Chapter 2
Systems Thinking

> *Design is an activity, which aims at the production of a plan, which plan—if implemented—is intended to bring about a situation with specific desired characteristics without creating unforeseen and undesired side and after effects.*
>
> —Horst Rittel, 1968

How architects have come to be largely absent in disaster recovery activities compared to some of the other sectors in the medical, the legal, and even the engineering fields can, in part, be explained by how architects have responded to industrialization, which transformed how cities developed. In *A New Professionalism: Remedy or Fantasy?* Bordass and Leaman (2013) argue that the diminishing authority of building professionals is a result of professional systems being replaced by a bureaucratic one in the industrial era. Appeal to expertise alone no longer provided the same privilege that traditional architects of earlier era had over influencing the design of the built environment, and building professionals have been left to compete against what came to be characterized as alternative forms of structuring expertise, such as through establishment of organizations and commodification of professional services. According to this theory, the combined forces of commodification and organization had already "colonized" professionalism via "larger, often multinational, organizations… employ[ing] building professionals as part of the organizational machine, [while] constrain[ing] their independence" (Bordass and Leaman 2013). It then follows that organization forces in the form of government regulations, and commodification of the building industry via standardization of processes and products have contributed to curtailing the independence of the architectural profession. By taking these factors into consideration it is hardly surprising that architects are disaster's last responders in many societies.

The architectural profession has endured an increasing climate of marginalization within the building sector since the 1970s. Apart from the gradual fragmentation of roles that were once exclusively in the domain of architects such as those caused by the rising demands of construction and the necessity to specialize due to increasing complexity of some building types, Thomas Fisher, the Dean of the

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College of Design at the University of Minnesota, attributes the profession's marginalization to their inability to establish value. Aesthetic values have little appeal for the modern day patrons of architects who are accustomed to economic appraisals, so architects struggle to articulate their value to those outside of the profession. When pitted against competing service providers such as developers and engineers, architect's input naturally becomes delayed to ever more belated stages of the building process (Fisher 2000). In spite of the shared conviction that the "[designer-user] relationship… [is at] the heart of what the architect does and has to offer the community", architects have become, in many cases, "mere expendable cosmeticians" (Marshall 1973). Increased demands for efficiency and cost-reduction have effectively replaced trust for accountability to minor details, and ethics for basic adherence to rules and regulations.

Nevertheless, the silence of architects in the public realm in the 1970s and 1980s were also productive times for those who were incubating big ideas that are now beginning to gain traction. One such an example is the 'design methods' movement of the early 1970s led by design thought-leaders such as Christopher Alexander and Horst Rittel, whose ideas gave rise to the current prevalence of *design thinking*, a strategy used not just in design but also in business management, marketing, and engineering applications. Understanding the systemic thinking as developed within the design field can enrich how post-disaster spaces are conceptualized, inhabited, and constructed.

2.1 Design as a Method

The rapid industrialization in the first half of the 20th century fueled the widespread systematization of societies. Exceptional technological advancements were achieved within a fraction of time that humanity has reached civilization. The NASA's successful space mission on the moon made anything seem possible. Wars were fought and won by those who were able to most optimally calculate and allocate their resources. Systems thinking assumes that all problems exist under definite conditions, and that they can be predicted with definitive accuracy and solvable using a linear process. Systems thinking was the technocrat's answer to societal problems that would be executed with high levels of efficiency, predictability and control over outcomes and were increasingly applied to streamline, commodify, and quantify every dimension of our lives.

At the peak of systems thinking, the design methods movement was also in full swing among the specialized design theorists and practitioners advancing what Richard Buchanan, editor of Design Issues journal, characterizes as "the new liberal arts of design thinking" (Buchanan 1992). Attracted by the reductionist logic and the potential to design better buildings, the proponents (Cross 1984; Buchanan 1992) of design methods simplified a typical design rationale as only consisting two stages: design problem *definition* and its *solution*. Systemizing design in such a way was intended to supplement rather than to supplant traditional design methods.

