IF THE HOUSE FITS: THE POLITICAL ERGONOMICS OF DESIGN THINKING FOR POST-YOLANDA SHELTER DEVELOPMENT

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The notion of design thinking has become increasingly fundamental to the understanding and practice of design. On the one hand, business practitioners emphasize its meaning as a replicable method for managing practical design projects in a broad sense, while design scholars, on the other hand, discuss the concept in light of ways of knowing that bring about design ability. In this paper, cultural analysis is made central to understanding the applications of design thinking, more specifically as utilized in developing disaster-resilient shelter possibilities in and with coastal communities in the Visayas that were affected by Typhoon Yolanda (Haiyan) in 2013. Building on Langdon Winner's notion of political ergonomics, this paper looks at how design thinking output, in the form of shelter prototypes, can materialize, reconcile, or provoke conflicting subjectivities across multiple actors involved in disaster rehabilitation efforts, and how these subjectivities, in turn, shape designed output. We maintain that disaster-related designed output are political artifacts that emphasize how sociocultural relations in which they are embedded may both frustrate or further design processes and the various agenda that underpin these. This project aims to contribute to the growing literature in the field of design anthropology by being conscious of the workings of power that constitute the creation of artifacts that we use in our lives.

Keywords: *Design thinking, design research, design anthropology, humanitarian architecture, humanitarian engagement, disaster studies, development*

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Design is in a state of flux. A shift from a mechanical to an information age characterized by increasingly miniaturized and often visually similar electronic and digital devices expanded design from subfields involving direct manipulation of material forms to conceivably "less material" domains (Raizman 2010:12). Moving from a primarily visual paradigm that celebrates the individual designer, such as an architect or an industrial designer, ideas such as "interactivity" and collaborative work have expanded the scope of the field (Raizman 2010:12). The term "software design" embodies more recent applications of the field. Raizman further states, "[w]hile actions of the software designer do not result in a physical object, they certainly entail a set of instructions and a menu of choices or decisions that enable users to access and navigate through a sea of information" (2010:12).

Design, according Raizman, thus subsumes a diverse range of activities from drafting decorative patterns and typefaces, inventing new manufacturing and production process, and designing software interfaces. Consequently, Gunn, Otto, and Smith (2013:2) note that "… design has arguably become one of the major sites of cultural production and change, on par with science, technology, and art" given the emphasis modern societies place on innovation and change as intrinsic values. This shift and expansion of the field prompts examination of methods, abilities, and mindsets gleaned from practicing designers that non-designers could apply, collectively identified as "design thinking." Nigel Cross (2011), for example, expounds on what he terms as "designerly ability": ways of knowing, doing, and thinking as practiced by the designer communities independent of the sciences and the arts.

Design thinking

One of the more public figures associated with design thinking is Tim Brown, chief executive officer (CEO) of the design firm IDEO. The firm applies their approach to design thinking – branded as "human-centered design" – in both business and development settings, and their intersections. Design here is largely conceived as innovation, the discovery and implementation of new products and services based on a clear understanding of the priorities of end users. In an article for the *Harvard Business Review*, Tim Brown defined design thinking as

> [...] a methodology that imbues the full spectrum of innovation activities with a human-centered design ethos. By this I mean that innovation is powered by a thorough understanding, through direct observation, of what people want and need in their lives and what they like or dislike about the way particular products

> are made, packaged, marketed, sold, and supported [...] it is a discipline that uses the designer's sensibility and methods to match people's needs with what is technologically feasible and what a viable business strategy can convert into customer value and market opportunity (Brown 2008:86).

While Brown's framing of design thinking applies to an overtly market-driven context, he has extended its use to include innovation for socially relevant concerns, such as education. In this light, Tim Brown and Jocelyn Wyatt (2010) primarily view design as a method in their discussions of "design thinking." Brown and Wyatt state:

> The design thinking process is best thought of as a system of overlapping spaces rather than a sequence of orderly steps. There are three spaces to keep in mind: inspiration, ideation, and implementation. Think of inspiration as the problem or opportunity that motivates the search for solutions; ideation as the process of generating, developing, and testing ideas; and implementation as the path that leads from the project stage into people's lives. (Brown & Wyatt 2010:33)

Roberts (2013) expounds on Brown's notion of design thinking, in its ideal sense, as a means to accord more value to the opinions, values, and experiences of users of designed artifacts. According to Roberts,

> Design in the sense invoked in Brown's definition is also a way of thinking that subjugates, or controls, the designer's creative urge through attention to the circumstances of the object's users. In this sense, design tempers the force of the technological script – the desire to do something merely because it is technically feasible. Instead, attention turns to how the design can support experiences. In this understanding, design is about attending to practices and focusing on what people are trying to achieve and then to design for that. (Roberts 2013:239)

Applying design thinking, as described by Brown (2008) and Brown and Wyatt (2010), enables the authors as researchers to participate in the design process and collaborate with other actors in the field to develop products and services that are user-centered. This is in spite of the fact that two of the three of us have no formal training in design practice.

The participation of researchers in the design process is nothing new. Waisberg (2009) notes how social researchers have long been engaged to identify human factors critical to the adoption of designs based on knowledge of intended users. Meanwhile, Clarke (2011), Gunn and Donovan (2013),

and Cajilig and Maranan (2013) have identified examples of design research projects that also double as anthropological research.

