Wicked Problems Framework: Architectural Lessons from Recent Urban Disasters

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Abstract This chapter extends the design framework of Horst Rittel (1930–1990), who argued that complex societal problems that cannot be addressed using linear systematic processes, namely, 'tame' problems, may need alternative approaches, since they are 'wicked' in nature. Urban issues such as informal settlements, poverty, and overcrowding, are merely the physical symptoms of deep systemic issues beyond the control of planners and architects alone, and hence, are 'wicked'. Rittel, a thought leader of design thinking, coined the expression "Wicked Problems" in 1973 to describe the complex issues of society situated in the real world that cannot be solved using rationality alone. In fact, such issues need transdisciplinary understanding and action to optimise decision-making based on multiple viewpoints and methods of inquiry.

Keywords Horst Rittel · Wicked problems · Disaster recovery · Community development · Democratic design

1 Introduction

1.1 Resurgence of Democratic Design

Societal progress through scientific innovation and architectural design has long been a central endeavour for the architectural profession, mandated through institutional code of practice, and rewarded through peer recognition and professional awards. By and large, however, the architects' service to society is demonstrated through practice. For instance, the community architecture movement of the 1960s remains an

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emphatic example of the design profession's commitment to and a concern for social justice. Such practices were motivated in part due to the rapid urbanisation of industrial cities and the proliferation of government-funded mass housing developments [33], p. 69), most notably in the UK and the U.S. In the UK the self-build champions such as Turner [62] and Habraken [31] mobilised a new generation of builders and steered the government authorities to make the state-led developments more inclusive and democratic. In the U.S. a similar movement came to be known as the Community Design Centres. In the last decade, the community design movement is experiencing a rapid resurgence under familiar expressions such as, "participatory design", "community-led design", "co-design", "human centred design" and "public interest design". The concept of community-centred, democratic design methods has also become widespread in other disciplines, credit to Horst Rittel, a UC Berkeley professor of architecture who coined the expression "wicked problems" in 1973.

2 Background

2.1 Theories of Horst Rittel (1930–1990) and the Wicked Problems

Rittel's concept of "wickedness" describes a class of problems that are ill-defined, complex, and for which there are no straightforward solutions, in contrast to "tame" problems that can be rationalised, and relatively simple to solve. Tame problems Rittel argued that most societal issues are *wicked*, because most real world problems have multiple facets and considerations that cannot be solved using rationality alone. As such, wicked problems require transdisciplinary response. The concept of sustainability, for instance, cannot be considered from a single perspective, but requires knowledge and experience of multi-scale, multi-generational, multi-disciplinary methods of inquiry [38]. Wicked problems require industries to work together, rather than in their siloes. Wicked problems form an integral part of the society that generated them, thus their resolution requires change at societal level. Brown et al. [11] argued that "transdisciplinary imagination" is essential in approaching wicked problems for "just and sustainable decision-making" (Brown et al. [11] pp 4–5).

2.2 Wicked Problems and Disasters

Many of the *wicked* attributes of society are amplified in a state of chaos, and nowhere is this more evident than in the early days of a natural disaster in cities. In the past decade, the community architecture movement has extended to disaster recovery, with the emergence of non-profit organisations such as Architecture for Humanity (U.S.), Emergency Architects (FR), Article 25 (UK), and Architects Without Frontiers (AUS) specialising in disaster recovery architectural service and consultancy. By and large, however, architectural contributions to disaster recovery

are few and far between, existing as part of a humanitarian agency sponsored technical manuals for emergency/transitional shelters, or brought in towards the end of the critical recovery period to rebuild infrastructure and housing. Architects are generally considered in public as the last responders to disasters [15]; Lee [39]; Sanderson [52]; Boano and Hunter [8]. Charlesworth [16] noted that architects are seldom party to the critical political decisions that determine the reconstruction vision of post-conflict cities, and suggested "architects should adopt an interventionist stance by taking a professional stand against the violation of human rights… [using] their design expertise" (p. 16). In finding that architects have little political influence in post-conflict cities, Charlesworth sets out a challenge for architectural researchers: "How can architects engage in… the problem-sharing processes needed in urban centres… broken by systemic urban conflict? Is it our role to provide the definitive solution, or rather to provoke… collective action in rebuilding civil society after the disaster…?" (p. 132) While Charlesworth does not situate her research in terms of *wicked problems*, the evidence of the wickedness is ubiquitous in her characterisation of urban disaster problems as needing to be "[shared]", and in the inherent challenge of providing a "definitive solution" in a place of systemic conflict. This paper re-evaluates these issues by employing the Rittelian strategy of design inquiry to evaluate the *wicked* aspects of urban disaster recovery process.

