

## **Rapid Review**

Theme: Sustainability

Policy Area: communities, culture and belonging

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### **Introduction**

The following paragraphs are written against my background and research in social science aspects of climate change adaptation, water governance and the governance and regulation of underground space, especially with regard to communities and civil society and in the context of sustainability. All of these research fields are interlinked, interdependent and the Covid-19 pandemic has either exacerbated or at least laid bare open existing problems and it also opened up the chance for rethinking, improvements or change of direction of these issues.

### **Water use, climate change and sustainability**

Working from home has increased water use across the UK. A report by Artesia Consulting and the University of Manchester (Alda-Vidal et al., 2020) has four main findings. First, changes in the organisation of life and work. Working from home means people use more water for cooking, drinking and cleaning and also adopt new water uses such as more intensive gardening. Second, at the beginning of the lockdown people adopted water intensive practices to protect themselves from contracting the virus (washing hands more frequently for instance), however, this behaviour has faded as people got used to living with the virus. Third, water consumption rose because people gave new or more value to outdoor gardens which require watering but are also used for socialising and breaks from work. Fourth, some water intensive practices will fade others will remain. For instance, instead of a quick shower before commuting to work, people tend to take longer showers throughout the day.

Some people may be surprised when they receive their annual water bill as it is likely to be higher than last year due to the effects described in the previous paragraph. Of course, people use water during the day when they are at their workplaces for making coffee, tea, using the toilet, showering (when commuting by bike for example) or water is used of course for the preparation of food and cleaning in the office canteen or in food outlets. However, this water use usually goes undocumented for the individual user but not for the employer. In a report published last year, Grecksch & Lange (2019) argue for water efficiency campaigns in the public sector and large private organisations using social norms. Social norms are value commitments that shape water use behaviour. Social norms have become the tool of choice for today's behavioural policy-makers. The inclusion of a social norm in a message can be a way to encourage citizens to carry out a wide range of socially desirable acts. Social norms serve as cues and they motivate action by providing information about what is likely to be effective and

adaptive. (Larson & Brumand, 2014; Lede & Meleady, 2019; Posner, 2002) A good example for a social norm is the message we find in almost every hotel room about the re-use of towels. Water use at the workplace uses different social norms than water use at home, however, both can influence each other in a positive way. A ‘water savvy person’ may influence the water use behaviour of colleagues in the office kitchenette and subsequently induce changes in water use behaviour at home. Other measures the report by Grecksch & Lange (2019) mentions are competitions between departments, the use of reference groups and to develop a water saving narrative that is embedded into the wider environmental story, i.e. climate change and energy use.

Hence, we need to understand why and how water is valued. It is important to explore what values customers, communities and civil society hold towards water and why or why not they engage in water efficient behaviour. Values are influenced and shaped by society, culture and religious belief systems. (Corral-Verdugo et al., 2008; Hoolohan & Browne, 2016; Sharma & Jha, 2017; Simpkins, 2018; Sofoulis, 2005) Moreover, telling a story or shaping a narrative is of importance. Simple messages such as ‘Save more water’ do not get through to water users. Instead, the bigger story must be told, i.e. water efficiency should be linked to the wider environmental story, e.g. the water-energy-food nexus (Waterwise, 2018). At least for the majority of the first Covid-19 lockdown in England, a similar model seems to have worked well. The message: ‘Stay at home, protect the NHS, save lives’, was simple yet telling the bigger story. By staying at home, we protect not only ourselves but we also protect one of the country’s most valued institutions. How information about water efficiency is shaped and contextualised within a familiar frame of reference and meaning is of great importance. And, it makes a difference who is conveying the message about water saving – water companies, regulators or intermediaries. (Byerly et al., 2018; McQuail, 2005; Whiting et al., 2019) In the future targeted messaging could be carried out by actors, sportspersons or other well-known persons from for example BAME groups to reach specific audiences. Setting realistic targets is also of importance. There is a limit to water conservation as we for example need to use water to wash ourselves or to wash clothes. People may need water for religious reasons and some people simply do not care about efficient water use. (Ek & Söderholm, 2010; Mills & Schleich, 2012; Siero et al., 1996; Steg, 2008) The Covid-19 pandemic has seen the introduction of a new social norm: the 20 second hand wash. Messages instructing the population on how to do it were put up in public toilets, public buildings, through TV, radio and advertising in general. Competitions can also be a useful tool in the context of social norms. They can leverage the power of social norms. People like to know where they stand compared to others and they like to be told that they are good. (Petersen et al., 2015; Siero et al., 1996; Vine & Jones, 2016) In addition, our behaviour orientates itself at reference groups – group thinking. In other words, we tend to adapt our behaviour according to what is the norm within a reference group (Goldstein et al., 2008). Herein lies a huge potential for short and long-term also in combination with who is conveying a message as explained above.

