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Housing as critical social and economic infrastructure: A decision-making framework

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Housing as critical social and economic infrastructure: A decision-making framework

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Abstract. Housing is an important social and economic asset for society. However, increasing costs of living and demand for affordable housing is outpacing supply in Australia. Governments and housing providers, particularly community housing providers, are grappling with these challenges. This paper discusses steps towards building a more rigorous, evidence-based approach for social and affordable housing provision in Australia. It is proposed that housing be considered like other critical social and economic infrastructure such as schools, hospitals and civil infrastructure (i.e., roadways). The paper presents findings of Australian industry-led social and affordable housing research undertaken between 2014 to 2020. Past and current research findings inform the decision-making framework, including: (i) a productivity-based conceptual framework; (ii) the establishment of nine impact domains including meaningful and measurable outcomes and indicators; (iii) a composite return on investment approach which addresses the broader benefits of access to safe and secure housing; and (iv) thirteen elements being used to map the complex and integrated social and affordable housing network. The emergent decision-making framework resulting from this longitudinal study will be a critical tool for government and social and affordable housing providers to achieve economically and socially sustainable outcomes.

1. Introduction

Effective and appropriate provision of social housing is increasingly difficult given on-going fiscal constraints and increasing and unmet social and affordable housing need. In Australia, in 2019 (prior to the impact of COVID-19 pandemic), the unmet need for social housing was estimated at approximately 437,000 dwellings [1]. However, this is not unique to Australia with global figures indicating a significant shortfall between demand and supply of social housing. In the United Kingdom (UK), The Guardian reported a national shortfall of more than 800,000 social housing dwellings [2]. In Canada more than 140,000 families are awaiting rent-subsidised housing in 2015 [3], and in the United States the social housing crisis is acutely experienced with a shortage of 5.3 million affordable housing units reported [4]. The global COVID-19 pandemic has only further exacerbated the gap in social housing provision as societies and economies struggled to address the health and wellbeing crisis. It is therefore vital that an economically and socially sustainable framework, supporting housing as essential infrastructure, is established. which shifts the focus from a cost versus revenue model (operating deficit), to a return on investment (ROI) approach that values social and economic benefits (benefits gained rather than the costs of provision).

To meet this challenge, many innovative models are being explored both in Australia and internationally, through partnerships and financing arrangements involving a mix of public, private and not-for-profit (NFP) agencies. This approach is currently compromised in Australia given bi-lateral

arrangements between Federal and State agencies no longer provide a collaborative forum to advance research and policy development supporting investment in social and affordable housing on the basis of realised social and economic benefits (i.e., beyond relative funding contributions). It remains important however, to contextualising housing need across this spectrum to effectively address this challenge. Partnerships need to be supported by frameworks which appropriately address not only short-term financial benefits but also long term social and environmental returns.

This paper presents research findings from a longitudinal program of research, including an emergent decision-making framework proposed as a critical tool to help government and social and affordable housing providers achieve economically and socially sustainable outcomes. The paper discusses industry-led research undertaken in Australia from 2014 that has sought to create an evidence base which supports investment in social and affordable housing, across government, the private sector, and NFPs (Figure 1).
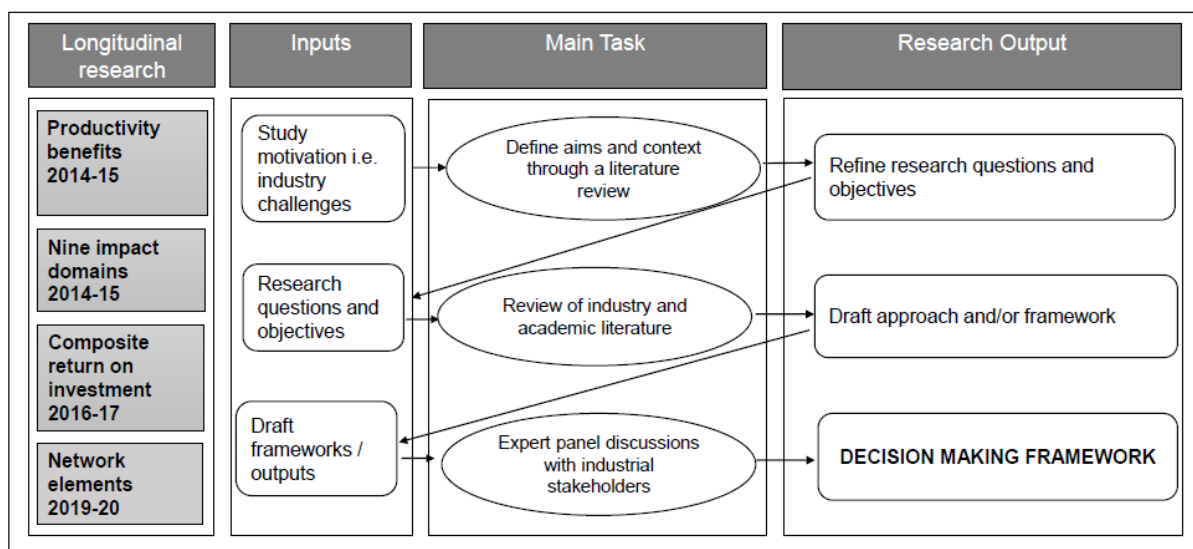

