

Reconstruction: Delivery of Rebuilding and Repairs

Introduction

On January 4th, 2020, the Kangaroo Valley region was hit by the Currowan Fire, part of the 2019/2020 bushfire season now often referred to as the Black Summer. The Currowan Fire began on the 26th November 2019 more than 100 kilometres south of Kangaroo Valley. It would eventually burn for 74 days across 320,385 hectares. The fire directly impacted approximately 100 properties where it is estimated that over 130 substantial structures were destroyed, including around 48 dwellings (which represent roughly 10% of homes in Kangaroo Valley).

In recovering from a major bushfire, the construction industry plays an important role in both the immediate clean-up and recovery, as well as the longer term reconstruction of damaged homes and infrastructure. The construction supply chain is known to be complex, typically made up of a fragmented network of interrelated stakeholders and activities, which often faces significant resourcing and cost challenges following natural disasters.

As part of this research project, we sought to better understand how key aspects of the reconstruction supply industry responded to the rebuilding requirements of Kangaroo Valley in particular, while also considering wider impacts across the NSW South Coast region.

Figure 1 illustrates the key phases of construction activities, which are embedded in changing policy and technical contexts. Within this framework a typical construction or rebuilding project will move

through the phases of: planning and design, sourcing materials, making components, and finally the delivery or building of the final structure for the end user.

This document is one of several *Bushfire Research Briefs* that summarise research findings by the University of Wollongong (UOW) research team regarding the Kangaroo Valley community's activities and perspectives regarding bushfire-resilience.

In-depth interviews were conducted with over fifty interviewees, including Kangaroo Valley residents, business owners and tradespeople from the NSW south coast, RFS volunteers and local service providers. Through these interviews we explored the construction supply ecosystem servicing Kangaroo Valley in order to understand the issues faced by the supply chain since the 2019/20 bushfires.

This particular *Bushfire Research Brief* provides an overview of the existing Kangaroo Valley construction supply ecosystem across those four stages of a building project, then looks at the rebuilding of infrastructure following the bushfire. It then focuses on the experiences of members of the construction industry and the community during the delivery phase of rebuilding (Figure 1). Particular areas of interest included the demand for builders and tradespeople, and the capacity of the supply chain to cope with changing demand following disasters. Other aspects of the building reconstruction process are discussed in separate *Bushfire Research Briefs*.

