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Social vulnerability and climate change adaptation: The critical importance of moving beyond technocratic policy approaches

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Planning policy can play a key role in effective, equitable climate change adaptation; however, its capacity remains undermined by technocratic approaches reliant on hard measures, discounting significant research on addressing sources of social vulnerability for successful adaptation policy. Not surprisingly, little research makes use of a planning lens to explore the challenge of utilizing policy measures to address social vulnerability – particularly in relation to climate change. Through a scholarly narrative review of interdisciplinary sources an in-depth understanding of climate change vulnerability is gained and its importance in successful adaptation planning demonstrated. The urgency and complexity of climate change requires overcoming socio-political barriers within the existing adaptation paradigm, balancing technocratic methods with a collaborative approach focusing on the social, economic and ethical components of vulnerability to climate change.

Keywords: climate change, adaptive capacity, resilience, social stressors, vulnerable communities, urban planning and policy

Highlights:

- Reliance on technocratic approaches hinders adaptation initiatives.
- Critical assessment of planning approaches for adaptation policy is necessary.
- Exploration of social vulnerability through a planning lens remains novel.
- Effective adaptation planning addresses both social and physical vulnerability.
- Complex human systems and socio-political constructs perpetuate vulnerability.

1. Introduction

Anthropogenic climate change continues to pose significant risks to humans and the natural systems on which they rely (IPCC, 2014; Naylor et al., 2020; Pandey et al., 2017; Shrubsole, 2015). Because curbing greenhouse gas emissions contributing to climate change has been slow, wrought with political resistance and a lack of necessary collective action (Eriksen et al., 2020; Gim et al., 2019; Shrubsole, 2015; Birchall et al., 2015; Birchall, 2014), planning for adaptation and resilience is essential to humanity's ability to navigate future risk (Benevolenza & DeRigne, 2018; Siders, 2017; Siders, 2019; Williams et al., 2020). However, the overall adaptive capacity of human systems to respond to this threat is complicated by rampant social stressors which perpetuate physical and social vulnerability (Eriksen et al., 2020; IPCC, 2014; Mace, 2006; Naylor et al., 2020).

While adaptation planning continues to gain momentum amongst planners and policymakers (Benevolenza & DeRigne, 2018; Birchall & Bonnett, 2021; Ford & King, 2013; Siders, 2017; Siders, 2019; Williams et al., 2020), research into the aspects of climate vulnerability that reduce adaptive capacity has been controversial and incomplete in the face of the complex systems that inform adaptation (Naylor et al., 2020; Reghezza-Zitt & Rufat, 2019; Siders, 2019). Consequently, there is a persistent belief that planning for adaptation and climate resilience is best approached through technocratic means, making use of predominantly top-down methods with little or no public participation, and a heavy reliance on technology and hard measures which address only the physical aspects of climate change (Osborne, 2013; Reghezza-Zitt & Rufat, 2019; Siders, 2019; Stoett & Omrow, 2020). However, the need to move beyond hard structures is well understood (Bonnett & Birchall, 2020), and numerous social scientists continue to demonstrate that such approaches restrict our capacity to respond, while perpetuating the social and political inequalities that have led to climate change in the first place (Adger et al., 2009; Garvey, 2019; Naylor et al., 2020; Olsson et al., 2015). To overcome this discrepancy, deliberate connections need to be demonstrated within the complex systems of adaptation and vulnerability; equitable policy requires knowledge of what aspects within the human system perpetuate vulnerability, predominantly the social, economic and ethical systems that inform, and render ineffective, our approaches to adaptation policy.

The planning profession has, for the most part, shifted away from technocratic approaches toward a focus on advocacy and participatory processes, yet, for many reasons its approach to climate change has been left behind (Meerow & Newell, 2016). As climate-exacerbated hazards continue to become more frequent and intense, the social and economic consequences of climate change are likely to be considerable (Eriksen et al., 2020). When facing the looming threat of climate change, a technocratic approach is simply not enough; planning for and understanding how to address all aspects of climate vulnerability through effective and equitable policy is essential to ensure that communities are resilient, regardless of what climate change brings (IPCC, 2014; Pandey et al., 2017).