Figure 1. Longitudinal research program for social and affordable housing

The research has contributed to a strengthening of the policy environment for housing, through aiming to provide an equal standing with other essential forms of social and economic infrastructure, such as schools, hospitals and roadways. This has been done through establishing evidence-based frameworks which address both quantitative and qualitative benefits and impacts across housing and associated non-housing-based outcomes. The key research findings to date are presented in this paper including: the productivity-based conceptual model; the nine impact domains; the composite return on investment approach; and thirteen elements developed to map the social and affordable housing networks. We conclude by presenting the decision-making framework which integrates this research to facilitate new thinking around housing as critical social and economic infrastructure. These conclusions also discuss current barriers for policy makers and those delivering housing and service outcomes across Australia

2. Building the evidence base for the decision-making framework

Housing provides a foundation from which we build our lives, with widely acknowledged links to and impacts upon many other aspects of daily life, including our health, economic security, education, employment, social engagement and neighbourhood security. This requires that the social, cultural, environmental and economic facets of housing are addressed [4, 5], and that the key role of housing in both individual and national productivity is recognised and understood. Social housing is now becoming recognised as infrastructure, evidenced by inclusion in both national and state infrastructure plans [6, 7]. However, an agreed methodology to measure benefits derived from social housing assistance is yet to be established. 'Social infrastructure, and the services it supports, not only enables Australians to live better lives, it delivers substantial direct and indirect benefits to the nation's economy' [8, p.546].

Government agencies are developing resources and tools which acknowledge this broader need. The complexity of delivery and upgrading social housing portfolios is discussed by [9]. The authors highlight partnering arrangements, legal frameworks, master-planning arrangements (sometimes over a decade or more), financial packaging and the need for interim re-homing of residents in the case of urban renewal projects as some of these [9, p.325]. Each State has addressed this complexity in unique ways. In Queensland, State Government's Business Case Development Framework (BCDF) includes guidance notes on cost benefit analysis, benefits management, investment logic mapping (ILM), stakeholder engagement and social impact evaluation [10-12]. The Cost Benefit Analysis Guide addresses both qualitative and quantitative costs and benefits requiring 'strategic assessment, service need and demand analysis, social impact evaluation, sustainability and environmental assessment, financial analysis, and risk and benefits analysis'[12]. Frameworks such as the BCDF, whilst cumbersome in practice, could become enablers for more innovative considerations in smaller projects with the right stakeholders involved. They can provide a robust tool across a housing portfolio which could lead to more rigorous and substantial budget requests to Treasury, and reinforce the need for innovation in policy, investment, design and delivery. The Victorian Government's ILM, when conducted in alignment with the Queensland State infrastructure planning process provides a list of initiatives from the outset of a project that any investment decision must tick off in a priority of: 1. Reform (highest priority), 2. Better Use, 3. Improve Existing, and 4. New Build (least preferred) [13]. Findings of this program of research can thus be used to inform this changing focus on housing as critical social infrastructure.

The longitudinal study inputs into the decision-making framework reported on in this paper has adopted an exploratory approach which has included literature reviews and expert panel engagement with key government, not-for-profit and industry stakeholders. Drawing upon both academic and industry literature, a theoretical foundation defining productivity benefits, nine impact domains, a composite return on investment approach and network elements was established to inform the decision-making framework. Table 1 presents a summary of the key components, methods and the affiliated projects.

