How forcing community resilience in rural communities harms sustainable development

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Abstract

Community resilience is critical to managing the effects of climate change and in achieving the United Nations (UN) Sustainable Development Goals (SDG). Resilient communities are able to manage stressors and recover from them, such as in instances of energy service outages. Instances like these can lead to communities that feel forced to exhibit individual characteristics of resilience, such as neighbors relying on each other in times of need because history has shown them that they cannot rely on outside institutions for help. Communities may adopt factors of individual psychological resilience in the face of energy service outages because they lack structural support to exhibit community resilience or to pursue resilient energy systems. This lack of access to support and resources is in conflict with principles of procedural justice and energy sovereignty while reinforcing institutional mistrust within affected communities and contributing to social vulnerability. This article contemplates and expounds on the idea of coerced resilience in the face of energy service outages and severe weather within a rural, remote community in Michigan's Upper Peninsula (UP). The UP is located at the tail end of electricity infrastructure, putting its residents at increased risk of experiencing energy service outages that are further complicated by its isolation and severe winter weather. We examine the idea of coerced resilience, its relation to social vulnerability, and how it conflicts with concepts of energy justice and the UN's SDG. We further go on to highlight how certain populations and youth can minimize instances of coerced resilience and contribute to sustainable development making it an important consideration to achieve sustainable development goals.

Keywords Coerced resilience, Sustainable development, Energy services, Vulnerability, Rural

Introduction

With the threats and impacts of climate change becoming more prevalent in everyday life, the need for sustainable development is more significant than ever [1, 2]. Community resilience is a vital component of sustainable development teaching and is necessary to address many of the United Nations (UN) Sustainable Development Goals (SDG) [3, 4]. Existing ideas of community resilience have often focused on the ability of a community to cope with crises [5] or disasters [6]. While the role of resilient communities in sustainability is difficult to deny [7, 8], little consideration has been given to influencing resilience factors. The authors of this paper (hereafter referred to as "we") contemplate that some communities may feel forced to exhibit characteristics of individual resilience, leading to a community that exhibits its "coerced" resilience (CR) rather than true community resilience. Coerced resilience is particularly important in relation to energy justice and energy sovereignty informing the learning and practice of SDGs.

Energy justice initially dealt with the fair distribution of the benefits and costs of energy services, integrating concepts of procedural and distributive justice

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Ketola *et al. Sustainable Earth Reviews*   (2024) 7:2

Page 2 of 9

[9] and has since expanded to encompass five types of justice: distributive, procedural, restorative, recognition, and cosmopolitan justice [10, 11]. In situations such as energy service outages, CR may require communities to rely on each other for support because they have limited ability to access structural support or external resources. Individuals must make decisions about their survival with little say in how to make their community more resilient or improve structural characteristics of resilience, such as redundancy and responsiveness. Individuals have limited access to information or resources to address the situation and have limited options to address problems with their resource access.

Energy sovereignty can be defined as the part that local people and their institutions play in deciding culturally relevant and ecologically sustainable energy systems [12]. CR harms the energy sovereignty of a community by limiting its people's ability to make decisions about their energy systems, instead leaving them to work around its shortcomings to survive. We recognize the role of resilience in sustainable development science and education and believe that limited understanding of CR harms communities and individuals significantly. Teaching and practicing SDGs curriculum requires development of resilience while differentiating it with CR.

Through the case study highlighted in this paper, we examine CR during energy service outages within Michigan's Upper Peninsula (UP) (Fig. 1) and present its need for research and teaching. While the community in this case study is not forced to exhibit characteristics of physical resilience, such as through the construction of redundant energy infrastructure, its members must rely upon one another in the face of disaster or crises. This self-reliance within their community potentially is related to generations of mistrust in external agencies, lackluster energy infrastructure, and social resilience that has seen the community through its challenges for decades. This may further be related to a reliance on internal support systems over external networks and a lack of institutional and physical resilience structural characteristics. The region in this case study is isolated, remote, and at the tail end of transit and energy infrastructure. The rural community has limited access to outside resources and experiences extreme winter weather that can trigger energy service outages. Managing these outages can be challenging given the remoteness of the area, leading to cascading impacts on the community that are complicated by a mistrust of outside resources and a belief that they must help themselves.

