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Climate Change Challenges to City and Regional Planning

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Introduction

Climate change poses major challenges for the city and regional planning profession. Since most of the world's population live in urbanized areas, the profession, focused as it is on human settlements, will play a key role in facing these challenges.¹ Here I will briefly discuss three major challenges or opportunities: the long-range physical planning focus of the profession and its time horizon, its community engagement tradition, and its multi-disciplinary orientation and potential for simulating urban systems and their complexities.

Climate Change

Since 1988, the UN has been convening consortia of experts, the International Panel on Climate Change (IPCC), periodically, to assess climate changes brought about by human actions (the science), the ways in which we can adapt to climate changes that we cannot reduce (adaptation), and the potential ways that human societies can reduce or mitigate climate change (mitigation) (Jones 2013). The three volumes of the Sixth IPCC report, which focus on the science, adaptation, and mitigation were finalized between 2021 and 2023. (IPCC n.d.).² This periodic effort to assess new research findings on climate change, its impacts, and alternative policies to reduce and adapt to climate change is the most authoritative international source of information, which has been instrumental in prompting national and international research and policy. The most significant international policy influenced by the IPCC findings is the Paris Agreement of 2015.

The Paris Agreement of 2015 is a legally binding treaty on climate change that was adopted by 196 parties to “hold the increase in the global average temperature to well below 2 degrees C above pre-industrial levels” and to pursue efforts “to limit the temperature increase to 1.5 degrees C above pre-industrial levels” (UN Climate Change n.d). However, already as of July 2023, the Copernicus Climate Change Service (2023) reported that temperatures reached 1.5 and 1.6 degrees C higher than before the widespread use of fossil fuels and that without dramatic reductions in emissions, the

1 As of 2018, 55% of the world's population lived in urban areas, and by 2050, the U.N. projects, urban populations will reach 68% (UN 2019).

2 I contributed as a lead author of the chapter on urban systems in the mitigation volumes of the 5th and 6th IPCC reports on climate change (Seto et al. 2014, Lwasa et al. 2022).

1.5-degree threshold would be breached by 2030. Diffenbaugh and Barnes (2023) also estimate that global warming is already close to crossing the 1.5 C threshold, and suggest that even with significant GHG mitigation, failing to keep global warming below 2 degrees C is a real possibility. Given that most of the world has now experienced the warming effects of 1.5 degrees C warmer world, at least for a few months, it is essential that the profession focuses on the implications of climate change for their practice.

Challenges to Long-range Physical Planning

Among the challenges to long-range physical planning from climate change, two major ones are the reduction of areas suitable for human habitation, and whether planning for, or relying on the longevity of infrastructure systems and the built environment is still a viable assumption or goal.

I. Reduction of Buildable Areas. Climate change is reducing areas for human habitation, buildable areas. Many seacoasts, lands adjacent to forests, areas subject to catastrophic flooding or fires, or other impacts of climate change may no longer be suitable for human settlements.

Insurance or rather lack of insurance is likely to reduce new development in these areas, creating an exodus of existing populations from such areas. In California, by mid-2023, several of the state's largest home insurance companies, including Allstate and State Farm, paused, or limited new home insurance applications, due, to a large extent, to their losses from wildfires (Kamisher et al. 2023). But recognizing the catastrophic impact of the lack of home insurance, Gov. Newsom in Sept. of 2023 issued an executive order requiring the Insurance Commissioner to take action to stabilize the state's real estate market. California's Insurance Commissioner negotiated an agreement providing relief for insurance companies to continue coverage in the state.

But city and regional planning will need to confront this problem. There are legal and physical aspects of urban development. How should areas that we already know are subject to extreme events, which will be made more severe and frequent by climate change, be rezoned? This is a politically fraught issue, directly addressing property rights and local government powers—to what extent can or will the police power of the State protect people from the potential harm stemming from individuals' choices about their property? From a rational point of view, a property owner whose property has been devastated by a climate-change extreme event, such as a wildfire or catastrophic flood, climate-related disasters which are likely to become more frequent, should have a claim against a local jurisdiction that continues to zone an area to permit housing despite increasing disasters and climate change projections. Realistically, however, it is more likely that property owners in such areas would sue jurisdictions for constraints on their right to build on their property. Given the strong private property rights tradition in the United States, it is more likely that the courts would uphold private property owners' decisions to build or rebuild in a fire-prone area.

How could planning address this issue? If the courts uphold property rights even in the face of likely harm to the owners and costs to the community, could planners designate such areas as transitional areas, with some level of government, local, state, or federal providing move out incentives, no new development permits, and advisories for existing development? Temporary or expiring building permits with provisos?