Table 1. Summary of the key components and methods.

Key components	Method/s
Productivity-based conceptual framework	Through a review of academic/industry literature, and expert panel input, benefits were mapped aligned with individuals, industry, government, the economy, environment and community.
Nine impact domains	Drawing on academic and industry literature, a set of outcomes and indicators was identified, and the nine domains of community and culture, education, employment, environment, economy, health and well-being, housing, social engagement, and urban amenity established. An expert panel was engaged with to finalise the domains which underpin subsequent research.
Composite return on investment approach (CROI)	After a review of academic and industry literature, a gap in the approach to identifying benefits was identified. Following focus group discussions with key stakeholders from industry and government (local and state) the CROI approach was established.
Network elements	Development of these elements was informed by previous research and a review of literature. Network maps for then in conjunction with 11 industry experts in focus group discussions

2.1. Productivity-based conceptual framework

Explicitly defining the productivity benefits of access to safe and secure housing is proposed as a key lever for improving the supply of social housing. Pawson and Pinnegar note the for "future economic productivity and efficiency" need to be considered alongside social good outcomes [9, p.327]. The French Commission in the Measurement of Economic Performance and Social Progress highlight those traditional measures for non-market services such as social housing have been based on inputs rather

than outputs. 'An immediate consequence of this procedure is that productivity change for government-provided services is ignored, because outputs are taken to move at the same rhythm as inputs' [14, p.26]. Through identifying and quantifying the productivity benefits which may arise from such investment all levels of government, and the private sector, can better engage with provision. This requires a broad understanding across the housing and non-housing outcomes and impacts of housing, for both the individual and society.

The impacts of productivity improvements in the design and construction of housing is widely addressed elsewhere and not expanded in this paper. However, impacts relating to individual, macroeconomic and fiscal outcomes of providing access to housing are considered [15-17]. Here productivity is considered as a 'measure of the effectiveness of the use of resources in the production of defined outputs' [15, p.3]. For example, what are the revenue impacts when access to housing produces benefits in other areas of government expenditure. There is 'growing recognition by business and governments that housing outcomes may already be constraining national growth or imposing undue expenditure costs on other budgets (e.g., homelessness effects on health)' [16, p.1]. Most recently the authors of the tri-nation Shaping Futures report note 'the major elements in a new narrative for housing policies goes beyond 'needs' approaches and highlights the productivity and equity effects of housing outcomes that can be convincingly included within an 'evidence-informed' approach to policy advocacy and design' [18, p.99]. And whilst the productivity focus is now broadly accepted, the value of equity remains understated.
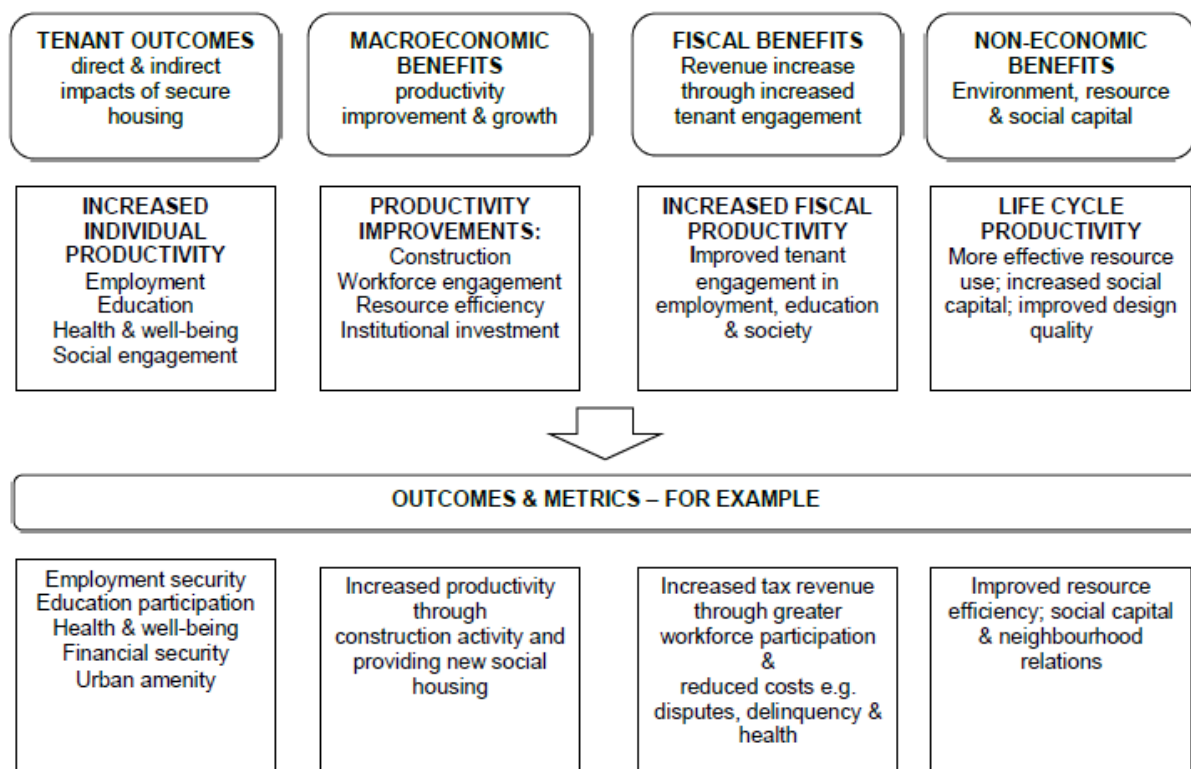

