

**Submission on Adaptation of Human Settlements for Nairobi work programme on impacts,  
vulnerability and adaptation to climate change (NWP), UNFCCC**

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Thank you for the opportunity to put forward this submission on adaptation of human settlements for the NWP and the UNFCCC.

This submission draws attention to key insights from research carried out by the Centre for Urban Research (CUR) at RMIT University, based in Melbourne, Australia. The submission makes ten key points in relation to adaptation of human settlements and the lessons learned from this work. The key publications are detailed in Table 2.

By way of background, CUR is an interdisciplinary urban research hub with approximately 60 staff. Its work spans disciplines including urban planning, public policy, public health, geography, economics, environmental sciences, spatial analysis, history and sociology. The issue of adapting human settlements to climate change is a core focus for CUR. CUR has eight research programs (<http://cur.org.au/research-programs/>). One of these, the Climate Change & Resilience (CCR) research program, specifically aims to build links between theoretical, disciplinary and practical perspectives to deliver insightful and useful research and to facilitate trans-disciplinary collaboration and dialogue between researchers, practitioners and policymakers as they plan for and act on a changing climate. The Beyond Behaviour Change research program also conducts highly relevant work on vulnerability and climate change adaptation, including on experiences of heat stress, inadequate housing and the conventional (mal)adaptation of air conditioning. Much of CUR's work is carried out with organisations and other partners and is focused on the real-world problems they are facing.

Table 2 summarises the lessons learned from CUR's research relevant to adaptation of human settlements. The key points are as follows:

**1. Adaptation is contextual**

The contextual nature of climate change adaptation has far-ranging implications across all the focus areas identified in this call for submission. Given the place-based characteristics of climate change challenges and adaptation, context-specificity and a focus on enabling processes – rather than purely focusing on results – are vital to adaptation success (Moloney & Fünfgeld, 2015; Rickards, Wiseman, Edwards, & Biggs, 2014) . Given it is shaping the world we are all in, adaptation also requires that research is done reflexively, related to the value-laden nature of the issue and the power relations involved (Preston, Rickards, Fünfgeld, & Keenan, 2015; Rickards, 2015; Rickards, Wiseman, Edwards, et al., 2014).

## **2. Adaptation often takes place in contexts defined by multi-level governance**

Adaptation of human settlements is occurring in a multi-level governance context. This has implications for national governments supporting adaptation at the local level as well as implementing national adaptation plans.

While political leadership and commitment at the national level is needed, this doesn't mean state-level or local actors are unable to change or adapt (Moloney, Funfgeld, & Granberg, 2018). State governments in Australia have demonstrated some efforts to adapt, while municipal governments have also shown they can advance adaptation initiatives in the absence of national frameworks (Moloney et al., 2018; Mulligan, McLennan, & Kruger, 2016). At the same time, it is clear that facing some of the more radical implications of climate change and considering transformational adaptation options remains a challenge (Rickards, Ison, Fünfgeld, & Wiseman, 2014; Rickards, Wiseman, Edwards, et al., 2014), in part due to senior decision makers' hesitancy around climate change action in general (Rickards, Wiseman, & Kashima, 2014).

## **3. The way adaptation is framed matters**

The way adaptation is framed matters for initiating adaptation processes and achieving transformative change within human settlements (Bosomworth, 2015; H Fünfgeld, Webb, & McEvoy, 2012; Rickards, Ison, et al., 2014). A frame-reflexive practice (in planning, adaptation planning, etc.) could enable policy sectors to appreciate:

- 1) how their current framing directs action towards particular policy options, while potentially ignoring others, and
- 2) how exploring the sector's issues through different frames could reveal a greater array of policy options than may currently be considered (Bosomworth, 2015; Preston et al., 2015; Rickards, Ison, et al., 2014).

At a broader level, framings of adaptation that often reflect “pre-existing perspectives” are potentially problematic when these framings serve to perpetuate “economic growth and neoliberalism, of the sort widely agreed to underline climate change itself” (Rickards, Ison, et al., 2014, p. 592). In Australia, pride in having a variable, extreme climate is arguably slowing political and social acknowledgement of and action on climate change (Rickards, 2016; Rickards, Neale, & Kearnes, n.d.).

