

EXECUTIVE SUMMARY

FINAL REPORT NO. 368

Sustainable Indigenous housing in regional and remote Australia



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Publication Date November 2021

DOI 10.18408/ahuri7323701

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ISBN

978-1-922498-35-9

Key words

Housing, climate change, Indigenous housing, healthy housing, repairs and maintenance, property management, environmental health, thermal comfort, employment, life cycle costing.

Series

AHURI Final Report

Number

368

ISSN

1834-7223

Publisher

Australian Housing and Urban Research Institute Limited
Melbourne, Australia

DOI

10.18408/ahuri7323701

Format

PDF, online only

URL

<https://www.ahuri.edu.au/research/final-reports/368>
(full report)

Recommended citation

Lea, T., Greal, L., Moskos, M., Brambilla, A., King, S., Habibis, D., Benedict, R., Phibbs, P., Sun, C. and Torzillo, P. (2021) *Sustainable Indigenous housing in regional and remote Australia*, AHURI Final Report No. 368, Australian Housing and Urban Research Institute Limited, Melbourne, <https://www.ahuri.edu.au/research/final-reports/368>, doi: 10.18408/ahuri7323701.

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Acknowledgements

This material was produced with funding from the Australian Government and state and territory governments. AHURI Limited gratefully acknowledges the financial and other support it has received from these governments, without which this work would not have been possible.

AHURI Limited also gratefully acknowledges the contributions, both financial and in-kind, of its university research partners who have helped make the completion of this material possible.

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Executive summary

Key points

- For Indigenous housing to be sustainable, it should be safe and humane. It should support householders to enact healthy living practices and secure their wellbeing and be provided in the places Indigenous people prefer to live to meet different needs and purposes.
- This requires a life-cycle approach to housing management, with appropriate levels of funding for planned and responsive repair and maintenance systems that attend to the functionality, quality and serviceability of a building, ensure safety, comply with statutory obligations, prioritise health hardware function, and protect householders from climate risks.
- Repair and maintenance activities are an inevitable cost in the life cycle of a dwelling. Construction defects, wear and tear, ageing and environmental factors impact on building components. Planned maintenance programs are important for sustaining higher levels of house function across time.
- Indigenous regional and remote communities will experience the negative impacts of climate change earlier and disproportionately, compared with most urban Australian settings. Funding for housing supply, design and maintenance must reflect this distribution of risk and higher cost.
- Modelled in terms of various climate, occupancy, ventilation and other scenarios, the thermal performance of existing and improved Indigenous housing currently fails to ensure the health, safety and comfort of householders.
- Addressing climate change in Indigenous housing and health policy is an urgent priority.

Key findings

This research explores what is required for sustainable Indigenous housing in regional and remote Australia. It argues that sustainability should be understood in terms of the capacity of housing to confer positive health and wellbeing outcomes for householders, where housing stock is consistently maintained at high levels over time and is designed with current and future climate change challenges in mind. The priority of quality design and rigorous property maintenance should be to ensure householders can better exercise healthy living practices (Figure 1).

Current regional and remote Indigenous housing stock is unable to provide consistently healthy and comfortable indoor environments. There seems to be an unstated assumption that what is practically sustainable for governments and housing providers is the undersupply of substandard housing serviced by inconsistent repairs and maintenance (R&M). Operating and maintenance costs are three times greater for remote housing than in capital cities, so developing strategies to reduce these costs is a key goal. The adoption of life-cycle costing (LCC) frameworks offer potential to reduce expensive responsive repair work while guaranteeing amenity to householders. An LCC framework requires thinking of the lifespan and benefits of a structure within which savings might be derived by strategic investments. An LCC approach enables maintenance to be understood as:

- a central consideration in the design phase
- an investment to protect the value of a public asset
- a means of reducing significant costs later in the life cycle
- an essential requirement for improving the health and wellbeing of tenants.

Our research on housing management in the Anangu Pitjantjatjara Yankunytjatjara Lands (APY Lands) identifies features of effective property maintenance within current national policy constraints. Programs are required that prioritise maintaining housing health hardware through both responsive works driven by tenant notification and planned works. A planned multi-trade program significantly reduces travel expenditure by bundling work. This ensures houses are tended to (irrespective of tenant reporting) and it is more likely to maintain better-functioning housing than a responsive program. Where possible, parts and components are also standardised. Housing SA spends 52 to 57 per cent of their remote housing budget on planned maintenance, with only 20 to 26 per cent expenditure on responsive fix work. This distribution conforms to target benchmarks for planned maintenance in urban social housing, but it is rarely achieved in regional and remote housing.

Planned maintenance approaches also offer potential for local employment, including apprenticeships. Local employment is beneficial not only for community capacity but to improve the efficacy of maintenance programs. Such dividends require assured funding, contracts of appropriate length, an adequate volume of work, planning to distribute that work across a scheduled period and investment in trade training and administrative labour. For additional health and wellbeing gains, environmental health programs that operate inside and outside the fence line are also needed to complement property maintenance programs.