This paper argues that reconstruction strategies in many post-disaster sites have failed largely because the *wicked* issues of architectural design have been approached as *tame* problems. Wicked problems require an open systems approach that embraces multiple methods of constructing knowledge, that is, from the collective knowledge of both professionals and civil society, and from the "humble position of uncertainty and provisionality" (Brown et al. [11], p. 39) rather than that of linear, positivist rationality that have, thus far, dominated post-disaster management. So how is the architectural notion of "wicked problems" relevant to democratic design decisions in urban disasters?

2.3 Reflection on Systems Thinking

In the first instance, it is useful to look back on what prompted Rittel to distinguish the tame problems versus the wicked problems, in which he classified the former as the first generation systems approach and the latter as the second generation systems approach. According to Rittel [48, 49, 50], the systems thinking of the first generation pertains to "attacking problems of planning in a rational, straightforward, systemic way" (1973, [48, 50], p. 390) which has enabled revolutionary progress in aeronautics and led to improvements in health systems and the environment. However, Rittel observed that such early successes in the systems thinking were short-lived, because "most research about creativity and problem-solving behaviour is about 'tame' problems… (yet) all essential planning problems are wicked" (p. 392). Where the problem is insufficiently understood, and where the consequences of an action taken in response to such problems are unknown, the classical systems approach can lead to catastrophic failures. Herbert Simon

described such problems "ill-structured problems" [55], and Donald Schön called them the "swampy lowlands" of reality [53]. Urban issues such as informal settlements, poverty, and overcrowding, are the physical symptoms of more complex, interdependent systemic issues beyond the control of planners and architects alone, and hence, are 'wicked'.

3 Methods

3.1 Ethnographic Research

A critical study on architecture's relationship to urban disasters seeks a broad understanding of the attitudes and intentions of architectural professionals. The author has opted to undertake an ethnographic study of such architects rather than electing to study the specific buildings designed by them. Yet because architecture is a discipline grounded in practice, case studies are a common research method in architectural research [57] and this research has undertaken to study three of the recent events in Haiti, the United States, and New Zealand, and interviewed some 50 experts who have experience in at least one of the three disasters at those locations in the last decade. In lieu of undertaking longitudinal research of how professionals responded to disasters at different phases of recovery, the research took a snapshot of their activities across three case studies at different phases of recovery. The most profound observation to emerge out of undertaking research across the three countries was not only the extent to which the research informants were previously acquainted with one another within each case site, but also the fact that these relationships were found to be common across multiple disasters (Fig. 1). The complex interrelationship of experts within the field revealed the close-knit nature of the expert community at such sites, as well as amplifying the importance of a sense of community in establishing an effective practice.

3.2 Ontological Rationale

In terms of the methodology employed, the author followed a mixed methods research that resonates strongly with the ontological position of Rittel. This study combines an empirical approach of theory elaboration as developed by Diane Vaughan [63] and a constructivist grounded theory method as developed by Kathy Charmaz [17–19]. Constructivist grounded theory methods combine the reflexive nature (i.e. construction) of semi-structured interviews with the analytical methods of grounded theory. Theory elaboration methods set out a robust criteria for validating a theory, whereby the theory to be tested is triangulated from multiple perspectives, academic rigour, transparency, and at multiple scales (or 'units of analysis'). At the centre of both these methods is the recognition of self, and ways
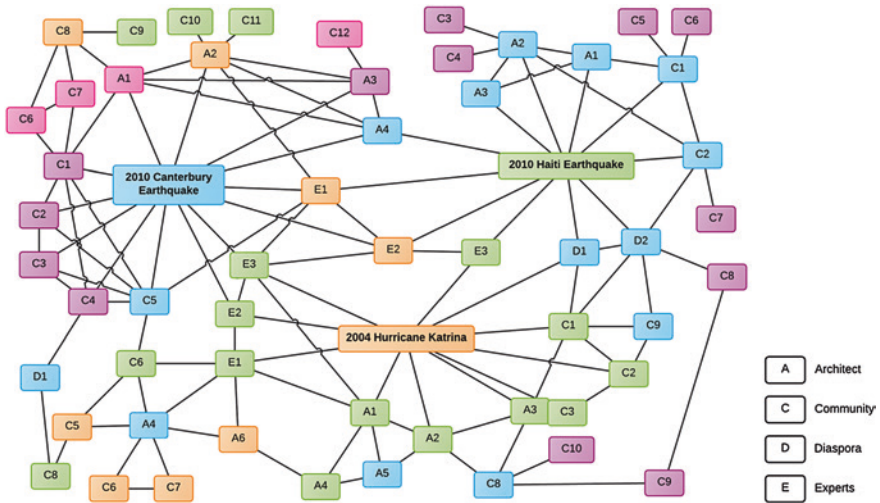
Fig. 1 Social network diagram of interview participants