#### 4. Partnerships strengthen adaptation at the local level

Municipalities are an important governance scale for climate change adaptation and, through city partnerships and networks, are important actors in global climate governance (Hartmut Fünfgeld, 2015, p. 69). Understanding types of change occurring as a result of adaptation action is subject to ongoing research (Hartmut Fünfgeld, 2015; Moloney & Fünfgeld, 2015; Moloney et al., 2018). However, collaborative alliances have been shown to encourage healthy competition that drives adaptive capacity and capability amongst partner organisations (Moloney et al., 2018). The following table from Moloney, Fünfgeld and Granberg’s forthcoming edited book (2018) highlights conditions that enable and constrain local innovative and transformative action on climate change mitigation and adaptation.

**Table 1. Enabling & constraining conditions for transformative adaptation action at the municipal government level. From Moloney, Fünfgeld & Granberg (2018)**

Conditions	Institutional and organisational dimensions in which condition applies	Enabling condition	Constraining condition
<b>1. Clarity of roles and responsibilities</b>	Multi-level governance of climate change  Intra-organisational division of roles and responsibilities	Efficient and effective planning and decision-making across multiple scales and institutional levels	Confusion about roles and responsibilities leading to stalling and inaction  Conflicting actions increasing emissions and maladaptation
<b>2. Political commitment and high level support</b>	Democratic decision making processes  Organisational buy-in	Political commitment demonstrates importance and enables buy in from across the organisation / constituency	Lack of political commitment leads to neglect or active discouragement of climate change action
<b>3. Organisational and institutional co-ordination and integration</b>	Horizontal and vertical collaboration across institutions and departments	Well co-ordinated climate change action leads to mainstreaming into all organisational processes	Poor coordination leads to sporadic and fragmented action

<b>4. Problem/policy framing and formulation</b>	Multi-level/actor participatory approach  Value based framing and prioritisation in the formulation of issues on the policy agenda	Climate change is framed as an all-encompassing problem that requires coordinated and sustained action	Climate change action remains a niche task of environment departments
<b>5. Local context and specific circumstances</b>	Translation of climate challenges/ problems in relation to local contextual conditions  Inclusion of multiple local scale actors and forms of knowledge in decision making	Climate change action is tailored to and grounded in locally specific circumstances, drawing on local knowledge	Climate change action ignores local knowledge and context and is devised in a top-down fashion
<b>6. Social learning and experimenting</b>	Developing capacity through breaking path dependency  Commitment to innovation, reflexive learning and developing new pathways of action	Experimenting and social learning is encouraged, leading to innovation and transformative action	Experimentation is discouraged or not resourced and climate change action is required to fit into 'business as usual'

**5. New research tools are helping to more comprehensively assess the inequities and uneven distributions of sensitivity and vulnerability to climate change**

It is increasingly clear that climate change events can amplify urban inequity (Nicholls, McCann, Strengers, & Bosomworth, 2017a; Nicholls & Strengers, 2017; Reckien et al., 2017). Research has found that heatwaves, but also flooding, landslides, and even mitigation and adaptation measures, affect specific population groups more than others, particularly women and low-income residents (Nicholls, McCann, Strengers, & Bosomworth, 2017b; Reckien et al., 2017). In Australia, for example, research indicates that an increasing number of households are at risk of lacking essential energy services, particularly at times of extreme heat (Cornwell et al., 2016; Nicholls et al., 2017b). Recent CUR research has looked at who is vulnerable in the context of electricity provision and heatwave vulnerability and has found that national energy governance does not yet account for the impact of energy policy on household vulnerability (Nicholls et al., 2017a; Nicholls & Strengers, 2017). Meanwhile, rural

and regional communities are also disproportionately affected by the impacts of climate change (Hughes, Rickards, Steffen, Stock, & Rice, 2016).

CUR research has also contributed to the challenge of assessing sensitivity and vulnerability in Vanuatu (Trundle & McEvoy, 2015), the Solomon Islands (Trundle & McEvoy, 2017) and Vietnam (Nguyen, Horne, Fien, & Cheong, 2017). Working in Vietnam, Nguyen and colleagues (2017) suggest assessments of social vulnerability should be undertaken at a sufficiently local and fine-grained scale to account for the influence of local factors on vulnerability. The research developed a neighbourhood social vulnerability index (SVI) based on components of exposure, sensitivity and adaptive capacity and emphasises the use of expert judgement and stakeholder perspectives to identify which SVI factors inform vulnerability assessments.

## **6. New research is contributing to advancing monitoring and evaluation**

Academic literature suggests five broad steps that are central to developing an monitoring and evaluation (M&E) framework (Turner, Moloney, Glover, & Funfgeld, 2014). These involve:

1. Establishing the purpose for doing M&E;
2. Establishing what is to be evaluated and why;
3. Identifying an appropriate type of evaluation;
4. Adopting an appropriate methodology for M&E
5. Identifying a set of indicators that address both outcomes and processes.