Hence, in the short run (1-2 years) people may become more aware of their daily water use and water companies, which are responsible for water efficiency campaigns in England and Wales, could roll out targeted campaigns on how to save more water. Daily per capita water use in the UK is among the highest in Europe – 142 litres per person per day compared to for example Germany – 121 litres per person per day (<https://discoverwater.co.uk/amount-we-use>). Robins et al. (2017) also want to create a more water-literate society, where UK citizens better risk and engage in decision-making about how water should be managed. ‘A more water-literate society will better enable water managers to shift from reactionary, crisis-driven approaches to long-term, agenda-driven plans in line with agreed strategic goals.’ (Robins et al., 2017, p. 52) Water

literacy can be acquired by obtaining basic literacy competencies and a certain level of education (Yuto et al., 2014). The authors suggest for example to improve the water literacy of all local governments and residents through educational activities to ensure safe water use and to promote sustainable water supply. Grecksch (2021) suggests waterways or drought walks to reconnect people to water and to start a discussion about water and its value. Another place to start this necessary discussion about sustainable water use are public parks (see also below). The pandemic has seen an increased use of public parks and many of them have water features that could be used for water education. Thus, water education could become ‘a walk in the park’, combining recreation with education.

In the long-term, water use will most probably normalise to pre-Covid levels as people adapt or return to their offices and workplaces although maybe not to pre-Covid levels. Decisions on water infrastructures are long-term decisions and are hence characterised by path dependency and lock-ins, i.e. policies set in the past. The current political responses in the UK to COVID-19 point towards a recovery and return to the situation before the pandemic with economic growth being the main driver.

However, water use will still be subject to the already existing pressures such as population increase and climatic changes. Sir James Bevan, chief executive of England’s Environment Agency, underlined in what is now known as ‘Jaws of death’ speech, that unless action is taken to change things, England will not have enough water to supply its needs (Bevan, 2019). Thus, short-term and long-term action is needed. This is supported by evidence of the UK Committee on Climate Change Risk Assessment, which attributed a ‘medium magnitude now’ but a ‘high magnitude in future’ for the ‘risk of water shortages in the public water supply, and for agriculture, energy generation and industry, with impacts on freshwater ecology’ in its latest assessment (Committee on Climate Change Risk Assessment, 2016).

The Covid-19 pandemic offers the chance to rethink existing assumptions and strategies in the UK water sector in order to make it more sustainable. As mentioned before this includes for example creating a wider environmental story that connects water to food, agriculture, energy, and climate change. This for example means including local environmental knowledge. Grecksch & Lange (2018) could show that local (expert) knowledge is an emerging source of knowledge in UK water management. Regulators and water companies are discovering the value of local knowledge though. Local (expert) knowledge can fill gaps left by more abstract and formal environmental science knowledges and add new perspectives. And, including local knowledge in water resources management can empower stakeholders and strengthen the legitimacy of regulatory decisions. Including more local knowledge in environmental governance issues is of course widely discussed in the literature as for example by Jacobs et al. (2016) or Charles et al. (2020), but issues and questions of participation and access to decision-making processes remain (Grecksch & Klöck, 2020). However, one needs to be cautious not to create knowledge inequalities. The World Social Science Report 2016 (ISSC et al., 2016, p. 22) speaks of knowledge inequalities, which ‘includes the question of whose knowledge counts and what types of knowledge are considered most important. Knowledge inequalities between individuals and groups affect the capacity to make informed decisions, to access services and to participate in political life.’ With reference to flooding Whatmore (2009), (but also Landström et al. (2011)) introduced so-called Environmental Competency Groups (ECG). ECGs encourage scientists and local residents to work together to create knowledge about local environmental issues. The approach therefore creates a space where those who are directly affected can question expert knowledge and bring their experiences to bear on how the problem is framed and what different courses of action are available. It is