Early on, many designers worldwide, led by visionaries such as Walter Gropius and Le Corbusier, were seduced by the concept of International Style, and rejoiced the newfound liberty to break free from the past traditions in favor of pure functionalism and simplicity. By the second half of the 20th century, however, this scientific orientation of early systems approach in design was met increasingly with strong resistance from those who felt threatened by increasing marginalization of the profession through automation and mimicry of styles that were once the hallmarks of good design. By the 1970s, the designers were not alone in believing that, "the 'systematic' must be the enemy of the 'intuitive'" (Cross 1984) and figures like Jane Jacobs and George Baird led the way in fueling the public backlash against the modernist movement that littered the cityscape with sterile metal frames and glass façades devoid of history, identity and context. The dynamic and often improvised nature of design process, and the desire for the particular, were inherently incompatible with deterministic rationality of early systems approach.

Horst Rittel and Martin Webber, early proponents of design methods movement recognized that majority of design issues and those that manifest in society are too complex and indeterminate for scientific systems approach to apply (Rittel and Webber 1972, as cited in Protzen and Harris 2010). The main shortcoming of systems thinking is that the reductionist nature of systems fails to consider the complex social and environmental conditions in which they operate. In her book, *The Challenger Launch Decision: Risky Technology, Culture, and Deviance at NASA*, sociologist Diane Vaughan illustrates the dangers of institutionalized systems and its lack of flexibility in incorporating the incremental social, behavioral and psychological anomalies that eventually culminated in the disaster. While systems approach is highly effective at measuring outcomes within predefined parameters, it has evolved to recognize the need to operate in concert with social factors that are in a constant state of flux.

Indeed, the burgeoning fields of interaction design, experiential design, and service design reflect a renewed demand for designers to curate new spaces for communicating, finding meaning, and building experiences that transcend existing frameworks and systems. This further reinforces the need for architects to strengthen their understanding of cognitive, emotional, and behavioral aspects of human condition in urban settings beset with systemic crisis and disruptions. These are the wicked problems of our generation.

2.1.1 Democratic Decision Making for Wicked Problems

Although Horst Rittel, as both a designer and a mathematician, recognized the shortcomings of the early models of design methodology, he sought to reframe it in terms of "wicked problems" (Rittel et al. 1984). He proposed a generational split between the earlier generation of systems approach, which were linear and were only suited to what he considered to be "tame" problems, and proposed a mature version of systemic thinking which would be modified to incorporate more

complex, "wicked", and non-linear situations. Rittel believed that this "second generation" design methods had the potential to lift the design profession from its own crisis of marginalization, because it was both procedurally and attitudinally different from the scientific, mission-oriented systems approach of the former generation (Rittel et al. 1984). In developing the second generation approach to design, Rittel coined the expression "wicked problems" which he broadly defined as a "class of social system problems which are ill-formulated, where the information is confusing, where there are many clients and decision makers with conflicting values, and where the ramifications in the whole system are thoroughly confusing" (Churchman 1967). By reframing the systems thinking as a strategy more germane to "tame" problems than "wicked" ones that are more prevalent in everyday life, Rittel drives at the essence of what design contributes to systems thinking: the fundamental shift from outcome-orientation to placing value on processes that can lead to transformative decision-making as an outcome in itself. If earlier generation of systems thinking was focused on *solving* problems, the latter generation of systems thinking was geared towards problem *framing*. To illustrate this point, Rittel outlined the ten characteristics of wicked problems in 1972, which sets out the basis for collective participation and argumentation:

1. *Wicked problems* have no definitive formulation, but every formulation of a *wicked problem* corresponds to the formulation of a solution.
2. *Wicked problems* have no stopping rules.
3. Solutions to *wicked problems* cannot be true or false, only good or bad.
4. In solving *wicked problems* there is no exhaustive list of admissible operations.
5. For every *wicked problem* there is always more than one possible explanation, with explanations depending on the *Weltanschauung* of the designer.
6. Every *wicked problem* is a symptom of another, "higher level," problem.
7. No formulation and solution of a *wicked problem* has a definitive test.
8. Solving a *wicked problem* is a "one shot" operation, with no room for trial and error.
9. Every *wicked problem* is unique.
10. The *wicked problem* solver has no right to be wrong—they are fully responsible for their actions.

As can be ascertained from the above list, framing a problem in terms of wicked problems is conducive to a collective, democratic decision-making strategy. Rather than an expert-centric model as espoused by the first generation model, the second generation model embraces equity and pluralism by placing the expert on par with other stakeholders. This shift away from expert centrism was in fact congruous with the wider societal trends of the 1960s. What had been the "golden age" for traditional experts—whose esoteric scientific power was unencumbered by criticism and where they had considerable authority over the public—was long gone by the 1970s. The initial period of positivism as shaped by systems thinking gave way to the "second wave" (Bogner et al. 2009), the age of democracy, which, along with the technical revolution made knowledge available to all. And having access to

information at one's fingertips made the concept of subject expertise seems acutely pedestrian.