Design consultancies, such as U.S.-based firm Reboot and IDEO (2015), engage anthropologists to provide the cultural backdrop for the needs and motivations that should underpin designed output manufactured for development objectives. However, as design researchers who would also like to contribute to an anthropology *of* design, rather than *for* it (Cajilig & Maranan 2013, Gunn & Donovan 2013), limiting cultural analysis to the motivations, relations, and practices of only end users also limits our understanding of how cultural formations shape designed output and vice versa. Our experience working on shelter prototypes for survivors of Typhoon Yolanda (Haiyan), the strongest typhoon to make landfall in recorded history as of 2013 (Dimacali 2013), made us realize that the urgency, anxiety, and uncertainty that characterize disaster contexts tend to further magnify the complexity of the mutual constitution of material forms and human relationships.

Aside from our consultancy, other local organizations also use design thinking. Habi Education Lab for example, is a company that applies design thinking methods to the field of educational design. Habi has attempted to interpret design thinking in the vernacular context as it engages teachers and administrators of public and private schools. Habi's design thinking process thus involves the following stages: 1) *himayin ang problema* (identifying the problems with stakeholders), 2) *ambagan ng mga ideya* (collaborative brainstorming), 3) *bumuo ng prototype* (externalizing an idea to get immediate feedback, and 4) *ipakita, suriin, at ayusin* (finding ways to improve and redefine the solution).

Within graphic design, the design process appears to be more fluid. A Manila-based graphic designer who with his wife owns a T-shirt design company for children, describes his design process as "setting the stage for *tsamba*" or chance (Cajilig 2013:95). This entails preparing materials and equipment prior to creating designs while keeping the creative process open as well as iterative. The goal is to arrive at a serendipitous moment in which the designer, along with his wife, feels he has reached a satisfactory design suited for market consumption. In this case, and as opposed to more complex design projects that implicate a wide range of stakeholder positionalities and resources, the extent to which the design meets project objectives of the moment in such cases often depends on the subjective assessment of the designer.

The perspectives on design thinking, in addition to the findings discussed in this paper, could thus be a starting point for further conversation toward a

nuanced understanding of design across different fields within the local context.

Political artifacts and political ergonomics in architecture

This paper builds on Langdon Winner's conception of "political artifacts" (1995) in demonstrating that design, as a process, is as much technical as it is sociocultural. When viewed as political artifacts, the tools, instruments, and outcomes of technological innovation illustrate how designed objects "strongly condition the shared experience of power, authority, order and freedom in modern society" (Winner 1995:147). Winner's discussion of political artifacts focused on examining the shared territory between politics and design, starting with the assumption that in advanced industrial society, "relationships of power and authority are frequently expressed in material settings that are deliberately designed and built" (1995:147). As such, Winner recognizes technological innovation as a site in which "basic patterns of private and public life are continually reorganized, renegotiated, and reconstituted" (1995:147).

Winner's (1995) analysis of the intersection of design and politics encompasses the design traditions of statecraft, engineering, and architecture and urban planning. Within architecture and urban planning in particular, Winner was interested in how the shapes of buildings, cities, and furnishings influence patterns of human interaction, as well as in how ideals about community and good order can be translated into the design of material structures (1995:156). He observes that "[a]rchitects don't often reflect underlying political principles of their work, but they are strong where political theory has been weak: exploring reasons why a particular design could be expected to have desirable consequences" (Winner 1995:156). Winner further emphasizes how architects, through the structures they create, shape the lives of end users:

> [t]he architect tries to influence the social experience by arranging collections of material features that constrain or enable activity in particular ways. Those who use the buildings find their lives determined in part by the pushes and pulls the built environment creates. (Winner 1995:157)

Additionally, Winner (1995) notes how some practitioners have bucked the environmental determinism of many architects. Frank Lloyd Wright and Le Corbusier (cited in Winner 1995), for example, offered comprehensive proposals for good society to be expressed in the material configuration of buildings and whole cities.

Winner also extends the idea of political artifacts to discuss the notion of "political ergonomics." He borrows the term "ergonomics" from engineering and industrial design "as a name for the process in which the shape of a useful instrument is tailored to human form" (Winner 1995:163). Political ergonomics therefore examines the extent to which technology is compatible to personal habits, social relationships, and institutional patterns (Winner 1995:163).

While this paper is fundamentally based on Winner's formulations of political artifacts, we also complement his assertions by acknowledging that the qualities of sociocultural life mobilized by built structures are not entirely up to the meanings and functionalities that architects imbue in their work. Our research aims to show that end users of architectural products, in addition to institutional entities that commission architects in the first place, are actors who are capable of influencing and manipulating the built environment as much as architects. This is why we also anchor our discussion on notions of design thinking (Brown 2008; Brown & Wyatt 2010; Roberts 2013), which tend to acknowledge the participation of end users in the creation and regeneration of material culture.

We aim to examine how the design thinking-driven development of shelter prototypes as political artifacts is a parallel exercise in political ergonomics. It is an endless search for a fit between concrete shelter features and the large and small cultural formations that frame the positionalities of the actors implicated by disaster: international funders, nongovernment (NGO) project coordinators, survivor-homeowners, local construction industry specialists, and the authors as design researchers.

