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## KA MUA, KA MURI: DESIGNING WHENUA-BASED KĀINGA FOR A CLIMATE-RESILIENT FUTURE

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# KA MUA, KA MURI: DESIGNING WHENUA-BASED KĀINGA FOR A CLIMATE-RESILIENT FUTURE

James Berghan, Fiona Cram, Violet Pou and Kathleen Morrison

## INTRODUCTION

Kia whakatōmuri te haere whakamua  
I walk backwards into the future with my eyes fixed on my past

Housing and home ownership continue to be some of the most pressing issues for Māori. Māori home ownership rates are consistently lower than non-Māori (Stats NZ, 2020), with flow-on effects such as increased mobility, reduced stability and limited potential for intergenerational wealth transfer (Statistics New Zealand, 2016; Goodyear, 2017). However, concepts of 'home' for Māori extend beyond physical dwellings to encompass broader connections with whānau, whenua and whakapapa (Cram, 2020; Boulton et al., 2022). These understandings remind us that strategies to address Māori housing must go beyond physical structures to consider what Māori need to be genuinely 'at home'.

A range of toolkits now support culturally appropriate housing for Māori, including Te Puni Kōkiri's *A Guide to Papakāinga Housing* (2017), regional resources such as the Waikato, Heretaunga and Te Tai Tokerau papakāinga toolkits and specialised guides like *He Keteparaha Tēnei Mō Te Whare Kaumātua: A Toolkit for Kaumātua Housing* (Reddy et al., 2019). Increasingly, these resources are contributing to more culturally grounded housing solutions. However, despite advances in Māori housing guidance, a significant gap remains in understanding how to develop climate-resilient housing for Māori that honours te ao Māori and strengthens connections to the whenua and te taiao.

The whakataukī above describes Māori as drawing on the taonga (treasures that include the whenua, mātauranga and tikanga) handed down to us from our ancestors, to help ensure the resilience, viability and sustainability of generations to come. For many Māori communities, these taonga inform responses to the challenge of building warm, safe and affordable homes in the midst of climate risks that threaten land, infrastructure and wellbeing (Johnson et al., 2021). Climate change stands as one of today's most urgent global concerns and "is a threat to human well-being and planetary health" (IPCC, 2023: p. 33). Although climate change affects all New Zealanders, hapori Māori face disproportionate impacts. As noted by Te Puni Kōkiri (2023):

Despite Māori households having similar exposure to climate hazards as the overall population, they are projected to face greater risks due to a higher proportion of Māori households at risk related to poverty, health disparities, justice and protection concerns.

At the heart of this research is the principle of tino rangatiratanga: the right of Māori to exercise authority over their lands, resources and ways of living. This right is affirmed in Te Tiriti o Waitangi and reinforced through contemporary frameworks such as the Waitangi Tribunal's WAI262 report. Housing, when framed as an expression of self-determination, becomes more than a physical structure: it is a platform for sustaining whakapapa, reconnecting with whenua and enacting Māori aspirations for the future. In the context of climate change, realising tino rangatiratanga means enabling whānau to design, build and govern kāinga in ways that

reflect their own tikanga, values and relationships with te taiao. This framing informs not only the kaupapa of the research, but its methods and approach to engagement.

This paper draws on findings from “Ka mua, ka muri”, a research project focused on initiating meaningful conversations with whānau about the dual challenges of housing provision and the climate crisis (see below). We ask: *how do you start conversations with whānau about these intersecting issues?* While resilience is often framed in biophysical terms such as siting homes away from hazards and designing climate-responsive whare, we argue for a more holistic approach that incorporates whanaungatanga and social cohesion. Housing that fosters strong connectivity among whānau can enhance collective resilience in the face of climate-related and socio-economic challenges. These insights resonate with a growing body of international Indigenous scholarship that emphasises self-determination and ancestral knowledge as vital components of planning for climate change futures (e.g. Whyte, 2017; Osborne et al., 2024). By exploring both the practical and relational dimensions of Māori housing resilience, this research contributes to ongoing discussions about sustainable and culturally responsive housing solutions for Māori communities and Indigenous communities globally.