Forms of resilience and coerced resilience

Resilience is often described as the ability of a system and its actors to prepare for threats, absorb impacts, recover, and adapt in the aftermath of stressors or disruptions [13, 14]. The concept is widely defined, dealing with issues from climate change and energy to psychology [15–18]. Resilience is typically regarded optimistically, being treated as something to strive for in systems and by actors [19, 20]. At a global and institutional level, resilience can be used alongside concepts of sustainability and robustness in efforts of global change, as opposed to the current confusion and overlap the ideas currently experience [13, 21]. For instance, SDG 9 aspires to "build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation [22]." SDG 11 aims to "make cities and human settlements inclusive, safe, resilient, and sustainable [23]." However, while the SDGs make mention of resilience and its role in sustainability, they provide limited guidance to evaluate the idea of resilience and how its contributions to sustainability can be measured [24]. Different types of resilience, such as energy and community, may be discussed about specific aspects of sustainable development and are relevant to this article's case study.

Energy resilience often refers to the ability of energy systems to recover and adapt to challenges and is utilized to explain the SDGs [16, 25]. This definition, however, underemphasizes the role that energy services and actors play in energy resilience [14]. Energy services are services that people derive from modern energy (electricity). For instance, people do not need electricity in the circuits; they need services that they can derive from the electricity rather than the electricity itself. For instance, a household needs lighting, cooking, and doing laundry as energy services rather than the electricity flowing in the wires, making electricity a means and not an end. While resilient energy systems may typically preclude resilient energy services, they are unlikely to endure without individual resilience among their actors.

Community resilience takes a more targeted approach, focusing on how people and their communities overcome stress, trauma, and other challenges with support from their social and cultural networks that form a community [26]. Community resilience is indispensable in survival and recovery from disaster and the concept has contentious definitions [27, 28]). One predominant definition focuses on how communities develop and engage with resources in the face of change and uncertainty [29]. Another examines the social processes that local people engage with to learn and transform their communities in the face of common problems []. These definitions approach community resilience slightly differently, but both consider how a community deals with threats. They
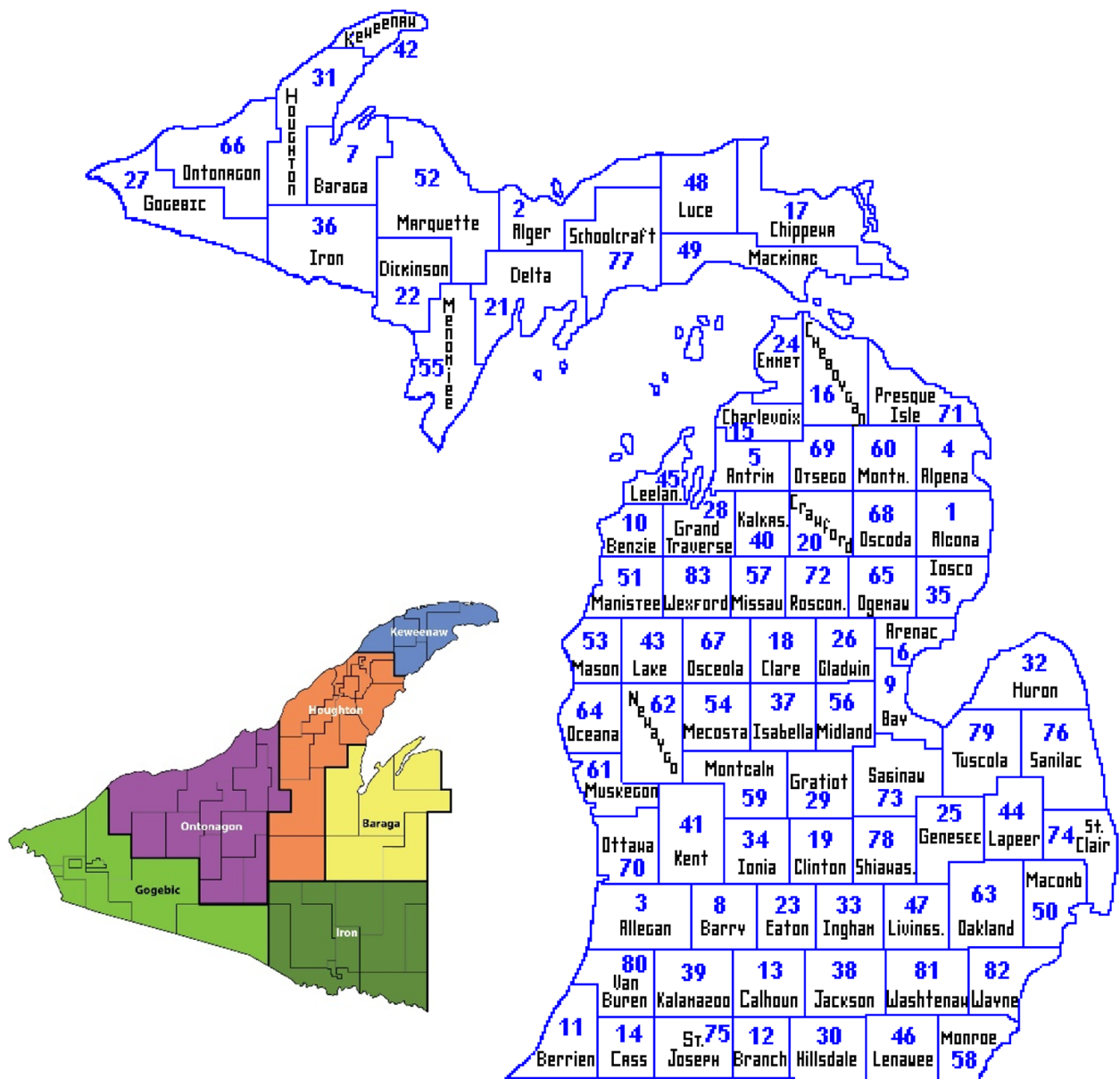
Ketola *et al. Sustainable Earth Reviews*   (2024) 7:2

