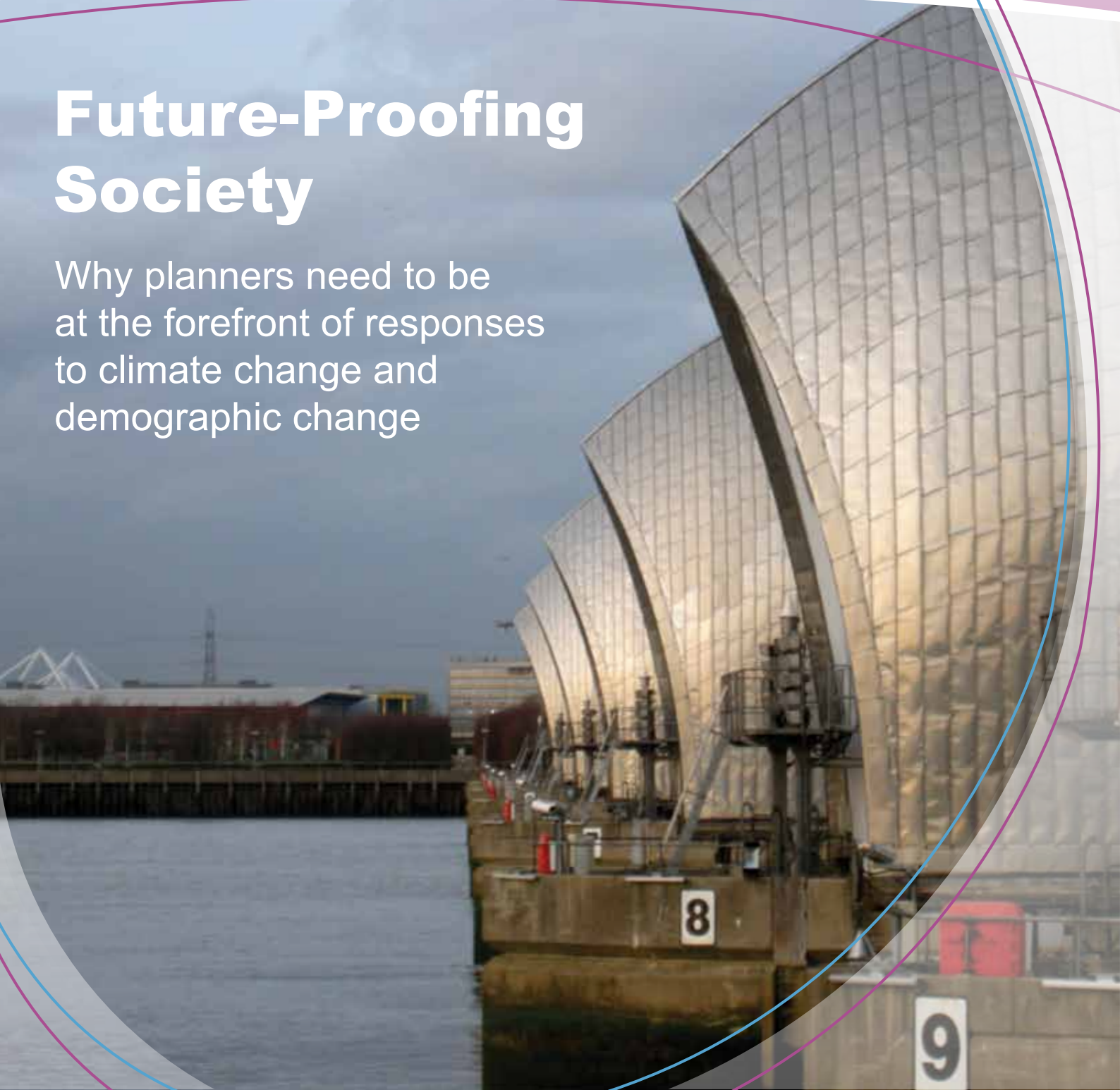




# PLANNING **Horizons**

## **Future-Proofing Society**

Why planners need to be  
at the forefront of responses  
to climate change and  
demographic change



# About the RTPI

With 23,000 members worldwide working in the public, private, charitable and educational sectors, the Royal Town Planning Institute (RTPI) is the largest professional institute for professional planners in Europe.

As well as promoting spatial planning, the RTPI develops and shapes policy affecting the built and natural environment, works to raise professional standards and supports members through continuous education, training and development.

Everything we do is inspired by our mission to advance the science and art of planning (including town and country spatial planning) for the benefit of the public.

**Front cover:** The Thames Barrier, located downstream of central London.

Photo credit: Martin Deutsch via Flickr.

In the winter and early spring of 2013/2014, the Thames Barrier, which protects London from surges in the River Thames, was raised at least 50 times, a record for the highest number of times it has been raised in a single season. This winter was the wettest since records began, with the South East of England receiving double the amount of rainfall expected in a normal winter. The Barrier, which opened in 1984, is around halfway through its designed lifespan. It was designed to protect London from flooding until at least 2030. The Environment Agency is examining how the Barrier will cope with climate change; with appropriate modification, it may be capable of providing continued protection to London against rising sea levels until at least 2070.

# Foreword by the RTPI President



I am proud to be President during the Institute's Centenary Year of 2014.  
I am also proud to be a planner.

Planning was established as a discrete profession in response to the challenges of the day and a fundamental belief that the world needs planning. A century later, it is timely to review the challenges that we face now and their potential to shape professional planning for the next 100 years.

Our *Planning Horizons* series of papers considers how planning needs to respond to some of the major challenges we face in the twenty-first century. These challenges are already with us – from sharing economic growth and promoting better health in cities, to responding to climate change and ensuring sustainable development compatible with environmental resilience.

This second paper in the series considers two of the most pressing challenges facing our societies – climate change and demographic change. These are complex global issues that will require local, regional and national as well as international responses over the next century and beyond.

The paper summarises these challenges and provides examples of where planners are leading responses to them, drawn from the UK and around the world. They suggest that planning needs to be a critical part of our collective responses to these challenges. Indeed, these papers demonstrate how the future of planning is critical to our collective future, with many areas of climate policy-making involving value judgements and ethical considerations.

As a result, our profession will have to adapt and evolve as these challenges increasingly shape our world. In another respect, professional planning will need to return to its historic broader mission to create healthier, safer, stronger communities for all, but in the context of improved understanding of the fragility of our ecosystems. This series of papers is just one part of the effort to give planning a renewed sense of purpose as a force for good.

A handwritten signature in black ink that reads "Cath Ranson".

**Cath Ranson MRTPI**

RTPI President 2014-2015

# Two twenty-first century challenges that threaten our future: climate change and demographic change



Some of the challenges that we face are so significant and long-term that they will require widespread and fundamental changes in the way our societies are organised and managed. Two such challenges are climate change and demographic change.

Across the globe cities, towns and villages are facing flooding at an increasing rate, while others are experiencing droughts. Climate change is also causing biodiversity loss, famine, desertification, and increasing conflict. At the same time rapidly growing populations in some parts of the world have led to increasingly overcrowded cities, while other regions, particularly rural areas, are suffering from population decline.

Responding to such challenges includes a critical role for urban and rural planning. This paper includes examples from around the world of how planners are responding to these challenges in often very different contexts.

On its own, planning cannot resolve these challenges, but their scale and scope emphasises why planning is such a crucial part of the solution. Further, planners' responses to these challenges suggest ways that policy- and decision-makers more broadly can make our societies more resilient – effectively to help 'future-proof' our societies for the twenty-first century.

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Makoko, pictured here, is a sprawling informal settlement in Lagos. Established as a fishing village in the eighteenth century, much of Makoko comprises structures on stilts above Lagos Lagoon and is home to tens of thousands of people. Makoko is increasingly battered by floods from heavy rains and rising seas. In 2013 the Government forcibly cleared part of the settlement to redevelop what is now seen as prime waterfront. Lagos is one of the fastest-growing cities in the world, increasing by 275,000 people a year. Its population in 1950 was only 290,000 people; now it is estimated at 21 million, making it the largest city in Africa. Photo credit: Rainer Wozny via Flickr.

# Executive summary

**The focus in this paper is on three aspects of climate change – extreme weather, water provision and energy supply – and three aspects of demographic change – population growth, ageing populations and social cohesion. The significance of a changing climate and its impact on communities and countries around the world is increasingly understood. Population growth, and in some cities and regions population decline, also represents a major challenge to the livability and indeed sustainability of many communities in both the developed and developing world.**

These challenges may never be resolved completely, nor can they be ignored or denied. But we can mitigate some of their impacts, and strengthen the ability of our societies to prepare for and respond to the impacts we cannot avoid. This is 'resilience'.

Urban and rural planning – both in the sense of regulating development but also creating and implementing visionary strategies for future sustainable development – is critical to strengthening our resilience to these challenges. Effective responses will require greater attention on how we organise and use land, how and where we live and work, how we transport ourselves, how we generate and distribute energy and so on, in a coherent and coordinated way – all of which can be informed by planning.

This paper identifies some of the ways in which planning is critical in responding to these challenges. Planning can help to shape patterns of urban and rural development, protect against the increased risk of flooding, reduce energy demand and carbon emissions from the built environment including when planners are prepared to demand higher standards in developments and support integrated sustainable forms of transport and energy consumption.