of relating to others. This means that in order to undertake a research about democratic design, and in order to make a fair representation of views about a particular architecture (whether whole or in part), the research must draw on the experience of the insider (the designer) as well as the outsider (the intended occupant or user). In other words, both grounded theory and the theory elaboration method can make *explicit* what has been made *implicit* by the researcher.

3.3 The Rittelian Framework

How these methods are relevant in testing the Rittelian framework is straightforward. This paper argues that the constructivist approach can help to untangle some of the design problems of *wicked* situations, based on the following observations. First, the *wicked* problems framework shares the philosophical position of theory elaboration in their acknowledgement of multiple realities and the value of transparency. Second, the grounded theory research is recognised as one of the first ways in which humanities researchers were able to quantitatively evaluate qualitative data [25]. By employing a set of robust, tried-and-tested analytical tools developed by sociologists and ethnographers since the 1960s, it is possible to deduct useful insights from interviews, using analytic strategies such as 'coding', 'theory generation', and 'constant comparison'. Third, the method enables a cross-sectional comparison between disparate units of analysis and distillation of large quantity of data through the process of 'abductive' reasoning. The research has yielded three key themes as follows.

4 Top-Down Strategies

4.1 Build Back Faster

Rittel's characterised design as an activity, which is "intended to bring about a situation with specific desired characteristics without creating unforeseen and undesired side and after effects" (Rittel 1978, as cited in [46]). However, whether the aims of 'build back better' are fulfilled on the ground is debatable. Since the establishment of the United Nations in 1945, the humanitarian aid sector has progressively increased its influence by partnering with first-responder government agents and other specialised NGOs in response to humanitarian crises, whether natural or human-induced. Though considered "natural" disasters, cyclones and earthquakes are increasingly associated with human activities, as a product of how we design, manage, and live in our cities, using the resources available around us. International aid agencies and governments often rush in their policy decisions in an attempt to demonstrate resilience after a major disaster.

Nevertheless, systemic approaches that fail to consider the long-term effects can backfire, sometimes exacerbating the effects of the disaster itself. The agenda for building back better changes according to how a given disaster agency interprets its physical manifestation. In Haiti, it became 'Build Back Better Communities' (BBBC); in New Orleans, it became 'Bring New Orleans Back'; and in Christchurch, 'Restore Christchurch Cathedral'. A case in point, Haiti's international design competition, BBBC, was an abysmal failure. Spearheaded by the former U.S. President Bill Clinton and the Republic of Haiti's Prime Minister Michel Martelly who jointly presided over the Interim Haitian Recovery Commission, launched the initiative in the hopes of developing new low-cost permanent housing solution for Haitians. The initial Request for Proposal (RFP) had four criteria: (1) to use durable local building materials, (2) to be buildable using local Haitian labour, (3) to be affordable and earthquake resistant, (4) to use green technologies where possible [42]. The RFP drew over 350 submissions from around the world, out of which some 140 entries were shortlisted and invited to present their full-scale prototype at the housing expo and some 60 eventually delivered.

Unfortunately, there are some major oversights that turned this ambitious endeavour into a failure. The amount of financial resources that could have been used for more urgent, systemic housing problems in Haiti pales in comparison to billions of dollars in aid that was pledged but has yet to be delivered. In fact, the campaign was illustrative of the reason why Haiti is often referred to as the 'Republic of NGOs' [37]. The housing for Haitian citizens were wholly outsourced to foreign design professionals, not many of whom adequately understood the social, cultural, political, environmental realities of Haiti. The outcome of BBBC led to an alienation of its own citizens, castigating the survivors under a veil of political 'tokenism' [5] where one maybe seen (populations in crowded areas are assigned limited housing aid) but not heard (their minimal housing needs are not met). What resulted was a cluster of militarised transitional housing compounds fabricated overseas—symbolically reminiscent of Western ideologies.