Page 3 of 9

Fig. 1 Map of Michigan with inset of counties in Western Upper Peninsula of Michigan. Inset illustration by Don Lee to use for the article

mention the individual's role in creating a resilient community, as resilient communities are unlikely to be made up of non-resilient residents [30]. The aggregation of individual resilience leads to community resilience supported by community resources and structures [30].

Some communities may feel forced to adopt factors of individual psychological resilience (such as adapting to diversity or overcoming certain challenges) at the community level as they lack the structural support to support community resilience. We put forward the idea that some communities may feel coerced into adopting

resilient traits because of institutional mistrust and lack of structural resources related to their geography, climate, or historical relationships. For example, residents may believe that they can only rely on their neighbors for assistance during an electricity outage rather than relying on their power provider or outside resources due to previous incidents of a similar nature. Individually resilient traits are present because of a lack of access to structural and external resources and previous experiences with power outages. This understanding of coerced resilience is important to consider to sustainability learning and

Ketola *et al. Sustainable Earth Reviews*   (2024) 7:2

Page 4 of 9

practice as it informs development of development of future resilient communities.

CR has been discussed and taught in the fields of agriculture, wildfire research, psychology, and production ecosystem research, with definitions changing as the field does [31–34]. The concept so far has not been utilized in energy or sustainable development research. Existing discussions tend to focus on CR of their systems or society [31, 32] more than among individuals, as is discussed in psychology [33, 34]. Drawing from psychology and wildfire management, we consider CR to be the use of influence, force, contexts, conditions, or experiences [32, 33] to trigger resilience among actors, with the understanding that adverse conditions and contexts can force humans to exhibit traits of resilience [33]. CR can be brought on by a failure of the state or other external organizations to provide resources to a community in their time of need, such as in the aftermath of a disaster, leading to a distrust that aid will be provided in the future. Communities may feel that these situations are unfair but may lack the ability to access information or resources to address the problem at hand or feel like they do not have a voice in rectifying the situation given historical contexts.

In an energy context, we define coerced resilience as the use of influence, force, contexts, conditions, or experiences [32, 33] to trigger resilience among actors and discuss its role in community resilience in the face of energy service outages, as well as its violations of energy justice tenets and energy sovereignty. We find that by failing to distribute structural support or harms from outages, failing to address how to improve or avoid the outages themselves by process or other means, and failing to recognize the different rights and needs of rural communities impacted by energy outages that CR breaches central ideas of distributive, procedural, and recognition justice. Energy and sustainable development research have not made consideration of coerced resilience, despite the understood importance of resilience [13, 21–23] and resilient communities [7, 8] to sustainable development efforts.