Planning operates at many spatial (geographic) scales, creating and implementing long-term frameworks for economic, social and environmental development which support the sustainability and cohesion of communities. Planning is necessarily inter-disciplinary and integrated in its approach, making connections

between issues (such as housing, transport and public services), understanding how decisions impact cumulatively on places, and managing competing interests in the wider public interest in an accountable and transparent way. Planners also work cooperatively with a wide range of stakeholders and interests to develop, improve and protect the built and rural environment.

This paper includes examples from around the world of how planners in both the public and private sectors are responding in practice. Of course, on its own planning can't resolve the challenges we face – it can have most impact where it is aligned with other policy initiatives and fiscal measures set by governments – but the scale and scope of these challenges does show why we need planning to help create resilient societies for the twenty-first century.

Resilience means adapting to uncertainty especially in dynamic systems such as the climate or population growth and migration, recognising that there may be no single 'best' response, and changing our conventional responses through greater flexibility and capacity for learning. This requires more integrated thinking to appreciate the relationships between social, economic and environmental systems – for example how societies weaken their energy security due to uncontrolled urban development, which in turn increases their vulnerability to climate change, and so on.

The concept of resilience is increasingly being adopted by businesses, civil society organisations and researchers in relation to issues ranging from climate change to economic and social change. However, much policy, including in relation to these challenges, could benefit from incorporating more resilience thinking.

The best way to do this would be through a better understanding of place. As argued in the first paper in this series, *Thinking Spatially*, policy especially at a national level often lacks an integrated understanding of place and space, for example how various policies and interventions interact on the same pieces of land or locations (further papers in this series examine urbanisation and health, economic growth and governance). Thinking spatially about resilience, and integrating a better understanding of place into resilience planning, would support policy- and decision-makers to formulate and implement more sustainable strategies across a range of policy areas. It would also support planners in their work to strengthen the resilience of communities locally.

To strengthen our resilience, policy- and decision-makers need to work with planners, businesses, civil society organisations and communities to:

- set out visions for the sustainable development of our societies, including by thinking boldly and imaginatively about the choices we face;
- establish long-term frameworks for action that reach beyond typically short-term political timescales;
- establish systems and delivery mechanisms – including planning systems – that can turn plans into action;
- plan and collaborate across institutional, sectoral and administrative boundaries to develop more integrated policies and practices;
- create conditions for markets to operate in ways which strengthen resilience; and
- where necessary, challenge existing interests in the wider public interest (including the interests of future generations).

In some countries where national spatial plans or frameworks exist, these could incorporate resilience to challenges as arising from climate change and demographic change. In other countries where national resilience strategies exist, these could incorporate a greater spatial intelligence. In some countries, such planning might be done primarily at a regional or sub-regional level. But at whatever spatial scale integrated planning occurs, and however it is achieved, a more spatial approach to resilience planning would:

- present challenges such as climate change and demographic change as significant current threats to the sustainability and livability of communities;
- identify the issues for co-ordinated action between agencies and professions;
- develop a greater understanding of where action is most urgent and which types of action are needed in which locations.


Such resilience planning is often most needed where the current institutional and professional capacity is typically most limited. Governance and professional planning are often least developed in those parts of the developing world which are most vulnerable to climate change and demographic change (and the combined effects of both). In such contexts, recognition of the need to strengthen spatial resilience might help to spur the development of (and support for) professional planning. Alongside national governments, international development agencies could play a particularly important role in promoting and resourcing stronger planning for resilience in this regard.

Ultimately, in the face of challenges such as climate change and demographic change, one of the key responsibilities of both policy-makers and planners in both the developed and developing world is to protect their communities from avoidable risk, and to seek to minimise and manage risks where they are unavoidable. In this respect, planning in all of its dimensions is fundamental to our collective security in the twenty-first century.

Globally, temperatures have risen by 0.9°C since the early 1900s, with 0.7°C of this warming occurring since the 1950s.<sup>1</sup> Latest predictions suggest that the planet will have warmed by at least 2°C above pre-industrial levels by 2100.<sup>2</sup> Yet planet-warming emissions of carbon dioxide continue to grow; another record high of 35 billion tonnes of emissions was recorded in 2012,<sup>2</sup> with ambitions to stay under the 2°C temperature rise limit (generally acknowledged as a tipping-point) looking increasingly difficult.<sup>3</sup>

Climate change is already affecting our daily lives – from water and food supply, energy production and distribution, how we work to how we travel. Different countries will be affected in different ways however, with many of the most intense impacts predicted to take place in low and middle income nations, in some cases exacerbating poverty and social inequality.

Urban and rural planning has a critical role to play in ensuring that we take informed action to combat climate change across all of its impacts. As in the latest Intergovernmental Panel on Climate Change (IPCC) report, the focus here is urban areas because they have the densest populations and are often located near coastal areas or large river systems.



According to two studies published in May 2014, the collapse of much of the West Antarctic Ice Sheet may now be irreversible.<sup>4</sup> This will mean that sea levels will rise one metre worldwide. It may also trigger the collapse of the rest of the West Antarctic ice sheet, resulting in a sea level rise of between three and five metres over the next two centuries. Such an event will displace millions of people worldwide. Photo credit: Mariusz Kluzniak via Flickr.



# Climate change



# Unpredictable and extreme weather

Climate change is causing increasingly extreme weather patterns and events. Warming temperatures are inducing sudden shifts in long-established regional weather patterns such as the monsoon rains or the El Niño phenomenon. The number of extreme weather events is increasing, causing drought and flooding events such as Typhoon Haiyan in the Philippines in 2013, persistent drought in California and fatal mudslides in Afghanistan in 2014. Incidences such as these are predicted to intensify in the years to come. Meanwhile, the monsoon rainfall in Southern Asia has been declining since the 1950s. More than a billion people are dependent on these rains for water, agriculture and hydroelectricity, and population growth is rapid in this region.

## Many areas are becoming hotter and drier

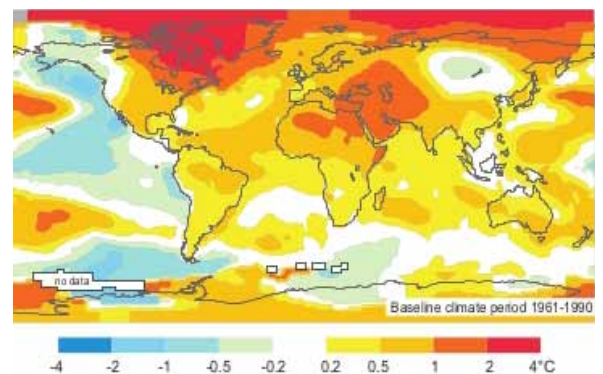
Last year, 2013, was the sixth hottest since records began. Thirteen of the fourteen hottest ever years occurred during this century.<sup>5</sup> These temperature rises will have severe consequences for water availability and the success of current agricultural practices, as both crops and livestock will suffer. California is experiencing its third dry year in a row and has called a state of emergency, and last year saw a summer of record temperatures fuelling major bush fires in Victoria, New South Wales and Tasmania, while some parts of Europe are experiencing desertification in addition to wild fires.<sup>6</sup>

There are health problems associated with high temperatures. A hotter climate is already causing worldwide deaths from malnutrition, threatening the livelihoods of millions of people.<sup>7</sup> Excessive heat causes discomfort and premature death, with over 600 cases of heat-related deaths reported in the UK alone during the heat wave of July 2013.<sup>8</sup> In cities, the urban heat island (UHI) effect, caused when heat is absorbed and then slowly released by hard surfaces, pushes urban temperatures even higher.<sup>9</sup> [The health-related impacts of a changing climate will be noted further in the \*Planning Horizons\* paper on \*Promoting Healthy Cities\* \(October 2014\).](#)

## Why planning is important

Plan-making for towns and cities in particular can help to reduce energy demand (for example, through less travel and more sustainable forms of transport) and promote alternative sources of energy and fuel. Planners in the public and private sector can influence the design of developments in ways which mitigate and adapt to a more unpredictable climate, supported by development management systems. Planning systems can also protect and enhance natural spaces that sequester carbon (particularly forests) and which can provide a cooling effect in cities.

## Global annual temperature change 1991-2012



Source: Zoi Environmental Network via Flickr.

### Master planning: Reducing the Urban Heat Island effect in Tokyo<sup>10</sup>

Tokyo's Metropolitan Government is using built design principles in its master planning specifically designed to reducing Urban Heat Island effects. By designing streets to improve the flow of wind, installing pavements that block heat and absorb moisture, planting trees along the roadside and greening roof and walls, Tokyo's Government is committed to reducing temperatures and heat-related deaths.



Photo credit: Shutterstock

### Sea levels are rising

Warmer weather is also causing the sea level to rise. Compared to 1990 levels, UK sea levels could rise by 12-76 cm by the end of this century.<sup>11</sup> Similarly, in the US, recent studies suggest that parts of the Louisiana coastline in the US is disappearing faster than maps can be updated, with up to 16 square miles of land disappearing annually.<sup>12</sup>

Awareness raising activities with affected communities will become more important as sea levels continue to rise,<sup>13</sup> including taking forward policies of 'managed realignment' of hard defences, which are currently too expensive to maintain and refurbish after storm events (in the UK, reprioritising this investment would save an estimated £180-£380 million and deliver £80-£280 million worth of benefits, including for wildlife and recreation).<sup>14</sup> During Hurricane Sandy on the US Atlantic Coast, over 37,000 residents were displaced from Long Beach, one of the barrier islands to the east of New York City. Now, as part of long-term resilience plans to face up to the challenges of sea level rise, managed

retreat strategies include developing residential areas close to strategic transport nodes and a 'voluntary buyout' scheme attempts to relocate residents away from the shore.<sup>15</sup>

### Why planning is important

Plan-making and planning systems can play a critical role in meeting these challenges by identifying assets on the coast or in flood plains, especially in estuarine and delta regions that will be at increased risk from storm damage, coastal erosion and sea level rise, by working with partners to develop long-term strategic views for the siting or relocation of coastal developments. Establishing and administering development management can protect against inappropriate development in flood risk areas. Following traumatic events such as Hurricane Katrina and the 2004 Indian Ocean earthquake and tsunami, planners can and should play an important role in articulating the issues to ensure that reconstruction efforts build in better resilience, for example the Recovery Plan following the 2011 earthquake in Christchurch, New Zealand.