Figure 2. A productivity-based conceptual framework for social housing

To better define these impacts four aspects of productivity were identified:
- for the individual in terms of better engagement with employment, education, health resources and further to a sense of self efficacy and greater social engagement.

- for the nation through improved macro-economic via increased workforce engagement and housing construction.
- fiscal benefits from potential reduction in required social services.
- for non-economic productivity improvement, associated for example with the creation of improved social and environmental capital.

This productivity-based conceptual framework enables consideration of the benefits of housing for both the individual and for society more broadly. This is supported by the broad range of housing and non-housing outcomes identified which can be attributed (to varying degrees) to having safe and stable housing (Figure 2).

2.2. Nine impact domains
The nine impact domains provide a way to consolidate an expansive existing array of outcomes and indicators collated from multiple sources (e.g., strategic plans and policy evaluation documents), to help build rigor around and inform policy making and delivery. Associated with each of the indicators was attribution details (where available), data sources and references for further investigation [19]. Over 60 outcomes and 183 indicators were considered relevant and allocated into the nine domains as part of that research: community and culture; economy; education; environment; employment; health and wellbeing; housing; social engagement; and urban amenity.

Development of the nine domains included an extensive review of literature through which researchers compiled previously used outcomes and indicators from various disciplines with links to social housing. This breadth is critical to address the broad impacts and benefits of providing social housing including workforce participation; supporting family life and work family balance; supporting the health and wellbeing; enabling ageing in place; the creation of safer, stronger communities and community building processes; promoting independence; the creation of community spaces; and education and skills development [20, 21]. Selection and allocation were tested through expert panel involvement which included government, NFP and private sector stakeholders. A key aim was to provide both government agencies and community housing providers with additional resources to help them measure outcomes and better articulate the broader community value of providing housing security.

In practice, the nine domains and associated research findings have been used to validate the mission and many assumptions on which Creating Positive Futures (a social outcome focussed organisation) operated [22]. This has provided rigour around the impact of building houses, including job outcomes, and supporting one vision of having the cohort who may live in homes build them. The nine domains validated CPF's anecdotal observations, assumptions and commitment to their housing strategy as a part of a strategic social housing tender process. CPF have subsequently used research findings in bids to track alignment between government tender requests and policy around aligning the delivery of social housing targets and job outcomes [23]. CPF adopted the approach that a social housing proposal could be measured now beyond the capital dollar value, or value against taking someone off welfare for a period of time, and be referenced to compound social return on investment criteria. The project could now be a 'creation of incentives for workforce participation', potentially supporting all of the nine domains. Further to this, since adopting the nine domains CPF the observed benefits include:

- More ready alignment with the benefits of social enterprise labour in culturally and linguistically diverse groups to client objectives (both public and private sector).
- Compounding benefits across the 9 domains, with a commercial project fulfilling the corporate social responsibility objectives for private sector and local government affiliates, whilst at the same time, delivering work experience benefits and qualitative enhancements to a individuals' self-esteem and network. The later outcomes which cannot be monetised, with individuals receiving life-long benefits from this engagement.

