POLICY EVIDENCE SUMMARY November 2021

Sustainable Indigenous housing in regional and remote Australia

Based on AHURI Final Report No. 368: Sustainable Indigenous housing in regional and remote Australia

What this research is about

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 context of this research

Current regional and remote Indigenous housing stock is unable to provide consistently healthy and comfortable indoor environments, often being substandard housing serviced by inconsistent repairs and maintenance that were not built with global warming in sight. 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.

Indigenous housing also needs to be sustainable in the context of climate change. For example, in central Australia there were 55 days above 40°C in the year to July 2019, which included the hottest summer on record and the driest in 27 years. In addition, more than one-third (38%) of remote Indigenous people over 15 years lived in crowded conditions in 2014–15, compared to 13 per cent elsewhere.

The key findings

In a context where the Australian Government appears to have stepped away from regional and remote Indigenous housing provision, and state and territory governments have not yet developed comprehensive and well-funded strategies for stepping in, extending the lifespan of existing housing through planned repair and maintenance of existing stock is essential.

Our additional data and analysis indicate that even well maintained housing will not be adequate for climate change. 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 with climate change.

Alleviating the health impact of crowding through design and property maintenance regimes therefore remains critical; while anticipating climate challenges must become more prominent in policy agendas.

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Climate change

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.

The research's simulation of the stressors experienced by housing (occupancy levels, the presence or absence of cooling technologies and the like), shows the worst absolute conditions in tropical climate zones. However, it is within the hot/mild climate zone, representing a typical Australian hinterland area, where the highest change in likely future energy consumption related to managing hotter conditions 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 comprehensively upgraded.

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. Bolder solutions are required.

Life cycle costing

Life-cycle costing (LCC) provides a conceptual framing for analysing the requirements of regional and remote Indigenous housing across the lifespan of the house. The three major life-cycle cost elements of a housing program are construction, operations and disposal.

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; and an essential requirement for improving the health and wellbeing of tenants. It also counters the tendency of policy makers, builders and property managers to implement 'quick fix' approaches without attention being paid to the economic, health and social consequences of their decisions.

The central aim of an efficient Indigenous housing capital works program is to minimise the life-cycle costs for dwellings without compromising on the quality of those dwellings. Effective design, high quality construction and the installation of appropriate technologies can reduce the proportion of life-cycle costs committed to operating and maintenance expenditure.

In both remote and very remote regions operating and maintenance costs are significantly higher components of the total life-cycle costs compared to the base case. In very remote regions 75 per cent of the life-cycle costs of a dwelling is related to operating and maintenance costs. Construction is a relatively minor component of the total life-cycle costs of remote and very remote Indigenous housing compared to operations and maintenance over time.

The cost penalties of emergency repairs are significant with the median cost of emergency maintenance and repair activities 75 per cent higher than planned activities. Investing in planned maintenance is thus likely to reduce life-cycle costs.

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Improving or replacing housing stock

Current housing stock, funding, and property maintenance regimes are not sufficient to manage the thermal exposure and health risks associated with climate change. Retrofitting existing housing stock to improve thermal and energy performance is overdue and necessary in the short term. However, without major refurbishments that exceed power hungry air conditioner and solar panel additions, (and without guaranteeing ongoing maintenance funding of such retrofits) any gains will be short lived.

Major refurbishments to increase the energy standard of existing stock would require removing and replacing wall cladding, installing insulation, replacing roofs, double-glazed windows, installing wrap-around verandas and shading systems and tree-scaping yards and streets, with air conditioning being a technology of last resort. However, these interventions are not mandated as policy.

CASE STUDY: South Australia

To show how existing housing can be sustained, and to indicate the expenditures required and the possible efficiencies that might be generated, the research analysed the housing repair and maintenance (R&M) work on the Anangu Pitjantjatjara Yankunytjatjara (APY) Lands undertaken by the South Australian Housing Authority (Housing SA), through its Aboriginal and Remote Housing section, and Nganampa Health Council (NHC).