### Planning for flood risk: Room for the River, the Netherlands<sup>16</sup>

Governments in the Netherlands, where nine million people live on reclaimed land below sea level, known as polders<sup>17</sup>, are working across national boundaries in an attempt to reduce flood risk. The 'Room for the River' project operates with France and Germany to address flood protection via master planning in the Rhine delta by increasing the river's discharge capacity without flooding valuable land. Using climate change projections, the plan proposes to give the river 'more room' at over 30 locations to relieve pressure on the downstream flood defences. The project is being centrally co-ordinated by one Government department but delivered by a total of 17 partners. Work is due to be completed by 2015.

# Increased rainfall and flooding

Many countries are facing an increased threat of floods particularly as a result of more intense rainfall and increasingly violent storms ('pluvial flooding'). This can cause river and surface water flooding when volumes of rainwater are too large for drainage systems to cope. Events in the UK and southern Ireland during the winter of 2013-2014 demonstrated how devastating flooding events can be to local communities and infrastructure networks, particularly road and rail (though fewer homes were flooded than during the floods of 2007, in part due to better preparations).

In the developing world extensive areas of coastal cities, many of which are occupied by the poorest and most vulnerable communities, are frequently submerged. Ho Chi Minh City and Dhaka are dramatic examples of this due to river and sea flooding in the Mekong and Bengal deltas respectively.<sup>18</sup> The World Bank predicts that low-income nations will bear 75 per cent of the cost of damages brought about by climate change.<sup>19</sup> Large sections of internationally significant coastal cities such as Mumbai, Kolkata, Shanghai, Mombasa as well as the cities of the Pearl River Delta (including Hong Kong, Guangzhou, Shenzhen, home to 45 million people) are at risk of sea-level rise, river flooding and the threat of extreme weather, such as hurricanes, tsunamis or water shortages.<sup>20</sup>

## The economic impact of flooding

A 2013 study of 136 coastal port cities around the world estimated that the annual economic losses due to flooding are US\$6 billion per year. This is predicted to rise to US\$60-\$63 billion annually even if we are able to maintain current coastal defences, but it could reach US\$1 trillion if adaptation measures are not implemented and adequately maintained.<sup>21</sup>

Currently around one in seven properties in the UK – 3.6 million homes and businesses – face some form of flood risk. One million properties

in England alone are at risk of surface water flooding, a figure that is predicted to quadruple by the 2080s.<sup>22</sup> As a result, damage to buildings and property could reach £12 billion per year by the 2080s, a ten-fold rise on 2012 costs.<sup>22</sup> In addition to property, much of the UK's energy and transport infrastructure is at significant risk of flooding. Water treatment works and power stations are often close to rivers or the sea. In England, 14 per cent of electricity infrastructure, 28 per cent of gas infrastructure and 10 per cent of roads are located in flood risk areas.<sup>23</sup>

There is also strong evidence linking flooding to reduced economic growth. A study focussing on European nations found that a one per cent increase in the area experiencing extreme rainfall can reduce GDP growth by 1.8 per cent (this is even higher for drought at 2.7 per cent)<sup>24</sup>.

### Policy development to manage flood risk in an area of high housing demand:

London faces some of the highest risk of flooding in the UK. The London Borough of Sutton is significantly affected by fluvial (river), surface water and groundwater flooding and these risks are expected to increase over the next few decades with climate change. Across the Borough as a whole, approximately five per cent of the land area lies within areas of high flood risk with a further five per cent located within areas of medium risk. Fluvial flood risk areas in the Borough are mainly located within the suburb of Hackbridge adjacent to the River Wandle, where up to 80 per cent of the floodplain has already been developed. This has resulted in large areas of impermeable surfaces, which have reduced the overall capacity of the ground to infiltrate rainwater.

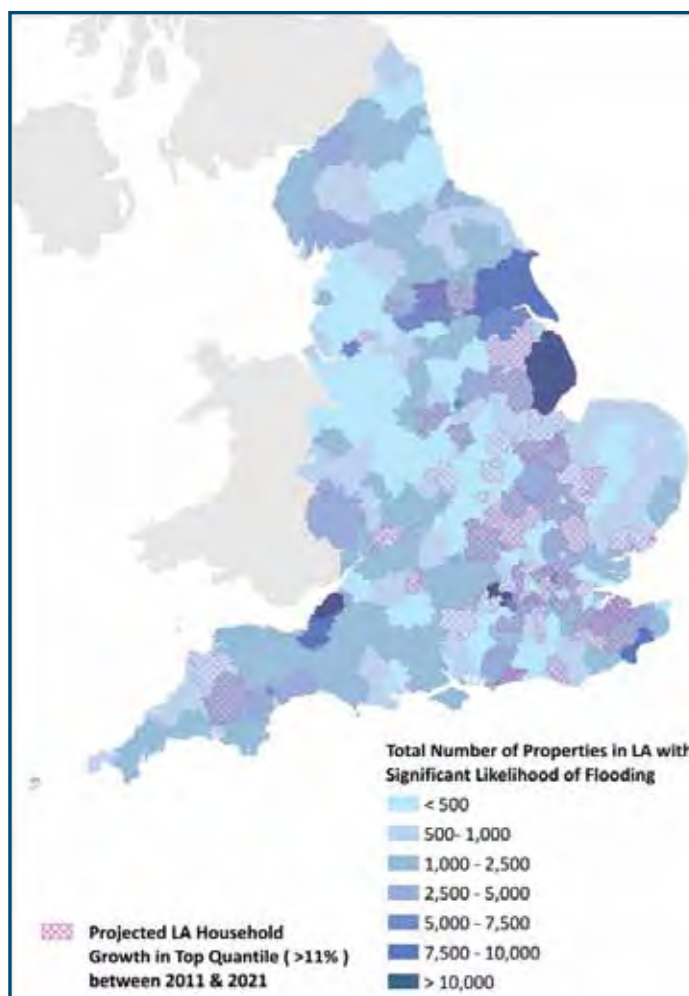
Although the Borough seeks to locate residential developments within areas of lower flood risk in line with the 'sequential approach' advocated in the National Planning Policy Framework (NPPF), some new housing within higher flood risk areas is unavoidable due to the need to meet housing targets. The Local Plan seeks to accommodate around 20 per cent of planned housing growth over the next 10 to 15 years in the Hackbridge area.

The Council has identified sufficient sites to meet the development needs of the Borough and has set out a range of development management policies aimed at promoting the highest standards of sustainable design and construction. These include policies designed to minimise all sources of flood risk to and from all development and to include appropriate climate change adaptation measures, including green roofs, as an integral part of the design and layout.

### Household growth and flooding

The map here details the number of properties in each local authority in England that are significantly likely to flood along with those projected to have above average (greater than 11 per cent) household growth to 2021. Local authorities with over 5,000 potentially impacted properties and which are also projected to see high levels of household growth include North Somerset, East Lindsey, Boston, Windsor and Maidenhead, along with Leeds, Runnymede, and Waltham Forest.

### Map: Flood risk and household growth in England



Source: University of Manchester.<sup>25</sup>

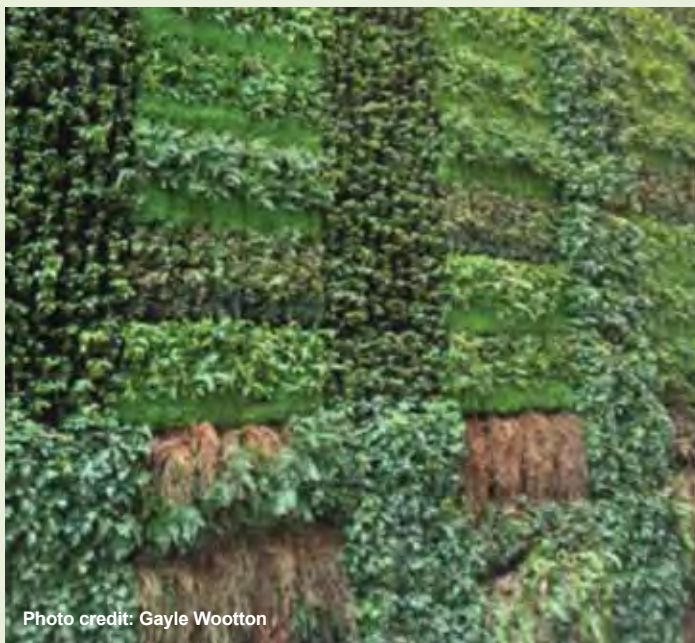


Photo credit: Gayle Wootton

#### Innovative building techniques with multiple benefits:

##### Green walls and roofs

There are ways of designing in mitigation measures to reduce the risk of surface water flooding. The green wall on the side of the Rubens Hotel at the Palace in London's Victoria district collects rainwater near the top of the wall which both serves to irrigate the plants but also reduces surface water flooding. Collectively, green walls and roofs can have a demonstrable impact on surface water flooding. Research has shown that greening just 10 per cent of roofs can reduce runoff by 54 per cent for the immediate area and 2.7 per cent for a catchment.<sup>27</sup> The largest concentration of green roofs is in Basel, Switzerland, measured by area per capita of population. A combination of financial incentives and building regulations which require vegetation on all new and renovated flat roofs since 2002 has been the primary cause although their popularity dates back to the 1970s. The city also employs a green roof expert to advise on larger more complex cases.