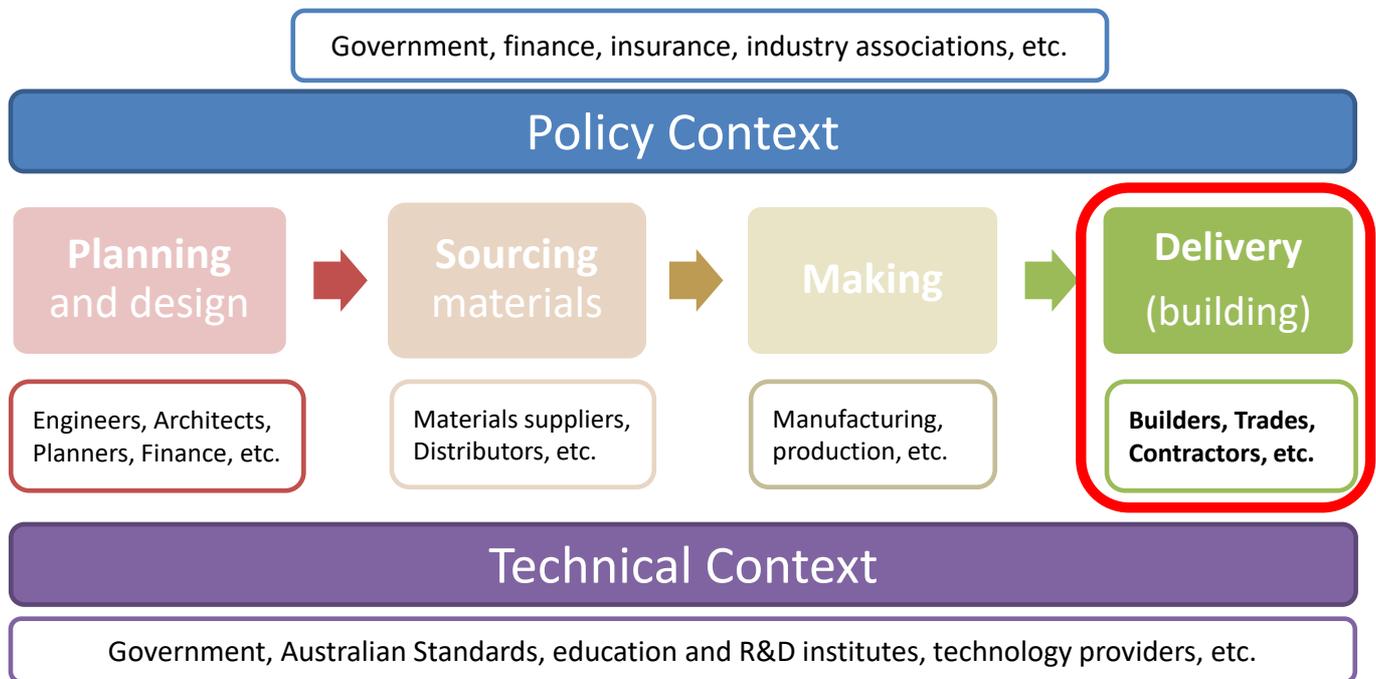


Figure 1: A schematic representation of the key elements of the building reconstruction process and ecosystem. This Bushfire Research Brief focusses primarily on the elements highlighted in the red rectangle.

Overview of the Kangaroo Valley construction supply ecosystem

Kangaroo Valley is a relatively small community (population approximately 880 from the 2016 Census), and is located in a river valley of the Shoalhaven Local Government Authority. It is geographically separated from surrounding large towns, with the closest, Nowra, being approximately a 30 minute drive away. However, in a wider context it is only slightly more than a 2 hour drive from the centre of Sydney. There are a limited number of access routes into or out of the valley (three local roads, and the state administered Moss Vale Road), and a single crossing point of the Kangaroo River.

The location and size of a community has an influence on the characteristics of the construction supply chain available to it - through the size of the pool of skilled and unskilled labour, materials supplies and delivery lead times, for example. We

undertook a desktop evaluation to provide an indicative overview of the type and prevalence of construction related supply chain entities at key population centres in the region around Kangaroo Valley¹. This is mapped in Figure 2. However, it should be noted that businesses based as far away as Canberra and Sydney also carry out work in the region, but do not generally work regularly in Kangaroo Valley.

Hardware supply stores in the Southern Highlands region (to the north-west of Kangaroo Valley) indicated that they supply up to 500 building, construction and trade businesses (including over 100 builders). If landscapers, plumbers and electricians are included, this increases to over 1500 different business accounts. However, hardware supply stores we spoke to estimated that the top 20-30 customers accounted for about 60% of business, indicating that most of the commercial activity is concentrated around a few major customer

¹ Based on searching the online databases of yellowpages.com.au and Kangaroo Valley business directory (<http://kangaroovalley.nsw.au/directory/>). The local region was defined as the Southern Highlands and northern Shoalhaven region within a 45 minute drive of Kangaroo Valley. A larger region was applied for modular housing technology providers and consulting services (e.g. architectural, geotechnical and bushfire) who would typically service a much larger area as standard practice.