Problem solving through democratic process can unclog an existing system that may eventually become redundant over time and transform it to ones that are open and receptive to pluralism. By reconciling multiple perspectives, such system can evolve beyond its conceptual state to one that can encompass the complexities outside of itself, making it more resilient, relevant, and robust.

Nevertheless, approaching wicked problems through democratic process is laden with uncertainties. It is necessarily complex and risky. Some of the risks are: (1) Objectivity—how do we ensure that an expert does not dominate the process and heavily influence the outcome through his or her expertise? (2) Equity—how do we ensure the plurality of perspectives is honored? How do we bridge the differential skill-sets? (3) Ignorance—how do we ensure that sufficient data has been collected and all possible scenarios had been considered before arriving at a decision with confidence?

Attaining objectivity in accordance with the characterization of wicked design problems is inherently problematic because it presupposes an outcome of a decision as being independent of the subjects carrying out the task. Especially in architecture, as most design decisions are concerned with the *particular* rather than the *general*, they are necessarily subjective. In light of this, Rittel argued for transparency through sharing all available data among stakeholders as being sufficient to reach what he called "objectification". Objectification is distinct from the notion of scientific objectivity in that the person making a decision is responsible for objectifying the decision-making process to all those that are affected by the outcome by stimulating doubt, sharing of information, delegating judgment, and most importantly, allowing others to participate in the democratic design decision-making process. Objectification, therefore, allows subjective viewpoints to be balanced and reconciled through evidence-based approach of systems thinking.

Design systems of the second generation departs from the traditional characterization of the designer as the "prima donna" whose authority rests on the "operational knowledge" of the profession, to that which acknowledges "everyone is a designer" (Protzen and Harris 2010). Celebration of pluralism, which Rittel articulates as a "symmetry of ignorance", broadens the definition of experts to include those who have specialist knowledge in one field alongside those who may be non-experts but rich in experiential, local knowledge, allows identification of decision blind spots and biases of systems designers—be they architects, politicians, or scientists. This in turn has the effect of deepening trust and credibility among all those affected by the system, experts and non-experts alike.

When faced with wicked problems, value conflicts can precipitate further uncertainties and produce unintended consequences. While Rittel proposed some practical strategies for overcoming some of the risks within the second generation systems thinking, they serve to describe, rather than prescribe how wicked problems of society can be tackled.

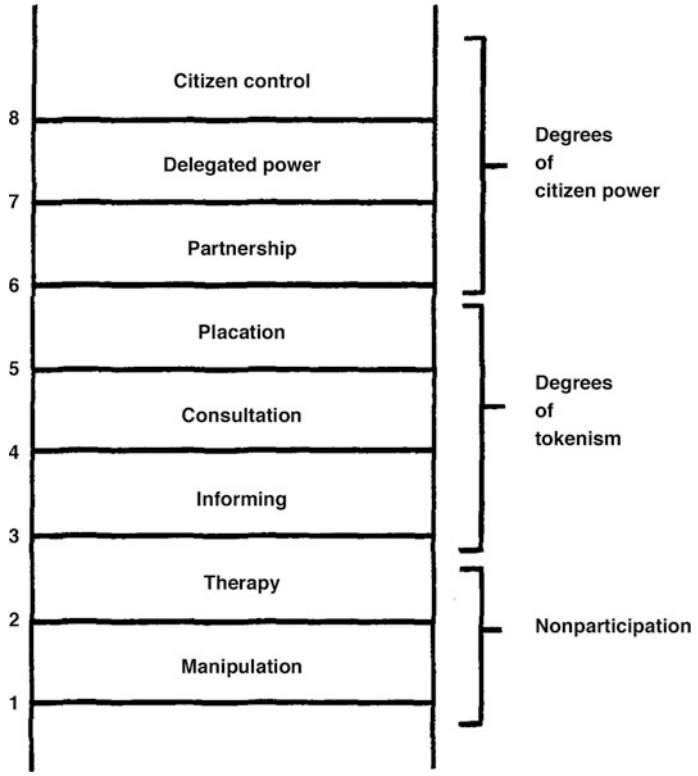

Fig. 2.1 Eight rungs on a ladder of citizen participation (from Arnstein 1969. Reprinted by permission of Taylor & Francis Ltd., http://www.tandfonline.com)