## Cumulative impacts and actions

Seemingly small actions can be taken locally which collectively can make a big impact. For example, paving over gardens to provide parking spaces for residents can have significant implications for natural water management in areas and increase the risk of surface water flooding during periods of high rainfall. Norwich City Council has taken a simple but innovative step to reduce the number of hard surfaces in the county by providing a description of common soil types in its area with an indication of whether planning permission is likely to be granted on the basis of soil type and associated drainage potential, using a coloured map indicating where these soils occur.<sup>26</sup>

## Why planning is important

As the *Pitt Review* concluded in 2008, planners and developers should pay proper regard to these risks, as should those purchasing or occupying properties in risk areas.<sup>28</sup> Plan-making and planning decisions can reduce exposure to current and future flood risk by avoiding inappropriate development within areas at risk from flooding.<sup>28</sup> In many planning systems, there are exceptions to this policy where there can be significant design elements to mitigate the risk, and identifying alternative land for development will play its part.

With other built environment professionals, planners can also identify sewerage systems that are unlikely to have capacity to deal with more intense rainfall through the development of strategic drainage plans, and also work with the natural environment, such as restoring uplands so that they can act as rainwater 'sponges' as well as sequester carbon and provide spaces for recreation. More broadly, because planners are trained in engaging communities and individuals they can help to educate the public as well as policy- and decision-makers at all levels and across all sectors on flood risk and practical solutions.

# Water provision

**Climate change is affecting rainfall patterns. Globally up to 500 million people will experience water scarcity by the end of the century with a further one billion experiencing water deprivation, mainly in North Africa, parts of Asia, the Mediterranean and the Middle East.<sup>29</sup>**

By 2050 parts of the UK could experience an average annual reduction in river flows of 15 per cent, and as much as 80 per cent in some catchments during the summer.<sup>30</sup> There will however be heavier rainfall in the winters. Coupled with population growth and an increased water demand in hotter seasons, this could lead to serious water deficits of up to three billion litres per day.<sup>28</sup>

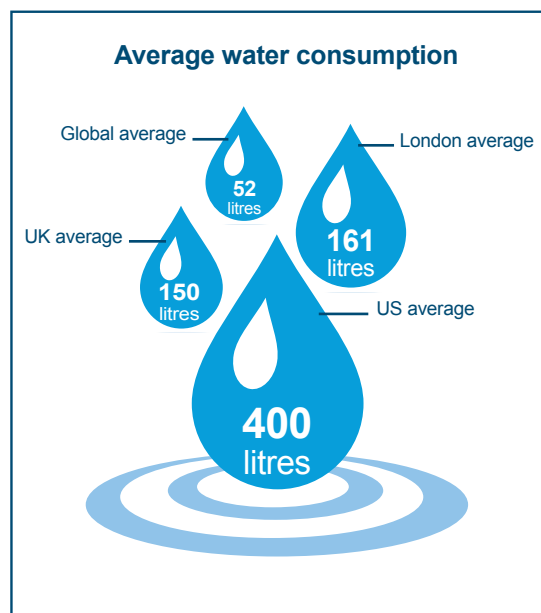
Climate change impacts all areas of the water supply network; the quality and availability of water sources, the infrastructure needed to supply homes and businesses and the treatment that will be required to meet quality standards.

Part of the response needs to lie in reducing consumption. At 150 litres of water per day, (and 161 litres for residents of London), UK consumption is well over the global average of 52 litres per day.<sup>31</sup> The average American uses even more – 400 litres of water a day. The UK's ageing water infrastructure also contributes to this problem; although reduced in recent years, around 20 per cent of water is lost before it reaches households.<sup>28</sup>

Water shortages will not only affect individuals and households, but businesses as well. The Carbon Trust suggests that businesses must improve their resilience to shortages, since there could be a 40 per cent gap between available supplies and needs by 2030.<sup>32</sup>

## Why planning is important

Plan-making and development management decisions can help to alter the balance of water demand and supply in certain areas. Planners can help to identify demand for water supplies arising from developments and work with allied or sister professions to plan better responses to this demand, for example additional winter storage capacity to deal with increased winter rainfall and summer deficits. Planners and allied professionals can also inform the design standards which homes and other developments are built to in order to limit the amount of wasted water. On a broader scale, planners can support upland catchment management measures and forestry management strategies to ameliorate the run off regimes within the lower river systems as well as protecting important biodiversity.



# Energy supply and consumption

The burning of oil and its derivatives is one of the main causes of the release of greenhouse gases and so the main contributor to climate change. The warning of 'peak oil' is not new, yet global energy consumption continues to grow at approximately 2.5 per cent per annum.<sup>33</sup> Further, policy-makers are increasingly concerned about 'energy security'. As fossil fuel resources decline, the European Union is on course to be dependent on imports for 90 per cent of its oil and 80 per cent of its gas by 2035.

## New sources of energy

We need to reduce our dependence on oil by reducing our consumption and shifting to other sources. At the same time we have to ensure sufficient energy supply for a growing population.

The UK is legally committed to ensuring 15 per cent of its energy demand from renewable sources by 2020.<sup>34</sup> Scotland has taken this aspiration further with a commitment to meet 100 per cent of electricity demand from renewable sources by 2020. The UK is embracing offshore wind<sup>35</sup> and collaborating with Irish wind energy smart grids<sup>36</sup> to deliver wind energy across the Irish Sea. In Scotland large-scale wind projects are receiving planning permission, such as Whitelee wind farm on Eaglesham Moor near Glasgow which combines 140 turbines

supporting 180,000 homes with 88 km of way marked path across the moor for visitors' enjoyment of the natural environment. Other nations have arguably taken-up renewable technologies even more readily as the 'green economy' gathers pace.

Local planning policy can help to promote new thinking in planning systems. For example the 'Merton rule' stated that developments were required to generate 10 per cent of their energy from renewable sources. It was named after the London Borough of Merton which developed the policy. It was adopted into English planning policy guidance in 2004, though it is no longer part of guidance.

## Why planning is important

Plan-making can provide support for the local generation of renewable energy, in the context of energy policy and other fiscal and behavioural incentives, and local policies can drive new thinking within planning systems. Planners in the public, private and third sectors can also engage with local communities' sometimes considerable concerns over renewable energy developments, and proactively plan to respond to these concerns.

### Actively seeking solar: Cornwall's solar planning team.

Cornwall Council recently took a proactive approach to managing interest in developing solar farms in the area. Section 97 of the English National Planning Policy Framework encourages Local Planning Authorities to identify opportunities for renewable energy developments and have a positive strategy. Cornwall responded to the emergence of this Framework by establishing a dedicated solar planning team which worked with developers to help realise their investment aspirations through high quality, well designed and located developments. The Council's planning team also produced solar planning guidance which has been recognised both nationally and internationally as an exemplar. As a direct result, more solar photovoltaic was installed in Cornwall in 2011 than had been across the whole of the UK in 2010, and more than £100 million of investment was attracted to the local area.<sup>37</sup>



## Energy consumption

The Stern Review of the economic impact of climate change pointed to better design of buildings and other infrastructure to reduce our reliance on carbon-emitting fuels.<sup>7</sup> Much of the focus of energy efficiency relates to new developments, however in the UK 85 per cent of the buildings that will be utilised over the next one hundred years are already with us.<sup>38</sup> Many of these older buildings are not compliant with today's emissions standards.

Patterns of land use will change and consumption will need to reduce in order to meet carbon emission reduction targets. Although there is some debate about the extent to which urban density reduces overall carbon emissions, lower emissions are associated with urban areas, suggesting that car use is the main contributory factor to high emission lifestyles.<sup>39</sup> New developments will need to incorporate a greater consideration of how people will travel to them, given that one-fifth of total emissions are travel-related. Responses to these challenges will necessarily reflect the local context. In the UK and other developed nations, it might be possible to use the growth in one person households (see the next section) as an opportunity to increase density from town centres outwards, including by ensuring that town centres continue to offer a range of public services, employment and recreation.

The contribution of the BRIC nations (Brazil, Russia, India and China) to global energy consumption patterns will continue to rise significantly as these countries develop and urbanise in search of a more consumer-based lifestyle, including rapidly rising private car ownership and usage.

**New developments will need to incorporate a greater consideration of how people will travel to them, given that one-fifth of total emissions are travel related.**

### Reducing consumption:

#### The 2,000 watt society

The '2,000 watt society' project initiated by the Swiss Federal Institute of Technology in Zurich represents an attempt to reduce the average power consumption of every developed world citizen to 2,000 watts, without lowering their standard of living.<sup>40</sup> On average each person requires 17,500 kilowatt-hours of energy per year, which corresponds to a continuous requirement of 2000 watts, although there are significant variations (6,000 watts in Western Europe and only 1,000 watts in India).