Methodology

The massive devastation caused by Typhoon Yolanda includes an estimate of 1.1 million homes damaged (USAID 2014), making shelter a priority in reconstruction efforts. Two weeks after the typhoon struck, an internationally-funded NGO approached Cajilig and Salva to engage in design research to ensure the cultural relevance of shelter solutions, and eventually worked with Maranan to develop the final design concept accordingly. The NGO representatives also briefed us on the shared institutional thrusts between them and their funding agency: programs should prioritize the most vulnerable communities which at that point had yet to receive any type of international aid. More importantly, programs had to focus on empowering vulnerable members of society, such as women and children, to encourage them to claim their rights and fight for equality and

against injustice.[1] The NGO prioritized six adjacent coastal and low-income barangays that had yet to receive international assistance. They selected these sites through informal surveys of affected areas throughout the country conducted through site visits, gathering damage assessment reports from local government units, and inquiring through informal networks.

We based the following discussion on three rounds of intermittent rapid assessment activities in the Visayas from December 2013 to March 2014. Each round of assessment activity consisted of five days. These activities involved qualitative social research (focus groups, semi-structured interviews, unstructured interviews, direct observation) and quantitative design research (the profiling of 100 houses along a national highway to determine the presence and absence of disaster-resilient features), as well as online desk research to review the agenda and policies of international development agencies working in the field of disaster, shelter guidelines, and humanitarian architecture examples.

We framed our research practice and resulting reflections using the three design thinking stages outlined by Brown and Wyatt (2010): inspiration, ideation, and implementation.

Design thinking stage 1: inspiration

The inspiration stage of design thinking involves pinning down the various problems and concerns the potential shelter designs need to address. In many cases, our design consultancy has had to address design challenges with either undefined or broad parameters. Our experience echoes that of Suri (2011), who leads ethnography-inspired research and immersion trips for IDEO. Suri describes how many of the company's design projects begin:

> At the outset of many projects we don't even know what we need to know or what we're looking for. We know only that we need to fulfill our promise to find or give appropriate shape to

[1] Shelter response varies across international aid agencies. Agencies, like the United States Agency for International Development (USAID), largely define shelter as a built structure. USAID also makes available downloadable design guidelines with a materials list and budget for those who want to directly adopt their designs (Build Change 2012). Meanwhile, organizations, like The Shelter Centre (FP Innovations and Royal Roads University n.d.), view shelter response as a systemic and administrative response, with resources focused on how to ensure alignment and collaboration across multiple stakeholders to mobilize shelter and WASH (water, sanitation, and hygiene) programs, rather than focusing on built structures in and of themselves.

> opportunities – whether that's for product, service, space, strategy, media, or organization. Even so, design teams often find themselves pressed to create and follow a detailed plan for research and exploration. There's no doubt that design projects benefit from constraints, including constraints on the time to explore, to hone intuitions, to seek inspiration. But following too tight a prescription for exploration can be counterproductive. (Suri 2011:18)

According to Suri (2011), activities that help close knowledge gaps at this phase include, but are not limited to, exploring metaphors, interviewing extreme users, visiting the factories and salerooms, and observing production processes. Designers still have to process the information gathered from these techniques and interpret them in order to develop design outcomes: "[t]hey need to be able to 'make something' of their observations, whether design strategies, principles, or concepts relevant to the project brief" (Suri 2011: 18).

Because interpreting information from users is a subjective process, Suri emphasizes the importance of diverse perspectives within design teams. Not everyone will view the same piece of information as being critical to the project, nor will they find the activities to elicit insight equally useful. Suri notes:

> This diversity and richness of perspectives is in itself powerful. Exploration in design is not a search for absolute truth, but for insight about the nature of the challenge and for generative ways to frame it. Indeed, one of the benefits of diverse perspectives is that they can help others see situations in a new light, challenge conventional interpretation, and reveal previously unappreciated possibilities. (Suri 2011:18)

Our experience in design thinking, however, has taught us that the diversity in teams goes both ways. While diversity can stimulate ideas and critical thinking within the team, multiplicity of perspectives can also prevent the team from moving forward in the project. This is especially true for projects that involve several formal approval processes within an organization before a range of ideas can be fully explored.

We spent five days conducting focus group discussions among barangay officials and health workers to obtain an overall view of the challenges faced during evacuation and during the actual onslaught of the typhoon. We also explored perspectives among practitioners of the local construction industry: a male engineer, two female students of Architecture, and construction

workers (all male). We gathered their opinions on why houses in the area could have been particularly vulnerable. We asked residents whose houses had largely withstood the winds and storm surges to take us through their homes and give their analyses as to why their dwellings survived in contrast to the others. These activities were essential to building up to the funder's goal of empowerment by integrating the viewpoints of locals and local specialists, rather than simply relying on "expert" knowledge brokered by design practitioners and policy makers from Metro Manila or outside the Philippines.

There was general consensus on the importance of having a second floor among survivor-homeowners, which also brought about parallel concerns regarding affordability. Many of those who survived the storm surge at the last minute managed to get to higher ground, such as multiple-story warehouses or platforms on unfinished construction sites. Our observations of houses along the provincial highway also reflected the importance of having a second floor. We saw several bungalows being extended into two-story homes. However, parents also raised concerns that were not necessarily related to disaster. These had to do with the challenges of allocating space within a dwelling posed by a growing family with limited economic resources. Having a second floor therefore not only addresses safety concerns during flooding but also privacy concerns, such as having more space for more than one room to accommodate both male and female teenage children.

The design also had to accommodate the agenda and concerns of our NGO partners and their funding agency. While addressing the shelter needs of all people in the supported areas would have been ideal, the modest budget could only cover so many households. The entire team also felt the need to build permanent, disaster-resilient model homes, as the budget could not include land purchase for large-scale shelter construction. This approach would allow us to capitalize on resources we felt were already present. Some survivors mentioned that they already had land and just needed to either repair or rebuild their homes and improve these over time to be increasingly disaster-resilient.[2]

[2] This view is in line with the transitional shelter approach (Shelter Center 2012) for nondisplaced populations, in which shelters are built on the site of original homes starting with basic starter homes that will be upgraded, expanded, or replaced over time as resources permit.