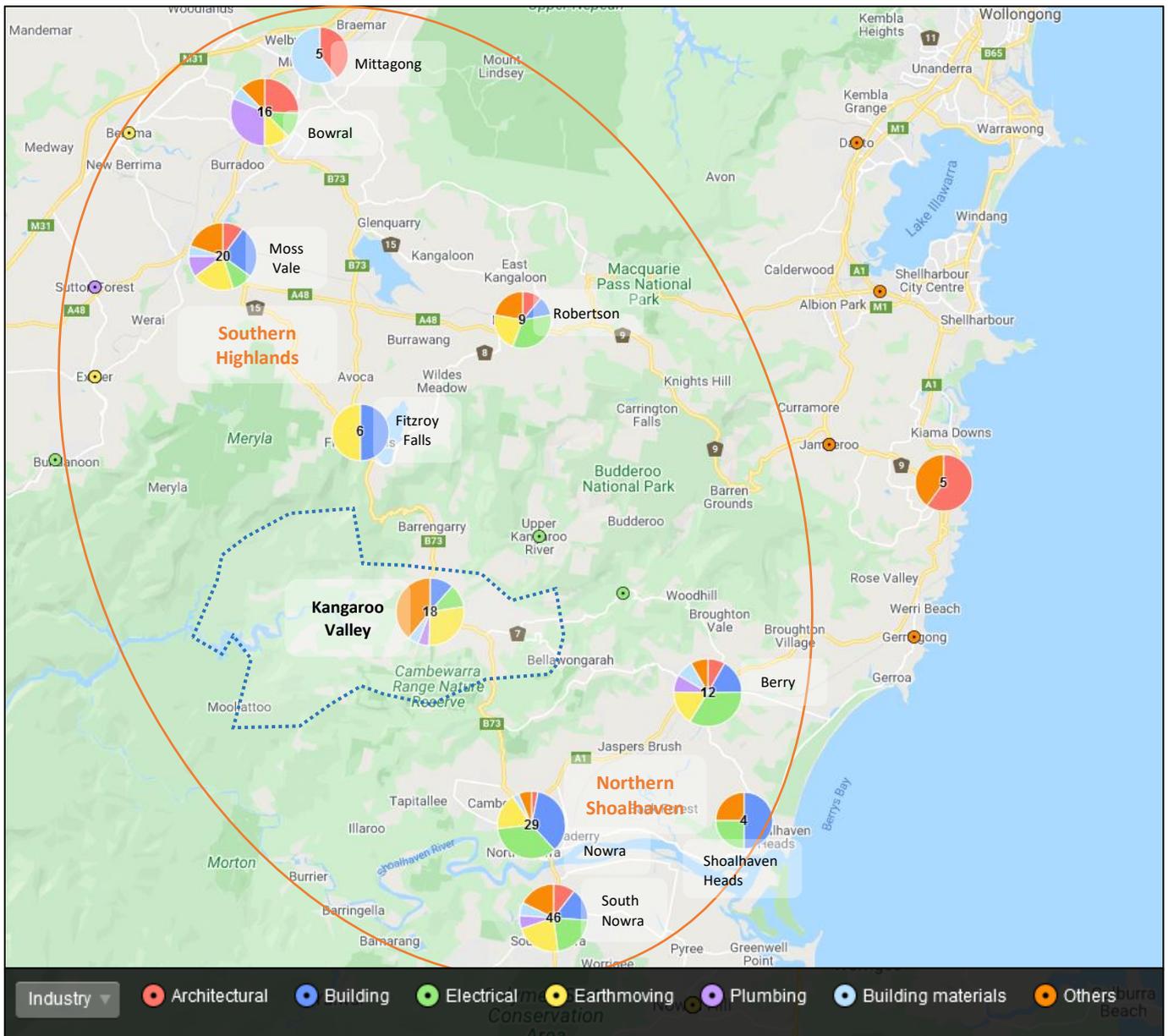


Figure 2. Mapping of locations of key supply chain entities in the vicinity of Kangaroo Valley.

Our desktop analysis indicated that many construction industry suppliers and project-based firms are located in close proximity to Kangaroo Valley. Compared to more remote communities it can be expected that this close proximity provided relatively good access to these services. However, it is notable that most supply chain businesses are based outside of Kangaroo Valley, and travel can become a significant factor in terms of time, price, and labour availability, particularly when work is readily available in other regions.

“But [Kangaroo Valley is] a remote area. Guys [employees/contractors] don't want to drive down here for four years straight every single day. So we've had a few leave, [that] was purely because of travel, and then we've had a few subbies start and then say, well, I may as well just work in Shellharbour, or Kiama, it's closer to home. So then you lose them because of travel.” (Builder)

The next section of this brief examines post-bushfire rebuilding experiences in Kangaroo Valley, first covering the repair of key infrastructure, then focusing on the ability of the labour force to cope with housing demand in 2020/21.

Post-bushfire: Rebuilding and Repairing Infrastructure

Before households could begin the process of rebuilding or repairing damaged homes, restoring access to key infrastructure was a priority. In particular, interviewees spoke about the telecommunications, electricity and roads networks.