2.1.2 Democratizing Design

Another seminal work that emerged from this era is Sherry Arnstein's illustration of the "Ladder of Citizen Participation" (Fig. 2.1), which articulates a tiered notion of power distribution in the participatory process of planning.[1] Both Rittel and Arnstein's work converge on seeing their work as being influenced by politics. Social participation in the process of design and planning was a phenomenon that developed in reaction (Jenkins and Forsyth 2010) to the government driven building boom that followed in the post-war era in the UK and North America in the 1960s.

[1]The ladder of participation is categorized under eight successive rungs according to the levels of participation, determined by extent to which the participating citizen has influenced the outcome. The eight rungs of the ladder are clustered into three tiers of power, namely: citizen power, tokenism, and non-participation.

Arnstein (1969) posited that citizen participation is unequivocal to attainment of citizen power since forms of participation are distinctly independent of their actual substance, and argued that participation can become an "empty ritual" if it does not accompany resources and influence. The lack of robust guidelines on how the principles of participation can be applied in practice can hinder effective community participation.

To illustrate this, tokenism is a commonly observed phenomena in town hall meetings and public consultation workshops where participants are given the opportunity to voice their views based on proposals developed ahead of the sessions. A city hall meeting that brings together neighborhood residents of a pending high rise development in the vicinity is one such example.

One downside of consultation is that the participants—who are often stakeholders of the issues being consulted on—are *heard* but not necessarily *listened* to. Because there is no assurance that the views of participating community will be reflected in the decisions ultimately made for them, such consultation is a guise for predetermined action which gets "passed off as legitimate forms of community participation… despite the users' participation in decision-making being stifled" (Davidson et al. 2007), the community is held hostage to consequences that they had no power to change.

Beyond Rittel and Arnstein, design thinking has been widely adapted as democratic tools for participatory decision-making and community empowerment.

Design charrettes facilitated by architects and planners are often employed in community settings to level the power discrepancy between sponsors and their beneficiaries. The U.S. based design consultancy firm IDEO's Human Centered Design Toolkit is an example of systems thinking that has been adapted for use by those from non-design backgrounds in remote locations where professionals are scarce, to solve a wide range of social, political, environmental problems using basic design principles. OpenIDEO, a global online platform for documenting human centered design implemented in local communities, have dealt with a plethora of issues that span the environment, politics, and economy.

With the human centered design, participants are able to reap the benefits of design process with minimal learning curve, while discovering and co-creating ideas through the structured creative process that begins with empathy building, followed by storytelling, and the recursive process of trial and error until the group reaches consensus. A defining characteristic of such strategy is the establishment of personal responsibility and ownership, where power is distributed to willing participants rather than on the basis of professional merit.

IDEO's example suggests a paradigm shift not only in the social perception of professionals but also in what society demands of professionals in the new era of democratized knowledge and platforms for communication. As we enter the age of diversified expertise, the knowledge base on which decisions are formed is co-created by both professionals and the public, and the professionals' role as both providers of specialist knowledge and as supporters of the public needs is

particularly valuable. Imbalanced power dynamics or over-reliance on professionals can debilitate recovery efforts in disasters. The main risk of expert centrism is that while professionals provide specialist service to a community using deep domain expertise gained from outside, when the relevant skills are not transferred to the public, it can create an unhealthy dependence for the public. In *The Abundant Community: Awakening the Power of Families and Neighborhoods*, social policy experts John McKnight and Peter Block assert that "professionalization is the market replacement for a community that has lost or outsourced its capacity to care" (McKnight and Block 2010). Professionalization of disaster can alienate communities from its ability to be self-sufficient. But the rejection of professionalism is by no means to advocate for an insular society that is hostile to outsiders, but to highlight the dangers of unabated reliance on globalization and potentially one-sided systems of commodification that can diminish the well-being of communities at every scale. For communities to truly prosper, McKnight and Block said that people cannot thrive in a consumer society, and that people must also re-learn to become citizens and producers.