Design thinking stage 2: ideation

Once the research is completed, the next stage, the ideation process, is commenced. The ideation process involves sifting through the information to identify data points that could inspire designed outcomes. The IDEO Human-Centered Design (HCD) Toolkit notes that this stage "requires a mode of narrowing and culling information and translating insights about the reality of today into a set of opportunities for the future" (IDEO HCD:79), a move toward "real-world solutions."

Armed with defined opportunities, design teams then adopt a generative mindset: They will typically undergo several rounds of brainstorming to develop a range of solutions (IDEO HCD:79). Teams will then rapidly make these solutions tangible by creating prototypes. Based on our own experience, these can be in the form of a drawing of a service concept, scale models of structures, slide presentations that expound on a product's functionalities, and skits or short films that demonstrate a new or improved process. The point is to turn the solutions into forms that provoke feedback. The prototype is also used to ensure that stakeholders are aligned in their interpretations of what the solutions entail.

IDEO's HCD Toolkit encourages hundreds of solutions to be developed during this stage. In our practice, however, the number of solutions typically ranges from only two to twelve. In a developing context, many organizations cannot spare as much resources to explore a large number of possibilities. Certainly when innovating during a disaster, we have observed that the urgency of the situation can discourage teams from exploring a wide range of concepts in order to go straight to implementation.

Round 1. Ideation also entails the development and testing of designed output. After we, Cajilig and Salva, shared our research findings with Maranan, who is an architect, she developed three types of permanent shelter prototypes rendered in 3D graphics:[3] 1) a basic 25-sqm house that can later be extended to add a concrete roof deck, then eventually fully remodeled to become a two-story house; 2) a hexagonal version of the first, given the idea that more rounded houses are more resistant to the force of the wind, and; 3) a set of row houses with high ceilings that can later on accommodate a loft. We proposed modular designs given the observation that houses among lower- and middle-income groups in the country often start small and then tend to expand with the increase of household income.

[3] The architect rendered the design using AutoCAD, software typically used by architects, engineers, and interior designers to visualize design possibilities.

Aside from meeting National Building Code requirements, these designs bear additional disaster-resilient features, such as short eaves, parapets, and awning-style windows. They also address the assessment of local construction industry representatives pertaining to building practices that may compromise the safety of dwelling structures: umbrella nails spaced too far apart, the application of spot weld rather than full weld for structural steel connections, the use of hollow blocks without (or too thin) steel reinforcements, among others. The basic structures were initially estimated to cost ₱300,000 including all materials and labor, but not land.

Prior to testing the designs among the affected homeowners, we first needed to run these by funding agency representatives and the other NGOs they support in a forum. While forum attendees saw the relevance of the proposed designs, their reactions centered on the cost of the houses. The funding agency representatives, in particular, asked us to explore ways to bring the cost down. They also asked us to examine ways to increase affordability for homeowners who might want to replicate the designs by breaking down the construction process into specific stages and costs.

Round 2. The original designs featured concrete walls. To make the design more affordable, the team had to switch to wood. A review of photos captured during direct observation showed that some houses which fared better than the rest during the storm had walls made of *amakan* (woven bamboo strips) rather than plywood.[4] With the change to amakan, the cost was now down to ₱200,000. The lower cost would allow our NGO partner to build six model houses, one for each supported barangay. The NGO intended these houses for households headed by the most vulnerable women in each community.

The second round of rapid assessment, specifically among affected homeowners, occurred in February 2014, comprising both those who might be recipients of model houses and homeowners who might want to adopt these designs for themselves. Many of those we talked to had houses that were partially or completely damaged. Some lived within the original dwelling structures which, by the time of the assessment, had been given either new or makeshift roofs and walls. Others lived in completely makeshift dwellings on the land where their original homes used to stand.

[4] According to our architect, *amakan*, because of the spaces between the weaves, are a more stable option for walls than plywood. A strong wind would likely blow through the spaces in the amakan walls rather than flip them over, as it might do with plywood.

The basic square house was the most popular design among the homeowners who participated in the assessment. They said, however, that we ought to revise the design to place the staircase inside rather than outside the house. Homeowners explained that one had little chance of surviving if moving to higher ground also entailed exposure to the wind and rain.

The two-story version, while also being disaster-resilient, also matched what many have long envisioned as their ideal home. The hexagonal design gave some of the homeowners the impression that it was costlier than the other two, while others found the shape too strange to adopt as their home. People appreciated the row house for being slightly cheaper than the square stand-alone design. However, they raised concerns regarding privacy.

We also noticed a specific gender dynamic upon testing the designs. When we asked some male homeowners if we could ask the opinions of their wives, they discouraged us from doing so. "*'Wag n'yo na 'yan tanungin. Susundan lang niyan ang sasabihin ko* (Don't ask her, she'll just follow what I'll say)," said Bert, a police officer who does his own home construction, when we tried to engage his wife. This was among the typical responses that husbands gave, sometimes even within earshot of their wives. Males commonly had knowledge of construction and considered it a man's domain. We also asked the women what they thought of this male-driven sentiment. Many of the women responded by saying that their husbands consulted them on the finances that the rebuilding of their homes entailed. "*Siyempre, ako ang taga-approve [ng budget]* (Of course I'm the one who approves the budget)," said Lydia, a barangay health worker whose family escaped through the roof by using the TV stand as a ladder when the storm surge inundated their home. However, the women also admitted little knowledge of construction. This gender dynamic would later become fundamental to the outcome of this shelter project.