As a response, architects and planners have designed urban developments with this goal in mind. Zurich's Kalkbreite co-operative housing development is a development of approximately 90 apartments created above a tram depot in the city centre. By using resource-efficient construction methods, renewable sources of energy, low area requirements (just 35m<sup>2</sup> per person) and with all residents undertake to not own a car, the development hopes to achieve the target consumption level.

## Why planning is important

Plan-making can help to ensure that cities and other settlements urbanise and grow sustainably at a human scale, by informing the density of development and its location, how it is integrated into other land uses and the location of renewable energies, and helping to promote walking, cycling and public transport and dis-incentivise private car use. Planning systems are one means to specify the design and energy efficiency of new and existing homes and buildings, and planners can support homeowners, businesses and communities wishing to improve the climate resilience of their own properties and communities.



# Demographic change

A vibrant, densely packed hillside community with a mix of brick, concrete, and colorful buildings. The architecture is a blend of traditional and modern styles, with many buildings featuring balconies and laundry lines. The surrounding landscape is lush with green trees and vegetation, creating a scenic backdrop for the urban development.

In 2011 there were seven billion of us on the planet. There will be more than 10 billion people by the end of this century.<sup>41</sup> The highest growth rates are in developing countries, with rapid increases in youth and working age populations. More than 200,000 people move into cities globally every day.

As a result, many cities are becoming more congested. Already more than half of the world's population lives in cities, a proportion that is expected to reach 70 per cent by 2050. This brings with it huge challenges to provide sufficient homes, infrastructure and livelihoods.

Conversely, many countries in the European Union are facing declining and ageing populations (sixty per cent of regions will experience population decline to the middle of the century), and some cities in the US, most notably

Detroit, are witnessing avicious circle of population decline and under-investment in infrastructure.

Many cities in the developing world are expanding at such a rate that there has been mass construction of informal settlements on the city's periphery. These settlements are often built on steep and unsuitable land with little or no provision of essential infrastructure.

Population changes such as these will present many critical roles for planning, from marshalling evidence to plan for future population projections and scenarios, delivering adequate housing supply, striking a balance between built, agricultural and natural land uses, curbing environmental pressures, and helping to address social needs such as jobs and the provision of public services.

Rocinha in Rio de Janeiro, pictured here, is the largest favela (informal settlement) in Brazil. Most of the current favelas expanded rapidly in the 1970s as a construction boom in affluent districts of the city prompted a rural exodus of workers from poorer regions of Brazil. It is estimated that about six per cent of the country's population live in informal settlements, or more than 11 million people. Brazil's favelas are growing at a quicker rate than its cities as a whole, but these areas are associated with extreme poverty, inequality and exploitation. In 2013, Brazil's population reached 200 million people.

Photo credit: Crystal Davies, World Resources Institute via Flickr.

# More, but smaller households

The UK population was 63.2 million in 2011, a figure which is expected to reach nearly 75 million people by 2035.<sup>42</sup> It is likely that the UK will have the highest population of any country in the European Union by 2060, with 79 million inhabitants.<sup>43</sup> However, international migration is the biggest unknown when it comes to predicting the UK's future demography; predictions for 2050 vary by almost 10 million as a result.<sup>44</sup>

High population growth is predicted in England and Northern Ireland to 2031, with much smaller increases for Wales and Scotland.<sup>45</sup> London and the East of England is projected to experience the greatest percentage increase in population between now and 2022 (13 and 8.6 per cent respectively), with lower increases in the North West (3.6 per cent), North East (2.9 per cent) and the West Midlands (5.5 per cent).<sup>46</sup>

Conversely, some areas of the UK have experienced a falling population in recent years and this is likely to continue. Parts of the Western Isles and Caithness and Sutherland in the Highlands have seen population decline alongside a general trend of population movement towards major urban settlements such as Stornoway and Lerwick. The issue that the UK faces is then not only related to the total size of the population, but where and how people will choose to live, including the supply of affordable housing.<sup>47</sup>

Similarly, there will be significant variations across Europe. While the overall population is predicted to rise by a modest five per cent until 2040.<sup>48</sup> European countries will experience wide variations, some growing by 46 per cent while others decline by 27 per cent. Some fifty European cities have lost more than a tenth of their population since the mid-twentieth century.<sup>49</sup>

## Smaller households

Around the world, we are typically living in smaller households, requiring a greater number of homes, more resources to build and furnish, and to heat and cool them. In the US and Europe, average household size was approximately five people in the late 1800s, now it is about 2.5.<sup>50</sup> In the UK, 7 million people now live alone<sup>51</sup>, and if current trends continue 18 per cent of the UK population is projected to live in single occupancy households by 2031, 42 per cent of which will be aged 65 years or older<sup>45</sup> (see overleaf). The same trend to smaller households is apparent in developing nations, with consequent demands on electricity and water infrastructure, more household appliances and so on.

## Thinking wider than housing

As a result, we need to think beyond the number of homes needed – although this is a significant challenge that cannot be avoided – to include the type and nature of housing, the location of developments, how developments relate to economic development, impacts on public services, the associated consumption of resources and infrastructure such as transport. There is room for greater consideration of the impact of more housing on carbon emissions and environmental sustainability, the balance between urban land and land for growing food, as well as how we create viable, cohesive and sustainable communities. As argued in the first paper in this series, *Thinking Spatially*, as well as the other papers in this series, we need a stronger, more integrated approach to dealing with land, place and space.



Photo credit: Photocity of Malmö

**Carbon-neutral districts:** Malmö's Western Harbour – 100 per cent locally renewable energy<sup>52</sup>

With a smart heating and cooling system and renewable energy, the city district of Västra Hamnen (Western Harbor), in Malmö, Sweden is establishing itself as the first carbon-neutral neighborhood in Europe. Also known as the 'City of Tomorrow', it has been transformed from a former shipyard in 2001 and is now home to 4,000 people. This development proves it is possible to supply an entire city district with 100 per cent locally renewable energy, offering ways for people to live in a sustainable way, use public transport and economise on resources.

## Why planning is important

Plan-making is crucial to deliver the number of homes and supporting services needed in response to urbanisation and population growth and movements. To do this there is a need for stronger evidence on future population projections and scenarios.<sup>53</sup> Plan-making can also help us to think beyond just the supply of housing; it can provide a wider context in which developments are considered in terms of impacts on public services and other infrastructure such as transport, as well as economic development and sustainability objectives, to create viable, cohesive and sustainable communities.

Planners in the public and private sector can then help to shape individual developments in line with these plans. National governments can help by incentivising housing schemes, for example, through finance mechanisms or national planning policy.<sup>54</sup> Such thinking, linking together infrastructure expenditure with housing, can help to unlock potential sites for development, including by working across collaboratively across administrative boundaries. Planners in all sectors can advocate for the right homes in the right place at the right time.

# Changing age structures

**One of our great public health achievements is that in the UK the population is getting older. By 2061 more than a quarter of UK residents will be aged 65 and over, and the fastest growth will be in the number of people aged over 85.<sup>55</sup> This will mean that the ‘economically active’ age group (people between 16 and 64 years old) will have to support a greater number of older people; by 2037 to the ratio of working age people and those of state retirement age will fall to 2.7 from the current 3.2.<sup>56</sup>**

As with population growth projections, changes in age structure will vary by nation and region. While Scotland’s projected population growth is less than that of the rest of the UK, it is ageing more rapidly. Scotland’s pensionable population is expected to increase by 2.9 per cent between 2010 and 2035, compared to 1.7 per cent for the rest of the UK.<sup>57</sup> The rural population is also ageing faster than urban populations, particularly in Wales which has seen an outflow of young people for many years.<sup>58</sup>

Globally, by 2050 there will be more people aged over 60 than under 15,<sup>59</sup> but for many urbanising cities the ‘urban youth’ are the dominant demographic. Further, the responsibility for care in many countries, particularly those without developed care systems, is highly likely to fall on families, particularly on adolescent girls and women, in turn impacting on their ability to receive education, gain employment or contribute to raising their own families.<sup>60</sup>

## **Built environment responses to an ageing population**

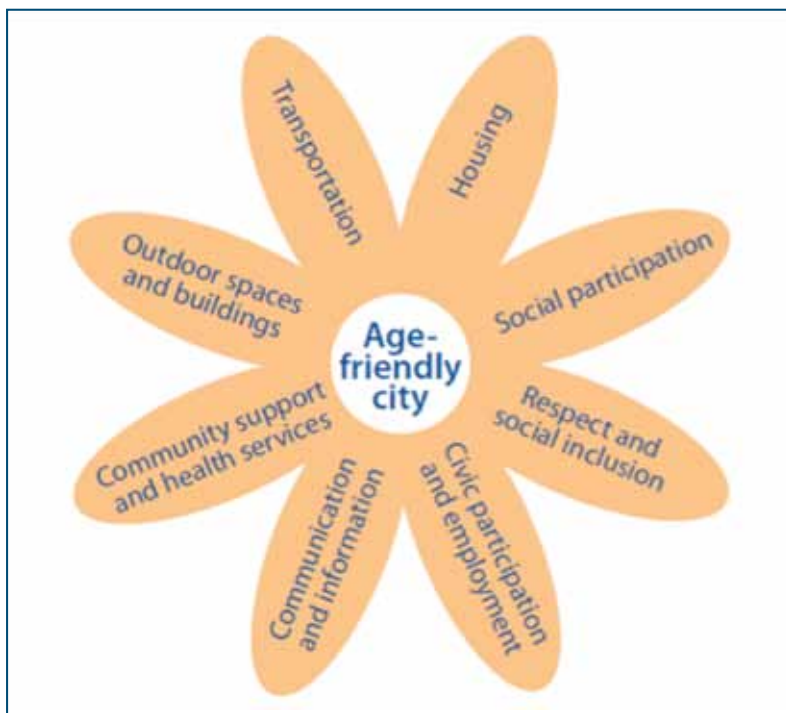
Planning for these changes is complex as there will be considerable diversity amongst older populations and the experience of ageing will vary from region to region, even from neighbourhood to neighbourhood.<sup>61</sup> What is certain is that responding to changing age structures will need to encompass virtually every aspect of the built environment. Most obviously, this means the types of homes

needed (for example incorporating greater ease of maintenance and security as well as increased sociability in neighbourhoods), and adaptations to existing housing (including greater energy efficiency). In the UK, around 35 per cent of the 4.8 million properties classified as ‘non-decent’ are inhabited by older households.<sup>62</sup>