2.2 Operationalizing Wicked Problems

> In a world with little respect for traditional structures, almost everything… can be approached as a design problem, in which new solutions must be sought to meet particular needs and specific contexts.—Fisher (2000)

One recurrent controversy surrounding the second generation design thinking is that in spite of its many achievements, working with wicked problems is still an evolving and, to a large extent, an emergent endeavor. Much of its development, though endured through successive research and scholarship since Rittel's initial articulation, remains a description of the social reality of wickedness rather than grounded in empirical investigations. The focus has been placed upon raising awareness, preaching for acceptance, and advocating for creative strategies and innovative approaches. But little has been reported on exactly how these ideas and proposed approaches can effectively be operationalized.

Developments in technology have given professionals the power to produce larger and broader effects at the same time that they become more clearly aware of the remote consequences of their prescriptions. Rittel defined design as "an activity, which aims at the production of a plan, which plan—if implemented—is intended to bring about a situation with specific desired characteristics without creating unforeseen and undesired side and after effects". To that end, Rittel focused on *describing* wicked problems rather than offering a *prescription* to solve wicked problems, which is consistent with his conviction that design is a tool for argumentation rather than a one-size-fits-all type solution.

2.2.1 Limits of Systems and Professionals

> Systems aggregate deficiencies in the name of efficiency. Systems and professionals promise that the institutions customizes care and personalizes service, but it is an unfulfillable promise… What they miss in the aggregation of deficiencies is that the structure itself and the thinking that underlies it makes personalized care impossible.—McKnight and Block (2010)

Introducing efficiencies in existing systems in and of themselves do not alleviate problems it is trying to fix, if underlying problem are not first addressed. The concept of personalized care within structured systems is inherently contradictory, because the personhood invariably gets lost within the systemic aggregation process. The limits within existing systems and professionalization are often hidden from the view of its agents. The main argument for humanitarian design practice is not to establishing post-disaster context as the new frontier for engaging creative professional practice, nor is it to force alternative forms of shelter upon disaster survivors by competing with established aid operators. Doing so would only be addressing the symptoms of crisis rather than its root cause. Instead of considering what skills designers can offer in humanitarian settings, design activities need to be reframed in terms of how it best aligns with a community's existing competencies and their vision for resilient future.

Historically, the moral hegemony of architecture has been polarized between those that see its practice as a product of traditional patronage typically reserved for society's elites, and those that view architecture as a basic human right (Burgess 1983; Ward 1996; Watkin 2001; Ray 2005). In terms of their respective design process, the former group employs an outcome-led approach defined by policies and regulations, taking on the characteristics of first generation systems approach, while the latter employ open-ended, process-centered approach that is conducive to second generation systems approach. In practice, however, there are advantages and shortcomings to either approach in humanitarian applications.

Top-down, First Generation As already mentioned in the previous chapter, humanitarian design is often misconstrued because it is seen as an activity that threatens to encroach on the resources that are already stretched. Nussbaum contended that democratization of architecture should not promote mass proliferation of pseudo-architecture, but instead to invite architects to reassess the process of design and the overall objective by "switch[ing] gears from designing for to designing with" (Nussbaum 2007). But under ordinary circumstances, design in its traditional application is seen to carry too much risk for humanitarian endeavors. Whereas both humanitarian agencies and architectural professionals appreciate the general activity of design as a systemic tool, humanitarian agencies hold the view that architectural input is an economically burdensome exercise that can safely be value-engineered (Ban 2011) out with minimal downsides for the overall disaster recovery process. Architects, on the other hand, view the same activity as an opportunity to add value (Jenkins and Forsyth 2010) and productivity through innovation. When considering design from a purely economic standpoint, the innovation "valley of death" and the high upfront development cost of design

prototyping and testing competes directly with the urgent survival needs of emergency relief.

Design activities also carry the risk of imparting negative consequences, what Rittel described as "unforeseen and unintended side and after effects". The skeptics of humanitarian design are not concerned so much as with the underlying altruistic motivations of designers as they are with designers' ability to do harm. In extreme cases, systematic architectural responses to social problems can decouple the designer from reality by turning them into an "anonymous, detached, scientifically rational diagnostician" (Spector 2001). A temporary refuge that such approach provides, however, can stifle valuable dialogue with users and limit further opportunities to integrate their actual needs. Unfortunately for designers, the news media feeds on the faults of a few by sensationalizing the speculative design gestures of those who offer their vision for rebuilding an entire neighborhood—often without ever having set foot on the site—when most from within are still grieving their loss.