Design thinking stage 3: implementation

According to the IDEO HCD Toolkit, this phase entails "creating the elements necessary to make the solution successful, and to track the impact of the solution" (IDEO HCD Toolkit:123). These include ensuring the financial sustainability and operational viability of the proposed solutions, typically by applying small-scale or mini pilot testing to minimize risks during the implementation of the final plan. The mini pilots may also test out new relationships that are being explored, such as the formation of new institutional linkages, the creation of new departments, or hiring of new talent (IDEO HCD Toolkit:125). The HCD Toolkit also encourages

continuous iteration of the solution during the implementation phase, coupled with measurement and evaluation at each stage.

Notably, these stages are not meant to be experienced in a linear fashion. In cases that involve development work in particular, financial constraints often set the early parameters of the project. Meanwhile, there usually is no guarantee of sufficient funding for measurement, and evaluation takes place often and continuously. Further, certain areas of design, such as architecture, are difficult to pilot. Clearly, while this paper is in part framed by design thinking approaches, it also exposes the formulation's limits within the local context.

Meanwhile, in the implementation stage of our shelter project, and as we finalized the design concepts, challenges to implementation surfaced. Our NGO partner had exhausted all efforts to find land to build on, but securing it remained a problem. The municipal government announced to the NGO that they had no land to give away, nor resources to purchase it for their constituents. The budget from the international funders could cover the construction of the six model shelters but not the purchase of land.

As frustration mounted and as chances for shelter construction in the original site grew bleak, our colleagues from the NGO started to look into other provinces for the implementation of the shelter designs.[5] Because shelter remained a priority of the funding agency, the NGO allocated a portion of the budget to provide shelter materials such as roofing and nails. The organization prioritized women heads of households (many of them were either senior citizens or had lost able-bodied male family members to the typhoon) for this effort, which also triggered resentment among other community members who felt that everyone regardless of gender or vulnerability classification was going through hardship and deserved an equal shot at being given supplies. "*Lahat naman dito nawalan, hindi lang mga babae* (Everyone lost something here, not only women)," complained some of the male community members. We and our NGO partners thus realized that only funding one disaster-resilient model unit for one household in one barangay might be the cause of envy and social separation. Vulnerable

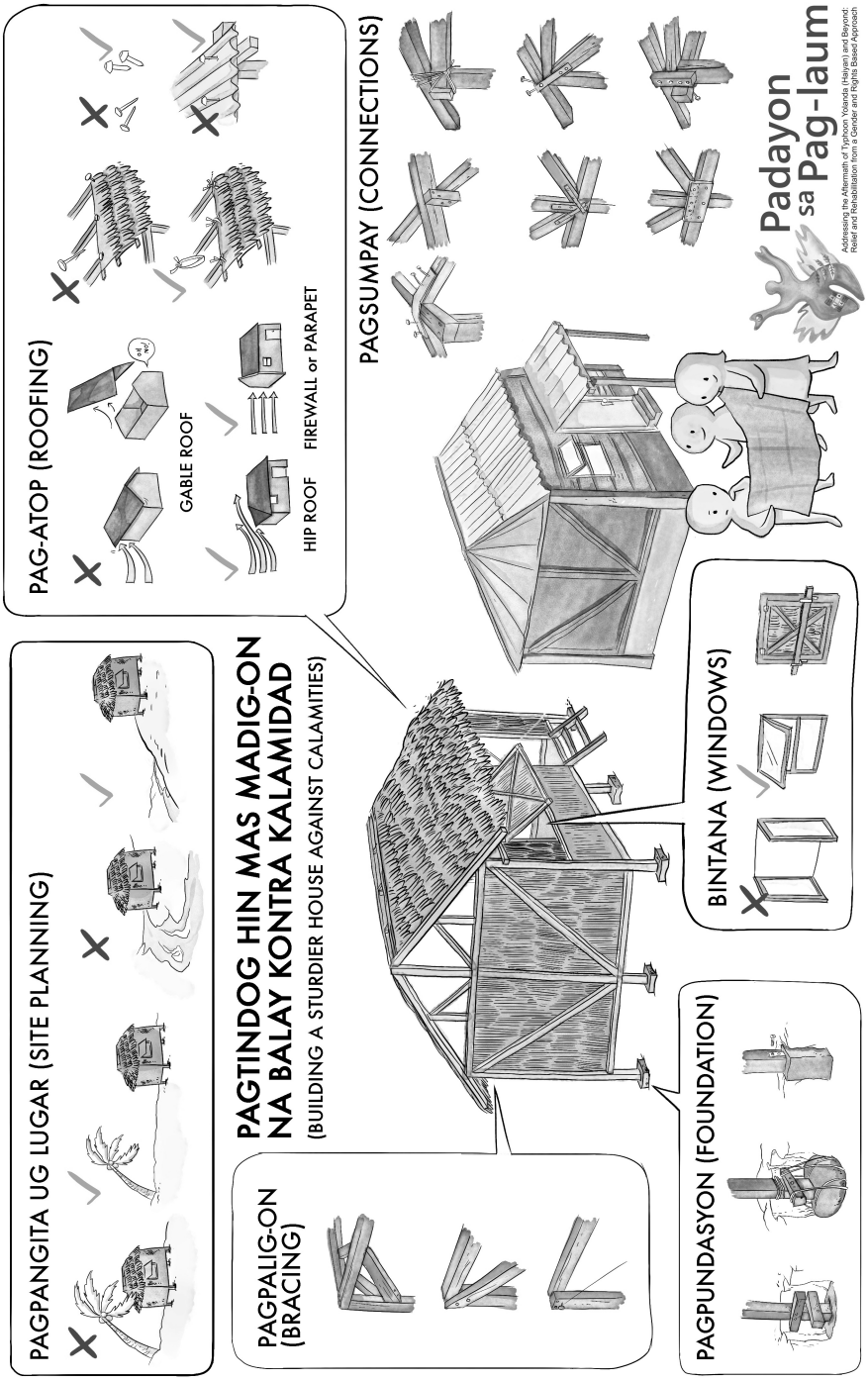
[5] Eventually, the organization found a town in Western Visayas, which in March 2014 still had not received any form of international aid. Here, the mayor was more willing to mobilize resources compared with the city government of the original site. The city government of the new site had no budget for shelter, but there was a budget and land on which to build a community center that could double as an evacuation center. Our basic square design was adopted for this purpose. At the time of writing, the construction had started but was stalled midway because of a lack of supply of cement in the area.