This report finds attention to climate change is not yet a feature of Indigenous housing and infrastructure agreements, with inadequate funding and attention paid to climate preparedness in new builds, refurbishments and retrofit programs. This is despite the impact of extreme temperature on both householder wellbeing and health hardware. Current consideration largely extends to the potential provision of split system air conditioning units for existing stock, meeting the minimal requirements of state/territory environmental design measures for new houses and residential tenancy acts for existing houses. Quantitative analysis of the resilience of existing housing stock (unimproved or improved to current construction recommendations) to the pressures of representative climate regions (tropical, arid and hot/mild) and for different heating and cooling scenarios (ventilation, occupancy, mechanical cooling, temperature) reveals the inadequacy of existing policy responses for current and anticipatable climate challenges.

When modelled for their performance under variable conditions of crowding and cooling systems, current Indigenous housing models are unable to provide resilience to different usage patterns and fail to provide comfortable and healthy indoor environments. This situation will worsen. Our simulation of the stressors experienced by housing registers the worst absolute conditions in tropical climate zones. However, it is within the hot/mild climate zone, representing a typical Australian hinterland area, where we calculate that the highest change in likely future energy consumption related to heat management will occur. Since regional and remote areas currently configured as hot/mild will experience comparable conditions with those now found only in tropical climates, this greatly exacerbates the health risks of vulnerable populations, if housing is not more comprehensively upgraded.

Temperature increase is already having significant effects in regional and remote areas, with predictions of higher frequency and intensity of extreme weather events, including heatwaves. Across Australia, a warmer climate will generally increase the energy consumed for cooling, while decreasing heating needs. Buildings must therefore provide better cooling performance, while minimising energy consumption by enhancing passive cooling opportunities. This requires design and refurbishment strategies including insulation, double glazing, energy generation technologies, mechanical and passive cooling and water management technologies. However, modelling of thermal loads shows that while retrofitting existing housing will assist habitability in the immediate to short term, such measures will be insufficient in the medium to longer term. That is, small-scale energy retrofits or reliance on mechanical cooling are necessary but inadequate interventions.

In urging attention to climate issues in relation to housing, it is important to recognise the place-based knowledge and practices of Indigenous people in adapting to Australia's diverse environmental demands and changing environmental conditions. Alongside Indigenous people's capacities to endure rapid and unsettling social, political and economic change, Indigenous histories feature resilience and self-reliance in adjusting to extreme or adverse weather events. However, resilience is not a rationale for the provision of substandard housing.

Policy development options

The clearest area requiring policy development identified by this research is clarifying the intent of sustainability and the associated funding requirements for Indigenous housing under climate change. Addressing the inadequacy of funding to the sector would first ensure the expansion of housing supply, which is no longer guaranteed in many areas, despite demographic increases and continued crowding. Our modelling clearly implies that *occupancy* remains a major driver in determining the cooling needs of Indigenous housing. Adequate funding must:

- enable planned and responsive repair and maintenance systems that increase the lifespan of housing stock and facilitate householders to exercise daily healthy living practices
- reduce current levels of crowding since occupancy levels are a major factor in determining housing performance
- provide people with more accommodation options across various locations
- develop new construction techniques and design strategies to ensure healthy indoor environments for the coming decades.

To this end, policy for sustainable housing must interrogate what is being sustained and specify commitments to standards that cannot be compromised on behalf of 'balancing' competing economic, social and environmental priorities. In many Australian jurisdictions, inadequate Indigenous housing stock of substandard quality is what is being 'sustained'. Sustainable houses are built with structural integrity and robust materials, given climate and household compositional requirements, and are maintained in good working order through effective planned and responsive property maintenance systems. Such systems prioritise health hardware function, not just asset management.

Property maintenance programs are inconsistent across the social housing sector and regional and remote Indigenous housing poses additional challenges to maintaining housing at high levels. There is significant potential for the expansion of planned maintenance programs underpinned by both life-cycle costing and an understanding of housing as a health amenity. Multi-trade planned maintenance programs that are effectively managed promise reduced repair costs over the medium to long term whilst maintaining houses at higher function, compared to what responsive programs can achieve. In turn, planned maintenance programs are likely to improve health outcomes for householders, to support local employment more effectively and to reduce government expenditure in other sectors, especially where property maintenance is augmented by environmental health programs. It is likely that the more comprehensive redesigns and attendant maintenance required for housing to remain health-conferring under more extreme climate conditions will cost far more than is currently allocated to even standard issue housing. Using modified LCC frameworks, further policy-related research is needed to model these cost factors.

Planned maintenance programs should be further examined for their capacity to support local Indigenous employment. This report outlines factors that should be addressed for maintenance programs to provide such employment, which could be incorporated into proposals for remote employment reform, such as the Aboriginal Peak Organisations Northern Territory (APO NT) proposal to abolish the Community Development Program (CDP) to be replaced by a federally-funded Remote Development and Employment Scheme (APO NT 2020).