In the temptation to *tame* the *wicked* nature of Haiti's crisis, some experts have resorted to dismissing this earthquake as just another Haitian tragedy [54].

4.2 Yearning for the Past

A German philosopher, Friedrich Hegel popularised the notion that, "all we learn from history is that we learn nothing from history". Perpetuation of Hegel's adage is still evident today not only in urban planning decisions and policies but also in behaviours of disaster survivors that reinforce this phenomenon. An urge to return home has been a defining behaviour of displaced survivors, irrespective of the expert advice given [13], Potangaroa and Kipa [45, 56]. There is a high probability of a disaster becoming a recurrent event, even though the specific intervals of its recurrence are not always predictable (particularly earthquakes). Yet rebuilding over the likely path of *future* disasters is a commonplace amongst the survivors of disasters. People's sense of attachment to the land—whether personal, social, commercial, historical—is only heightened by the stark absence of place that had forged their identity pre-disaster [12]. The devastation of the February 2011 earthquake—which was essentially an aftershock of the September 2010 earthquake—muted the discourse on architecture and heritage at large, but the Christchurch Cathedral remained a contentious topic for all. Some supported its demolition, while others wanted to see it reinstated. Architecture became a battleground for earthquake-battered Christchurch citizens who saw it as a symbolic opportunity to reassert their 'right to the city'. The cathedral became a media poster-child for the earthquake, and also a symbol of Christchurch residents' identity, and perhaps, the last vestige of resilience and hope amid the lack of certainty.

4.3 Discord Between Knowledge and Action

Rittel characterised wicked problems as having no immediate and ultimate test of a solution (1973, p. 392), which is also applicable to how people assess disaster risk. The main hindrance to understanding disasters remains to be the perception that natural disasters are high impact events with low probability occurrence (HILP), which some would dismiss as having zero probability [23]. Dunlap and Michelson [28] argued that the society-wide underestimation of disaster risk is a direct result of the reactive nature of social response to disaster. For instance, disaster risk mitigation measures can be difficult to enforce as the needs are not immediate, and consequently, the potentially devastating impact of a disaster is left unaddressed. In the cases of both Hurricane Katrina and Canterbury earthquake, risk assessment for potential disasters was undertaken within a couple of years prior to both events, but in neither cases had these reports resulted in any changes in policy or mitigation measures. Furthermore, Alexander [4] argued that, while building codes can regulate the design, construction and maintenance of structures within its jurisdiction to protect its users and occupants from the forces

of disasters, the technological protection measure have not kept pace with the growing vulnerability of places with high risk to disasters (2006: 6).

Lessons in 'building back better' from the case studies thus far converge on the fact that *how* one might build back following a disaster hinges on *what* the appropriate definition of building back better is. Too often, post-disaster cities are 'built back' into a 'worse' state than before, making itself vulnerable to future events of similar magnitude. Authorities in underdeveloped nations governed by policies that prioritise short-term gains and populist agendas are unlikely to invest in disaster planning and management because their payoffs are uncertain. Building back entails an impossible task of replicating a pre-disaster city in a post-disaster context. While disasters often result in short-term exodus of survivors, many of those displaced by the event display remarkable persistence in their resolve to return to original sites of destruction despite the risks of doing so. Public denouncement of Mayor Nagin's 'Bring Back New Orleans' plan, which sought to replace entire neighbourhoods with green fields, illustrates the extent to which communities can mobilise together to reinforce a sense of belonging and the importance of *home* versus a *house*. Development of 'Unified New Orleans Plan' forced dozens of independent planning initiatives to reconcile their differences but also to expose blind spots, identifying new perspectives that made people's needs more transparent as a result. This further reinforces that most people are not resistant to change; they fear change when they lack transparency; they fear change when they perceive what they might lose as a result of change outweighs the benefits of change. The key issue here, however, is *for whom* rebuilding can be considered 'better'. Top-down architectural and planning interventions have limited success without strong engagement with the community throughout the recovery process, from inception through to completion.