Bottom-up, Second Generation For those designers who advocate for, and practice, humanitarian design, they insist that humanitarianism is "the new compassion", which "demands more than a one-off transactional relationship between demand and supply: it becomes an integrated discipline that responds to local needs more directly than conventional practice" (Kaye 2011). Social design entrepreneur Pilloton (2010) argues that "most critics who call humanitarian design the new imperialism haven't done the work and realized how messy, political, and complex it can be", while conceding that "we don't have the best practices or answers yet". Influencing social change by enabling design to occur from the ground up has been a common strategy for humanitarian design practitioners.

The mediating role that architects can play in local communities as "skilled understanders" (Ward 1996), and as facilitators for group problem solving is widely documented. What has now evolved to be called the 'Public Interest Design' (PID) movement in the U.S. can be traced back to the community architecture movement in the UK in the 1960s. It was a direct reaction to, and as an alternative to top-down development projects amid the proliferation of public housing and state-led mass redevelopment (Jenkins and Forsyth 2010). The "self-build" approaches of Turner (1972) and the "supports" approach of Habraken (1972) mobilized a generation of architects and planners to reinforce the need for wider social participation in architecture. Its early success was reflected in local policy documents that began to incorporate community participation as part of their strategic planning process.

Today's contemporaries such as John Peterson, Teddy Cruz, Bryan Bell, Maurice Cox, and Cameron Sinclair follow on the footsteps of pioneers like Turner and Habraken. They continue to champion the social design's requisite goal of democratizing design. Though wildly diverse in their approach, whether expressed in terms of 'community-led design', 'cooperative design', 'co-design', 'co-creation', 'self-help design', or 'participatory design', the underlying principle is similar in that it goes beyond the token participation of users, where design is used as a mediating tool for communicating and interpreting needs and priorities of

stakeholders, establishing equity, and empowering those without voice. Maurice Cox, a PID evangelist, recalled that empathic design has been about giving users choice (March 25, 2010). John Peterson's "the one percent" initiative was launched in 2005 to invite the U.S. architects to pledge one percent of their time annually on community projects. Peterson contends that the work of professionals solely driven by "generosity of spirit" (John Peterson, as cited in Peterson et al. 2010) or altruism cannot be self-sustaining in the long run; it must incorporate non-profit work within normal for-profit practice while the former meets the performance objectives of the latter. The one percent initiative has shown that the main barrier for architects to engage in non-profit work—whether in post-disaster reconstruction or in low-socioeconomic communities—is not in the lack of financial incentives or time, but because the *pro bono* component of architectural design service had not yet been professionalized and recognized as they have been in other disciplines.

2.2.2 Disaster as a Wicked Problem

Whereas human error may be minimized through successive systemic improvements, natural disasters that manifest at the intersection of human activity and routine metabolic activities of mother nature cannot be avoided, and thus fall under the class of wicked problems that Rittel espoused. The systemic failures that accompany such events also require government agencies, humanitarian organizations, professionals, and communities that each has values that sometimes align and compete with one another.

Wicked problems in disasters manifest in all forms, at all stages from emergency to recovery, from how they are measured, managed and assessed, in how they affect individuals, communities, organizations, and government agencies, to smorgasbord of approaches in which societies and cultures learn from the experience, and the countless ways in which they do not. The prevalence of disaster myths and misconceptions propagated throughout society add to the challenge for those in humanitarian aid. Whether driven by popular culture, sensationalist news media reports, rumors, or even forgetfulness, disaster misconceptions persist and plague our ability to manage it. David E. Alexander, the Professor of Risk and Disaster Reduction at University College London, conducted a transatlantic study (Alexander 2007) among the students of disasters to test the extent of the misconceptions based on the most persistent myths, such as: 'earthquakes are commonly responsible for very high death tolls', or that 'looting is a common and serious problem after disasters', and 'companies, corporations, associations and governments are always very generous when invited to send aid and relief to disaster areas'. He was surprised to find that many of the myths endured beyond educational levels and cultural backgrounds (2007).