The intended aim of this research is to explore and ultimately facilitate critical thinking about the many multifaceted aspects of climate change vulnerability, and in this way begin to unearth the barriers in planning practice that prevent adaptation policy from being truly effective and equitable. Theoretically we draw from resilience theory (Birchall & Bonnett, 2021; Moench, 2014; Borquez et al., 2017) and governance theory (van Asshe et al., 2018; van Asshe et al., 2016;

Birchall et al., 2021) and numerous interdisciplinary sources through scholarly narrative review – through which a preliminary literature scan identified a general theme ("vulnerability to climate change"), followed by a supplementary literature search into the many subthemes that occurred. Analysis of the resulting research draws on the authors' experiences with marginalization, and education in planning and human geography; this allowed a critical analysis of planning practices that would not have otherwise been possible. This research is outlined as follows: *section 2* contextualizes climate vulnerability; *section 3* critically examines how vulnerability functions within our social system, ethics, and economic system; and lastly, *section 4* considers both constraints and opportunities for planning and policymakers to address vulnerability to climate change and have a positive impact on all communities.

2. Context – Vulnerability

Vulnerability itself is dauntingly complex. However, there exists a great need for policy focusing on preventative measures, preparedness and relief efforts directed toward vulnerable communities (Benevolenza & DeRigne, 2018), not only for the individuals in the community, but to ensure the resilience of human systems in general (IPCC, 2014).

At its most simplistic vulnerability is an aspect of risk: the likelihood a community is to be negatively impacted by, or worse off after, a hazardous event (IPCC, 2014). In a human context this can mean many things, both physical and social; however, human systems and the social stressors that plague them exacerbate vulnerability, consequently negatively impacting resilience and adaptive capacity (Naylor et al., 2020; Osborne, 2013; Paavola et al., 2006; Williams, 2020). Social vulnerability is the ability to cope and adapt to any external stress regardless of physical risk (Adger & Kelly, 1999). This is an essential aspect of humanity's capacity to adapt to climate change: If a community does not have the skills or resources to recover from or overcome the stresses of climate change, then regardless of existing policies they will continue to be perpetually vulnerable.

The existence of vulnerability is deeply rooted in interactions between socio-political and economic systems and the physical world (Adger & Kelly, 1999; Barnett et al., 2008). Power structures and unequal access to resources magnify and perpetuate each other throughout western society (Adger & Kelly, 1999; Osborne, 2013). This results in social stressors such as poverty, inequality, famine, and discrimination due to disability, age or race, which exacerbate the socio-economic conditions and compounding already physically vulnerable populations (Adger & Kelly, 1999; Dow et al. 2006; Garvey, 2019; Osborne, 2013). Despite the IPCC having identified addressing social stressors as a key factor in equitable and effective adaptation to climate change, existing approaches often view social stressors and the consequent vulnerable groups as an unavoidable aspect of our capitalist system (IPCC, 2014). Yet, challenges faced by those without access to the resources necessary to meet their basic needs ripple throughout our system creating economic inefficiencies and threatening the stability of our society as a whole (IPCC, 2014; Shrubsole, 2015; UN, 2019).

Vulnerability remains underrepresented in approaches climate change policy; the technocratic approach focuses on increasing resilience and adaptation without acknowledging the considerable role social vulnerability plays (Adger & Kelly, 1999; Osborne, 2013). Resilience, or

the ability to cope post-disaster, is largely related to the adaptations that existed prior to the disaster – yet systemic vulnerabilities significantly reduce the ability for communities to build adequate adaptive capacity necessary to achieve true resilience to the climate emergency (IPCC, 2014; Meerow & Newell, 2016; Osborne, 2013; Paavola et al., 2006). On the other hand, adaptive capacity, or the potential for a community to adapt, is constrained by the social limits imposed by the dominant values and ethics of the local community and culture (Adger et al., 2009; Osborne, 2013); and a community's adaptive readiness, continues to be hindered by the willingness of the government and political system to implement adaptation and facilitate change (Ford & King, 2013).

Without taking an explicitly bottom-up approach to policy, planners risk failing to ensure that communities have the capacity to actively participate, collaborate and offer citizen-based knowledge to emergency management planning (Johnson et al., 2015; Nelitz, 2013; Ramsey et al., 2019). A deliberately holistic approach to planning for adaptive readiness allows the complex nature of climate change vulnerability to be better addressed; by bolstering different forms of capital (such as social, political, human, financial, and environmental capital) adaptation policy is likely to be more equitable and effective (Williams, 2020).