Housing SA managers typically make monthly trips to APY Lands communities to assess housing stock, scope required capital upgrades, attend council meetings, consult with tenants, contractors and the Housing SA capital works and maintenance coordinators who work on the APY Lands. Nganampa Health Council supplement these visits with a comprehensive environmental health program that also takes in the yard and householder appliances.

The common hardware failures occurring on the APY Lands include electrical failures, air conditioner malfunction or breakdown, damaged and broken doors and door handles, missing screen doors and windows, blocked toilets, septic tank corrosion and appliance failure, especially stoves. Hardware failures were attributed to myriad factors such as the hardness of water, the dusty, arid landscape and the presence of insects, rodents and other animals (domesticated and feral). Crowding was also identified as another cause of accelerated wear and tear.

The total budget for the APY Lands maintenance program in the 2019–20 financial year was $3,726,237. The average spend per property is approximately $10,000 per annum. $500,000 is allocated from the total budget for vacancy maintenance, which aims to refurbish properties between tenancies.

The contract for housing maintenance on the APY Lands is awarded to a head contractor that provides multi-trade services through a combination of employees and sub-contractors. Importantly, lessons from the R&M field also inform Housing SA's construction program, providing an important feedback loop.

Areas of high maintenance cost

- Plumbing works accounted for the highest average number of jobs over the four-year period under analysis and constituted more than 20 per cent of all housing maintenance jobs in any year. In 2020 it constituted nearly half of all jobs undertaken. This work category includes internal work (related to sinks, bath, showers and laundries, taps, toilets and sewer drains) and external work (related to guttering, stormwater, hot water systems and rainwater tanks).
- General works constituted the second highest average number of jobs over the four-year period, accounting for around 18 per cent of all jobs undertaken on APY Lands housing, related to doors and windows, screens, locks, fixing and flushing, internal walls and ceilings, insulation, fencing, gates and roofing and tile repairs.
- Electrical works accounted for the third highest average number of jobs, constituting around 15 per cent of all R&M work, and includes repairs to appliances, lighting, circuit boards and wiring and smoke alarms. Air conditioning R&M constituted around 12 per cent of the total work.
- Fire safety, painting, cleaning, waste management and building works accounted for a small proportion of the total work in the program over the period 2017–2020. Travel is approximately 10 per cent of the budget. Given the cost pressures on remote R&M, it is likely that this proportion would be significantly higher (as it is elsewhere) if not for the planned delivery of works.

Case study outcomes

- Standardisation is important for cost-saving and time efficiency for maintenance and repairs.
- Contract bundling should be undertaken with care in other contexts, lest services be monopolised by an unsatisfactory provider. On the APY Lands, the relationship between Housing SA and the head contractor has been critical to success.
- The planned maintenance schedule has allowed Housing SA to maintain relatively low spending on travel costs, especially for one-off visits to address responsive work orders.
- The 'feedback loop' between property maintenance and capital works improves effective housing design and material function, and has contributed to increased efficiencies and innovative solutions to systemic maintenance issues.
- Contemporary crowding levels will place acute pressure on maintenance programs in the coming years.
- The environmental conditions on the APY Lands are extreme and impact the selection of appropriate hardware inside houses. There are significant issues related to remote water, sewerage and power infrastructures, with some communities at capacity in their serviced lot availability, power generation and water supply. Integration of environmental designs with housing design and maintenance programs are vital.

Employment opportunities relating to repairs and maintenance

Local employment

Planned maintenance approaches offer potential for local employment, including apprenticeships. Local workers also have a range of informal and formal knowledge and skills that contribute to their efficacy on the job.

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.

The potential for Indigenous housing to support sustainable employment remains under-realised. Housing construction projects generate jobs but can be sporadic and short-term. Repairs and maintenance, as ongoing requirements, could provide a more reliable source of sustainable local employment for local people who do not have extensive formal training, an issue which will become more pressing with climate change related impediments to external labour and logistics.