Disaster research is an interdisciplinary field that has dedicated itself to detangling some of the challenges posed by the recurrent wicked problems of disasters yet even within this field there is a divergence (Perry 2007) between those

researchers who follow the "hazards" approach, the study of disaster cycles; those who adopt the "sociological" approach, the study of social disruption accompanying disasters; and those who take the "social phenomenon" approach, the study of socially constructed vulnerabilities and social change. Such divergent approaches of disaster researchers can sometimes produce contradictory findings that create more confusion than understanding (Stallings 2007). Alignment of classifications and typologies employed in conducting disaster research, which may prove to be fruitful for the sake of consolidation, still poses a major challenge since bulk of the prototypical disaster research are produced as independent field studies (Stallings 2007). In other words, the limited resources, tight deadlines, and improvised conditions in which such studies are produced often lead researchers to employ closed-systems approaches to justify their methods, not unlike the behavior (Schilderman 2010) of humanitarian agencies that, while preferring participatory approaches to rebuilding, are still hard-wired to behave in the top-down manner. In reality, many relief agencies seek to maintain control and implement the first generation systems approach, and as a result, communities can be left out of the design decision-making that directly impact on their livelihood.

What these observations also suggest is that the quality of wickedness is not only inherent in the phenomenon of disaster itself, but also exists as a byproduct of the human response to the disaster.

2.2.3 *Beyond Rittel: Reasserting Design as Universal Human Right*

> most of the design problems we face lie far beyond the expertise of a single individual or profession—Protzen

Resilient design is neither a top-down nor a bottom-up approach, but a design conversation that provides communities with the means to become authorities in their own decisions, to support them in making a decision appropriate to the circumstances, and to build capacity for carrying on the work long after the designers have left the room. Former U.S. Congressman and architect Richard Swett argued that engaging the broader community as decision-makers has the effect of "transform[ing] the ultimate users of the project into its stakeholders", because, "Without stakeholders, there is little appreciation for the outcome of the project and little desire to maintain it" (Swett 2005). Even as the nature of humanitarian assistance in recent years are shifting from a professional-led approach to one that is more community-centered, architects are hardly strangers to the idea.

The history of architectural profession reinforces the strong reciprocal relationship that architectural profession has with society (Till 2009; Cruz and Tate 2010; Boano and Hunter 2012; Jenkins and Forsyth 2010), mirroring its development in both positive and negative ways. The discussion also leaves open the possibility for the profession to act as an influential middle-agent that can enable,

mediate, and aggregate societal change, as much as it can disable, disconnect, and disaggregate relationships. In *Architects Without Frontiers*, Charlesworth (2006) employs the terms 'architect' and 'architecture' interchangeably to encompass multiple professional groups operating in the built environment. Despite the traditional association of architecture with "elite edifices for the emerging bourgeoisie", Charlesworth argues that architecture also embodies "broader acts of thinking, creating, and implementing in a structured intellectual framework" (2006). The context of disasters provide an opportunity to discuss how architects can engage in the problem-sharing processes needed within the complex parameters of urban environments, where Charlesworth asks: "Is it our role to provide the definitive solution, or rather to provoke… collective action in rebuilding civil society after the disaster…?" (2006).

Richard Coyne denied that Rittel's conceptualization of wicked problems does little beyond shifting the problem from those that can be dealt by professionals to the community: "so-called 'second generation' analytical methods shifted the ground to a consideration of communities and their means of communication… But this move from a rationality based on abstract logic to a more empiricist or experiential position merely shifted the problem of defining rationality and rational criteria to the broader arena of community consensus" (Coyne 2005 #873@7), however, within the post-disaster context, such shift is not only desirable—as it repositions problems from being contained within the exclusive domain of professionals to that of communities—it makes the wicked problems approach a viable route to resilience.

Operationalizing the wicked problems, which can be considered as the third generation systems thinking, is about having the wherewithal to bring the second generation systems approach to the context that is still operating within the first generation systems mindset. Rittel provided a framework for applied design thinking but what Rittel advocated for was not a dogmatic adherence to any particular strategy in practice, but to provide a guideline for resilience by minimizing the unforeseen side and after-effects that can arise in all design decisions. Finally, design thinking can be operationalized within the context of humanitarian activities to diagnose the extent of its wicked properties as well as to develop a better understanding of the design decisions made during times of crisis so we can quantify its long-term social impact.