Phone and Internet

Long delays in the restoration of telecommunications connections after the fire was a complaint from many interviewees. In the aftermath of the Black Summer bushfires a great deal of attention by media and other stakeholders was placed on damage to mobile phone infrastructure and towers.

But the majority of households in the fire-affected areas in Kangaroo Valley did not previously have mobile phone coverage, and the great majority of these households were therefore wholly reliant on landlines for phone and internet. It reportedly took between 4-6 weeks to restore the landline telephone network in these areas, with further disruptions as repairs were made to damaged parts of the network which then impacted residents who had not lost their landline service immediately after the fire.

Much of the Telstra landline infrastructure in these areas was clearly not resistant to intense bushfires. This included the large number of above-ground Plastic Pillars holding complex multi-core copper cable junctions that were destroyed in fire-impacted areas of Kangaroo Valley. Telstra contractors had to spend long periods of time digging up cables adjacent to these pillars and repairing burnt items of infrastructure.

These burnt pillars were replaced with plastic pillars rather than more resilient metal pillars (see below).



Replacement plastic pillar (l) & repaired cable junction (r) of a plastic pillar destroyed by fire.



Superficially fire-damaged plastic pillar (l) and a metal pillar, undamaged despite exposure to the fire (r) (photos – Paul Cooper).

This delay in the restoration of phone and internet services after the fire meant that many residents had to drive into the village to make or receive phone calls, or access the internet while dealing with insurance agencies and other challenges delaying the repair of damage and commencing the process of rebuilding their properties.

The Kangaroo Valley recovery "Drop In Centre" provided vital support to the community in this regard, and helped residents navigate some of these issues, as

discussed in our 'Community Connections' *Bushfire Research Brief*.

Electrical Power

The Currowan Fire caused widespread damage to the electrical supply network infrastructure (timber power poles, burnt trees falling on power lines, etc). The response of the electricity service provider was praised by several interviewees for mobilising relatively quickly and effectively to restore electrical service to homes and/or providing residents with generators, at least in comparison to the restoration of phone/internet services.

In the immediate aftermath of the fire the Drop In Centre also played a crucial role, together with other members of the Kangaroo Valley community, in arranging for the loan of portable electrical generators from within the community to those households without power.

Water and roads

Many bushfire impacted properties relied on their own water supplies (e.g. tanks or bore water), with many reports of damage to this decentralised infrastructure. However, there was apparently no damage to the Kangaroo Valley village reticulated water supply network infrastructure, which was not within the area affected by the fire.

Remote roads and bridges were also damaged across the South Coast region by the fires, often requiring repair before clean-up of properties, or even light vehicle access, could commence. In some cases on the Far South Coast, residents needed relays of cars and canoes to access their properties because timber bridges had been burnt.

In the Kangaroo Valley region, the School Creek Bridge in Budgong was replaced using a semi-modular construction method. This was described as achieving a permanent bridge replacement for a similar cost and timeframe that a temporary bridge would normally take to install. It also points to the fact that modular and innovations in offsite manufacturing can be successfully

applied to infrastructure repairs as well as housing.



Installation of School Creek Bridge in August 2020 (Photo: Shoalhaven City Council)

Bushfire Recovery Drop in Centre

Another crucial aspect of post-bushfire infrastructure was the important role played by the Kangaroo Valley bushfire recovery Drop In Centre and the impact it had on many residents. This was a temporary, community-led centre run by volunteers that is discussed in more detail in our *Bushfire Research Brief* 'Community Connections'. This was seen as a very positive aspect of the post-bushfire recovery response from the community, particularly in assisting in the immediate aftermath for residents who had lost their housing, electricity, water or communication services.

Establishing the physical and organisational infrastructure to support community bushfire recovery hubs to operate effectively is clearly an important part of preparation and planning for future disasters. A number of interviewees from outside Kangaroo Valley shared information on various initiatives across Victoria and in NSW (such as Cobargo) that are utilising post-bushfire recovery funding to ensure this community infrastructure is in place. This ranges from new purpose-built community resilience centres, to upgrades of existing community halls.