important however to start this discussion with the civil society and communities now. Recent opinion polls show a gap between actions and belief that threatens green recovery from pandemic, for example, people plan to drive more post-Covid (Watts, 2020).

### **Public parks, public spaces and the use of underground space for infrastructure**

The lockdown has shown an increased use of public parks and public spaces but also the scarcity of public spaces and parks especially in areas with mostly BAME or poor people (Duncan et al., 2020; Office for National Statistics, 2020; Shoari et al., 2020). According to data from the Office for National Statistics (ONS), one in eight British households has no access to a private or shared garden. In London this rises to one in five. With regard to ethnic disparity, the ONS observes: 'In England, Black people are nearly four times as likely as White people to have no access to outdoor space at home, whether it be a private or shared garden, a patio or a balcony (37% compared with 10%)' (...), and 'even when we compare people of similar age, social grade and living situation (similar area, with or without children), those of Black ethnicity are 2.4 times less likely than those of White ethnicity to have a private garden'. (Office for National Statistics, 2020) However, access to a park or spending time in your garden is beneficial and positively associated with health and wellbeing (de Bell et al., 2020; Shoari et al., 2020). As the architect David Chipperfield reflected in a newspaper article: 'It was the parks that were full not the spaces predicated on retail which we've been building. They have failed us.' (Heathcote, 2020) In the same article the sociologist Richard Senett warns: 'In my work with the UN, everything has been about making cities denser to make them more efficient, more liveable and sustainable. I worry that the pandemic will have passed in a few months but we may succeed in dismantling all our progress and just building suburbs again. Which are a disaster.' (ibid.)

Schindler (2015) could show for the US how architecture can exclude for example access to areas by certain population groups (mostly African Americans in her examples) for recreation thereby reinforcing discrimination and segregation. For the UK, the issue of land ownership and access to land has been gaining track. Shrubsole (2019) compiled a list of the biggest landowning companies in the UK, which together own more than 405,000 hectares of land in England and Wales, land which is mostly inaccessible to the public. During the first lockdown, Gomm and Shrubsole (2020) also made the case for golf courses to open their gates to the public thereby offering much needed green space. Generally speaking, more public green spaces mean more space for social distancing, which is vital during a pandemic. The Countryside and Rights of Way Act (CRoW) 2000 implemented the right to roam, however, not everywhere. Scotland introduced a more wider ranging Land Reform (Scotland) Act 2003 institutionalising unhindered open access to open countryside provided that care is taken.

England and Wales could follow suit as a short and long-term response to the pandemic and the issue of access to public spaces. Unhindered access to wild and open country side could also reconnect people with nature thereby helping and supporting long term sustainability goals, i.e. access to nature, leads to valuing of nature, which leads to protection of nature. In cities and towns, future focus should be on creating public spaces and public parks for BAME people as they are currently lacking sufficient access to public parks or gardens as outline above. And referring to the first topic reviewed above – water and climate change – those parks could be the places for water features and water education. Droughts or floods could be 'memorialised' in public parks serving as a reminder of drought or flood. Hence, public parks with water features provide an opportunity to render more visible the issue of water availability for a range of citizens also in urban areas, i.e. by showing changes in water levels of the water features and vegetation e.g. during periods of drought. Already media images of hot and water

scarce summer periods usually show citizens congregating in parks and on beaches in the UK, with children playing in water fountains. (Grecksch, 2021)