While disasters due to climate change itself are physical phenomena, effectively addressing this emergency requires planners and policymakers to see both sides of the coin: Vulnerability to climate change is both physical and social. Here, it seems policymakers are potentially bypassing necessary actions to adapt and reduce cumulative long-term resilience of the communities they serve – an understanding of the many sources of vulnerability is key to being able to conceptualize the effects of climate change, and what approaches to policy and planning are most effective (Naylor et al., 2020).

3. Vulnerability – Is It Avoidable?

Vulnerability persists across the globe and throughout our history, so much in fact that it would be reasonable to assume that it is a necessary aspect of our society. Rash individualism and our current approach to capitalism have led to the general (though paradoxical) consensus that, while there must be those who have and those who do not, those who have not do so willingly (Shrubsole, 2015; Stoett & Omrow, 2020). When attempting to balance technocratic approaches to climate adaptation and a more social perspective one must ask: Is vulnerability necessary? Is it avoidable? Who benefits from vulnerability? Who pays for it?

Climate change adaptation is largely viewed as a physical response to ever-increasing vulnerability to environmental risks and hazards. Yet, within complex human systems this vulnerability also manifests as a social, ethical, and economic issue due to interactions between power and institutions in our socio-political sphere, our economy and the physical environment (Osborne, 2013; Van Assche et al. 2016). Policy and planning can be used to target aspects of our human system which perpetuate low resilience; adaptive capacity can be increased by reducing social stressors through policy actions such as improved access to education, poverty alleviation, and disaster risk management (IPCC, 2014).

Despite ineffective planning practices and the complexity of the climate emergency, the effectiveness of adaptation planning hinges re-adjusting perspectives of adaptation planning to consider interrelationships between the social, ethical, and economic aspects of vulnerability. For planners, the difficult reality is that human lives are at stake; achieving effective adaptation planning for all of humanity is a necessity for facing the future.

3.1 Vulnerability as a Social Issue

Rampant social stressors ensure that vulnerability remains persistent throughout our society. International organizations continue to highlight the importance of addressing vulnerable communities as a method of equitable and achievable policy for climate change adaptation (IPCC, 2014, 2015; UN, 2019). While the relationships between social stressors, vulnerable communities and resilience remain complicated and without consensus (Meerow & Newell, 2016), Adger (2006) argues that, contrary to our current approach, there is moral imperative to address the social justice aspects of climate change, and that to achieve equality we must optimize the position of those who are most disadvantaged.

Challenging Western Perspectives of Climate Change Risk

Climate change continues to be gravely misrepresented; risk and vulnerability tend to be minimized, while tangible physical impacts are prioritized. However, the western socio-economic system results in wealth hoarding, racism and individualism that ensures climate change is inseparable from an infinitely complex human system. The unfortunate reality is that the communities most deeply affected by climate change are often othered from the process of trying to navigate it (Garvey, 2019; Osborne, 2013; Thomas & Twyman, 2006) while those with the power to prevent climate change simultaneously profit off its continuation and hoard the privilege and capital to escape its most devastating effects (Osborne, 2013). Leaving planners to advocate for the vulnerable in a system that continually neglects the complexity of climate change.

Effective adaptation planning requires understanding that, while climate change is a looming and momentous threat facing all communities, for vulnerable populations it is literally a matter of life and death (Benevolenza & DeRigne, 2018; Stoett & Omrow, 2020). Within our social systems, at-risk populations tend to have co-occurring vulnerabilities, which are often compounded by lack of resilience (financial, social, and/or community), and are more susceptible to Chronic Disaster Syndrome (Benevolenza & DeRigne, 2018; Schneider & Lane, 2006). Contrary to some strongly held political beliefs, these communities do not have control over their vulnerability (Pandey et al., 2017). In fact, the risk of becoming vulnerable is there for everyone: Any external event of varying degree is enough to significantly change one's circumstances (Butler, 2016). The simple reality of the human condition is that we are inherently vulnerable, yet the political and economic structures of the western world perpetuate the notion that one chooses to be vulnerable – seeing the plight of the vulnerable as an isolated issue, only affecting those directly involved.