CUR has submitted a separate submission on monitoring and evaluation, however relevant research is included in Table 2.

## **7. Planning for adaptive capacity: considering housing, building, infrastructure & biodiversity**

Housing, building and infrastructure are significant variables in the adaptive capacity of human settlements and their vulnerability to climate change impacts. At a broad level, infrastructure must be conceived to include the natural environment, whether soil, vegetation, air or water. Deterioration in these assets poses immediate economic and social costs. But allowing such change can also be mal-adaptive and mal-mitigative because “green” and “blue” infrastructure (whether trees, waterways or other such infrastructure in cities, wetlands, or coastal ecosystems) provide adaptation and carbon sequestration benefits for humans (Neave, Rayburg, & Al-Obaidi, 2016; Reckien et al., 2017).

At the household scale, poor thermal performance is a challenge for household vulnerability in times of extreme heat (Nicholls et al., 2017a). Designing and constructing climate-

responsive housing is an important step in tackling such vulnerability. For example, in the state of Victoria, Australia, low-energy (high performance) houses without air-conditioning have been measured and perceived as more comfortable than 'standard-performance' houses with air-conditioning (Moore, Ridley, Strengers, Maller, & Horne, 2017). 'Greening' urban infrastructure is an adaptation measure available to mitigate urban heat island effects, which contribute to heat related illnesses in cities (Neave et al., 2016, p. 2322). However, urban greening must be attentive to issues of justice and equity to ensure it meets broader sustainability objectives (Cooke & Coffey, n.d.). We also need plural approaches to understanding and addressing the governance challenges of greening (Cooke, West, & Boonstra, 2016).

Green and blue infrastructure is not only beneficial to humans, however. Research is increasingly pointing to the benefits for humans of bringing 'nature' back into human settlements (Maller, 2018; Maller et al., 2009) – or acknowledging when human settlements are also rich habitats for nonhuman species. Australian cities, for example, support a greater number of threatened species than non-urban areas (Ives et al., 2016).

#### **8. Adaptation has major implications for health, including how we assess health, wellbeing and adaptive capacity**

The above points highlight the significant implications of adaptation of human settlements for human health, wellbeing and adaptive capacity. CUR research highlights the importance of expanding the tools policy-makers use to determine and think through the impacts of climate change on human health and wellbeing. For example, there have been calls for more research that explores the influence of social and contextual factors when considering climate change impacts on the capacity of vulnerable populations' to adapt to heat impacts (Maller & Strengers, 2011), but also in terms of how sustainable housing outcomes are assessed (Horne & Martel, 2015; Moore, Strengers, & Maller, 2016). This research suggests the usefulness of a practice-based methodology and conceptual framework (Maller & Strengers, 2011) to assess the implications of adaptation measures for human health.

#### **9. Disaster management is part of adaptation**

Incremental approaches to disaster risk management can help mainstream adaptation by avoiding recourse to top-down 'predict and act' approaches and instead integrate local knowledge and help build community resilience over time (Heazle et al., 2013). Emergency management should be reframed as *a component* of disaster risk reduction (DRR) rather

than them being one and the same; enabling vulnerability reduction efforts in DRR to support longer-term adaptation (Owen, Bosomworth, & Curnin, 2016).

**10. Finally, adaptation calls for multiple approaches to plan for and acknowledge uncertain futures**

Adaptation needs to be based on flexibility, robustness and the ability to navigate change and uncertainty. Thinking through adaptation pathways (Bosomworth, Leith, Harwood, & Wallis, 2017) and scenario planning (Rickards, Ison, et al., 2014) are just two approaches explored by CUR research.