In exploring the various nuances of 'build back better', the author learned that those accustomed to operating in an autocratic manner see the objectives of 'building back better' as simply an invitation to 'build back faster' under the mantle of 'progressive' design and 'avant-garde' concepts, but the social reality of post-disaster complexities suggests they can undermine the *wicked* problems of *building back better*. This observation does not contradict the need to restore key physical urban infrastructure as a first-response. Rather, it serves to highlight the importance of having mechanisms in place to help rebuild *communities* as an equally important consideration for improving the overall resilience of a place. But how this may be achieved in practice is another wicked problem, which is discussed in the next section.

5 Bottom-Up Tactics

5.1 Design as Power

In his 1987 essay, *The Reasoning of Designers*, Horst Rittel stated, "everybody designs sometimes; nobody designs always. Design is not the monopoly of those who call themselves 'designers'." (p. 1). Yet, Rittel proposed that design is

associated with power, but moreover that designers are actors in the application of power (p. 6). The recognition that every person affected by a decision being made has at least some power to influence lies at the core of an argument for democratic decision-making. Participation of disaster victims in rebuilding projects remains a major challenge for disaster recovery [24]; Kendra and Wachtendorf [34] because community engagement is a resource-intensive activity, monetarily and in terms of time. Incidentally, money and time are two resources that are always in short supply [47], which lead many field practitioners, however reluctant they may be, to rely on improvisation to solve most of the challenges they encounter on the ground. Seasoned professionals have some advantage in that they are more nimble and familiar with this state of post-disaster chaos, are thus able to navigate through the complex reality by cutting through bureaucracy to arrive at solutions that no technical manuals can provide. But another wicked problem that emerges in post-disaster context is that in many cases, there are no manuals or 'how-to' guides to start with. In Haiti, where there has not been any state level enforcement of national building code to speak of prior to the 2010 earthquake, the proliferation of *bidonville* (urban informal settlements) in the decade leading up to the event was the primary contributor to the loss of lives, and illustrates that such urban disasters are exacerbated through human actions. But the absence of national building code in Haiti is a symptom of larger, systemic problem, which many scholars argue has been compounding since their independence in 1805 [21, 26, 27], and some claim to go back as early as 500 years [44].

5.2 Wicked Problems of Social Cohesion

The extent to which citizen participation leads to project success or failure is often determined by whether the agents of power are working *with* people or exerting power *over* people [29]. A key challenge that remains is that while there is a considerable difference between the design outcomes of the two approaches, the engagement processes of these approaches are, on the surface, seldom discernible from one another, and are thus difficult to measure.

Following a major urban disaster, disaster recovery agencies operate under constant pressure to expedite through the early emergency phase continuing through to recovery, often leading to early burnouts and high staff turnover. Coupled with the fact that disasters catch most of its victims off-guard, each disaster is often the incumbent political leader's first [51]. This does not mean that the institutional structure for disaster management has little impact in the processes of recovery. In the U.S., for instance, emergency response to natural disasters remains the responsibility of local government, wherein the incumbent mayoralty has statutory authority as well as accountability over civil military activities within his or her jurisdiction [20]. So then at least in theory, having the direct means to call upon local professionals and to direct first responders where the needs are most dire gives the regional network of disaster responders, which includes the local

members of community, power to effect change. By contrast, in New Zealand, civil defence remains the responsibility of central government [9], which is conducive to a top-down disaster response and reconstruction process. The political actions employed by the local authorities since the 2011 Christchurch earthquake were described by the local media as 'scapegoating', 'hiding', 'excluding', and 'not communicating', which reflects the way authorities have managed uncertainties and the recurrent aftershocks. Such reactionary tactics, in turn, can obstruct community's ability to contribute in early design decisions. After all, the Haiti earthquake illustrates that systemic interventions, be they building codes or regulatory frameworks around deforestation or arbitrary tariffs on local produce to make imported goods more competitive, are what Rittel calls, *constraints* (1987, p. 6), which in the end are self-imposed and negotiable, rather than absolute or necessities in the eyes of power brokers.

But when the central governing authority is no longer able to keep pace with the changing demands of disaster recovery, or in the case of Haiti, physically falls apart, disaster opens up opportunities for new leadership to emerge. In Foucauldian sense, disaster creates an opportunity to create an alternative space, or "places of deviation" that falls outside the established norm within society (Foucault 1986). Boano and Hunter [8] characterised post-disaster sites as offering a depoliticised arena for reproduction of space (p. 1). Post-disaster sites can lead to production of new space—to be contested by community in the absence of a clear authority. So how might communities harness this newfound opportunity towards stronger social cohesion and resilience?