Policy, Politics and Adaptive Capacity

Political willingness to enact policy for adaptation to climate change is a large barrier to our adaptive capacity (Ford & King, 2013). Here vulnerability begins to compound itself as a social issue: Regardless of any efforts to increase resilience, the simple fact is that adaptation and

relief policy measures only work if vulnerabilities are adequately addressed (IPCC, 2014). Attempts to increase resilience are hindered greatly by social stressors such as poverty and inequality as they perpetuate and intensify vulnerabilities (IPCC, 2014). In the end, political apathy toward and lack of action on social stressors severely limit humanity's capacity for resilience.

From a planning perspective, there is a strong positive relationship between social capital, local knowledge, and successful adaptation and emergency management planning (Johnson et al., 2015; Pierce et al., 2011; Ramsey et al., 2019; Wang et al., 2020). Contrary to this knowledge, planning for resilience to climate change is approached with rigidity and staunch technocraticism (Osborne, 2013) – despite a thorough understanding of the, although unintended, unethical consequences of this approach (Pløger, 2004). Paradoxically, while participatory planning process cannot function effectively without participation from all community members (Katan & Shiffman, 2014), the process is rendered ineffective when those who are marginalized by social stressors are continuously unable to participate (Sandercock, 1998), suggesting that our approach to planning is fundamentally exclusionary and ineffective. Clearly, to ensure that adaptation to climate change is possible, the removal of barriers to the participatory process is essential.

By taking a social perspective of vulnerability several things are clear: Vulnerable communities are a symptom of social inequity and stressors (Adger & Kelly, 1999; Dow et al., 2006; Kreslake et al., 2016); without addressing social stressors adaptation is unlikely to be effective (IPCC, 2015); and social capital is an essential component of both the planning process (Johnson et al., 2015) and the resilience of a community in the face of change (Wang et al., 2020). It becomes apparent here that it is crucial to address vulnerability, not only from a social justice and moral perspective, but also because the ability to plan for, survive and be resilient to climate change depends on it.

3.2 Vulnerability as an Economic Issue

Much of the reluctance of our socio-political system to meet everyone's basic needs stems from neoliberalist ideologies that suggest the following: Pre-emptive measures in the face of environmental change are unnecessary, as the market will respond if needed; and those with the desire to do so can improve their economic situation (Shrubsole, 2015). These two notions no longer function efficiently for our economy, particularly in the face of climate change. Still, because policies for adaptation and resilience are largely a result of the political system, this neoliberalist perspective remains a defining feature when addressing climate vulnerability, consequently perpetuating a focus on technocratic methods of planning and fueling the system of inequalities that established climate change as a global emergency in the first place. In this regard, a focus on vulnerability allows planners and policymakers to oppose such notions, not simply because of their ethical principles, but because vulnerability to climate change is an immense economic issue that, even from a neoliberal perspective, requires immediate action.

Costs of Climate Change

The question of "who pays for climate change?" is an onerous one. Due to the contentious relationship between climate change and our economy, the cost of climate change often is not present in the market and therefore the market is unable to respond to those stressors and maintain equilibrium. Because there is no sufficiently effective "market cost" for climate change the cost is

then externalized and paid by someone else through heightened exposure to climate impacts – while right now it is mostly poor, developing countries and vulnerable populations, in the end the answer will be simply everyone (Andrew, 2008; Baer, 2006; IPCC, 2014).

The long-term financial value of adaptation and who pays upfront tend to be widely contested in our current socio-political system (OECD, 2015). Meanwhile, potential costs of climate change in a system without adaptation planning and increased resilience are likely to be catastrophic, so it seems pertinent that in this case prevention is the less expensive option (Baer, 2006). While the distribution of wealth in our current economic system is highly discriminatory, the simple fact is that putting public resources toward climate change adaptation is the least expensive and most fiscally sound option; in fact, some simulations find that if the average global temperatures increase by 1.5°C to 4.5°C, global GDP is expected to reduce by up to 3.2% per year by 2060 (OECD, 2015).

The OECD suggests that the most economically effective ways to adapt to climate change are policies and plans intended to generate net social and economic benefits both now and in the future, regardless of the effects of climate change (OECD, 2015). This is best achieved through policies with low risk and high benefits, such as those geared toward disaster risk management, economic policies to increase market efficiency and generate cost savings for public services, or policies addressing any existing social or economic stressors (OECD, 2015). Policy recommendations by the OECD align well with those offered by the IPCC, focusing on improved education and health facilities, poverty alleviation, and many more (IPCC, 2014; OECD, 2015). Most interestingly, it is often these low-risk policies addressing social and economic stressors that can have significant benefit for vulnerable populations while increasing economic efficiency, resilience and adaptive capacity (Andrew, 2008; Baer, 2006).