My current research is on the governance and regulation of underground space use in the UK (Grecksch, under review). Underground space is used for a variety of purposes, for example for mining, the extraction of coal and gas, transport, storage, or the extraction of groundwater. Other uses which are of potential interest here are storage and the shifting of other infrastructure underground. This way space above ground could be freed up and used for much need public parks. For example, in Helsinki, Finland we find a public swimming pool underground (Vähäaho, 2016) as well as a wastewater treatment plant (ibid.). But there are no limits and for instance waste disposal or sorting sites could be built or relocated underground. However, it is important to embed this into a spatial planning programme that interlinks the above with the underground. Again, the city of Helsinki is a forerunner in this respect (Vähäaho, 2016, 2018) with its Underground Master Plan as are the Netherlands, the first country in the world to publish a national planning strategy for the subsurface (Government of the Netherlands, 2018; Volchko et al., 2020).

### **Summary**

There is a striking parallel between COVID-19 and climate change. Both are global phenomena, but the impacts are local and they differ from locality to locality. In return this should mean a focus on the local when it comes to responses. However, this would mean a complete rethinking of current, overcentralised British politics and policy-making. Focussing on the local could regain trust in political institutions and legitimise decisions and measures taken locally. People could 'own' their decisions and actions.

Both areas I presented pose opportunities to shape a fairer and more inclusive society. Building public parks in areas where so far people have no or only limited access to green space will be beneficial for their overall health and well-being. This can also reduce long-term costs for the public health system, it can empower them and strengthen their communities. At the same time saving water and using water more sustainably can be shaped as a community effort, again using target messages and messengers. It is also important to involve these communities (e.g., BAME and poor people) into the decision-making, because often these communities have sufficient local knowledge to make for example sure a new public park is accepted by the community and has all the necessary amenities.

This is a time for rethinking, for developing ideas and potentially (though unlikely) radical change. One way to develop ideas is to build scenarios – blue-sky thinking about the future and trying to answer the question: what could happen? (De Jouvenel, 2000; Durance & Godet, 2010; Grecksch, 2018) Building these scenarios must include groups that are usually less well represented such as BAME minorities or young people. Once developed, scenarios open up the possibility for further exercises such as backcasting (Quist et al., 2011; van der Voorn et al., 2012). This means going back to the present and building a roadmap of concrete steps on how to achieve the desired scenario. Scenario building gets people talking and discussing and they are exposed to opinions that may be opposed to their own. But one goal is to make them aware that other worlds are possible. And with reference to the point above these scenario exercise could happen local to make sure that they are not too general and fuzzy.