- Through the CPF demonstration of the benefits of the nine domains approach, they anticipate, expect and are able to deliver on future tenders that will require a growing number of indicators across the nine domains.
- Using this structure and framework for proposals assists in decision-making around partners, materials and locations, enabling a greater discernment around and impact for investment.

2.3. Composite Return on Investment (CROI)

All the above contributes to better identifying return on investment (ROI), in a way which can inform investment decision-making in housing as infrastructure. A significant array of tools and approaches were identified to account for ROI (Table 2).

Table 2. Tools and approaches for accounting for ROI.

Tools and approaches	Brief definition	References
Cost benefit analysis (CBA)	Considers ratio of housing costs to value of housing benefits.	Fujiwara and Campbell 2011
Cost effectiveness evaluation (CEE)	Examines disaggregated housing costs to tenant outcome measures.	Pawson et al. 2014 Parkinson et al. 2014
Financial feasibility analysis	Compares development costs per unit of supply to industry benchmarks in the area.	Milligan et al. 2007
Post-occupancy evaluation	Determines what occupants think about building quality in terms of standards and design.	Milligan et al. 2007
Social cost benefit analysis	Assesses net value of a policy or project to society.	HM Treasury 2011
Social impact value calculator	Supplies values listed in Social Value Bank to community investment activities.	Campbell Collaboration 2014
Social return on investment (SROI)	Measures impact of a project, program, enterprise, organisation or policy by analysing value created from social outcomes compared to the investment.	Dunn 2014
Wellbeing valuation analysis (WVA)	Provides values for impact of a situation on the average person's well-being.	Fujiwara 2014

It is argued that while tools and methods may effectively provide information on the economic costs and benefits of a program or activity, they lack rigour when accounting for social outcomes and impacts which are less easy to quantify [5]. A single method to articulate return on investment cannot capture the complex nature of the value returned to society and the individual. Two methods were identified as providing complementary understandings for establishing an approach to understanding broader return on investment: (i) Social Return on Investment (SROI); and (ii) Wellbeing Valuation Analysis (WVA).

SROI enables organisations to measure the broad benefit to society derived from their operations, in addition to the traditional monetary returns, which is increasingly important with the rise of social benefits bonds and the like. The intent of SROI is to provide organisations with a ratio of inputs to impacts; and to calculate the dollar value of social impact compared to cost of the benefits provided [24]. This approach was developed in 2000, by the Roberts Enterprise Development Fund in the US, with early adoption occurring in Australia around 2005, and by the Productivity Commission in their proposed Performance Measurement Framework in 2010 [25].

WVA provides a measure for the benefit to an average individual of the services provided by an organisation. The Organisation for Economic Cooperation and Development (OECD) has been developing this approach to measuring physical and social wellbeing for several years. In the UK, WVA has been developed as a tool for community housing associations to measure the impact of their investment. This is done in terms of impacts on an average person's wellbeing of the broader non-housing benefits of access to safe and secure housing, and placing a dollar value on these [26-28]. In

2019, the New Zealand Government introduced this approach, and a Living Standards Framework, to budget development and delivery [29]. This approach aims to estimate the impact of a good/service on subjective wellbeing, then uses this to calculate the exact amount of money that would produce equivalent impact.