Disaster scholars argue that communities with strong networks affect the ability of individuals to activate informal ties in disaster (Hurlbert et al. [32], as was demonstrated in New Orleans after Hurricane Katrina [3], where "higher levels of social capital facilitate recovery and help survivors coordinate for more effective reconstruction" [2]. Neighbourhoods that were well-connected had a better chance of survival than those who were not. Knowing one's neighbours, Aldrich argued, exceeded the benefits of governmental support and economic resources. Not surprisingly, those without access to private vehicles were from lower socioeconomic neighbourhoods, in low-lying lands of the Mississippi Delta are those who suffered the most flood damage.

5.3 Design as Choice

In reality, equitable citizen participation requires leadership and responsibility from all sides—not just politicians, policy makers, and technical experts—but also from the community whose constituents are diverse and knowledgeable. Design equity is as much about making professional services available to communities in need as much as it is about democratizing the process of rebuilding generally. Where equity is not sufficiently present, however, the study found that the local community finds empowerment through tackling the wicked problems themselves.

A Latin adage, *nihil de nobis, sine nobis*, ('nothing about us, without us, [is for us])' which is often employed by post-disaster community organisations reinforces an understanding that empowerment is obtained not by having problems solved by others on their behalf, but by being supported to tackle many of the *wicked* problems themselves. The Christchurch earthquakes became a catalyst for galvanizing communities, and the overall improvement in social resilience has been a valuable outcome of the disaster. Suburban communities like the Port Hills, Sumner and Lyttelton, that were initially 'forgotten' by council authorities in the early days of the earthquake implemented innovative resilience strategies such as 'time banking', which enabled local communities to share their resources through exchanges of time credits, and established community-led urban design groups to positive effect. These communities demonstrated a strong sense of local identity and solidarity, enabling them to bounce back more quickly compared to those who waited for actions by the powers-that-be. In the case of the latter, such external interventions tend to resemble a stopgap rather than a long-term solution.

Disaster can serve as a catalyst for renewing community spirit and resilience against future disasters, and, in many cases, creates an even stronger sense of community than before [1, 36, 58]. Solving problems according to the community's values—irrespective of whether they align with expert advice—is an ethical consideration for professionals engaged in disaster recovery projects, and also an opportunity to challenge the existing mores of professional practice. Design is an equalizer that has the potential to re-empower communities struggling to restore their sense of belonging and identity.

5.4 Overcoming Disaster Capitalism

At the other extreme, architects can become inadvertent instruments of what Klein [35] calls, "disaster capitalism". As multiple agencies jockey for control in a state of disarray, politicians and professionals who work for them can just as easily be turned into public scapegoats. As people search for answers amid a climate of uncertainty and trauma, misunderstandings often exaggerated through the media can breed public contempt for even the most well-meaning professionals. In the early days following the September 2010 earthquake in Christchurch, where no human casualty occurred, the primary concern for the nation was to determine the fate of unreinforced masonry structures, many of which were heritage and character buildings. The New Zealand Institute of Architects (NZIA) responded by appointing an Architectural Ambassador to serve as the expert liaison for architects in the public arena. The selected architect, Ian Athfield, was known for a number of successful public works around the country but the fact that he was born in Christchurch was a lesser-known fact. So when the incumbent Mayor Bob Parker made a public endorsement of Athfield's appointment the next day, the media interpreted as part of Parker's political bid for reappointment of his term [22]. While professionals can and often do intervene, any suspicion of agendas

that serve personal rather than public interest can backfire on their efforts to assist in disaster recovery efforts. In New Zealand, architects were much more successful outside of the media limelight. At the national level, the NZIA worked with the government's Department of Building and Housing to develop strategies for mass housing; Athfield proceeded to give over 50 public talks in his first year of his formal appointment as the ambassador, helping to improve the public's understanding of architecture; but most importantly, many local architects offered pro bono service to the public, and worked as building assessors to salvage historic buildings that were erroneously marked for demolition.