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## References

- Bosomworth, K. (2015). Climate change adaptation in public policy: frames, fire management, and frame reflection. *Environment and Planning C: Government and Policy*, 33(6), 1450–1466. <https://doi.org/10.1177/0263774X15614138>
- Bosomworth, K., Leith, P., Harwood, A., & Wallis, P. J. (2017). What's the problem in adaptation pathways planning? The potential of a diagnostic problem-structuring approach. *Environmental Science & Policy*, 76, 23–28. <https://doi.org/10.1016/j.envsci.2017.06.007>
- Cooke, B., & Coffey, B. (forthcoming.). The politics of urban greening - an introduction. *Australian Geographer*.
- Cooke, B., West, S., & Boonstra, W. J. (2016). Dwelling in the biosphere: exploring an embodied human–environment connection in resilience thinking. *Sustainability Science*, 11(5), 831–843. <https://doi.org/10.1007/s11625-016-0367-3>
- Cornwell, A., Hejazi Amin, M., Houghton, T., Jefferson, T., Newman, P., & Rowley, S. (2016). *Energy Poverty in Western Australia: A Comparative Analysis of Drivers and Effects*. Perth. Retrieved from <http://bcec.edu.au/publications/energy-poverty-western-australia/>
- Fünfgeld, H. (2015). Facilitating local climate change adaptation through transnational municipal networks. *Current Opinion in Environmental Sustainability*, 12, 67–73. <https://doi.org/10.1016/j.cosust.2014.10.011>
- Fünfgeld, H., Webb, B., & McEvoy, D. (2012). The significance of adaptation framing in local and regional climate change adaptation initiatives in Australia. In K. Otto-Zimmermann (Ed.), *Resilient Cities: Cities and Adaptation to Climate Change* (pp. 283–293). Dordrecht: Springer Science+Business Media. <https://doi.org/10.1007/978-94-007-4223-9>
- Heazle, M., Tangney, P., Burton, P., Howes, M., Grant-Smith, D., Reis, K., & Bosomworth, K. (2013). Mainstreaming climate change adaptation: An incremental approach to disaster risk management in Australia. *Environmental Science & Policy*, 33, 162–170. <https://doi.org/10.1016/J.ENVSCI.2013.05.009>
- Horne, R., & Martel, A. (2015). Housing, households and climate change adaptation in the town camps of Alice Springs. In *Applied Studies in Climate Adaptation* (pp. 289–296). Wiley Blackwell.



- Hughes, L., Rickards, L., Steffen, W., Stock, P., & Rice, M. (2016). *On the Frontline: Climate Change & Rural Communities (Climate Council of Australia)*. Retrieved from <https://www.climatecouncil.org.au/ruralreport>
- Ives, C. D., Lentini, P. E., Threlfall, C. G., Ikin, K., Shanahan, D. F., Garrard, G. E., ... Kendal, D. (2016). Cities are hotspots for threatened species. *Global Ecology and Biogeography*, 25(1), 117–126. <https://doi.org/10.1111/geb.12404>
- Maller, C. (2018). *Healthy Urban Environments: More-than-human Theories*. Routledge.
- Maller, C., & Strengers, Y. (2011). Housing, heat stress and health in a changing climate: promoting the adaptive capacity of vulnerable households, a suggested way forward. *Health Promotion International*, 26(4), 492–498. <https://doi.org/10.1093/heapro/dar003>
- Maller, C., Townsend, M., Leger, L. S., Henderson-Wilson, C., Pryor, A., Prosser, L., & Moore, M. (2009). Healthy Parks, Healthy People: The Health Benefits of Contact with Nature in a Park Context, 26(2).
- Moloney, S., & Fünfgeld, H. (2015). Emergent processes of adaptive capacity building: Local government climate change alliances and networks in Melbourne. *Urban Climate*, 14, 30–40. <https://doi.org/10.1016/j.uclim.2015.06.009>
- Moloney, S., Funfgeld, H., & Granberg, M. (2018). Towards transformative action: learning from local experiences and contexts. In *Local Action on Climate Change: Opportunities and Constraints*. Routledge, UK. Retrieved from <https://www.routledge.com/Local-Action-on-Climate-Change-Opportunities-and-Constraints/Moloney-Fuenfgeld-Granberg/p/book/9781138681521>
- Moore, T., Ridley, I., Strengers, Y., Maller, C., & Horne, R. (2017). Dwelling performance and adaptive summer comfort in low-income Australian households. *Building Research & Information*, 45(4), 443–456. <https://doi.org/10.1080/09613218.2016.1139906>
- Moore, T., Strengers, Y., & Maller, C. (2016). Utilising Mixed Methods Research to Inform Low-carbon Social Housing Performance Policy. <http://dx.doi.org/10.1080/08111146.2015.1077805>. <https://doi.org/10.1080/08111146.2015.1077805>
- Mulligan, M., McLennan, B., & Kruger, T. (2016). *Resilient Melbourne: Implementing the 100 Resilient Cities Project in Melbourne*. Melbourne. Retrieved from <http://cur.org.au/publications>