women in the community also voiced out concerns that they might be ostracized if they were singled out for the project.

We wanted to find a venue that would allow our NGO partner to apply research findings even with the uncertainties that surrounded the shelter construction project. We were mainly driven by a sense of *hinayang* (regret) for the funds and efforts that we, our NGO partners, their staff, and research participants had spent for the research. We proceeded from findings pertaining to the lack of inclusion of and participation among women in the rebuilding of their own homes, the perceived costliness of our shelter designs, and qualitative data that showed many families that refused to evacuate were those whose houses were built by household heads that had full confidence in their construction skills. We also did not want our advocacy for building permanent, disaster-resilient shelters to backfire into refusal to evacuate during a disaster.

Two weeks after the last day of research, we mounted a project in service design with support from our NGO partners: an interactive forum designed to show women the basics of disaster-resilient dwelling design. The forum, conducted by a disaster specialist within the NGO team, started with an explanation of climate change in lay terms and a run-through of the national and local disaster response institutional structures. Next, Cajilig conducted a guided discussion of various beliefs that might prevent timely evacuation, culled from the research.[6] In the same venue, Salva and Maranan conducted an interactive demonstration of shelter principles that included a run-through of our proposed designs to get additional women-centered concerns, such as where they will hang laundry if the eaves are too short. Next, the managing director of our NGO partner discussed women's rights during disaster and stressed the need to self-organize. The forum ended with a distribution of posters (Figure 1 on next page) featuring shelter design principles adapted to concrete houses as well as *bahay kubo* (hut). The posters featured gender-neutral graphics rendered through pro-bono services of a graphic designer friend, and our design research agency shouldered the costs for printing. The NGO initially budgeted provisions for only 60 women to attend. Instead, at least 200 women and government officials attended the forum, held at a .

[6] These included beliefs such as "*huwag nating pag-usapan ang bagyo, baka dumating* (let's not talk about typhoons, one might come)", and "*Nasa Diyos iyan kung mamamatay tayo o hindi* (It's up to God whether we'll die or not)." During the discussion, we exposed these beliefs as stated, and rather than prescribe how to respond to each belief presented, we encouraged the women in the forum to express their views and discuss and debate among themselves.

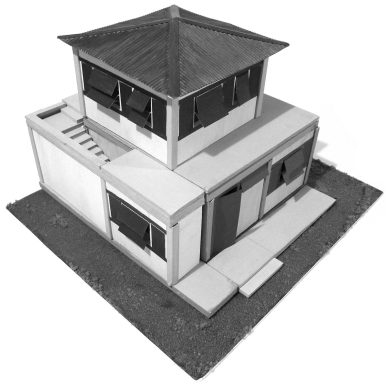

PAGTINDOG HIN MAS MADIG-ON NA BALAY KONTRA KALAMIDAD
(BUILDING A STURDIER HOUSE AGAINST CALAMITIES)
PAGPANGITA UG LUGAR (SITE PLANNING)
PAG-ATOP (ROOFING)
GABLE ROOF
HIP ROOF
FIREWALL or PARAPET
PAGSUMPAY (CONNECTIONS)
PAGPALIG-ON (BRACING)
BINTANA (WINDOWS)
PAGPUNDASYON (FOUNDATION)
Padayon sa Pag-laum
Addressing the Aftermath of Typhoon Yolanda (Haiyan) and Beyond:
Relief and Rehabilitation from a Gender and Rights Based Approach

basketball court, its use obtained through permission from one of the barangay officials who collaborated with the NGO. Qualitative feedback collected after the forum indicated a wide appreciation for the event. However, we have yet to gauge its longer-term effects and have applied for funding to do so

Considering the challenges posed by community micropolitics and the lack of support from the local government, the NGO decided to focus its shelter efforts in another province affected by Typhoon Yolanda, in a coastal municipality that faces earthquake- and landslide-related hazards aside from typhoon-related dangers. This time, based upon what we learned from our previous experience, the team did not go into the municipality immediately assuming that the shelter solution ought to be permanent disaster-resilient housing.