Measuring CR falls back to understanding how community resilience is measured. Magis [29] identifies eight dimensions of community resilience, dealing with how resources are accessed and used within a community by its actors. Some of these dimensions, such as engageable resources, development of resources, and how well a community is able to respond to a crisis, opportunity, or change, provide insight into how CR can be measured. For example, assessing how internal and external resource utilization changes over time provides opportunities to assess if community members continue to favor

self-reliance or are willing to accept outside aid and why either situation might occur.

Case of coerced resilience in michigan's western UP

For individuals or a community exposed to potentially life-threatening conditions, resilience is a given [33]. There is hardly a choice when it comes to life or death. Due to climate-induced disasters and severe weather, the loss of critical energy services following sustained power outages can often necessitate resilience for survival. In communities that are situated at the end of line in terms of energy infrastructure and that experience extreme weather, like in Michigan's Western UP, residents must be prepared for the often-present threat of freezing temperatures and possible power loss. When energy service outages arise, community members must weather the storm, so to speak. The resilience that individual community members and outsiders often praise is the only option supporting survival. Individuals and their communities are subject to conditions and experiences that force them to exhibit traits of resilience, limiting their energy sovereignty and leaving little room for just outcomes.

The UP is characterized by its brutal winters, the toxic legacies of its extractive mining economy, and its geographical position at the tail end of US energy and transit infrastructure. The region experiences severe winter weather, including high snowfall totals and one of the highest electricity rates in the contiguous US [35, 36]. The Western UP is prone to extreme weather events, experiencing long winters where snowfall often averages over 300 inches [37]. The area is increasingly impacted by weather events such as polar vortexes in 2019, during which the temperature dropped below -6°F with wind chills of -25°F to -30°F [38]. These characteristics leave the region's residents vulnerable to energy service outages and their consequences. These outages are further complicated by the belief among some residents that they must practice extreme self-reliance in the face of disaster and energy service outages because help has historically failed to arrive quickly.

Tiwari et al. [35] indicates that respondents, consisting of health system officials, nonprofit officials, and county officials, in the Western UP relied on themselves or their immediate community in times of anticipation of a disaster, such as during historic flooding that occurred in June of 2018 [39] or the infamous winters. They expressed that their location and distance from Michigan's state capital in Lansing made it difficult for state resources to be accessed promptly, highlighting distributive issues in regard to structural resources and negative disaster outcomes as well as procedural issues in the processes required to access these resources. Instead of relying on structural resources, respondents

discussed contacting their neighboring counties, friends, and other connections when they needed resources such as vehicles or culverts to respond to disaster conditions. Outside of these community relationships, disaster planning in the Western UP relies on transporting supplies, labor, or other resources long distances due to their lack of availability in the region, raising further distributive and procedural concerns regarding how resources are accessible and to whom, as well as concerns regarding the recognition of groups like Western UP residents that may possess different rights or needs in these situations. This approach of transporting supplies is complicated by the severe winter weather that often plagues the region and can compromise road access, though current conditions which compromise energy sovereignty leave those affected with little choice in creating culturally and ecologically sustainable and appropriate energy systems that could address this issue.

Western UP residents did not appear to view community resilience as an explicit social problem [35]. They spoke highly of their ability to deal with disasters and emergencies using what they or their neighboring counties had on hand. Respondents proudly told stories of responding to service outages through informal response networks while waiting for outside bureaucracies to respond, highlighting the self-reliant nature of the community. These stories often referenced being unable to trust that state relief would get to them in time during these events, indicating that these violations of principles related to distributive, procedural, and recognition justice as well as energy sovereignty may be something that respondents have simply come to accept as status quo. While their perception of self-reliance has served the community and is something they value, we suggest that it is a form of CR. Western UP resilience is brought on through experiences of inadequate or absent resources in the face of extreme conditions, triggering a collective perception of self-reliance that is self-reinforcing. Individuals believe that they have no choice but to rely on their neighbors, operating under the assumption that there are no other resources to access or that resources will not arrive in time to be useful. As a result, any provided resources are underutilized, and in the next instance where resources are needed, fewer are provided. This reaffirms the belief among community members that they must rely on themselves alone. This goes on to create a perception that resilient communities are those that require minimal intervention following an extreme event to recover, limiting the capacity to achieve UN SDGs.