Escaping Social Vulnerability

The social expectations, values and ethics held by policymakers inform what, if any, climate adaptation policies are implemented (Adger et al., 2009); consequently, it is no surprise that there has been political reluctance toward implementing climate adaptation policy (Ford & King, 2013). From the meritocratic belief that one can and will improve their economic situation, provided they have the desire and work ethic, stems a deliberate sense of apathy to the plight of those most affected by climate change and made vulnerable by social stressors. However, the harsh reality remains: Vulnerable communities are unable to escape the cycle of poverty even across many generations (Barone & Mocetti, 2016); in a socio-political system plagued by social stressors, where those with privilege hold a significant advantage, climate change is sure to be colossal environmental injustice (Dow et al., 2006; Osborne, 2013).

While correcting injustices and striving for equity should never be driven solely by economic and financial benefit (Garvey, 2019), the unfortunate truth is that planners, while working within the political system, must work creatively to ensure that their ethical standards are met (Pløger, 2004). Climate change, and the social stressors that make us vulnerable to its effects, are simply market failures that pose a monumental risk to our economic system and, consequently, are the duty of public policymakers to correct.

3.3 Vulnerability as an Ethical Issue

Vulnerability to climate change remains vastly complex – yet it also exposes the inconsistencies of the ethical system which guides policy development. As the social and physical realms interact the consequences of western civilization's technocratic and teleological approach become tangible and increasingly difficult to ignore. Vulnerability to climate change, both social and physical, is truly an ethical conundrum; communities that are most affected by climate change often do not benefit from it, are most dramatically affected and continue to be othered from the processes of adaptation (Barnett et al., 2008; Benevolenza & DeRigne, 2018; Dixit et al., 2012; Kreslake et al., 2016; Pandey et al., 2017; Thomas & Twyman, 2006), while those who benefit do not pay the full cost, produce a significant portion of greenhouse gasses, and have the privilege to escape any immediate consequences of climate change (Adger & Kelly, 1999; Andrew, 2008; Osborne, 2013). Vulnerability reveals conundrums within our ethical system: Is it necessary to take responsibility for actions that cause harm? What are the sources of the ethics that guide approaches for addressing adaptation and vulnerable communities? Creating policy to address climate vulnerability is an overwhelming and seemingly impossible task, and considering how the ethical principles that guide both the planning profession, and society itself, fit into equitable policy only further complicates the issue. Yet despite this predicament, knowledge is power. While there are no answers to these questions, by simply asking them one can facilitate the critical thinking necessary for effective and equitable policy development.

Taking Responsibility for Harm

To fully appreciate this conundrum, it seems necessary to ask the following questions: Who is responsible for the impacts of climate change? Are those who are responsible liable?

Repeatedly research shows disparity between communities that produce emissions and those that suffer the consequences (IPCC, 2014; OECD, 2015). However, the economic and social privilege of emissions-producing communities ensures the realities of climate risk is so far removed and intangible that it is difficult to recognize the immediacy of it and act through policy measures. In this way the complexity of climate change causes the ethical principles that typically govern responsibility for harm to fail, rendering it impossible to determine the extent to which any one entity must take personal responsibility (Garvey, 2019). The notion that liability for costs falls to those responsible only further exposes fallacies within the ethics that guide global policy development (Garvey, 2019; Stoett & Omrow, 2020). The costs of climate change are likely to be monumental, therefore liability for the costs of climate change tends to be pushed around between levels of government, emission producing corporations, non-profits, and the communities themselves (Baer, 2006). This significantly hinders effective policy development; while there is some agreement amongst the global community that harm is being done and action must be taken, it seems that commitment to a truly effective formal policy for collective action has been challenging (Baer, 2006; Garvey, 2019; Stoett & Omrow, 2020).

When developing adaptation policy for climate change the ethical principles that typically guide planning begin to degrade. This is reflected in the policy choices around climate change – since assigning blame and imposing liability has proven difficult, humanity is unable to agree on impactful collective action. Consequently, adaptation planning continues to be approached through technocratic means, because if no one can be blamed it is easier to address only the local physical

risks posed by climate change rather than truly examining the systemic injustices that perpetuate vulnerability and risk further degrading the ethical principles guiding policy development.