More broadly, many features of our towns and cities will need re-thinking, from the ease of navigability of streets to more compact urban centres for populations who will increasingly rely on walking and public transport. An ageing population also places additional pressure on public services as well as reinforcing the importance of everyday services such as banks, shops and post offices. More programmes to involve all ages in city activities will be required, such as the ‘Growing Old Living Dangerously’ programme in Joondalup in Australia, enabling older people to continue to participate in group recreational activities. Similarly Edinburgh has developed a ‘City for all Ages’ plan to ensure the ‘full social and economic inclusion of older people’ including the involvement of older people in the design of care homes planning bus services to local amenities.<sup>63</sup>

The most proactive approach lies in prevention, which is to say environments which promote active and healthy ageing, so helping to improve people’s quality of life but also reducing pressures on public services.

## Aspects of age-friendly cities



Research on US cities shows that older adults want the same as younger adults, such as a police presence on the streets, a range of housing types and proximity to schools and shops.<sup>65</sup>

The graphic here represents the key dimensions of the 'age-friendliness' of cities, ranging from aspects of the built environment to public services and public participation, based on work in 35 cities across the developed and developing world.

Source: World Health Organisation<sup>64</sup>

Ageing and related-health impacts are considered in the *Planning Horizons* paper on *Promoting Healthy Cities* (October 2014).

## Why planning is important

Planners can help to articulate and promote an understanding of what demographic change including an ageing population means in practical (and sometimes challenging) terms, for example housing and infrastructure needs, and how these might be addressed across all spatial levels. Planning policy and systems can require that demographic data informs choices and decisions in planning processes and decisions. In both developed and developing nations, both planning

policy and planners can promote a much broader understanding of how our societies will need to be developed and adapted for an ageing population, for example through public transport providing better access to town and city centres which include public services and other facilities. Local planning policy can set out a vision for age-friendly communities, and individual planning decisions can help to put this vision into practice.

# Community and social cohesion

As well as providing jobs and opportunities, strong communities have good social interaction and networks, a shared sense of civic pride and active participation in shaping their local environment. Conversely, areas with limited social interaction and community participation (including for older people) tend to stagnate and suffer from high real or perceived levels of anti-social behaviour and crime. New technologies enable people to create and join virtual communities, but physical communities remain critical to our opportunities, health and wellbeing.

For many European countries, the recent recession, low growth and constricted public finances have led to reduced investment in public services, with the risk of exacerbating a range of social problems and widening social inequality, so eroding community and social cohesion. As populations change and age, there are likely to be increasing inter-generational tensions over resources, for example investments in education as opposed to healthcare and social care. Further, in many Western European countries there has been considerable public debate over immigration and the need for greater 'integration' of incoming populations.

Such debates often play out in public concerns over issues that planners deal with on a day-to-day basis, such as the supply of affordable housing, access to employment opportunities, the provision of public services and the quality of local infrastructure. The design of the built environment has a crucial role to play in helping to promote community and social cohesion, for example by ensuring well-designed public spaces, improving the attractiveness and liveability of communities, helping to provide equitable access to local public services, employment sites, community amenities and other infrastructure.<sup>66</sup>

## Planning sustainable communities:

Bath's local planning policy on houses of multiple occupancy<sup>67</sup>

Bath and North East Somerset's planning team have been working with their housing colleagues to develop an appropriate set of policies on 'houses in multiple occupation' (HMOs). The city of Bath is popular with students and other young professionals who financially are forced to live in shared homes to afford the relatively high rents in this popular city. However, in some areas of the city, there was a concern about social balance and housing mix, with a risk of local families being pushed out.

The UK Housing Act 2004 allows local authorities to restrict the proliferation of these dwellings by requiring owners to apply for a license to change internal structures or by using planning controls to control the location of HMOs. The Council introduced Supplementary Planning Guidance in 2013 restricting the number of HMO residences to a maximum of 25 per cent (in any one Super Output Area) across the city. A Geographic Information Systems (GIS) layer exists of all HMO residences so that officers can assess the impact of granting permission for changes of use, checking that the application is not within a 25 percent zone and considering at a more local scale whether a quarter of properties within a two minute walk are already HMOs.





Photo credit: Northampton Borough Council

#### Planning sustainable communities: Northampton Faith Study<sup>68</sup>

Northampton Borough Council and the Northampton Inter Faith Forum (NIFF) commissioned a study on faith communities to inform the development of the Borough's new Local Plan. Various secondary data sets were analysed to establish the composition of Northampton's faith communities, existing faith facilities and future needs, including via GIS mapping. An extensive engagement

process was also conducted, including one-to-one interviews, workshops and an online survey.

By providing a better understanding of the Borough's faith communities and their needs, this has enabled the Council to more effectively plan for future development needs. In addition, the project has facilitated ongoing engagement with faith groups, helping to inform the evolution of the Borough's Sustainable Community Strategy.

### Why planning is important

Plan-making can help to ensure that housing developments (whether new housing, refurbishment or adaptation of existing properties) are coordinated with demand for services and facilities such as hospitals, town centres and attractive public spaces. Planners can involve the community in all stages of the planning process to devise a collective vision for an area, assess how future developments will affect existing residents and communities, and work towards the vision by permitting developments that contribute to this overall goal. Crucially, at the heart of better planning

is the principle of consultation, for example communities are more likely to support homes being built in their local area if the quality of local services does not suffer, if developments are accompanied by the necessary infrastructure, and homes are well designed and in keeping with the local area.<sup>69</sup> More broadly, planning systems can represent an equitable and just means of resolving debates on competing demands and how communities are organised and develop.

Planning and economic growth are considered further in the *Planning Horizons* paper on *Creating Economically Successful Places* (November 2014).

# Planning our responses to major twenty-first century challenges



The way that we respond to these challenges will be critical to the sustainability and even survival of many communities and ecosystems. This will require much greater attention to how we organise and use land, how we transport ourselves, how we live and work in communities, how we generate and distribute energy, and how we use water – all in a coherent and coordinated way.

Urban and rural planning – both in the sense of regulating development but also creating and implementing strategies for sustainable development – will be critical. In many ways this returns planning to its traditional purposes and values, to create better living environments for all people in our towns and cities. In the twenty-first century, this will also mean the development of more resilient communities.

Medellín, pictured here, is the second-largest city in Colombia. Following huge migration into the city, it experienced high unemployment, lack of services in poor areas, and severe urban violence in several districts. But in 2013, Medellín was chosen as the most innovative city in the world due to its advances in politics, education, and social development. It hosted in the seventh UH-Habitat World Urban Forum in 2014, and has been selected by the Rockefeller Foundation for its '100 Resilient Cities' centennial challenge.<sup>70</sup> The Foundation launched the initiative in 2013 to enable cities to better address the increasing shocks and stresses of the twenty-first century. As a result, Medellín has appointed a Chief Resilience Officer, Oscar Santiago Uribe Rocha. Photo credit: Iván Erre Jota, via Flickr.

# Strengthening resilience

**For many experts and commentators, these challenges are sufficiently serious in their scale and potential impact that they need to be considered as major threats to the security and sustainability of our societies. For example, in the US, the federal government's National Climate Assessment report published in May 2014 characterised climate change as a 'clear and present danger'.**

The Intergovernmental Panel on Climate Change (IPCC) reports have been similarly stark in their warnings. Demographic change can also similarly be regarded as a major challenge, for example in terms of social cohesion and how we respond to an ageing society. The nature of these challenges is that, without adequate responses, the impact and costs that result are likely to increase significantly to the extent that we may lack the ability to respond and become overwhelmed by them.

On the understanding that we will be unable to avoid at least some impacts from these challenges wherever we live and that they will be disruptive to some degree – in both good and bad ways – our responses need to be focused on strengthening the ability of societies to anticipate and prepare for the effects of these challenges, and to recover as best as possible from impacts when they do occur. This is 'resilience'.

## **A broader understanding of 'resilience'**

'Resilience' is typically understood as being comprised of two main elements: preparation and planning; and response and recovery. The original meaning of 'resilience' in policy has focused on civil crises and emergencies. For example, the UK Government's National Security Strategy sets out the objective of ensuring a secure and resilient UK, from flooding to terrorist attacks. However, the concept is increasingly being interpreted and adopted much more widely, including by businesses, non-governmental organisations and researchers, including climate change mitigation and adaptation but also significant economic and social change.