The remainder of this paper is structured as follows. Next, we introduce the approach taken for this research. Then, we explore three key themes that emerged: (1) how whānau defined and expressed resilience through both physical and non-physical design features; (2) how resilience could be embedded in design practice; and (3) the barriers that whānau face in realising those aspirations. We conclude with reflections on future directions for research, design and practice in this critical intersection of housing and climate adaptation.

## RESEARCH APPROACH

This paper presents a subset of results from a larger research project called “Ka mua, ka muri: Connecting tāngata to whenua through housing”. The project was carried out from 2023-2024 and was funded from the Building Research Levy administered by BRANZ. Ethical approval for this study was granted on 24 January 2023 from the University of Otago (Category B – Departmental Approval).

This study employed an innovative kaupapa Māori design research approach to respond to an over-arching question: *What could climate-resilient kāinga look like for whānau looking to reinstate pā sites on their whenua?* We held two wānanga over three days with whānau at Pahaoa Marae in the Bay of Plenty. The first, a two-day wānanga, was held on 28-29 January 2023 and involved 18 participants (15 wahine, 3 tane). The second wānanga, lasting one day, was held on 9 September 2023 and included 10 participants (8 wahine, 2 tane), with nine returning from the earlier wānanga. Participants were primarily residents of the local rohe and were recruited using a snowball sampling method, led by two community researchers on the research team and in consultation with the Pahaoa Marae committee. Potential participants were identified and invited, with an open invitation for them to bring along others who may be interested in the kaupapa.

Both wānanga incorporated activities, presentations, kōrero and breaks for kai. The first wānanga focused on notions of home, Masterplanning and innovative housing solutions, whereas the second wānanga explored whānau ideas of a ‘dream whare’ and ‘dream kāinga’ to explore more detailed and nuanced aspects of what it means to live well and to live together. Group kōrero from both wānanga were audio recorded and manually transcribed by the lead researcher. A second member of the research team also kept written field notes during both wānanga which were added to supplement transcriptions. The combined set of field notes were thematically analysed using Braun and Clarke’s (2013) six-step approach for thematic analysis beginning with reviewing transcripts, iteratively coding and evolving those codes into defined themes and writing up the analysis by weaving those themes into a cohesive narrative. This paper includes relevant quotes to ensure participant voices are present throughout. Given the collective nature of the wānanga and data collection, quotes are not ascribed to certain individuals. Rather, they represent the collective nature of wānanga discussions.

The lead researcher engaged in ongoing hui with the Pahaoa Marae committee (two members of the research team are also part of the marae committee) before, during and after the wānanga to centre local perspectives and priorities in the work. This included presentations to a wider hapū hui with draft findings from the project for feedback.

## FINDINGS AND DISCUSSION

This section presents three interconnected themes that emerged from the wānanga. These themes reflect not only what climate-resilient kāinga might look like, but also how whānau defined resilience, their aspirations in design and the challenges they face in realising those aspirations.

### *Theme 1: Defining resilience through a whānau lens*

Throughout both wānanga, whānau views of resilience were broad. For many participants, resilience began with secure access to ancestral whenua and was sustained through relationships – with whānau, whenua and with one another:

*...for anything to happen, to get those results, to get the safety and the aroha [i.e. outcomes of a good home], you need a solid foundation. The first thing we talked about was securing the land.*

From this foundation, kāinga was described not simply as a set of houses but a lived expression of relationality and shared responsibility:

*It's about the collective...instead of having individual risks and individual bills, it's about coming together. Everybody wants safe, clean water, power...we all want access to that, so why not do it collectively?*

In this way, resilience (and climate-resilient kāinga) was understood as being deeply relational and interdependent as much as it is technical. This supports other research which has highlighted the importance of social connectivity for Māori resilience (Lambert, 2013; Awatere et al., 2019). That said, participants acknowledged very real material threats such as flooding, drought, wind, sea-level rise, slips and power cuts. In one example, a participant described how a recent landslide nearly cut off road access:

*There was a slip. Luckily it went over the road, but it came down through a creek and all the slash...if it had taken that road out, we would've been bugged...it would be a nine-hour trip back to Ōpōtiki (instead of 45 minutes).*

Importantly, the capacity to be resilient was framed as something collective, not individual. Participants repeatedly returned to the importance of whanaungatanga, communal decision-making, intergenerational thinking and the ability to lean on one another in times of need. Resilience was about living well together and designing environments that support whānau “from the cradle to the coffin”. This meant accommodating the needs of rangatahi and tamariki (the ‘future generations’) but equally, our kaumatua and kuia and everyone in between.



## Theme 2: Designing for resilience in practice

While part of being resilient meant having the ability to withstand increasingly frequent and severe weather events, conversations about resilience also raised deeper questions about how we live and how we might live differently to avoid worsening those impacts:

*I'm very concerned that...one day a big storm will hit us and we will go, why didn't we [do something]? We're still stuck in a way of living that we've been used to and we think that that's going to be sustainable...*

When we turned our attention to the practicalities of designing whare and kāinga through a resilience lens, a diverse range of aspirations emerged. Whānau envisioned homes that could adapt to local environmental conditions, with passive design strategies playing a central role. Many spoke of designing with the whenua rather than against it, siting homes into the landscape to provide shelter from prevailing winds and orienting them to maximise solar gain in winter and shade in summer:

*How do we approach building within the land? Like our old kāinga? Because [if] you actually lower your home, it's not sitting above the land, it's within the land and becomes quite protected from things like wind...the wind is sort of...just coming over the land, it's not catching on the house.*

There was also a strong interest in energy resilience. Participants expressed interest in using local, sustainable materials and designing systems that could operate independently from centralised infrastructure. When designing their dream kāinga in one of our wānanga activities, participants saw off-grid solutions including solar panels, water wheels and multiple power sources as essential in the event of infrastructure failure:

*[In my dream kāinga design] I wanted to have multiple power sources...gas, electricity, water wheel...*

*I'd love to see a community off the grid...[our design has] got solar, wind and rain. Because you're guaranteed to get one type of weather here.*

Design aspirations also extended beyond individual whare to consider the benefits of shared infrastructure and communal living. Many participants saw collective facilities such as shared laundries, māra kai (food gardens) and even shared transport systems not only as practical and environmentally responsible, but as ways to strengthen social ties and interdependence:

*Why do we all need individual cars, when we all end up going to the same place, like the supermarket? I'm a firm believer in [the idea] that you should share your cars, but people just don't like doing it...you've got individual cars, you've got individual driveways, individual roading costs...if we're wanting to be clever, that's what you start eliminating, what we really don't need.*

This raises the question of whether lessons can be learnt from other collective-focused housing models such as cohousing, where shared infrastructure is built into design and community function (e.g. James & Saville-Smith, 2017; Berghan, 2020). At the same time, participants acknowledged challenges of sharing. Trust, communication and clear tikanga would be critical to sustain collective systems, especially for shared spaces that require upkeep:

*I don't mind shared facilities, but I'd like to know there's some sort of arrangement for who cleans and when...*

*Working out how we can work together, as a collective. Like a code of behaviour as well. How do you talk to your family about no Holdens being tied up to the fence for 100 years? That sort of thing.*

Taking time to educate prospective kāinga residents on what it means to live collectively is an important consideration that should be built into any potential development (Dupuis & Dixon, 2006; Berghan, 2020). These kōrero showed that designing for climate resilience is inseparable from designing for the way we want to live together. It is not just about buildings, but about relationships – with the whenua, with each other and with future generations.

## Box 2: Designing a dream whare.

In the second wānanga, participants spent time designing and presenting their dream whare. These aspirational images captured several ideas expressing sustainability and energy resilience, including buildings embedded in the whenua, long roof lines which transformed into greenhouses with rainwater directly watering the māra kai, solar panels and more.