Deciding What to Do, Ethically

Planners are ethically obligated, first and foremost, to uphold the public interest (Canadian Institute of Planners, 2016), and while most planners consider themselves advocates for the vulnerable, in practice it can be difficult to uphold such ethics (Pløger, 2004). While in theory planning has dismantled its technocratic roots and ensured procedural fairness is a keystone of the participatory planning process (Katan & Shiffman, 2014; Paavola et al., 2006), in practice it has consistently struggled to maintain this set of ethics, which continue to fail spectacularly in the face of climate change (Adger et al., 2009; Johnson et al., 2015; Osborne, 2013; Ramsey et al., 2019). Ethical inconsistencies of technocratic approaches to climate change policy are particularly glaring in the face of vulnerabilities; decision making through the procedural process lacks transparency and accessibility to information, often coercing marginalized individuals into agreeing to a decision, resulting in a process that is neither fair nor ethical (Garvey, 2019).

Critical thinking about how decisions are made about climate change is essential to an ethical process; thinking through the social norms, values and institutions that inform those ethics is paramount to ensuring that the process is truly collaborative.

4. Vulnerability – Planning Implications

There is limited time to make the choices necessary to enhance our capacity to adapt and be resilient in the face of climate change (Hadarits et al., 2017; IPCC, 2014). Local policymakers have the greatest potential to make progress on effective adaptation initiatives that reflect these choices (Dale et al., 2020; Measham et al., 2011; Nordgren et al., 2016). However, the ability to do so remains elusive; effective adaptation requires planning for sustainable development and resilience within urban systems (IPCC, 2014), yet to do so there needs to be a critical assessment of current planning practices for infrastructure, resource management, and social protection (WRI, 2009). This critical assessment is integral to the transformation of planning for climate resilience.

While planning advocates for a bottom-up approach, when facing climate change adaptation it seems to start in the middle, continuing to perpetuate the technocratic approach from which it has desperately tried to distance itself (Karki, 2017; Osborne, 2013; Pløger, 2004; Sandercock, 1998). Vulnerability, particularly that of the social variety, simultaneously offers opportunities to address adaptation policy in a novel way, while exposing inefficiencies in existing practice – providing a starting point for the necessary critical assessment. By consciously considering the complexity and differing perspectives of vulnerability and the interconnectedness of our many realms – social, economic, political, physical, ethical, etc. – planners and policymakers have a place to begin the transformation necessary to face the monumental challenge that climate change will bring.

4.1 Critical Assessment of Planning Practices for Climate Change

Technocratic approaches to adaptation planning perpetuate barriers that limit the ability to address climate change in an effective way. Many of the barriers to adaptation stem from values, ethics, and cultural norms that are dominant throughout western society (Adger et al., 2009); consequently, bureaucratic institutions and political processes limit our adaptive readiness (Ford & King, 2013; Reghezza-Zitt & Rufat, 2019). Furthermore, consistent throughout planning practices is a political structure of power and institutions that disables planners from achieving their ethical goals (Karki, 2017; Pløger, 2004).

Ethical Standards, Politics, & Obligations of Conscious Thought

Planning holds itself to a certain ethical standard which relies on the objectivity of individual planners, while simultaneously requiring an ongoing, critical assessment of current planning practices; this necessitates an examination of how resilience is approached and perceived both within the political system and by individual planners themselves.

The execution of such an assessment reveals a confounding paradox. On one hand, for specifically Canadian planners, according to the CIP *Codes of Professional Conduct*, planners have a responsibility to the public interest (Canadian Institute of Planners, 2016), which is, in the context of climate change, most readily understood as planners having a moral obligation and duty to ensure the resiliency of communities in the face of climate change. On the other hand, for reasons explored in section 3, this ethical obligation is profoundly disabled by pervasive and dogmatic beliefs of western society such as meritocracy, individualism and neoliberalism. So, while upholding their ethical obligations requires planners to deliver policies that facilitate adaptation to climate change, politics consistently disable their ability to do so (Ford & King, 2013).