Current state and territory and federal housing policies and related bilateral agreements do not mention climate change nor adaptive measures for extreme weather events, and national schemes to improve dwelling thermal performance have no legal enforceability. These regulatory inadequacies will become more apparent with climate change and will be exacerbated by the scant detail on issues of housing quality and maintenance under current Closing the Gap commitments. The mandate to hold Indigenous housing construction, refurbishment and maintenance to high standards and key health considerations needs to be annexed to policy and funding. Intergovernmental discussions should take place to clarify funding strategies, ensure health hardware provision, establish standards for manufacturing and maintenance approaches, and plan for climate appropriate housing. Techniques such as better-designed window shadings, improved glazing systems, higher insulation standards, improved thermal mass and augmented natural ventilation must be placed at the core of Indigenous building design practice.

There is a vacuum of cross-jurisdictional engagement within the Indigenous housing sector. This means good practice in housing management and design is not broadcast, inappropriate housing continues to be built, and programs are not funded for best practice. There are gains to be made in the exchange of knowledge regarding the design of specific hardware items and economies of scale to be realised in the manufacture and distribution of new technologies.

Any improvement in Indigenous housing outcomes requires greater and sustained investment from the Australian Government. Improved engagement between state and territory housing authorities offers the potential to develop coherent strategies to compel federal commitments to sustainable funding, rather than intermittent or 'walk away' money. Governments might consider engaging AHURI as an appropriate body to support this policy dialogue.

The gap between present practices and the goals of instituting robust design and effective repairs and maintenance systems will become harder, not easier, in the coming decades. Tacit decisions are already being made not to 'over-invest' in climate-proofing legacy housing stock in outer regional and remote communities. At the least, these conversations should be made more explicit, to enable residents to have greater agency in deciding future options and for Indigenous organisations to determine appropriate responses. Covert policy withdrawal is an unacceptable resolution. Our preliminary analyses of methods for modelling the efficiencies that could be gained from more climate-ready designs and targeted interventions for intermediate gains suggest the benefits of acting early. Further research is also urgently needed to understand current housing performance, how R&M programs can support adaptation to climate change, develop design solutions and identify policy frameworks that Indigenous and other decision makers might consider, going forward.

The study

This report has sought to clarify what sustainable Indigenous housing requires now and into the future. We have targeted two regions—the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands in South Australia and north-western regional New South Wales (NSW)—to assess R&M requirements and the on-the-ground challenges of asset management in the context of climate change. In these contexts, Indigenous property and tenancy management practices are well developed and operating within relatively stable and highly principled organisational systems. We additionally simulated housing performance drawing on data from Borroloola (NT), Alice Springs (NT) and Moree (NSW) to represent the three climate zones (tropical, arid and hot/mild) where most Indigenous people in remote and regional Australia reside.

The research was conducted in partnership with Healthabitat, Nganampa Health Council, the Aboriginal and Remote Housing section of Housing SA and the Gunida Gunyah Aboriginal Corporation. Support for coding Housing SA data was provided by Dr Zoei Sutton, University of Adelaide. Support for virtual modelling for Indigenous housing was provided by Dr Aysu Kuru, University of New South Wales and Haniya Javed, University of Sydney. Additional pro bono support for climate data collation, analysis and visualisation was provided by the Sydney Informatics Hub Project Scheme, a Core Research Facility of the University of Sydney, and specifically by Dr Chao Sun and Dr Sabastine Ugbaje. Support for map design was provided by Isabella Sanasi. We employed a mixed-methods approach, comprising:

1. An evidence and policy review of literature on sustainable property maintenance models and climate change preparedness plans in Indigenous and other forms of social housing. The review also canvassed typical funding and policy settings at state, territory and federal levels and interrogated existing uses and definitions of the ubiquitous term 'sustainability', as it pertains to remote and regional Indigenous housing contexts. Emphasis was paid to material relevant to the case study regions of SA, NSW and the NT.
2. A program of empirical work conducted from July 2020 to February 2021. This involved 20 open-ended formal interviews conducted from July through November 2020 and fieldtrips to Alice Springs, the APY Lands and northwest NSW. Data analysis continued through to February 2021, using R&M log data from Housing SA, Nganampa Health Council and Gunida Gunyah Aboriginal Corporation; and Australian Bureau of Statistics (ABS) records of housing, demography and employment. Housing simulations were computed using transient thermal whole building simulation software, using field records taken in situ and architectural plans for characteristic housing types. Climate data was retrieved from the Queensland Department of Environment and Science and Bureau of Meteorology's partnership SILO data, the ABS, the Intergovernmental Panel on Climate Change and the American National Oceanic and Atmospheric Administration. Life cycle modelling used field data from this project and previous research.



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