communities we must broaden our horizons.

Witness profiles

Tom Armour

Global Landscape Architecture Leader, Arup

Tom is a chartered landscape architect with 30 years of experience working on a wide range of major development projects in the UK and internationally. He believes in a rigorous approach to landscape design that promotes practical and economically sustainable resolutions on projects. Additionally, he believes that the landscape design profession can help create more liveable cities, address climate change, design for health and wellbeing and promote the economic, environmental and social value of good landscape and public realm design. Recently, he co-authored the report 'Cities Alive – Rethinking green infrastructure' which shows how the creation of a linked 'city ecosystem' can create healthier and safer cities.

Dr Ellie Robinson

Assistant Director of External Affairs, National Trust

Ellie has been in her current post with the National Trust for 13 years, influencing public policy and political decisions on a wide range of environmental and sustainability issues, ranging from agriculture and food to water and climate change. Currently she leads the Trust's national work on urban green space as part of a new strategic innovation programme focused on the places where people live. This includes testing and developing new ways to help local authorities and communities fund and manage their public green spaces and secure them for future generations. To understand the real value of urban green space, Ellie has experimented with new tools like natural capital accounting to amalgamate a multidisciplinary evidence base.

Craig Bennett

CEO, Friends of the Earth (England, Wales and Northern Ireland)

Craig has spent most of his career as an environmental campaigner. He believes there is an urgent need for the 'environmental movement' to evolve rapidly over the next decade if it is to play a leadership role in creating a sustainable future. To reframe modern environmentalism will require substantial changes in how organisations like Friends of the Earth perceive, frame, communicate and interact with the emerging challenges and opportunities. Previously, as Director of Policy and Campaigns at Friends of the Earth, Craig Bennett has been the organisation's lead campaigner and policy strategist, representing the charity with Government and other key lobbying contacts, and leading its tactical response to the changing political and policy context. He is also a member of the Board of Friends of the Earth Europe, Chair of the Environment and Climate Change customer challenge panel for Anglian Water (established as part of the OFWAT price review process), and a member of the Net Positive Board Advisory Panel for Kingfisher plc. From 2013-2015, he was Chair of the Board of Stakeholder Forum.

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, UNIVERSITY OF EDINBURGH

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Cover Page:	**Old Green Tree – Meadows Park, Edinburgh**
Theme Summary, p3:	**Scott Webb – Unnamed**
Theme Summary, p.4	**Mitchell Bryson – Top View of Green Trees and Green Grass Field**
October, p5:	**Tommy Liu – Skyscrapers**
November, p7:	**Mike Boehmer – Chicago's Olympic Bid**
December, p9:	**Rickbrk – Chrysalis**
This page:	**Airbus Defence and Space – Copenhagen**

Forum members

Chair: Lord Martin Rees

Director: Professor Paul Linden

Deputy Director: Dr Rosamunde Almond

Head of Partnerships and Development: Dr Konstantina Stamati

The Forum was founded in January 2013. For this topic, members are drawn from all six University Schools and 21 University departments, centres and institutes, ranging from the Centre for Development Studies, the Departments of Engineering and Architecture to the new Leverhulme Centre for the Future of Intelligence and the Institute for Public Health, as well as the British Antarctic Survey. People from the Cambridge Institute for Sustainability Leadership (CISL) and the Cambridge Centre for Science and Policy (CSaP) are also founding members of the group.

People are initially invited to join the Forum for two years. Founding members who are taking an active role in the Forum for this topic include **Polly Courtice**, the Director of CISL; **Dr Hildegard Diemberger**, Senior Associate in Research in the Mongolia and Inner Asia Studies Unit (MIASU) in the Department of Social Anthropology; **Professor Peter Guthrie** from the Centre for Sustainable Development, Department of Engineering; **Professor Susan Owens**, Professor of Environment and Policy in the Department of Geography; **Dr Jake Reynolds**, Director of Sustainable Economy at CISL; **Dr Emily Shuckburgh**, Deputy Head of the Polar Oceans Team at the British Antarctic Survey, and **Professor Koen Steemers**, Professor of Sustainable Design in the Department of Architecture.

Members who joined in the last couple of years include: **Professor Andy Hopper**, Professor of Computer Technology and Head of the Computer Laboratory; **Dr Julian Huppert**, the Director of the Intellectual Forum, Jesus College; **Professor Ian Leslie**, Professor of Computer Science in the Computer Laboratory; **Dr Shailaja Fennell**, Lecturer in Development in the Department of Land Economy; **Professor Alan O'Neill**, Emeritus Professor of Meteorology at the University of Reading and currently a visiting professor in the Cavendish Laboratory; and **Professor Alison Smith**, Professor of Plant Biochemistry in the Department of Plant Sciences.

New members who have joined to help us to explore this topic include **Professor Carol Brayne**, the Director of the Institute for Public Health; **Professor Nick Wareham**, the Director of the Centre for Exercise and Activity Research (CEDAR) and the Director MRC Epidemiology Unit; and **Dr David Pencheon**, the Director of the NHS Sustainable Development Unit.

They joined **Dr Stephen Cave**, the Director of the new Leverhulme Centre for the Future of Intelligence; **Dr Rob Doubleday**, the Executive Director of the Centre for Science and Policy (CSaP); **Dr Mariana Fazenda**, Innovation and Enterprise Project Officer in the Department of Plant Sciences; **Dr Erwin Reisner**, a Reader and Head of the Christian Doppler Laboratory in the Department of Chemistry; **Professor David Dunne**, a Professor of Parasitology in the Department of Pathology and a founding member of the Cambridge-Africa Initiative; and **Professor Roderic Jones** from the Department of Chemistry have also become members. **Professor Theresa Marteau**, the Director of the Behaviour and Health Research Unit also re-joined in January.

Guests

Each month, experts who work in the areas we are discussing join our meetings as guests. For this topic, people from within the University included **Claire Higgit**, Head of Impact Acceleration, Research Strategy Office; **Professor Marcial Echenique**, Emeritus Professor of Land Use and Transport Studies in the Department of Architecture; **Dr Maria Abreu**, a Lecturer and Adam Smith Fellow in the Department of Land Economy; **Dr Simon Beard**, a Postdoctoral Researcher in the Centre for the Study of Existential Risk; **Dr Megan Davies Wykes**, a Research Associate working on the Managing Air for Green Inner Cities (MAGIC) project, Department for Applied Mathematics and Theoretical Physics (DAMTP); **Mingfei Ma**, a graduate student in the Department of Architecture; **Dr Rob Foster**, a Research Associate in the Centre for Natural Materials Innovation.

Guests also joined us from across and outside Cambridge, including **Andrew Limb**, the Head of Corporate Strategy, Cambridge City Council; **Annelisa Grigg**, Head of the Business and Biodiversity Programme at the UNEP World Conservation Monitoring Centre; **Ingrid Abreu Scherer**, Programme Manager for What Works Centre for Wellbeing and **Kirsten Henson**, the Director of KLH Sustainability; and **Dr Roger Mitchell**, an Executive Member and past Chair of the Cambridge Conservation Forum.

Cambridge Forum for Sustainability and the Environment

For more details about the Forum and the meetings please contact Dr Rosamunde Almond (r.almond@damtp.cam.ac.uk) and Dr Konstantina Stamati (ks712@cam.ac.uk)

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