Further complicating this already difficult subject is the way planning perceives itself and its decisions. As a profession, planning continues to incorrectly maintain that individual planners are objective, free from cultural norms and able to practice without allowing their own beliefs to affect their professional choices (Adger et al., 2009; Karki, 2017; Pløger, 2004). Without deliberately acknowledging the subjectivity of planning ethics, the impossibility of objective decisions, and the complexity of vulnerability to climate change, adaptation policy is unlikely to be effective. Arguably, for planners to uphold their set of ethics they must consciously consider the effects of their own privilege, prejudices and worldview on their decision making. Authors Meerow & Newell (2016) offer a set of questions to enable a critical assessment of the resilience goals of adaptation policy: Resilience for where? Resilience to what? Resilience for whom? Resilience for when? Why resilience?

Through the identification of the factors contributing to vulnerability, and critical assessment of current approaches to resilience which may or may not be equitable, planners can work toward critically considering the planning process and the efficacy of goals meant to ensure resilience and adaptive capacity.

Political & Economic Barriers to Adaptation Policy

Regardless of the objectivity or ability of any individual planner to think critically, there are significant barriers to policy change: Mindset barriers, informal social institutions and political

barriers all restrict the ability for climate change adaptation to succeed (Birchall, 2020). Frequently, social stressors are a result of our global political-economic system, suggesting that climate change has not simply manifested as natural disasters, but it is a human-caused and perpetuated global crisis directly resulting from neoliberal economic ideologies and laissez-faire capitalism – something which is difficult to change (Andrew, 2008; Baer, 2006; Shrubsole, 2015). Underlying the current economic approach are beliefs that stem directly from systemic prejudices and an acceptance of a social Darwinism that undermines the ability of vulnerable populations to achieve sustainable livelihoods (Adger & Kelly, 1999; Pandey et al., 2017; Shrubsole, 2015). Within government, adaptation priorities compete for each other, with more urgent and pressing concerns taking precedence over long-term systemic issues, while our socio-political system tends to perpetuate unequal distribution of resources, wealth and power (Adger & Kelly, 1999; Dow et al., 2006; Osborne, 2013). These factors are compounded by a lack of coordination across levels of government and unstable political dynamics (Dixit et al., 2012).

Unfortunately, the need to navigate such barriers undermines planning's endeavors; however, to encourage actual implementation of adaptation policy, some have found success by framing adaptation measures as policies to eliminate market failures and increase economic efficiency (Dow et al, 2006), or, while of questionable morality, taking actions such as manipulation or outright lying to ensure that their ethics are upheld within the political system (Karki, 2017). Despite these suggestions, there need not be lying or manipulation, but simply a firm presentation of hard truths: Climate change is a wicked, expensive, destructive problem that we are attempting to face with an inefficient economy that is rife with market failures. Prioritizing addressing vulnerability by reducing social stressors is simply the best way to address this catastrophe.

Barriers to a Participatory Planning Process

Planning prides itself on its participatory approach, arguing that ethically it must be non-discriminatory and advocate for those who do not have the capacity to advocate for themselves, yet it is consistently unable to fulfill this ethical agenda (Pløger, 2004). Why is it that, despite ample attempts to encourage minoritized groups to participate in civic life, they are unable to do so? The need to answer this question is dire: The IPCC (2014) states that adaptation measures benefit significantly from increased cooperation between government and vulnerable groups. Unfortunately, it seems that planning has been quite mistaken about the best way to ensure communities are resilient; resilience is not, in fact, an outcome of a participatory process, but rather, participation and collaboration are possible only within a resilient community (Johnson et al, 2015). This is important not only to climate change policy, but to planning across the profession. No policy is effective when any portion of the community is vulnerable; for any policy to function effectively, whether in public health, education or environmental management, a collaborative and participatory approach is essential, which is only possible within a resilient community (Johnson et al., 2015). The best way to ensure a community is resilient is to reduce social stressors (Eriksen et al., 2020; IPCC, 2014; Paavola et al., 2006; Thomas & Twyman, 2006) and ensure adequate social capital is available for adaptive readiness (Johnson et al., 2015; Williams et al., 2020).

Despite the clear need for a participatory approach to adaptation, significant social, economic and political barriers exist due to the way planners view social vulnerability and cling to the technocratic methods dominating planning for climate change. Clearly, a radical change in how planning approaches adaptation and resilience is necessary.