There is potential for cost savings in R&M programs through the direct employment of local unlicensed staff, but this depends on the availability of appropriate people and the capacity of an Aboriginal Community Housing Provider (ACHP) to train them. If established as a policy aim and properly resourced, such sub-contracting could include greater numbers of local Indigenous contractors.

The program's capacity to generate continuous local employment depends on the volume of work generated by the seven-year timeframe of the multi-trade contract, which also allows for apprenticeships that take a minimum four years to complete. Government contracts must exceed four years to facilitate apprenticeships.

Barriers to local employment

The challenges an employer faces in remote Indigenous communities are myriad, including the remoteness of the labour force; access to vehicles and tools; varying literacy and numeracy skills; licensing and safety regulations; limited capacity to insist on formal paperwork; an inability to obtain police clearances; and diseconomies of scale of work.

Limited literacy and numeracy skills was commonly identified as posing a barrier for local Anangu in terms of both undertaking the work required, and complying with employment practices such as government registrations and completing timesheets. The possession of limited official documentation was also frequently mentioned as posing a logistical barrier to the employment of local people.

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CASE STUDY: New South Wales

This case study draws on data gathered in collaboration with Gunida Gunyah Aboriginal Corporation (GGAC) in north-west NSW and information from the NSW Aboriginal Housing Office (AHO), to describe ACHPs and the housing stock that they manage.

The Climate Change Policy Framework and Climate Change Fund: Draft Strategic Plan commits the NSW government to manage impacts on government assets and services, but responsibility for adaptation measures is devolved to local governments, businesses, communities, and individuals.

Gunida Gunyah Aboriginal Corporation's systematic navigation of mixed housing stock inheritances within its property management program represents an exemplary version of Indigenous-controlled service provision and tenancy management in NSW. However, the inadequacy of existing housing stock to manage heat stressors, water variability and population migrations is a national blind spot in policy discussions and funding allocations targeting Indigenous housing and health.

In remote and outer regional areas, it is likely that increased seasonal and permanent movement of residents in response to climate change will strain services in regional towns and metropolitan areas. While partnership with governments is essential, Indigenous aspirations and strategies need to at the centre of any strategy.

What this research means for policy makers

Policy development options include:

- keeping existing housing stock in good repair via well planned, reliably funded and effectively implemented repair and maintenance programs. Consistent R&M additionally offers greater opportunity for sustainable local employment
- reducing the impact of crowding by providing new stock, adding space, and ensuring functioning health hardware
- providing people with more accommodation options across various locations
- adopting LCC models to meaningfully account for asset management costs over time can reduce the downtime for major repairs, waste and environmental impact while increasing overall asset value
- refurbishing existing housing to improve energy efficiency and environmental cooling properties to offer immediate living condition improvements
- sponsoring research and development on economical design solutions for climate-ready housing and related investment requirements
- designing houses that reflect how they will be used and within what kinds of climate pressures, to ensure they perform adequately now and into the future
- enshrining rigorous design standards and systematic R&M responsibilities within enforceable legislative and funding frameworks.

Methodology

This research reviewed literature on sustainable property maintenance models and climate change preparedness plans in Indigenous and other forms of social housing, with emphasis on the case study regions of SA, NSW and the NT, in combination with ethnographic fieldwork and interviews with stakeholders from appropriate state housing and Indigenous housing authorities.

The research additionally simulated housing performance drawing on data from three climate zones where most Indigenous people in remote and regional Australia reside (namely, the tropical, arid and hot/mild climate zones). The researchers created a simple typology of a standard (existing) and an improved (that is, modified to meet current design recommendations) three-bedroom house, as the base models to then compute housing performance using transient thermal whole building simulation software.

A total of 366 simulations were conducted, testing the performance of standard and improved housing using different variables: temperature, humidity, ventilation, crowding, mechanical cooling and heating. All settings were then additionally modelled with climate change scenarios suggested by the Intergovernmental Panel on Climate Change, taking (optimistic) scenarios where global warming is held at 1.5–2.0°C.

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