Whilst these two approaches address broad social return for organisations, they do not account for the potentially transformational nature of housing on the individual and their capacity to then further contribute to society. Individual productivity (for example around education readiness, physical and mental health, labour market participation) can be linked to housing, with broader outcomes and consequences linked to national productivity [30]. Individual transformational narratives were therefore included in the CROI approach, to better understand the value to the individual of having a safe and secure home. These narratives are often captured in the annual reports of housing agencies and service providers and in on-line digital stories. Developing narratives in a more rigorous way is proposed as a further avenue for capturing benefits as part of the CROI approach.
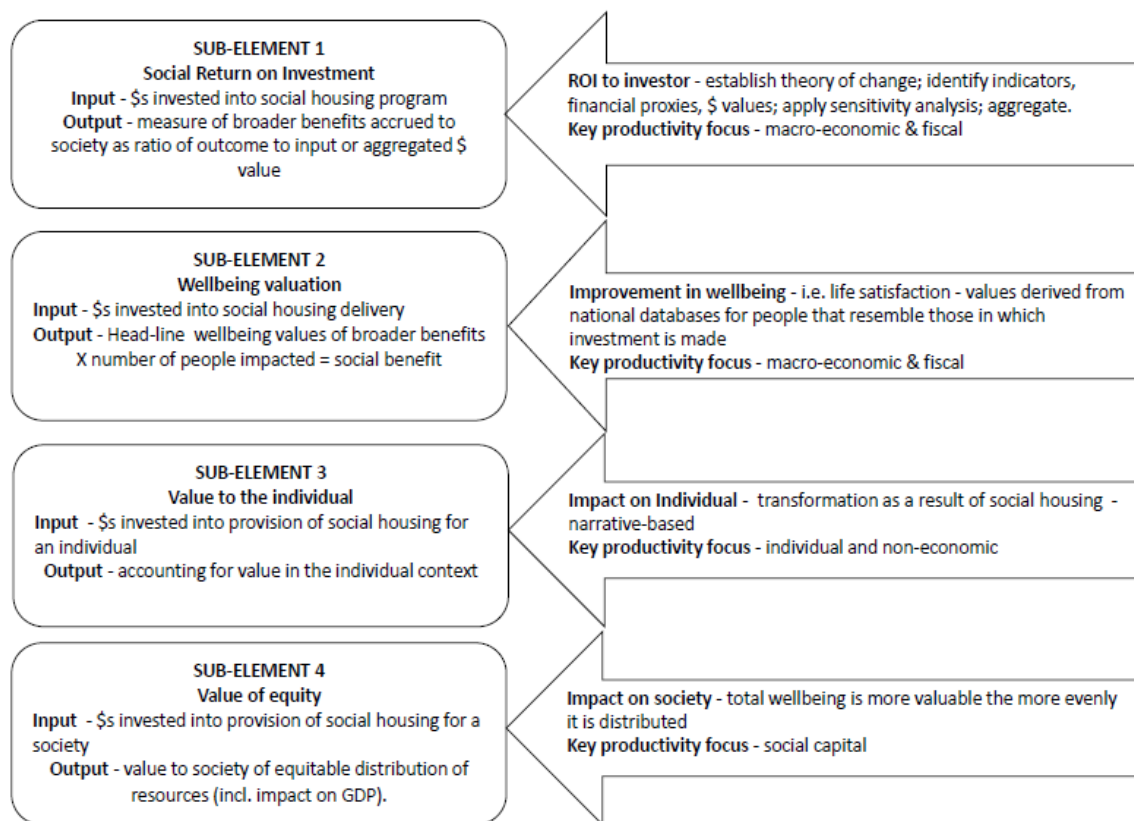

Figure 3. Composite Return on Investment Approach (CROI).

The final element of this approach considers the impact of economic inequality on society. Evidence now exists which links a lack of access to safe and secure housing to lower national productivity. 'Recent Organisation for Economic Co-operation and Development (OECD) research estimates that rising inequality has knocked as much as 7 percentage points off cumulative Gross Domestic Product (GDP) growth in the US since 1990' [31]. Comparing, understanding and aggregating the value different people place on social infrastructure such as housing, can lead to understanding the broader value of equitable access to such resources [32, 33].

The CROI approach is therefore intended to help those developing strategy and policy articulate the benefit (ROI) derived from providing safe and secure housing as essential infrastructure. This can in turn be used to provide evidence to support greater investment by public agencies in social housing and new investment via not for profit, public and private sector partnerships (Figure 3).

2.4. Mapping the social housing network

To further consolidate the view of housing as social and economic infrastructure, an understanding of the breadth of the housing network is required. Researchers mapped this network for two Australian States, Western Australia and Queensland. A hybrid social network analysis/actor network theory (SNA/ANT) approach was adopted to undertake this mapping. SNA identifies networks and maps the flow of information between groups or organisations utilising a structure driven approach [34]. The hybrid approach enabled the identification of participants within this network. It departs from traditional ANT by placing a high emphasis on the human and organisational stakeholders. This process was also informed by: (i) the Australian Expert Group in Industry Studies Mapping the building and construction product system [35]; and (ii) expert panel input including government, NFP and private sector stakeholders from May to July 2019.