SDG 9 & 11 are explicitly concerned with resilience [22, 23], though they make little effort to operationalize it in regard to sustainable developments. Communities that experience CR may fail to prioritize sustainable development and the active planning it requires for efforts like renewable energy development as historic events have indicated that they have little choice in their energy systems anyway. Western UP residents expressed concerns about costs and limited funding opportunities for the pursuit of renewable energy technology, even as a means to create more resilient energy systems [35]. The community placed greater stock in their existing utilization of oil and gas, believing that redundant fossil fuel methods were the path to resilience rather than a transition to clean energy methods. The region's geography and remoteness complicate this path – backup fuel is, at best, a few hours' drive away and may be inaccessible for days following a snowstorm or other complications. This delay can contribute to mistrust and feelings of unfairness in the Western UP as they must wait for access to resources.

The case of Western UP residents is one such example of CR's potential victims. Their ability to withstand energy service disruptions or adverse events is rooted in a belief that outside agencies or individuals will fail to recognize their regional needs and thus fail to bring aid during times of disaster, energy related or otherwise. The extent to which residents have individual resilience is maintained through the threat of disaster and the dangers it may bring, such as an energy service outage in a region isolated from resources that could bring relief. The CR of this region is further reinforced through a subsequent refusal or inability to request or utilize state resources, reinforced by historic slow or inadequate resource provision. This may contribute to perpetuating existing inequalities or dynamics of social exclusion in this community. Communities with limited resources and path dependency on disaster recovery seem to embrace social characteristics that support community resilience, yet their reliance on internal support networks over external ones harms their ability to build community and physical resilience.

Social & services vulnerability

CR is a matter of social vulnerability when considered alongside the communities within which it occurs. These communities may already be vulnerable to the threats of isolation - such as limited access to resources and a potential for extended energy service outages. If these individuals are forced to withstand adverse circumstances without access to assistance, they are being denied the resources necessary to withstand adverse impacts. This limited access to resources may make these communities more susceptible to climate change stressors and their impacts on human health and well-being. Further, it violates the principles of fairness and sovereignty previously

Ketola *et al. Sustainable Earth Reviews*   (2024) 7:2

Page 6 of 9

discussed and hence it becomes imperative to understand CR for sustainable development.

While the value of resilient communities is apparent [7, 8] the case study presented above raises questions regarding how CR may affect a community. Communities that proactively pursue resilience may pursue it differently than communities that are forced to embrace resilience through internal support systems rather than external networks. Chosen communities may feel a deeper connection to something they have selected for themselves. They may have an easier time accessing resources in the face of energy outages as they may not experience the resource scarcity that forcibly resilient communities associate with their self-reliance. Communities that are able to choose resilience are likely to be more comfortable accessing these resources, given that they are likely always available when they are expected.

Communities that experience CR because of their geographical and physical conditions may rely on internal features of their community to support resilience in the face of energy outages. These communities may fail to access resources even when they are available and accessible due to historical trust and path dependency challenges [32]. This further perpetuates the cycle of self-reliance, as fewer resources may be provided in the future since they were not utilized previously in the face of increased intensity and frequency of disasters. The communities may experience pride in their resilience and in their ability to persevere without assistance. They may find pride in building their resilience even with their limited access to resources. However, this CR may contribute towards an eventual catastrophe should individuals be expected to manage prolonged or particularly devastating crises or disasters without access to external resources.

Energy service outages can further contribute to social vulnerability. In some instances, such as in the Western UP, there are increased populations of vulnerable groups, such as older adults. Older adults are facing an increased disease burden [40, 41] and a higher likelihood of needing home medical care of equipment [42], making them more vulnerable to power outages that may compromise this equipment. The needs of vulnerable populations within the community may create additional stress for other community members regarding their own degree of resilience, causing them to shoulder the burden of resilience for themselves and their vulnerable neighbors alike. This creates a double-pronged CR, furthered by the vulnerability experienced in the community and the stress of managing situations that can result in harm to oneself or others.

Transformation and coerced resilience

To move beyond CR and allow communities to rely on both internal support systems and external support structures, transformation is required within internal socio-cultural dynamics and external agency processes. External agencies must examine why communities do not seek external support during disaster-induced energy service disruptions and work to understand how more effective support structures can be created and provided to communities. External agencies should understand that communities are unlikely to shed their lack of trust in these agencies to enhance their community's resilience in the face of energy outages by simply working with external partners. Further, external agencies must work to understand what has happened historically to cause communities to rely on their internal support systems exclusively and consider ways to address the mistrust of external systems that is likely to exist.