## References

- Alda-Vidal, C., Smith, R., Lawson, R., & Browne, A. L. (2020). *Understanding changes in domestic water consumption associated with COVID-19 in England and Wales*. Artesia Consulting and University of Manchester. <https://shorturl.at/cEHKQ>
- Bevan, J. (2019). *Escaping the jaws of death: Ensuring enough water in 2050*. GOV.UK. <https://www.gov.uk/government/speeches/escaping-the-jaws-of-death-ensuring-enough-water-in-2050>
- Byerly, H., Balmford, A., Ferraro, P. J., Wagner, C. H., Palchak, E., Polasky, S., Ricketts, T. H., Schwartz, A. J., & Fisher, B. (2018). Nudging pro-environmental behavior: Evidence and opportunities. *Frontiers in Ecology and the Environment*, 16(3), 159–168. <https://doi.org/10.1002/fee.1777>
- Charles, A., Loucks, L., Berkes, F., & Armitage, D. (2020). Community science: A typology and its implications for governance of social-ecological systems. *Environmental Science & Policy*, 106, 77–86. <https://doi.org/10.1016/j.envsci.2020.01.019>
- Committee on Climate Change Risk Assessment. (2016). *UK Climate Change Risk Assessment 2017. Synthesis Report: Priorities for the next five years*. <https://www.theccc.org.uk/wp-content/uploads/2016/07/UK-CCRA-2017-Synthesis-Report-Committee-on-Climate-Change.pdf>
- Corral-Verdugo, V., Carrus, G., Bonnes, M., Moser, G., & Sinha, J. B. P. (2008). Environmental Beliefs and Endorsement of Sustainable Development Principles in Water Conservation: Toward a New Human Interdependence Paradigm Scale. *Environment and Behavior*, 40(5), 703–725. <https://doi.org/10.1177/0013916507308786>
- de Bell, S., White, M., Griffiths, A., Darlow, A., Taylor, T., Wheeler, B., & Lovell, R. (2020). Spending time in the garden is positively associated with health and wellbeing: Results from a national survey in England. *Landscape and Urban Planning*, 200, 103836. <https://doi.org/10.1016/j.landurbplan.2020.103836>
- De Jouvenel, H. (2000). A Brief Methodological Guide to Scenario Building. *Technological Forecasting and Social Change*, 65, 37–48.
- Duncan, P., McIntyre, N., & Cutler, S. (2020). Coronavirus park closures hit BAME and poor Londoners most. *The Guardian*. <https://www.theguardian.com/uk-news/2020/apr/10/coronavirus-park-closures-hit-bame-and-poor-londoners-most>
- Durance, P., & Godet, M. (2010). Scenario building: Uses and abuses. *Technological Forecasting and Social Change*, 77(9), 1488–1492. <https://doi.org/10.1016/j.techfore.2010.06.007>
- Ek, K., & Söderholm, P. (2010). The devil is in the details: Household electricity saving behavior and the role of information. *Energy Policy*, 38(3), 1578–1587. <https://doi.org/10.1016/j.enpol.2009.11.041>
- Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A Room with a Viewpoint: Using Social Norms to Motivate Environmental Conservation in Hotels. *Journal of Consumer Research*, 35(3), 472–482. <https://doi.org/10.1086/586910>
- Gomm, J., & Shrubsole, G. (2020). It's time for golf clubs to open their gates | Letters. *The Guardian*. <https://www.theguardian.com/sport/2020/apr/22/its-time-for-golf-clubs-to-open-their-gates>

- Government of the Netherlands. (2018). *Spatial planning strategy for the subsurface. Summary*. Ministry of Infrastructure and Water Management. <file:///Users/kevingrecksch/Downloads/Spatial+planning+strategy+for+the+subsurface+-+summary.pdf>
- Grecksch, K. (under review). Out of sight – out of regulation? Underground space governance in the UK. *Journal of the British Academy*.
- Grecksch, K. (2018). Scenarios for resilient drought and water scarcity management in England and Wales. *International Journal of River Basin Management*, 1–9. <https://doi.org/10.1080/15715124.2018.1461106>
- Grecksch, K. (2021). *Drought and Water Scarcity in the UK. Social Science Perspectives on Governance, Knowledge and Outreach*. Palgrave Macmillan.
- Grecksch, K., & Klöck, C. (2020). Access and allocation in climate change adaptation. *International Environmental Agreements: Politics, Law and Economics*, 20(2), 271–286. <https://doi.org/10.1007/s10784-020-09477-5>
- Grecksch, K., & Lange, B. (2018). *Governance of water scarcity and droughts*. Centre for Socio-Legal Studies. [https://www.law.ox.ac.uk/sites/files/oxlaw/grecksch\\_lange\\_2018\\_-\\_governanceofwaterscarcityanddroughts.pdf](https://www.law.ox.ac.uk/sites/files/oxlaw/grecksch_lange_2018_-_governanceofwaterscarcityanddroughts.pdf)
- Grecksch, K., & Lange, B. (2019). *Water efficiency in the public sector. The role of social norms. A primer*. Centre for Socio-Legal Studies, University of Oxford. [https://www.law.ox.ac.uk/sites/files/oxlaw/grecksch\\_2019\\_-\\_primer\\_water\\_efficiency\\_public\\_sector\\_social\\_norms.pdf](https://www.law.ox.ac.uk/sites/files/oxlaw/grecksch_2019_-_primer_water_efficiency_public_sector_social_norms.pdf)
- Heathcote, E. (2020). *Park life: Harnessing the power of public space*. <https://www.ft.com/content/5b7862df-58fd-46d2-bc0c-17f4ee539df8>
- Hoolohan, C., & Browne, A. L. (2016). Reframing Water Efficiency: Determining Collective Approaches to Change Water Use in the Home. *British Journal of Environment & Climate Change*, 6(3), 179–191.
- ISSC, IDS, & UNESCO. (2016). *World Social Science Report 2016, Challenging Inequalities: Pathways to a Just World*. UNESCO. <https://unesdoc.unesco.org/ark:/48223/pf0000245825>
- Jacobs, K., Lebel, L., Buizer, J., Addams, L., Matson, P., McCullough, E., Garden, P., Saliba, G., & Finan, T. (2016). Linking knowledge with action in the pursuit of sustainable water-resources management. *Proceedings of the National Academy of Sciences*, 113(17), 4591–4596. <https://doi.org/10.1073/pnas.0813125107>
- Landström, C., Whatmore, S. J., Lane, S. N., Odoni, N. A., Ward, N., & Bradley, S. (2011). Coproducing Flood Risk Knowledge: Redistributing Expertise in Critical ‘Participatory Modelling’: *Environment and Planning A*. <https://doi.org/10.1068/a43482>
- Larson, K., & Brumand, J. (2014). Paradoxes in Landscape Management and Water Conservation: Examining Neighborhood Norms and Institutional Forces. *Cities and the Environment (CATE)*, 7(1). <https://digitalcommons.lmu.edu/cate/vol7/iss1/6>
- Lede, E., & Meleady, R. (2019). Applying social influence insights to encourage climate resilient domestic water behavior: Bridging the theory-practice gap. *Wiley*