4.2 An Approach to Adaptation Policy – Reduction of Social Vulnerability

While there is no simple answer to creating effective and equitable climate policy, our current approach has left much to be desired. Repeatedly, research finds that policy actions directed toward community building and reduction of social stressors have not taken the forefront of planning research; while efforts have occurred in the technical aspects of adaptation, there has been a gap at the community planning level (Rędzińska & Piotrkowska, 2020). Other disciplines such as human geography have alluded to the potential unintended consequences of purely technocratic approaches – even planning itself acknowledges its dark past of perpetuating inequality and the difficulty translating theory into practice (Pløger, 2004; Sandercock, 1998). Despite the current approach to planning for adaptation and resilience being largely misguided in this respect, with a drastic change in approach, planning and policy have significant potential to impact resilience through measures that improve access to basic infrastructure and public services (IPCC, 2014).

Community Building: Collaboration & Social Capital

Community building is an organic process: It cannot be controlled or contained, but rather, as a deeply participatory process, can only be facilitated (Katan, & Shiffman, 2014). Communities that are diverse, resilient and healthy – those that support their vulnerable members – are the ones that can adapt (Osborne, 2013) and collaborate with policymakers (Johnson et al., 2015). A unique approach to resilience and addressing vulnerable communities becomes available to planners who trust that when facilitated, community building happens organically. Regardless of significant environmental stressors, strong social networks and social capital have the potential to counter vulnerability (Johnson et al., 2015; Usamah et al., 2014) and facilitate adaptive capacity in the face of change (Harford et al., 2010) – confirming that community building is an essential component to resilience and adaptation to climate change and highlighting the necessity of taking an explicitly bottom-up approach. By addressing social stressors preventing collaboration, such as poverty or poor access to public services such as education, health and transportation, planners can simultaneously increase local resilience and enable the participatory planning process.

Targeted Policy Actions for Social Vulnerability

Government coordination and ensuring a voice for the vulnerable are integral to the success of any adaptation policy (Ford & King, 2013; Johnson et al., 2015; Mace, 2006; Williams et al., 2020). With the most significant effects of climate change occurring within urban areas, taking an urban planning approach to climate change adaptation is essential (IPCC, 2014; Meerow & Newell, 2016; Birchall et al., 2021). Planning can greatly impact adaptation measures by working to improve access to basic infrastructure and services; ensuring access to affordable, safe housing; and employing "soft" social-welfare solutions (such as a guaranteed minimum income) that can shift incentives, reduce barriers to action and provide a safety net for those who are vulnerable (IPCC, 2014; WRI, 2009). These goals may be achieved through zoning regulations, rules, taxes, and other policy actions (WRI, 2009). Safety nets for vulnerable populations may include plans intended for vulnerable groups or making use of illustrations and accessible language to communicate local climate change effects (Benevolenza & DeRigne, 2018; Kreslake et al., 2016). The IPCC offers policymakers a guide to approach reducing the risks of climate change by

predominantly addressing social stressors through policy such as equal access to education, adequate housing provision, sanitation and other basic needs.

While social programs are not traditionally considered within the domain of urban planning, climate change necessitates the adjustment of these values; adaptation policy that addresses the social aspects of vulnerability ensures that each community can meet the basic needs of its residents (Pandey et al., 2017), reduces vulnerability through social programs (IPCC, 2014; WRI, 2009), and facilitates the participatory process (Johnson et al., 2015). Only then is it possible, by making use of the sources of capital – natural, financial, physical, human and social – to encourage adaptation and increased resilience (Pandey et al., 2017; Williams et al., 2020).

5. Conclusion

In the face of climate change, the necessary steps seem clear: increase society's resilience, reduce the risks for vulnerable communities, lessen the economic devastation of climate change, and increase the livability of communities across the globe. However, while the planning profession has great potential to achieve such goals, its ability to do so is hindered immensely by a considerable reliance on technocratic approaches that minimize the importance of social vulnerability. Facing the monumental risks of climate change and the complexity of what to do about it requires challenging the existing adaptation paradigm; there is urgent need for an approach to adaptation which focuses on reconciling technocratic approaches to physical risk with a collaborative approach focusing on the social, economic and ethical components of vulnerability to climate change. Such an approach requires educated planners committed to critical assessment of planning practices and ethics, and focused on overcoming political and economic barriers to equitable adaptation policy. By genuinely leaving behind a purely technocratic approach to climate policy, it is possible to build communities that are diverse, resilient and healthy, consequently increasing the vibrancy and quality of life within them, while enabling them to adapt to their own unique local circumstances in the changing climate.

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