Figure 2 shows one dream whare. The modular design begins with a core living unit and expands as finances allow to include greenhouse modules, a carport and a multi-purpose room for mirimiri, crafts and for guests to stay in. The modules are arranged in a horseshoe layout, allowing for a covered courtyard to be constructed between the modules as a sheltered, collective space at the heart of the home.

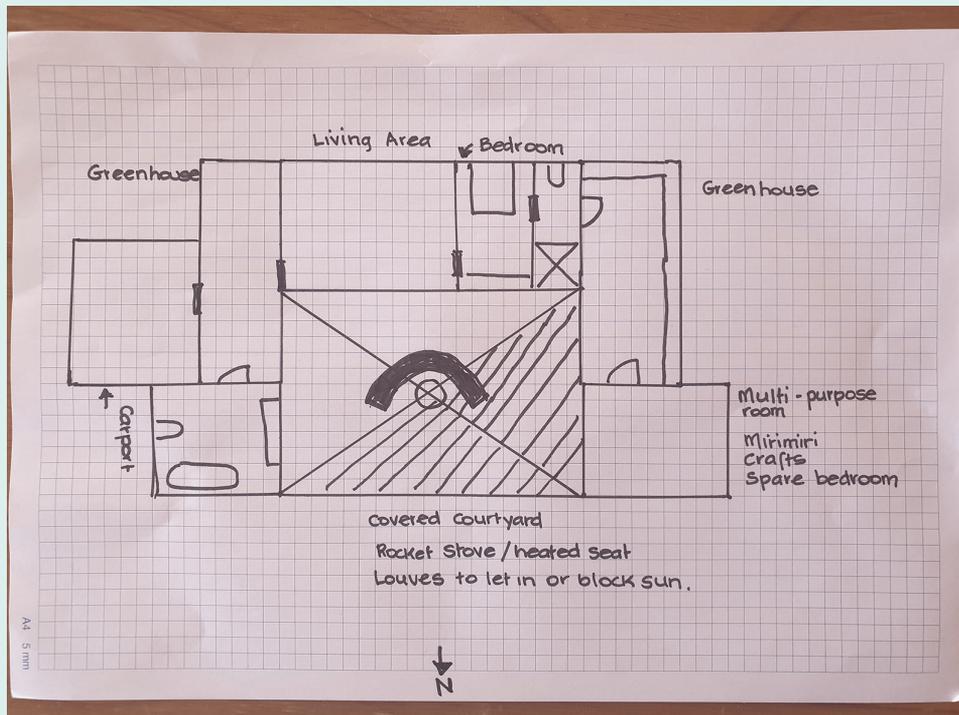


Figure 2: A sketched design for a dream whare by a wānanga participant. Photograph: by authors.



Financial constraints were the most consistently cited obstacle. Whānau described a tension between their aspirations for bespoke, sustainable homes and the financial realities. High costs of land development, infrastructure, building materials and compliance processes meant that affordability often overrode other priorities including environmental sustainability. These issues are well-documented: Māori housing developments often face high costs due to infrastructure shortfalls and challenges accessing finance, especially when development is on multiply-owned Māori land or involves non-traditional tenure options (Controller and Auditor-General, 2011). Until recently, there has been very little government or financial support for such aspirations (Arbury and Cram, 2023). In our study, participants noted that innovative designs, such as off-grid systems or collective living arrangements, could fall outside the norms recognised by banks and insurers, making it harder to secure funding or cover:

*The biggest barriers are the funding, the money. Bespoke, climate-resilient homes are probably going to cost more than others, you might not be able to get insurance for them, it's that sort of stuff...*

Regulatory processes also emerged as a major source of frustration and inertia, consistent with previous work on systemic inertia in planning policy frameworks in Aotearoa (e.g. Manning et al., 2015). Many participants spoke about the complexity, cost and slow pace of gaining council consents, especially when working with Māori freehold land. While some acknowledged positive experiences with individual council staff, the overall planning system was seen as poorly equipped to support whānau-led, collective, or non-standard developments. The emotional toll of dealing with these bureaucratic processes was tough, with participants describing feelings of being overwhelmed or worn down by repeated obstacles.