As part of a long-term Recovery into Resilience Program, Shoalhaven City Council has implemented a program to

upgrade communications and power services at community halls across the region as 'local information hubs'. This program was designed to focus primarily on information provision and communication to communities during disasters, and less so on establishing these halls as disaster recovery spaces. However, future programs could target cooking, water and sanitation facilities to further improve the preparedness of the halls used in this program for use as recovery centres, in a similar manner to that being pursued in other regions.

Unprecedented building demand

As discussed in the *Bushfire Research Brief 'Reconstruction: Sourcing and Supply of Materials'*, the national and international response to the COVID-19 pandemic had considerable effects on both demand and supply sides of the housing construction ecosystem. These concurrent disasters generated

confounding factors that made it more difficult to analyse which post-bushfire rebuilding supply chain impacts were specific to the bushfire rather than the pandemic. The University of Wollongong research

project examined some of the impacts of both these disasters on the construction supply chains servicing Kangaroo Valley and the associated wider South Coast NSW region.

According to the Housing Industry Association (HIA), a record number of new homes commenced construction in Australia during 2021, 20% higher than the previous record in 2018².

This made finding builders more challenging for some Kangaroo Valley residents, particularly those who didn't start looking to rebuild until late 2020/early 2021.

These extended delays started to cause issues for such residents as most insurance policies only covered emergency accommodation rent for a 12 month period post-disaster.

"There are people who somehow managed to get all their approvals and then the builders are so busy down south that they quote them some ridiculous amount to do it, or they give them a timeframe like we'll start 2022."

(Community member)

A large part of this increased building demand was related to factors other than the bushfire damage. Based on the best estimates of local builders, the scale of the post-bushfire rebuilding was not a significant change from business as usual in the Kangaroo Valley region. In part this was because there was a wide range in the speed with which different households were able to progress through the various stages of the rebuilding process. Hence builders generally could stagger commencement of building projects. The estimate of a local builder was that only one or two new rebuilding jobs were commencing each month.

"There were people who were given 12 months rent free, but rebuild hasn't even started. So suddenly they're paying their mortgage and rent because the rent free period is finished. So there's challenges, there's definitely challenges". (Community member)

² <https://hia.com.au/our-industry/economics/housing-outlook> (Accessed August 2021)



A record number of new homes commenced construction across Australia during 2021 (Photo - Billy Freeman on Unsplash).

Estimates from industry interviewees varied as to the impact of bushfire rebuilds on overall construction activity/workload. One smaller builder estimated rebuilding of bushfire impacted properties represented about 25% of their workload, while larger project home builders stated this was less than 5% of the ongoing workload. Within the Shoalhaven LGA, much of the rebuilding was done by project home builders, who are well positioned to adapt to changes in demand.

There was a desire from both householders and construction industry associations to use local labour and suppliers for bushfire reconstruction. Many bushfire reconstruction related government funding programs encouraged the use of local trades, services and businesses in their assessment criteria³. However, in many instances demand outstripped local capacity.

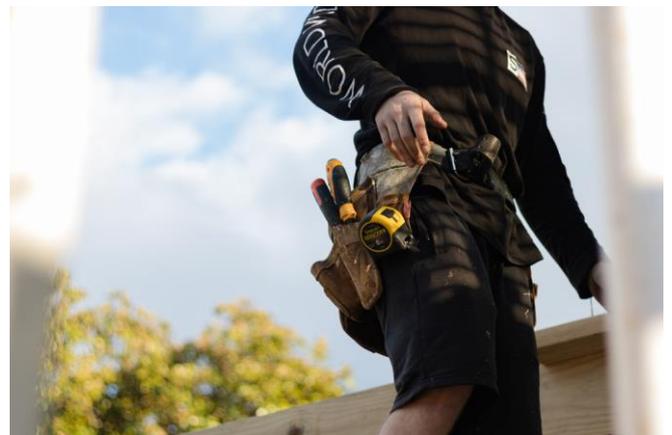
On the other hand, construction industry interviewees reported that the standard practice of many insurance companies was to hire a national builder to oversee all their rebuilds. The nominated national builder would then sub-contract smaller work packages frequently to local builders, but interviewees reported cases of building crews coming from interstate to work on repairs and rebuilds. It wasn't made clear if this was driven by workforce availability or

other business decisions, but there was evidence that the quality of some of the work carried out by some such contractors was below the expectations of residents.