In total 13 network elements were used to identify and aggregate participants and to facilitate map clarity. These network elements were: policy drivers and players; funding; financing; procurement and delivery; metrics; indicators and data; labour market dynamics and housing; changing demographics; housing typologies; socio/environmental systems; integrated, shared and disruptive technologies; housing asset management; production supply chain; skills, knowledge and capacity building. These elements were tested and refined by an expert panel.

In Queensland, CPF along with Rowlinson Architects work across the network elements, for example:

- *Policy drivers and player* - working with and steering government policy to achieve outcomes for people (e.g. jobs and experiences) through innovative design and delivery systems.
- *Funding* - work with Federal, State, Local, charity and private sources.
- *Financing* - with private projects - challenges remain as faced in other States.
- *Procurement and delivery* - strength is working with procuring difficult projects with time and cost limitations, whilst delivering jobs to those most in need.
- *Metrics, indicators and data* - work to achieve KPI's set-out in others' CSR agendas rather than prescribe them, and thus deliver upon their vision and along with internal CPF KPI's.
- *Labour market dynamics and housing* - key importance to CPF. Housing increases stability and thus access to employment. First-hand experience of the relationship between a home and ability to access and maintain a job with monetary benefit, and impact on self-esteem and wellbeing.
- *Changing demographics* - work toward platinum and gold level LHA projects, recognising the change in demographics of social housing residents [36].
- *Housing typologies* - address this with partners e.g. LendLease. Have been considering higher density models and merging greenfield and urban ideas of pedestrianism and terrace housing. Considering pre-manufactured housing and bespoke designs for NDIS and emergency housing.
- *Social and environmental systems* - work to deliver zero waste onsite amongst many other environmental impact considerations including design for disassembly.
- *Integrated, shared and disruptive technologies* – applicable to NDIS work and with the generation of UpHouse projects [37] under development.
- *Housing asset management* - work with long term asset owners and consider the total cost of ownership to help ensure our products are of a more robust nature.
- *Production supply chain* – work on a daily basis across supply chain and often directly with manufacturers. Aim to from the primary resources stage, across local supply chain.
- *Skills, knowledge and capacity building* - primary focus of all our projects, working with those most in need for experiences to build capacity as and where possible and chosen.

3. The decision-making framework

The decision-making framework presented in this paper brings together this portfolio of research, to build understanding and promote dialogue (Figure 4). The intent being to contribute to further build the case for housing as social and economic infrastructure.
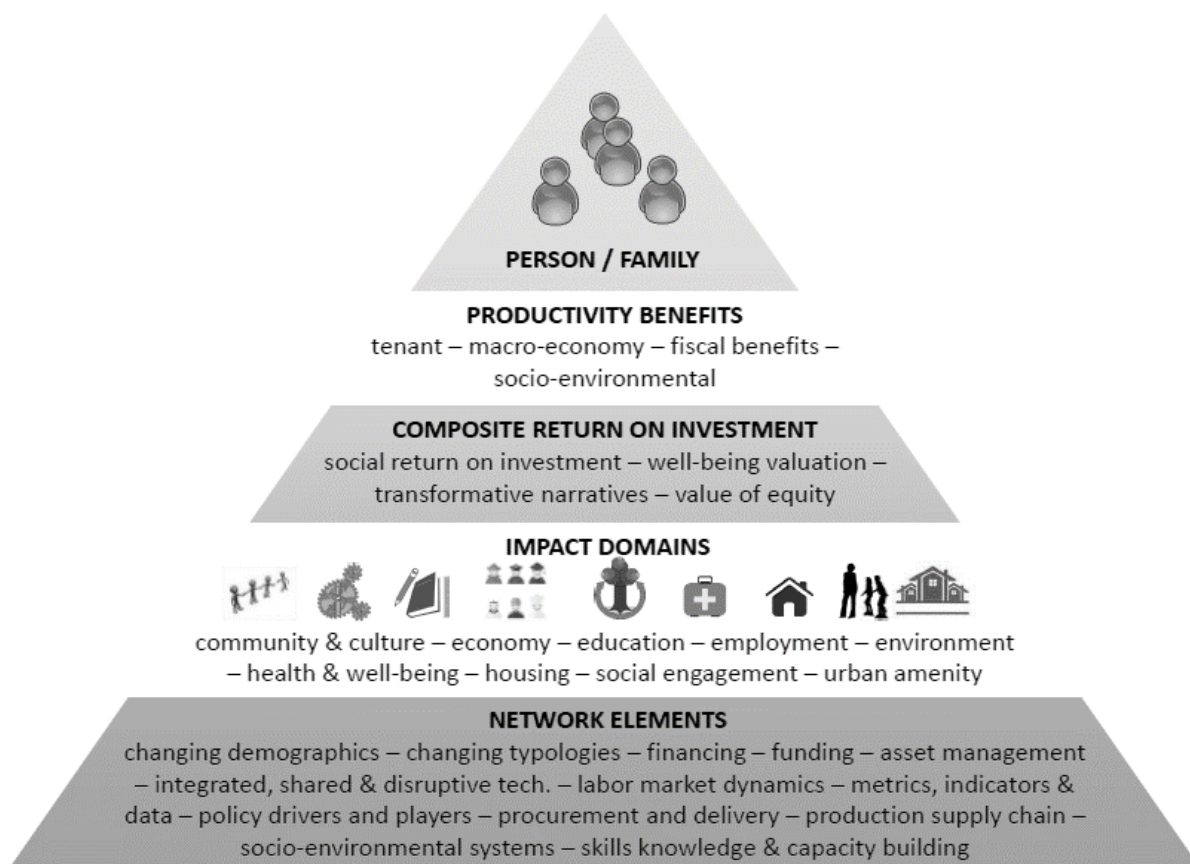
Figure 4. Decision-making framework