The engagement started with local government and community consultations regarding *which structure* would best suit the concerns and resources of the community during and after disaster. During the consultations, the stakeholders decided that the best solution would be to have an evacuation center that would double as a community center. This would benefit the entire community rather than just a few households. This effort was complemented with the organization of a local "women defenders' group," composed of women volunteers trained, together with the municipality's disaster response unit, in the basics of disaster preparation, rescue, and recovery. Since there was an island barangay about 30 minutes off the coast of the municipality, the NGO procured a boat ambulance that could transfer residents to the evacuation center if needed. In non-disaster situations, the boat could be rented out by the island barangay but it should primarily be used to ferry vulnerable women in medical emergencies from the island to the town. The necessity of the ambulance boat arose also out of consultations with officials and residents of the different barangays that comprised the municipality.

Maranan designed the evacuation center based on findings from the shelter research in the previous site, many of which were still applicable to the new site. Based on community consultations and Maranan's own experience as an evacuee in a public school in Baguio during the 1990 earthquake, the center's design includes features that allow implementation of domestic tasks typically assigned to women while their families are temporarily housed, as well as address privacy concerns that are relevant to all genders: several washing areas, a kitchen for cooking relief goods, and multiple toilet facilities. This is a different approach from the typical work around the country for providing communities with evacuation centers,



Figures 2 & 3: Scale model prototypes used to test concept designs

which makes people evacuate to existing public structures such as schools and coliseums that are not necessarily designed to handle evacuation-related activities. The architect initially included large windows to let natural light into the facility when it is used as a community center during non-emergency situations. At the request of the residents who, based upon their experience of Yolanda, advised against large windows as these would pose great safety risks to evacuees, Maranan made the windows smaller in the final iteration of the design. This was still part of our efforts to balance out notions of

"expertise" and "expert" as necessarily Manila-based and based on formal university education ("*may pinag-aralan*"), with concepts hinged on local knowledge and experience. That Maranan is a female architect was advantageous for the advocacy, as it also emphasized to the community, and particularly to the women in it, that women too can be experts in the largely male-dominated field of construction.

The first floor of the evacuation center was completed and inaugurated during the last week of October 2014. When news that Typhoon Ruby, initially feared to bring Yolanda-level casualties and destruction, would ravage the Visayas region in the first week of December 2014, families from adjacent vulnerable areas evacuated to the newly built center. At the time of this writing, gaps in funding remain and our NGO partners continue to look for financial support for the construction of the second floor, a feature that was also deemed important by the community in the new project site.

Reflections and conclusion

When we started out designing shelters for communities affected by Typhoon Yolanda, we assumed that the best design involved permanent disaster-resilient houses. The design thinking process focused on determining the material features that would make these houses acceptable to the various stakeholders of the project: the number of floors, the cost of materials, the presence of disaster-resilient features, and so forth. However, the difficulties faced in implementation largely had to do with the sociopolitical configurations that operated in the aftermath of the typhoon: the ability and willingness of the local government to fund land needed for the project, the agenda and budget constraints faced by our NGO partners and the international development agency that funded them, and the gender structures and tensions within the community that disaster response efforts reproduced and created. Instead of building several homes at our original project site, the design process unfolded so that the team ended up with a shelter forum in one place, and a single evacuation center in another. The relevance of Langdon's notions of political artifacts and political ergonomics (Winner 1995) is clear: shelter solutions must "fit" materially as well as culturally and ought to consider not just the immediate cultural context of the people affected but also that of the larger network of institutional actors that mobilize resources to mitigate the effects of disaster, and larger cultural formations such as gender dynamics. Hill and Julier (2009) arrive at a similar conclusion in raising the importance of "… developing a critical understanding of the 'fit' between national government aspirations, local authority implementation, and the role of creative consultants..." (2009:62).

This "fit" is particularly difficult to arrive at during the extraordinary circumstances of a disaster, given its totalizing and disruptive effects and the vast number of stakeholders involved. Disaster management strategies enforced by the state or humanitarian institutions often only ascribe the power to create and intervene to what Dyer (2002) calls a "club of experts" – policy makers, scientists, urban planners, architects – who are often removed from the realities of those affected (see also Oliver-Smith 2002). While our aim as researchers is precisely to bridge the gap between "expert" and "non-expert" perspectives, this identification is complicated by the fact that the trust given to us to close this gap also stems from institutions and organizations categorizing us as "experts." This is why, more than ever, we need to be critical of our practice as a potential tool for reproducing inequalities implicated by the world of materials.

"Experts" may not necessarily agree with each other, or those directly affected by the disaster might not collectively agree with their plans. For example, prefabricated housing is a contentious shelter solution. In January 2014, we interviewed the chief executive officer (CEO) of a company that imports prefabricated housing materials from China since we had earlier considered proposing a similar post-Yolanda shelter solution. The CEO's business pitch centered on how these innovative prefabricated structures can be mounted in days, an especially helpful quality given that citizens, the government, and humanitarian organizations scramble to build shelters post-disaster. The CEO mentioned that the structures are also popular among government officials seeking reelection because the rapid installation allows constituents to perceive tangible evidence of good governance. However, some architects and urban planners, with whom we have been in conversation, are concerned about the sustainability of pre-fab housing, given that homeowners often find it difficult to address wear and tear using locally available materials. Still further, homeowners at a solar-powered prefabricated housing settlement we visited complained about strict and inconvenient NGO-imposed everyday rules designed to maintain the quality of the houses. They are, for example, only allowed to cook inside the house using electric stoves – even though some families cannot afford to purchase one – as a safety precaution and so as to keep the walls free from soot. They are only allowed to cook using charcoal outside the house, and this applies even in stormy weather. Meanwhile, the private urban planning group who worked with the NGO to build the housing settlement has touted the project as an innovative solution to post-disaster environmental sustainability.