Some interviewees reported being able to negotiate the use of their own preferred builders and contractors with the insurers, whilst in other cases insistence of insurers on the use of their own contracted builders and contractors was the source of significant frustration for bushfire-impacted property owners. In one reported incident, a homeowner banned the insurer's chosen contractor from their property due to significant incidental damage caused during repairs. This was a potential point of tension in the rebuilding process, and highlights homeowner choice of builder, or contractor, as being an important consideration in choosing home insurance.

"Lesson learned would be, be careful of what's in the fine print of your insurance." (Resident)

At a regional scale, an analysis of the bushfire rebuilding workforce demand and supply found that the impacts of the bushfire rebuild varied across Southern NSW⁴. Within the Shoalhaven (where Kangaroo Valley is situated), the demand from bushfire rebuild was judged to be reasonably small relative to the size of the available workforce.



³ NSW Government, 2020, *Bushfire Local Economic Recovery Fund: Program Guidelines*

⁴ Deloitte Access Economics, 2020, *Workforce Analysis: Bushfire rebuilding workforce needs and supply analysis*, (March 2020)

Demand for skilled trades has surged across the South Coast of NSW in 2020/21 (Photo – Callum Hill on Unsplash)

This reflects the information from interviews with builders and tradespeople involved in the Kangaroo Valley rebuild. Further south, in coastal regions, the rebuild was seen as likely to generate significant workforce demands, crowding out many key occupations, but only for a relatively short period of time whilst rebuilding is occurring. A similar story was modelled for the Snowy Mountain regions¹. However, this analysis was undertaken prior to the full impacts of COVID-19 being understood.

Demand for skilled trades

The housing boom translated into surging demand for skilled trades across the south coast. A wide variety of trades were in short supply, depending on the particular business structure and projects of the interviewees. Some builders that were interviewed, for example, had sufficient carpenters on staff, but would experience issues with other trades.

“You’ve got the rebuild after the fires and then you’ve got the stimulus with renovation. So combine both of those, especially down on the South Coast ... at the moment that demand for trades is just huge.” (Industry association)

Others noticed the increasing workload amongst sub-contractors, but had strong existing relationships that meant they could manage to get work done when required. Reported shortages in skilled labour included:

- Carpentry was raised as a particular issue in Kangaroo Valley, where subcontractor rates were putting pressure on pricing and staffing;
- Bricklaying was an issue with interviewees reporting that builders were changing materials used in rebuilds to avoid significant delays and cost increases;

- Plumbers were in short supply, with delays of ‘several weeks’ for them to be available, with owners looking to Canberra or even Melbourne to source plumbers; and
- Concreters were also problematic with wait times increased by a number of weeks.

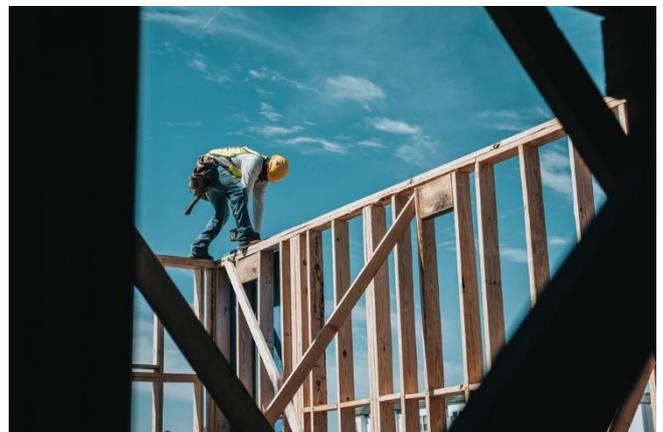
“You can’t get a plumber for love nor money here at the moment.” (Supplier)

Implications for rebuilds

As demand for labour increased, builders adopted various strategies to mitigate issues, outsourcing jobs that would previously have been performed by their in-house teams, sub-contracting people from beyond the local area, and increasing the number of contractors in their network.