II. Infrastructure Longevity in the Era of Climate Change. Urban infrastructure systems, such as water and sewage systems, have been long-lived, their lifetimes often exceeding 50, and even 80 or 100 years, despite the poor maintenance of many of these systems. The American Society of Civil Engineers rates the nation's and states' infrastructures, and periodically publishes a report card. The latest for California was published in 2019. Overall, ASCE rated California's infrastructures C-, with several systems, including energy, inland waterways, levies, public parks, and roads rating a D, and many others rating a C- (ASCE 2019). A major, if not the major, response that the threat of climate change poses for such systems has been to increase their resilience (UNDRR 2023).

Many infrastructure systems can be made more resilient to climate change impacts. But some urban settlements and their infrastructures, especially those located where sea level rise/storm surges and hurricanes will intensify under climate change are likely to experience increasingly existential and recurring challenges over the century. As climate change accelerates, especially during the second half of this century, urban areas subject to extreme, recurring climate impacts may require frequent rebuilding or abandonment.

In addition, more robust or resilient designs of infrastructures/built environment are likely to be resilient to the type of extreme event we can envision now. But extreme events in the uncertain future may be more extreme than the infrastructure planned for, and such events will likely increase in frequency over the century. Robust/resilient infrastructure now may not be able to cope with such changes. An alternative worth exploring is to consider planning the built environment for generational horizons, providing opportunities for rebuilding or abandonment. In effect, planners need to assess the likely temporal viability of areas for human settlements from the perspective of climate change and associated changes.

Planning as a Means for Building a Sense of Community

Climate change is already causing increasing internal and international migration. Researchers at the World Bank estimate that by 2050 there could be 216 million climate migrants (Clement et al. 2021). A recent book characterizes the coming century as the "nomad century" (Vince 2022). Social planning will become as necessary and important as physical planning, since we will be facing ongoing waves of migration (domestic and international), and our work as a species will be determined by how we, in the wealthier nations and regions, respond to ongoing waves of migration.

In the past, for the most part, immigrants have been left to adjust to their new country at their own pace. Typically, the full integration of immigrants has often occurred over several generations, having to overcome language barriers, with time and energy-consuming jobs. In the era of climate change, social cohesion will be essential for survival. Many policies can be used to integrate climate refugees as quickly as possible into national and local cultures, e.g., language skills facilitated at workplaces, access to adult education, and childcare.

Receiving countries or settlements will need to build an inclusive sense of community quickly, or likely face internal conflict. A powerful means for integrating migrant populations is through their inclusion in community planning. In the age of climate change, planners can play a key role in building community by engaging both long-term residents, and newcomers in community/city/regional planning. Engaging climate immigrants and migrants into community planning efforts could provide important opportunities for newcomers to understand their new culture, neighborhoods, country, to forge ties and friendships, to build community, to engage in democratic decision-making, contribute to community projects and become grounded in their new community.

Ongoing, Interdisciplinary Collaboration, Research and Learning

At its core, urban and regional planning is an interdisciplinary profession. Physical planning for a more precarious world will require ongoing, interdisciplinary, and interactive learning. The multiple challenges of climate change will increasingly make evident the complex, inter-related nature of our condition on earth, and planners with such an important role in the siting and the physical conditions of communities at every scale will need to become even more interdisciplinary in approach, and model interdisciplinarity for other fields. We face in the next decades, especially in large cities, tremendous challenges: increasing temperatures, changes in energy sources, changes in construction materials, desirable structures, and immigration from places made uninhabitable (for decades, if not centuries) to a large extent due to the “burning”/use of fossil fuels by “advanced economies.” (What will be advanced economies in the second half of the 21st century? Or the 22nd?)

Because the world we face is more precarious and uncertain, planning will require robust simulation with the inclusion and collaboration of engineering and scientific fields, public administration, the legal profession, as well as the social sciences, especially psychology and sociology, given the existential anxiety we will all face, the difficult adjustments to climate changes, and the need for rapid integration of climate refugees into communities at every scale in the coming decades. With its Environmental Simulation Lab in the 1970s, developed by Donald Appleyard, Berkeley led in the physical simulation of urban environments (Bosselman 1984), a tradition that Paul Waddell (2011) continued with UrbanSim.

Simulations will serve several purposes: aid experts in relevant fields develop interdisciplinary simulations of how projected climate changes will affect urban environments and their populations, provide a means to discuss and agree on how proposed strategies will affect such environments and their populations among interdisciplinary groups of experts, as well as provide an experimental platform to propose and examine alternative strategies. Such simulations can also be used to help educate community members and officials on such effects, further bridging the difference and gaps among expert judgments and enhancing community understanding of complex interactions.

Conclusion

Climate change is an existential challenge for our species. The city and regional planning profession, focused as it is on the habitats peculiar to our species, can play a crucial role in ensuring their safety, in facilitating the integration of climate migrants in host communities, and in developing and using simulations that incorporate the knowledge and experience of engineers, scientists, and relevant professions to enrich our understanding of climate change, its impacts on human settlements, and to develop more sustainable human environments.

Note

Thank you to the editors of BPJ for inviting me to write an article for BPJ on its 40th anniversary. It is a real pleasure to witness the Journal's endurance.

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