In practice, this framework provides guidance to organisations like CPF, who work on a daily basis across the nine impact domains, and work to build networks which require trust and a longer-term perspective considering the next project. Thus, they are consistently aiming to deliver transformative experiences for those most in need, to demonstrate they have made the intended impact. Sometimes this translates to measurable job outcomes, sometimes the realisation by individuals that they never want to use a hammer again. Ultimately CPF seek to impact at the personal level every time, resulting in cascading effects and impacts.

4. Conclusions and Further Research

Congestion travel times are often cited as indicators of mainstream infrastructure-based systems in need of attention [17]. Social housing waiting lists, rough sleeper counts and the percentage of income spent on rental accommodation provide similar evidence of a housing system in stress. This paper has highlighted key findings of an industry-led portfolio of research undertaken in Australia since 2014. This research has reinforced: (i) the position of the home as a critical foundation for individual and national productivity and wellbeing; and (ii) the need to shift the conversation from housing as a commodity to housing as critical social and economic infrastructure. This brings with it the need for rigorous planning and investment.

Whilst this body of research goes some way to address identifying social and affordable housing as critical social infrastructure significant critical barriers exist. First, the lack of a bi-partisan national housing strategy and agenda in Australia. For example, Canada launched that country's first National Housing Strategy in 2018. This 10-year, CAD$40-billion plan recognises: (i) the pivotal role of affordable housing in creating inclusive communities [38]; (ii) the need includes public consultation; and (iii) the establishment of a National Housing Council. Housing in Australia continues to be a state-based concern with limited input from the federal government. Second, there is a lack of national longitudinal databases to provide quantitative and qualitative data to inform and support policy and

decision-making. In the UK, HACT developed and maintains the Social Value Bank enabling organisations to determine social value built upon longitudinal data drawn from key national datasets to enable better understanding on the return on investment of providing safe and secure housing. Third, the fragmented nature of the housing construction and social services supply chains which still (importantly) comprise many micro and small-scale operators. Fragmented supply chains are especially problematic in a person-centred, place-based policy environment, and across a geographically diverse country like Australia. Maps of the social and affordable housing networks in Australia can now provide a baseline for better understanding the expansive network participants and interactions [39]. Fourth, the time frames for return on investment, impact and benefits realisation may be inter-generational [40]. Long-term outcomes and impacts need to be targeted and evaluated as a part of the move to considering housing as infrastructure. This requires non-partisan, and bi-lateral engagement between State departments, and between National and State governments.

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Acknowledgments