“So my new theory is I network a broader range of subbies and rely on them less. So talking to more guys, and asking less of them, to spread your dollars around and inquiries.” (Builder)

For instance, one company that always installed their own formwork and poured their own concrete had begun outsourcing to a concreter to free their carpenters for other work. In this way, shortages in one trade can flow through the supply chain to adjacent trades.



Builders changed their work processes during the post-bushfire recovery to adapt to demand (Photo – Josh Olalde on Unsplash).

For many builders, increased demand for labour meant sourcing labour from a wider geographical area. Compared with regions further south, Kangaroo Valley is close enough to Southern Sydney that tradespeople can drive down each day for work, rather than needing to find temporary, or rental, accommodation while they do the work.

“Time delays as well, for clients. That’s our biggest thing. Building times are blowing out from ... what they were a year ago... A couple months each house, type [of] thing, because of the wait time on all the materials and everything like that. We used to be able to get something at a seven day turnaround. [Now] Sometimes it’s a five-week turnaround.”
(Builder)

Nevertheless, as housing construction demand remained high throughout 2020/21, it was often difficult to attract workers when work was available closer to home. Many other bushfire-affected regions of the NSW

“There have been some tradies come down and rented houses and they’re down here for the duration of the job.” (Industry association)

South Coast were too far away major population centres (i.e. Sydney, Canberra or Wollongong) for building companies and contractors based in these locations to service with daily commuting. For example, the nearest major centre to Batemans Bay is Canberra, over 2 hours away. Trades and labour coming from population centres would therefore have to find temporary accommodation, often rental housing, while the work is done. The unfortunate scenario could arise where this labour force is competing with displaced residents for rental accommodation.

Under-insurance for many residents who lost their homes has been previously

reported as already relatively common, so any unexpected or unnecessary additional costs add further financial stress to those residents dealing with the rebuilding process.

“So at the moment, we’re paying 20% more than I was say only a year ago to these guys ... So at some point we might have to jump up again, and pay these guys slightly more, but it starts to get really expensive for the client.” (Builder)

Social support

Throughout the research project it was evident that professionals involved in the clean-up, recovery and reconstruction post disaster often played an important, but under-recognised role in providing emotional support for those impacted by the disaster.

In the immediate aftermath of the fires, businesses such as local hardware supply stores were often the first places people went. Likewise, construction industry workers (builders, tradespeople, delivery drivers) were in regular contact with the homeowners most impacted by the disasters. This kind of incidental contact with professionals involved in the reconstruction is a valuable way to reach impacted people who may find asking for help difficult.

Summary

The construction supply chain ecosystem servicing Kangaroo Valley faced a number of challenges in meeting the housing demand across 2020/21. However, the scale of rebuilding bushfire damaged properties was just one of several contributing factors in the surge in construction demand. The Kangaroo Valley region would likely have coped reasonably well were it not for the confluence of wider issues in the housing market, including the impact of the Covid-19 pandemic.

Increased delays in securing contractors and materials, along with rising costs of labour and materials combined to increase the financial risks for builders; and for householders the costs of rebuilding increased as a result.

While some of the issues experienced by this somewhat geographically isolated region, such as shortages of builders and skilled tradespeople, led to increased costs and challenges for Kangaroo Valley residents rebuilding, these challenges were no doubt much greater for more isolated regions further south, and elsewhere in Australia.

Additional Resources

The Renew Green Rebuild Toolkit:
<http://greenrebuildtoolkit.com/>

Chang-Richards, Y., Wilkinson, S., Potangaroa, R., Seville, E., 2013. Resource challenges for housing reconstruction: A longitudinal study of the Australian bushfires. *Disaster Prev. Manag. An Int. J.* 22, 172–181.

Whittle, L., (2020). [Effects of bushfires and COVID-19 on the forestry and wood processing sectors](#). ABARES, Insights Issue 6, 2020, Canberra.

[After The Disaster](#): ABC Radio Podcast
[CSIRO Bushfire Best Practice Guide](#)



Modern Australian home in bushland setting (photo: Vineyard Perspective/Shutterstock)

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If this document has raised challenging issues for you, Lifeline Australia provides crisis support 24 hours a day: call 13 11 14 or see <https://www.lifeline.org.au>