In development and humanitarian aid, 'building resilience' has been invoked as a new organising principle by the UN, donors and non-governmental organisations as a way to prevent unacceptable levels of human suffering and reduce the costs of emergency responses. This has included climate change, as a way of bringing adaptation into mainstream development practice, and to reframe challenges which have previously been discussed under headings such as sustainable development, vulnerability and disaster risk reduction (DRR).<sup>71</sup>

Related to this, resilience has also been used to consider the ability of natural ecosystems to absorb and recover from shocks and stresses (known as 'ecological resilience'). In social policy and practice, resilience has been applied to understanding how communities are able to cope with changing conditions, such as job losses or economic recessions, pointing to the importance of factors such as community cohesion and social capital. Many major businesses are also incorporating resilience into their planning and decision-making, as a more proactive approach than simply trying to manage or avoid risk.<sup>72</sup>

Resilience has come to be associated with our collective ability to manage change and uncertainty especially in relation to dynamic systems (such as the climate or population growth and migration), to recognise that there may be no 'optimum' fixed response and that we need to think about how to transform our approaches, and how this requires greater flexibility and capacity for learning in and between organisations.<sup>73</sup> It also suggests the need for more integrated thinking to appreciate the relationships between social, economic and environmental systems – for example

how sudden food price rises might be related to uncontrolled urban development, which in turn may also increase the vulnerability of communities to climate change, and so on.<sup>74</sup>

However, many current policy approaches that are in effect meant to strengthen resilience do not typically incorporate and integrate these issues in a coherent way, for example how climate change policy links to housing, transport, economic development and so on. This can be achieved by thinking more spatially about these challenges.

### Learning from planning – the importance of place and space

The first paper in the *Planning Horizons* series, *Thinking Spatially*, argued that there is an urgent need for a greater awareness of ‘place’ and ‘space’ in policy- and decision-making, in particular the way that various policies can combine to affect places in different ways. The lack of integrated and coordinated approaches to major challenges, which often cross local, regional and national boundaries, delivers ‘siloes’ policy responses and can even result in counter-productive outcomes, allowing these issues to proliferate and cause greater long-term costs and harm.

From this perspective, much of our resilience policy and planning is insufficiently spatial, especially in terms of promoting coordinated and integrated approaches to land use over a longer period. For example, in England the National Adaptation Programme (NAP) sets out what government, business and society should be doing to become more ‘climate ready’.<sup>9</sup> The plan mandates that local governments should plan to mitigate and adapt to climate change working with communities, taking ‘full account of flood risk, coastal change and water supply and demand considerations’. However, there is little consideration of adaptation challenges beyond flood risk, and this plan (and the subsequent ones produced by local governments) fails to consider additional challenges that may be

brought by a changing population (apart from some health impacts of higher temperatures on vulnerable groups) and the potential of spatial planning to tackle them.

The NAP and others including the National Security Strategy, the UK Infrastructure Plan<sup>75</sup> and the National Risk Register, are essentially aspatial documents mentioning only a handful of locations and containing no strategic vision for future challenges. A spatialised vision of measures needed to improve resilience would be invaluable for planning future development and investment in a more integrated and coordinated way, including issues such as energy and transport infrastructure, food and agriculture, regeneration, social policy and cohesion policies, and so on.

The way that planners are responding to these challenges suggests how policy- and decision-makers more broadly can make our societies more resilient – effectively to help ‘future-proof’ our societies for the twenty-first century. In short, we need to *spatialise* resilience planning, at various spatial scales as appropriate, from the national to the regional, sub-regional to the local.

Planning operates at many spatial scales, creating and implementing long-term frameworks for economic, social and environmental development which support the sustainability and cohesion of communities. To do this, planning is necessarily inter-disciplinary and integrated in its approach, making connections between issues (for example, housing, transport and demand for public services), understanding how decisions will cumulatively impact on places, and managing competing interests in the wider public interest in an accountable and transparent way.

Planners in the public, private and voluntary sectors also work cooperatively with a wide range of stakeholders and interests to develop, improve and protect the built and rural environment, including by being prepared to articulate the benefits of higher standards in developments. Planners need to be evidence-based, but also to see and act beyond the limitations of existing data and projections. Moreover, planners can respond to and help develop and implement practical but engaging collective visions for the future irrespective of their origin, for the communities for whom they work and to whom they are responsible.

Following this, policy- and decision-makers will benefit from working with planners and others to:

- set out visions for the sustainable development of our societies, including by thinking boldly and imaginatively about the choices we face;
- establish long-term frameworks for action that reach beyond typically short-term political timescales;
- establish systems and delivery mechanisms – including planning systems – that can turn plans into action;
- plan and collaborate across institutional, sectoral and administrative boundaries to develop more integrated policies and practices;
- create conditions for markets to operate in ways which strengthen resilience; and
- where necessary, challenge existing interests in the wider public interest (including the interests of future generations).

Thinking more spatially would then support us to formulate and implement sustainable strategies for the future such that we achieve the highest possible level of resilience.

## Planning for spatial resilience at a strategic scale

With different governance arrangements and legal systems in different countries, there is no single model of spatial resilience planning or single spatial scale at which it needs to be conducted. In some countries where national spatial plans or frameworks exist, these could incorporate resilience to challenges such as climate change and demographic change. However, as noted in *Thinking Spatially*, national spatial plans not appropriate for every context. In other countries where national resilience strategies exist, these could incorporate a greater spatial intelligence. In either context, what planners need in order to deliver for their communities (both at the project and plan scale) is a high level spatial vision for how each country or region will develop its resilience to climate change and demographic change. This would be valuable in every context.

In some countries, such planning might be done primarily at a regional or sub-regional level. But at whatever spatial scale integrated planning occurs, and however it is achieved, a more spatial approach to resilience planning would:

- present challenges as significant current threats against which multi-disciplinary and inter-agency action is required;
- be applicable and transferable across borders; and
- develop understanding of where action is most urgent as well as what types of action are needed in which locations.

Such a vision would provide decision-makers with a broad understanding of the role and function of their area in responding to these challenges, for example whether it is a sustainable growth zone or an area of 'managed retreat', how development in an area might contribute to carbon emissions or natural environment protection, and so on. Strengthening spatial resilience requires better intelligence and data, changes in the ways in which institutions work, and people at all levels who are able to lead efforts to strengthen resilience. These are discussed in turn below.



Photo credit: Thomas White (Thomas White Photography).

The African Climate Change Resilience Alliance using a 'reflective gaming' approach in workshops with district level officials and others in Ethiopia, Uganda and Mozambique to consider the real-life implications of climate change.

#### Co-ordinating programmes to reap multiple benefits: Lewes' Local Development Framework

The District of Lewes has embraced adapting to climate change within the development of their Local Development Framework (LDF). Climate change had been included in the Council's environmental management system since 1999, but the local authority was keen to extend this into a more integrated and strategic approach.

In 2004, Lewes joined a European project called 'Managing Urban Europe' to develop an Integrated Management System (IMS) and used the strategic nature of the LDF as the framework for developing a district-wide initiative.

As a result of these policies, all recent large development completions are within 30 minutes travel (via public transport, walking or cycling) of the most important community services and workplaces, no planning permissions have been granted without the approval of the Environment Agency on flood risk management and with a positive record of approving renewable energy installations, and carbon dioxide emissions per capita are continuing to fall.<sup>76</sup>

Planners need a high level spatial vision for how each country or region will develop its resilience to climate change and demographic change.

# Intelligence

**Policy- and decision-makers, planners and other professionals need better, timelier and, critically, *more spatial* intelligence, which is to say the evidence, research and analysis necessary to understand these major long-term challenges and to inform policy and decision-making at various spatial scales in ways that contribute to resilience.**

Collectively, the planning profession can use its influence to help develop and protect the data sources upon which so much of its work depends. National data sets including the UK census provide invaluable information on trends from which predictions can be made. Similarly, regional datasets as well as information provided in assessments originally produced for different purposes, such as Sustainability Appraisals, River Basin Management Plans, and Indices of Multiple Deprivation, hold information relevant to understanding inequalities in health and socio-economic status. But there are many simple ways in which policy- and decision-makers as well as planners could be provided with better data, including data expressed spatially – for example, adding contour lines to land use maps would allow a greater understanding of the topographical influences on flood risk, including run-off flow paths and potential flood depths.

Planners can also engage with research conducted on likely future risks and impacts, as well as technological changes in order to be able to assess the impacts of planning proposals. One increasingly cited example of this is the work being done to value ‘natural capital’. The aim of this work is to put an accurate value on the non-marketised elements of environmental goods and services, such as soil quality or water quality. These can be used in decision-making and help relevant professionals understand the implications of land use choices, for example relating to flood risk management. Indeed, a report by the UK Government’s independent Natural Capital Committee recognised that there ‘are substantial economic benefits to be gained from maintaining and improving natural assets’ but that some of the assets are not being managed sustainably causing significant economic implications’.<sup>77</sup>

## Managing current flood risk over the long-term: Bristol’s City Wide Strategic Flood Risk Assessment (SFRA)

Bristol City Council undertook a city-wide Strategic Flood Risk Assessment (SFRA) in tandem with the development of its Local Plan. Its predictions of future flood risk included climate change. While the Local Plan was written to guide development and growth until 2026, the impact of climate change on the risk of fluvial and tidal flooding was assessed for 60 and 100 years beyond 2026 (the anticipated lifespan of non-residential and residential properties respectively). These assessments included assumptions of a 20 per cent increase in peak river flows and sea level rise.

The first level assessment of flood risk in 2008 showed that high flows posed a risk to urban infrastructure and areas where development may take place. As a result, a Level 2 SFRA was commissioned to provide a more detailed assessment of flood risk in the area. This included information on all forms of flood risk: fluvial, tidal, surface water, groundwater, sewer and from reservoirs.