*Interdisciplinary Reviews: Climate Change*, 10(1), e562.  
<https://doi.org/10.1002/wcc.562>

- McQuail, D. (2005). *Mass Communication Theory* (Vol. 5). Sage.
- Mills, B., & Schleich, J. (2012). Residential energy-efficient technology adoption, energy conservation, knowledge, and attitudes: An analysis of European countries. *Energy Policy*, 49, 616–628. <https://doi.org/10.1016/j.enpol.2012.07.008>
- Office for National Statistics. (2020). *One in eight British households has no garden*. <https://www.ons.gov.uk/economy/environmentalaccounts/articles/oneineightbritishhouseholdshasnogarden/2020-05-14>
- Petersen, J. E., Frantz, C. M., Shammin, M. R., Yanisch, T. M., Tincknell, E., & Myers, N. (2015). Electricity and Water Conservation on College and University Campuses in Response to National Competitions among Dormitories: Quantifying Relationships between Behavior, Conservation Strategies and Psychological Metrics. *PLOS ONE*, 10(12), e0144070. <https://doi.org/10.1371/journal.pone.0144070>
- Posner, E. A. (2002). *Law and social norms*. Harvard University Press.
- Quist, J., Thissen, W., & Vergragt, P. J. (2011). The impact and spin-off of participatory backcasting: From vision to niche. *Technological Forecasting and Social Change*, 78(5), 883–897. <https://doi.org/10.1016/j.techfore.2011.01.011>
- Robins, L., Burt, T. P., Bracken, L. J., Boardman, J., & Thompson, D. B. A. (2017). Making water policy work in the United Kingdom: A case study of practical approaches to strengthening complex, multi-tiered systems of water governance. *Environmental Science & Policy*, 71, 41–55. <https://doi.org/10.1016/j.envsci.2017.01.008>
- Schindler, S. (2015). Architectural Exclusion: Discrimination and Segregation Through Physical Design of the Built Environment. *The Yale Law Journal*, 124(6), 1836–2201.
- Sharma, R., & Jha, M. (2017). Values influencing sustainable consumption behaviour: Exploring the contextual relationship. *Journal of Business Research*, 76, 77–88. <https://doi.org/10.1016/j.jbusres.2017.03.010>
- Shoari, N., Ezzati, M., Baumgartner, J., Malacarne, D., & Fecht, D. (2020). Accessibility and allocation of public parks and gardens in England and Wales: A COVID-19 social distancing perspective. *PLOS ONE*, 15(10), e0241102. <https://doi.org/10.1371/journal.pone.0241102>
- Shrubsole, G. (2019). *Who owns England? How we lost our green & pleasant land & how to take it back*. William Collins.
- Siero, F. W., Bakker, A. B., Dekker, G. B., & Van den burg, M. T. C. (1996). Changing Organizational Energy Consumption Behaviour Through Comparative Feedback. *Journal of Environmental Psychology*, 16(3), 235–246. <https://doi.org/10.1006/jevp.1996.0019>
- Simpkins, G. (2018). Running dry. *Nature Climate Change*, 8(5), 369. <https://doi.org/10.1038/s41558-018-0164-3>
- Sofoulis, Z. (2005). Big Water, Everyday Water: A Sociotechnical Perspective. *Continuum*, 19(4), 445–463. <https://doi.org/10.1080/10304310500322685>
- Steg, L. (2008). Promoting household energy conservation. *Energy Policy*, 36(12), 4449–4453. <https://doi.org/10.1016/j.enpol.2008.09.027>