References

Alexander DE (2007) Misconception as a barrier to teaching about disasters. Prehospital Disaster Med 22(2):95–103. doi:10.1017/S1049023X00004441

Arnstein SR (1969) A ladder of citizen participation. J Am Inst Planners 35(4):216–224

Ban S (2011) Shigeru Ban Lecture. School of Architecture and Planning Podcast, Auckland, New Zealand, 3 Nov 2011

Boano C, Hunter W (2012) Architecture at risk? The ambivalent nature of post-disaster practice. Architectoni.ca 1(1):1–13. doi:10.5618/arch.2012.v1.n1.1

Bogner A, Littig B, Menz W (eds) (2009) Expert interviews in interpretive organizational research. Palgrave Macmillan, NY
Bordass B, Leaman A (2013) A new professionalism: remedy or fantasy? Build Res Inf 41(1):1–7
Buchanan R (1992) Wicked problemd in design thinking. Des Issues 8(2):5–21
Burgess PG (1983) The role of the architect in society. Carnegie-Mellon University, Pittsburgh
Charlesworth ER (2006) Architects without frontiers: war, reconstruction and design responsibility. Architectural Press, Oxford
Churchman CW (1967) Wicked problems. Manage Sci 4(14):141–142
Coyne R (2005) Wicked problems revisited. Design stud 26: 5–17. doi:10.1016/j.destud.2004.06.005
Cox M (2010) Bayview rural village: a case study. Public Interest Design Institute, Austin
Cross N (ed) (1984) Developments in design methodology. Wiley, New York
Cruz T, Tate J (2010) Design Ops—a conversation between Teddy Cruz and Jonathan Tate. In: Choi E, Trotter M (eds) Architecture at the edge of everything. MIT Press, London, pp 75–83
Davidson CH, Johnson C, Lizarralde G, Dikmen N, Sliwinski A (2007) Truths and myths about community participation in post-disaster housing projects. Habitat Int 31(1):100–116. doi:10.1016/j.habitatint.2006.08.003
Fisher T (2000) In the scheme of things: alternative thinking on the practice of architecture. University of Minnesota Press, Minneapolis
Habraken NJ (1972) Supports, an alternative to mass housing (trans: Valkenburt B). Architectural Press, London
Jenkins P, Forsyth L (2010) Architecture, participation and society. Routledge, New York
Kaye L (2011). Making the ideal more real. Architect 30–31
Marshall KD (1973) President's address to annual meeting. J NZ Inst Architects 50(6):162–163
McKnight J, Block P (2010) The abundant community: awakening the power of families and neighborhoods. Berrett-Koehler Publishers, San Francisco
Nussbaum B (2007) Are designers the enemy of design? http://blogs.businessweek.com/mt/mt-tb.cgi/5969.1362014642. Accessed 21 June 2011
Perry RW (2007) What is a disaster. In: Rodriguez H, Quarantelli EL, Dynes RR (eds) Handbook of disaster research. Springer, New York, pp 5–9
Peterson J, Carter M, Cary J (eds) (2010) The power of pro bono: 40 stories about design for the public good by architects and their clients New York. Metropolis Books, NY
Pilloton E (2010) Are humanitarian designers imperialists? Project H responds. http://www.fastcodesign.com/1661885/are-humanitarian-designers-imperialists-project-h-responds. Accessed 21 June 2011
Protzen J-P, Harris DJ (eds) (2010) The universe of design: Horst Rittel's theories of design and planning. Routeledge, Abingdon
Ray N (2005) Architecture and its ethical dilemmas. Taylor & Francis, New York
Rittel HWJ, Webber MM (1972) Dilemmas in a general theory of planning. Policy Sci 4(2):155–182
Rittel H, Grant DP, Protzen J-P (1984) Second-generation design methods. In: Cross N (ed) Developments in design methodology. Wiley, New York
Schilderman T (2010) Putting people at the centre of reconstruction. In: Lyons M, Schilderman T, Boano C (eds) Building back better: delivering people-centred housing reconstruction at scale. Practical Action Publishing, Warwickshire, pp 7–27
Spector T (2001) The ethical architect: the dilemma of contemporary practice. Princeton Architectural Press, New York
Stallings RA (2007) Methodological issues. In: Rodriguez H, Quarantelli EL, Dynes RR (eds) Handbook of disaster research. Springer, New York, pp 55–82
Swett RN (2005) Leadership by design: creating an architecture of trust. Greenway Communications, Atlanta
Till J (2009) Architecture depends. MIT, Cambridge
Turner J (1972) Freedom to build: dweller control of the housing process. Macmillan, New York
Ward C (1996) Talking to architects: ten lectures. Freedom Press, London
Watkin D (2001) Morality and architecture revisited. University of Chicago Press, Chicago

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