The objective of most market-driven design is innovation, defined by the Oslo Manual as "the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new

organizational method in business practices, workplace organization, or external relations" (OECD & Eurostat 2005:6). Recent innovation discourse also advocates disruptive innovation, which Christensen (2015) defines as a process by which a product or service, beginning in simple applications, relentlessly moves up the market after having taken root at the bottom of the market, and displaces established competitors in its movement upwards. In a certain sense, disruptive innovation through the successful implementation of new ways of doing things is design geared and commodified toward gaining an overwhelming competitive advantage.

In a disaster setting, such a hegemonic approach to design and innovation could only result in exacerbating existing social orders that may directly or indirectly contribute to the extent to which communities experience disaster, or at least contribute little to solving the actual problem. For example, the Open Online Academy in 2014 saw it fit to use the post-Yolanda context in mounting a design challenge for Guian National High School in Samar across architects worldwide to design disaster-resistant architecture with their online course "Designing Resilient Schools (Wang 2014)." The winning group would have had the honor of having their design implemented by the Philippine Department of Education and Architecture for Humanity, which regularly holds international humanitarian design competitions. California-based architecture firm MAT-TER won the call with their new take on bamboo through a "singular, compact structure designed to better withstand the forces of major storms, doubling as both a school and a community emergency shelter" (Walker 2014).

Our team raised two questions amongst ourselves upon seeing the winning entry. First, we ourselves had ruled out bamboo as a material in our proposed designs for our research site because at the time we developed our own shelter concepts, bamboo was still difficult to source. This was one of the reasons why we considered amakan instead: It was readily and locally available. We wondered how feasible it would be for MAT-TER and their partners to procure bamboo. Secondly, MAT-TER proposed a novel design, at least within the local context, in an attempt to display architectural creativity and "disrupt" existing local school designs as well as outdo other entries in the competition. However, in our own shelter research, communities affected by the typhoon chose designs that reminded them of the familiar: the homes they lost or the homes in which they grew up. To what extent can organizations "help" and what purpose does being "disruptive" serve in the face of millions of lives massively disrupted by disaster? There is a tendency to overvalue the complex and the novel where simpler and more conventional approaches are more acceptable.

An online search to ascertain the implementation of MAT-TER's winning design to date has not yielded any indications of progress beyond the concept stage. There are no photos of construction, nor news of the MAT-TER team being in Guian to work with the government for the development of the project. Further still, implementing partner Architecture for Humanity closed its headquarters in San Francisco and laid off staff in January 2015, although other chapters around the world are still open (Dezeen 2015). The design, however, is still featured in the MAT-TER website, a showcase of the firm's commitment and capability within the area of Resilience in Architecture (MAT-TER: architecture, furniture, fabrication, n.d). In her discussion of the postcolonial implications of design innovation, Tunstall (2013) is thus right in asking: Who generates the innovation? What are its underlying values? Who benefits?

Clearly, design thinking as a process has its limits. Critical reflection leads us back to the idea of political ergonomics.

On the one hand, an inductive and iterative approach may not always "fit" situations that require an urgent scaling up of resources, such as disaster contexts. During our internal discussions, we realized that, perhaps, the best time to develop humanitarian shelter designs via social research may not be while survivor communities need urgent disaster response but after the response has settled down and, ideally, even before disaster strikes. Resources are also best used to prevent the effects of disaster before it happens, rather than frantically compelling people and pressuring resources to alleviate its effects. On a broader plane, there is also the issue of the "fit" of design innovation in and of itself as a locus for imagining social remedies to larger political-historical contexts, such as those which implicate postcolonial and market-driven concerns.

On the other hand, we, Cajilig and Salva, appreciate how this approach encouraged us to mobilize our agency as research and design practitioners. Because idea generation and collaboration with design specialists are integral to the process, we managed to go beyond our roles as design researchers, take stock of our findings, and make a quick assessment of more realistic and relevant ways to contribute to design thinking. Through the forum we initiated, we brokered our human capital, our social networks, and financial resources to create something potentially more useful for everyday realities – much like how a designer would.

Meanwhile, Maranan, as an architect, valued the experience of being able to directly consult the people who would eventually use her design in their everyday lives, and incorporate their design input. Notably, not all architects believe in more balanced notions of expertise. Willingness to

revisit power in architectural expertise is represented by Jonathan Hill's notion of the illegal architect "as one who questions and subverts the established codes and conventions of architectural practice, and acknowledges that architecture is made by use and by design" (2003:131). This and Hill's related understanding of design strategies of non-architects buttress his critique of the moral authority of the architect and the denial of the user. Hill's understanding speaks of a more inclusive design practice that views the user not simply as a source of insight to be processed by designers but as creative agents themselves.

The idea of anthropologists and social researchers intervening in their research contexts to this extent is admittedly a thorny subject that requires further conversation, and certainly design anthropology in the local contexts could benefit from more extensive and critical explorations of vernacular design processes, as signposted by Tunstall's efforts to decolonize design innovation (2013) and Sumandro's discussion of exclusion rather than profit as a primary driver of innovation in grassroots and development contexts (2013). Nevertheless, we are excited by the possibilities that the bricolages of researcher-designer and user-designer hold for the advancement of both design and anthropology.

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