Forward planners were identified at an early stage as a critical audience for the report’s findings, particularly as they were developing the Local Plan at the time. The resulting assessment fed into the Local Plan, allowing planners to identify ‘future developable land’ and avoids allocating housing sites in future flood zones.



# Institutions

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**Governments and agencies at all levels can work together to build spatial resilience. At a local level the responsibility will fall on urban governments to plan and manage much of the adaptive change that is required to respond to the impacts of climate change and demographic change.**

Cities will need an integrated approach in order to deal with the challenges faced. City governments will not be able to fund and implement all the interventions required, but they will need to provide the frameworks that encourage better decision-making across the built environment, including by businesses, communities and citizens. These frameworks include adequately considering the value of the natural environment to ameliorate impacts of climate change, as well as promoting sustainable lifestyles by avoiding low-density urban sprawl.

At a national level, the way in which governments typically divide themselves into functional departments can also have huge consequences for the policies and strategies that result. For example, the UK Government's Department for Transport's strategy for sustainable transport integration makes no mention of the need to work with planners to influence land use decisions.<sup>78</sup> While criticism cannot be laid simply at national governments, such examples reflect that many government strategies and action plans are somewhat internally-focussed and can neglect cross-departmental coordination.

Those involved in setting out resilience visions for cities or nations need to understand the latest research coming from the many academic institutions that are focussed on these challenges, where the level of data included and the science behind predictions can sometimes be

confusing and overwhelming. More broadly, we need to develop better mechanisms for sharing learning based on research and practice, bringing together individuals and institutions around different aspects of adaptation to climate and demographic change to strengthen resilience.

As part of this, decision-makers will often need to improve their liaison with external organisations and the work that they do. For example, when devising land use plans, this could include greater use and understanding of other land based plans, such as Shoreline Management Plans, River Basin Management Plans and investment plans of water companies.

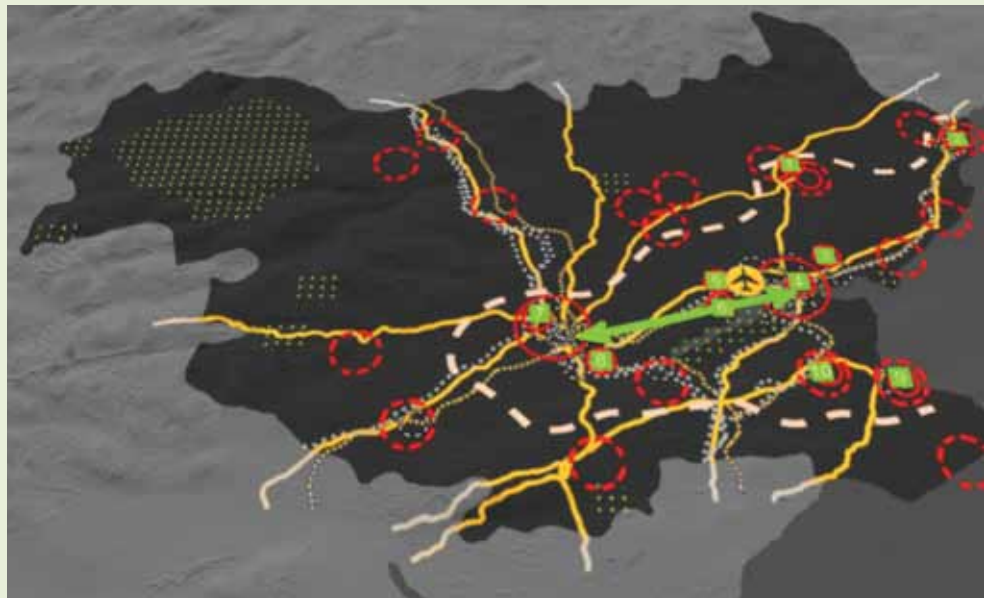
*Governance – how decisions around planning need to be made at the appropriate spatial level – is considered further in the [Planning Horizons](#) paper on [Making Better Decisions for Places](#) (November 2014).*

Individual institutions also have a responsibility to promote greater sustainability. For example, in 2009 the RTPPI adopted its seven commitments to climate change, recognising that planning is about providing a positive vision for a sustainable future. The commitments underpin all of our work and include promoting a shift to renewable energy supply, a reduction in carbon-consuming travel, reducing the consumption of natural resources and promoting existing places rather than building new.

**Collaboration between planning agencies:  
Strategic Development Plans in Scotland**

The Glasgow and the Clyde Valley Strategic Development Planning Authority comprises eight local authorities working together to develop a strategic regional approach to adaptation planning. The action programme developed from the Strategic Development Plan states the need to 'minimise the development and carbon footprints of the city-region, meet climate change emissions targets and above all, support a drive towards a sustainable low carbon economy'.<sup>79</sup>

Similarly, the TAYplan (the Strategic Development Plan incorporating the cities of Dundee and Perth) recognises the 'mitigation of and adaptation to climate change as the single greatest challenge facing humankind' as it sets out a spatial vision for the region. It includes a presumption against development in areas vulnerable to coastal erosion, flood risk and rising sea levels, policies to integrate new development with existing community infrastructure, ensure the integration of transport and land use to reduce the need to travel, ensure that high resource efficiency is incorporated within development through the orientation and design of buildings, the choice of materials and the use of low and zero carbon energy generating technologies.<sup>80</sup>



This illustration is not a map from a plan, rather it expresses a series of policy ideas and thinking from options that are being consulted upon using the Main Issues Report. The Plan will be prepared after this.

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# People

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**Whilst the importance of political leadership is well-recognised, professional leadership also has a significant role to play. Planners should recognise their potentially powerful position in promoting and leading efforts to strengthen resilience in the face of these challenges, but in order to do so planners will need to adapt their practices to these new environmental, social and economic realities.**

Clearly, spatial resilience planning cannot be limited to planning professionals. We need more inter-disciplinary approaches, and leadership across many sectors as well as in the planning profession. Crucially, for dealing with some of the predicted impacts of climate change in areas facing significant population growth, this approach requires an understanding and appreciation of geographical and ecological concepts such as 'natural capital' and 'ecosystems', as well understanding flood plains, environmental limits and so on. By working with natural environment professionals, transport planners and public health officials, lessons can be learned about urban drainage systems, the need to retain green spaces and re-engineer our towns and cities back to a more 'human scale', as well as the wellbeing benefits of more active travel patterns. The benefits of these concepts need to be better understood and explained to others including policy-makers and the public.

For maximum impact, each decision taken at the local level will need to consider how it will assist in meeting these challenges at a national and even international level. This type of 'strategic localism'<sup>81</sup> – whereby leadership at the local level is marshalled to help to achieve national outcomes – is needed to help us meet the 80 per cent emission reduction target at the same time as responding to demographic change. 'Sustainable development' needs to become truly sustainable.

To achieve this, we need stronger spatial capabilities across a range of practice and policy disciplines. This means the skills, abilities, awareness and position of planners, and of policymakers, decision-makers and practitioners in many different fields that are required in order to respond spatially and strategically to these challenges and build upon the public's inherent interest.

Although we face great uncertainty in how these challenges can be mitigated and prepared for, those in the profession will continue to need to educate themselves as evidence evolves and also to share intelligence with their stakeholders and communities. Given the way that research data tends to be made available, it is likely that data will always be behind the reality on the ground, necessitating flexibility in our responses. Importantly, reframing approaches as 'planning *in* change' rather than 'planning *for* change' – whether climate change, demographic change or both – will help to promote understand that changes are happening *now* rather than in some distant future and so the immediacy of action that is required.

Implicit within this is that planners and policy- and decision-makers will need to be prepared to make difficult decisions, whether on the location of communities, the design and development of communities and their sustainability, and so on. In this, planners will need to act as influencers, advocates, educators and advisors, helping to bridge the 'action gap' whereby most people agree that challenges such as climate change and demographic change (for example, an

ageing society) are significant issues but cannot identify who is responsible for taking action.

At the same time, planners and others will need to learn from and also respond to communities, who may in some cases be ahead of both policy-makers and professionals in reacting to these challenges or changing behaviours (such as supporting more local food produce or reducing car use).



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#### [Communities taking action on climate change](#): Bosham neighbourhood plan

Neighbourhood planning is a relatively new form of planning in England whereby the plan can be written entirely by a local community. Once adopted the plan forms part of the statutory planning hierarchy for the area. Bosham Parish Council is embarking on a neighbourhood plan. This coastal village in West Sussex is flooded annually and is also nearing the limit of sewerage capacity, however there is a demonstrable need for more housing for local people. Dissatisfied with the proposals put forward by local government, the Parish Council is using new neighbourhood planning powers to put forward three alternative sites that could bring forward approximately two-thirds of the housing requirement with no required upgrade to the sewerage network or increased flood risk. This demonstrates the ability of local communities to use their resources to plan for a changing climate and a growing population within their own neighbourhoods.

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# PLANNING **Horizons**

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Planners have a critical role to play in response to all of these issues. Just as the challenges of a hundred years ago spurred the development of planning as a professional discipline and as a field of study, so the challenges we face over the next hundred years will demand new contributions from the profession and beyond.

This paper was written by Gayle Wootton, with Michael Harris, RTPI. The *Planning Horizons* programme is managed by Michael Harris and Gayle Wootton, RTPI.

Our thanks to the Cecilia Wong and Brian Webb at the University of Manchester for the updated maps included in this paper based on the *Map for England* project.

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