- Vähäaho, I. (2016). An introduction to the development for urban underground space in Helsinki. *Tunnelling and Underground Space Technology*, 55, 324–328. <https://doi.org/10.1016/j.tust.2015.10.001>
- Vähäaho, I. (2018). *Urban Underground Space. Sustainable Property Development in Helsinki*. City of Helsinki, Urban Environment Division, Soil and Bedrock Unit GEO. <https://www.hel.fi/static/liitteet/kaupunkiymparisto/julkaisut/julkaisut/julkaisu-11-18.pdf>
- van der Voorn, T., Pahl-Wostl, C., & Quist, J. (2012). Combining backcasting and adaptive management for climate adaptation in coastal regions: A methodology and a South African case study. *Futures*, 44(4), 346–364. <https://doi.org/10.1016/j.futures.2011.11.003>
- Vine, E. L., & Jones, C. M. (2016). Competition, carbon, and conservation: Assessing the energy savings potential of energy efficiency competitions. *Energy Research & Social Science*, 19, 158–176. <https://doi.org/10.1016/j.erss.2016.06.013>
- Volchko, Y., Norrman, J., Ericsson, L. O., Nilsson, K. L., Markstedt, A., Öberg, M., Mossmark, F., Bobylev, N., & Tengborg, P. (2020). Subsurface planning: Towards a common understanding of the subsurface as a multifunctional resource. *Land Use Policy*, 90, 104316. <https://doi.org/10.1016/j.landusepol.2019.104316>
- Waterwise. (2018). *Water Efficiency Strategy for the UK. Year 1 Report. How is the UK doing?* Waterwise. [https://waterwise.org.uk/wp-content/uploads/2019/10/WEStrategy\\_AnnualReport\\_2018\\_Final201118-1.pdf](https://waterwise.org.uk/wp-content/uploads/2019/10/WEStrategy_AnnualReport_2018_Final201118-1.pdf)
- Watts, J. (2020). People plan to drive more post-Covid, climate poll shows. *The Guardian*. <https://www.theguardian.com/environment/2020/nov/10/people-drive-fly-climate-crisis-global-poll-green-recovery-covid-pandemic>
- Whatmore, S. J. (2009). Mapping knowledge controversies: Science, democracy and the redistribution of expertise. *Progress in Human Geography; London*, 33(5), 587–598. <http://dx.doi.org/10.1177/0309132509339841>
- Whiting, A., Kecinski, M., Li, T., r, K. D. M., & Parker, J. (2019). The importance of selecting the right messenger: A framed field experiment on recycled water products. *Ecological Economics*, 161, 1–8. <https://doi.org/10.1016/j.ecolecon.2019.03.004>
- Yuto, K., Eri, Y., Norichika, K., Brent Edwards Jr., D., Binaya, R. S., Bijon, K. M., Naoya, A., Andante, H. P., & Casey, S. (2014). *Linking Education and Water in the Sustainable Development Goals. POST2015/UNU-IAS Policy Brief #2*. United Nations University Institute for the Advanced Study of Sustainability.