- Neave, M., Rayburg, S., & Al-Obaidi, I. H. (2016). Winter urban heat island magnitudes of major Australian cities. *International Journal of GEOMATE*, *11*(24), 2322–2327.
- Nguyen, C. V., Horne, R., Fien, J., & Cheong, F. (2017). Assessment of social vulnerability to climate change at the local scale: development and application of a Social Vulnerability Index. *Climatic Change*, *143*(3–4), 355–370. <https://doi.org/10.1007/s10584-017-2012-2>
- Nicholls, L., McCann, H., Strengers, Y., & Bosomworth, K. (2017a). *Electricity pricing, heatwaves & household vulnerability in Australia*. Retrieved from [http://cur.org.au/cms/wp-content/uploads/2016/12/heatwaveshomeshealth-briefing-paper\\_rmit-2.pdf](http://cur.org.au/cms/wp-content/uploads/2016/12/heatwaveshomeshealth-briefing-paper_rmit-2.pdf)
- Nicholls, L., McCann, H., Strengers, Y., & Bosomworth, K. (2017b). *Heatwaves, Homes & Health: electricity policy matters for household wellbeing*. Melbourne.
- Nicholls, L., & Strengers, Y. (2017). *Rising Household Energy and Water Bills: Case Studies of Health, Wellbeing and Financial Impacts*. Melbourne. Retrieved from <https://researchbank.rmit.edu.au/view/rmit:44458>
- Owen, C., Bosomworth, K., & Curnin, S. (2016). The Challenges of change in future emergency management: Conclusions and future development. In *Human factors challenges in emergency management : enhancing individual and team performance in fire and emergency services* (pp. 219–229). Ashgate Publishing. Retrieved from <https://researchbank.rmit.edu.au/view/rmit:29027>
- Preston, B. L., Rickards, L., Fünfgeld, H., & Keenan, R. J. (2015). Toward reflexive climate adaptation research. *Current Opinion in Environmental Sustainability*, *14*, 127–135. <https://doi.org/10.1016/j.cosust.2015.05.002>
- Reckien, D., Creutzig, F., Fernandez, B., Lwasa, S., Tovar-Restrepo, M., Mcevoy, D., & Satterthwaite, D. (2017). Climate change, equity and the Sustainable Development Goals: an urban perspective. *Environment and Urbanization*, *29*(1), 159–182. <https://doi.org/10.1177/0956247816677778>
- Rickards, L. (2015). Power in climate change research. *Nature Publishing Group*, *5*. <https://doi.org/10.1038/nclimate2557>
- Rickards, L. (2016). Goodbye Gondwana? Questioning disaster triage and fire resilience in Australia. <http://dx.doi.org/10.1080/00049182.2016.1154496>. <https://doi.org/10.1080/00049182.2016.1154496>

- Rickards, L., Ison, R., Fünfgeld, H., & Wiseman, J. (2014). Opening and Closing the Future: Climate Change, Adaptation, and Scenario Planning. *Environment and Planning C: Government and Policy*, 32(4), 587–602. <https://doi.org/10.1068/c3204ed>
- Rickards, L., Neale, T., & Kearnes, M. (in press). Australia's national climate: learning to adapt? *Geographical Research*. <https://doi.org/10.1111/1745-5871.12240>
- Rickards, L., Wiseman, J., Edwards, T., & Biggs, C. (2014). The Problem of Fit: Scenario Planning and Climate Change Adaptation in the Public Sector. *Environment and Planning C: Government and Policy*, 32(4), 641–662. <https://doi.org/10.1068/c12106>
- Rickards, L., Wiseman, J., & Kashima, Y. (2014). Barriers to effective climate change mitigation: the case of senior government and business decision makers. *Wiley Interdisciplinary Reviews: Climate Change*, 5(6), 753–773. <https://doi.org/10.1002/wcc.305>
- Trundle, A., & McEvoy, D. (2015). *Climate Change Vulnerability Assessment: Greater Port Vila*. Fukuoka, Japan. Retrieved from <https://unhabitat.org/wp-content/uploads/2017/03/HURCAP-final-Endorsed.pdf>
- Trundle, A., & McEvoy, D. (2017). *Honiara Urban Resilience and Climate Action Plan*. Fukuoka, Japan. Retrieved from <https://unhabitat.org/wp-content/uploads/2017/03/HURCAP-final-Endorsed.pdf>
- Turner, S., Moloney, S., Glover, A., & Funfgeld, H. (2014). *A Review of the Monitoring and Evaluation literature for Climate Change Adaptation*. Melbourne. Retrieved from [http://adapt.waga.com.au/cb\\_pages/project\\_resources.php](http://adapt.waga.com.au/cb_pages/project_resources.php)