Despite such efforts, the 2010 and the 2011 earthquakes in Christchurch remains the most economically devastating event in New Zealand's history. In a 2012 Swiss Re report, the Christchurch earthquake ranked third in economic losses resulting a major earthquake as a percentage of its GDP, following Haiti (121 %) and Chile (18.6 %). The 2011 Tohoku earthquake in Japan, while it tragically took over 220,000 lives, its economic impact stood at 5.4 % [7]. However, the state-owned asset sales as a default economic strategy by the central government, apart from being unpopular to residents, reinforces familiar tactics of disaster capitalism as seen in New Orleans and Haiti. Even though scholars argue that government-led asset sales is a valid route of recovery strategy from lost economic productivity [30, 59] argued that New Zealanders are opposed to free-market capitalism. The free-market policy is intended to foster innovation, but the lack of design controls or establishment of standards meant that overall quality is lowered rather than pushed up. Disaster can equally pave the way for heroic grassroots movements and community leaders to flourish, but in the absence of architectural anchors, such as the aforementioned Christchurch Cathedral, that defined the community, neo-liberal forces and hegemonic political-interest-groups can equally hijack the opportunity to advance radical changes at the expense of disaster victims. Political proponents argue that the expert-centred reconstruction is less time-consuming and more straightforward in decision-making and policy implementation, but short-term advantages gained by such methods are lost in the longer term compared with the community-centred approach. There is no illusion that architects, even those who aspire towards the common good, are necessarily political. Rittel (1973) contended, "no plan has ever been beneficial to everybody", because decisions are "usually compromises resulting from negotiation and the application of power." That architects are party to such a process, Rittel argues, is what makes the very act of design a "political commitment".

Inasmuch as the socio-aesthetic convergence of architecture as an end product and as a process can create tensions around architectural identity and empowerment, the concept of community design warrants further reflection in terms of what it means (and for whom) in the post-disaster context. While the involvement of architects in times of disaster offers no singular panacea to the complex environment of disasters, architects involved in disaster recovery have the moral obligation to consider the consequences of the professional service rendered as the legacy of their work will outlive those of most other experts, including the first responders to disasters.

6 Conclusion: Beyond the Wicked Problems, an Argument for the Design Democracy of the Third Generation

6.1 Future of Democratic Design

The Rittelian framework, while not explicitly employed by the agents of disaster recovery as a formal strategy, its relevance is unequivocal for those who seek to establish community cohesion and empowerment. Additionally, by framing post-disaster decision-making processes in terms of *wicked* problems design-enablers in each community can better navigate the complex environment of disasters. To build societal resilience, public design education—more specifically, training in democratic design process—is invaluable in societies where the only constant is change. Democratic design can foster creative capacities in our communities and increase resilience by reducing societal vulnerabilities. Since 2011, Christchurch has embraced change by hosting dozens of innovative events and projects. A case in point is the annual Festival of Transitional Architects (FESTA), a weekend dedicated to exhibiting new architectural ideas and celebration of Christchurch's transition into a new city. It has spurred the global travel publication Lonely Planet to place Christchurch 6th in the "Top 10 Cities for 2013" for "rising from the rubble with a breathtaking mix of spirit, determination and flair"[41], and projects such as FESTA illustrate that architecture can serve as a powerful medium for expressing a community's resilience and solidarity.

Some critics of humanitarian designers argue that architects are the last responders to disaster [43, 52], but this paper demonstrates that architects should work alongside the first responders, and particularly with affected communities, because the groundwork for last responders cannot wait until after the decision-makers and key stakeholders have left the room. This research began with the question of how the 'wicked problems' framework is relevant to urban disasters, and has found that wicked problems are, in fact, everywhere. Design leadership in the context of urban disasters often implies physical transformation of post-disaster environments, but this paper demonstrates while the symbolic impact of architecture through its lifecycle of construction, destruction, and reconstruction, remains a powerful force for those it serves; architecture is an equally powerful agent in giving communities voice in the process of disaster recovery.

Tim Brown, the founder of global design consultancy IDEO, defended that society needs T-shaped professionals—people who not only have deep specialisation in his or her field, but also ability to empathise with others [10]. In other words, we need more architects. Yet an ethical pathway for architects cannot be pre-defined [39, 40], as the reality of the working environment tends to be swamped with *wicked* problems that require a series of improvised decisions and choices rather than those based on proven solutions from the last century. The experiences of disaster professionals interviewed reaffirm that creativity is an essential skill to have on stand-by, because design, ultimately, is a renewable resource and a source of community empowerment.

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