Another key tension lay in the mental and emotional challenge of planning for long-term resilience while grappling with immediate needs. For whānau experiencing housing precarity, financial pressure, or other urgent stresses, conversations about climate adaptation could feel distant or abstract. Participants recognised the importance of future-proofing their kāinga, but also spoke of the difficulty of holding onto visionary thinking when immediate needs dominate:

*I found it hard to think about a dream home because I don't have the finances to kind of, think green...to extend beyond what I have and can alter. So, it's a bit limiting...*

Despite these challenges, the overall tone across the wānanga remained hopeful. Participants saw these barriers not as reasons to abandon their visions, but as realities to be navigated with creativity, persistence and collective strength. In the words of one participant, “the obstacles need not be total obstructions.” Consistent with literature, this hopeful pragmatism was grounded in a recognition of the diversity and innovation across whānau and whenua (Johnson et al., 2022), along with an openness to adapt ideas to different contexts, drawing from ancestral knowledge and modern tools:

*Because we all come with a different whenua, we're all going to be innovative in different ways. And there will be some things that we can cross-pollinate and maybe adapt for different contexts and, by that perspective, innovation is not bound...*

*Not being limited by our past, or how homes have been in the past. Not being stuck with those limitations, but really letting our imaginations run free so that we can have the best of what our tīpuna used to have but also have the best that modern technology has to offer.*

In this way, whānau demonstrated a powerful capacity to imagine through constraint, to keep advancing toward climate-resilient futures.

## CONCLUSION

This research underscores that resilience is built through connection, not just construction. It must be grounded in relational values of whanaungatanga, whakapapa and connection to whenua. Climate-resilient kāinga, in turn, are not only those that can withstand storms and rising seas; they are expressions of collective identity and care. Participants shared that true resilience would require us to think differently about how we live together – sharing infrastructure, valuing communal spaces and building social cohesion through design.

At the same time, not everyone is starting from the same place. Supporting climate-resilient futures means walking alongside whānau wherever they are in their housing journeys and ensuring solutions do not leave anyone behind. The challenges whānau face to achieving this are both physical and non-physical: while climatic impacts like high winds and flooding pose obvious risks, so too do less visible forces like regulatory red tape, housing precarity and social isolation.

While this rangahau was limited to one area and one point in time, the insights gathered here point to clear implications for policy, planning and design. First, they highlight the need for regulatory frameworks and funding models that are flexible enough to accommodate collective ownership, intergenerational design and non-standard infrastructure. Second, they reinforce the value of supporting kaupapa Māori-led design processes that centre whānau aspirations from the outset. Third, they call for housing initiatives that go beyond compliance and consultation to co-creation, making space for the richness of Māori ways of living and being.

To move from kōrero to action, further research is needed to test these ideas in practice. This could include piloting small-scale kāinga developments that incorporate whānau-led Masterplanning, off-grid systems and shared infrastructure, with built-in support for tikanga-based governance and collective living arrangements. Comparative case studies could also explore how different whenua contexts, iwi-led initiatives, or design typologies support or constrain climate resilience.

Overall, this project points to the need for a shift in how we think about housing, not just as infrastructure and shelter, but as a vehicle for collective wellbeing. Climate-resilient development is anchoring our responses to environmental change in the taonga handed down to us by our tūpuna. As a participant reminded us, it is not just about bricks and timber:

*Look at your Masterplan. And it's not just a plan for housing. It's a whānau plan. It's not just 'how are we gonna do housing'. What's our Masterplan for our whānau?*

In doing so, we take a step toward restoring tino rangatiratanga by designing futures where whānau can thrive, on their own whenua, in their own way.

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