Communities must also work internally to address their mistrust of external agencies and resources and shift their narratives about pursuing outside aid. This requires the active involvement of youth populations, who likely do not have the same historical mistrust of external agencies that other members of the community might exhibit as they did not directly experience the instances of their creation and who have been found invaluable in disaster resilience [43]. External agencies, such as government bodies and academics, can aid communities in addressing their mistrust by providing information about resilience to community members and reminding them that they have choices in times of disaster rather than just relying on themselves or other community members like they may have done in the past. However, these agencies must also show that they will not repeat the instances of mistrust that have occurred in the past. This may include creating agreements with neighboring states or entities to access their resources should they be closer or more accessible to the region in times of crisis rather than forcing a community to wait.

These efforts to address socio-cultural dynamics and agency processes contribute to the ability of communities to learn and transform following outages and minimize the likelihood they will remain victims of CR. In recovering and learning from disturbances, communities can improve their well-being and resilience at all levels [4, 5]. This, in turn, can contribute to a pathway to achieve the UN SDG and furthering sustainable development efforts while correcting failures of procedural justice and restoring energy sovereignty to impacted communities.

Moving beyond coerced resilience for sustainable development

Sustainable development and resilience require individuals to actively participate in their community and its resilience. When conversations about resilience only focus on technological resilience, they fail to fully consider the role of community actors in creating resilient communities and systems. In rural places like the Western UP, a focus on technological or infrastructural resilience might indicate that the community lacks resilience. However, the Western UP community has significant resilience built around the region's socio-cultural contexts. The characteristics of the community, such as their determination and commitment to helping one and other, contribute to their perceived resilience but exist in the absence of technological and infrastructural resilience, leading to a CR that limits proactive support of these other aspects of resilience.

Community engagement and focus on role of resilience for sustainable development can help to avoid coerced resilience and the burden it can be to communities by allowing communities to have a choice in their energy systems and how resilience is built within their community. By working with community members, external agencies can minimize the harm perpetuated by CR and work to repair historical wrongs perpetrated on the community that lead to their over-reliance on internal support networks to begin with. Engaging with the community allows them to move away from the idea that their internal resilience is their only choice by providing evidence of accessible external resources, providing an opportunity to improve their community's well-being while improving its resilience. In doing so, we create truly resilient communities and support the achievement of the UN goals that currently are far from being realized in the set timeframe.

Conclusion & future research direction

While further research and education focus is needed to understand the impacts of chosen versus coerced resilience on community resilience, practitioners can begin to address the possible harms of coerced resilience by working to address the socio-technological factors that contribute to it within isolated communities that are prone to extenuating circumstances that reinforce it, such as mistrust of external agencies and severe weather. Solution sets are liable to be highly individualized and dependent on the circumstances of coerced resilience in the region, as well as the resources available at the state or federal level to address these circumstances.

Resilience is integral to sustainable development. When communities face technical or geographic challenges and have limited access to or trust in the support provided by external organizations, they may (like in the case of the Western UP) develop a collective self-perception of themselves as only resilient to the extent that they can take care of themselves and one another within the community. This reliance on internal and social features rather than integrating internal and external support as well as physical and social infrastructures is the result of a procedural injustice and can result in a failure to proactively engage in resilience planning, which will be key to facing what lies ahead as the global climate changes and communities must adapt to unpredictably, increasingly severe external shocks.

Future research on coerced resilience should seek to identify key characteristics of the concept and how they can inform more resilient and just systems It should further pursue an understanding of the appearance of these characteristics in varied communities exposed to different hazards or other situations that may trigger extreme expectations of self-reliance during times of energy service outage. This could include examining understandings of resilience in remote communities, communities with unique geographical challenges, or communities that may be otherwise isolated, such as through cultural distinctions or belief systems. It could further include creating a standardized understanding of the concept to be used within energy fields, such as through frameworks or other tools for identifying and addressing coerced resilience.

Additional work should also address the impacts of coerced versus chosen resilience among communities and their members, both psychologically and in terms of its impact on long-term resilience. While the ethics of coercion are well examined at large [44–46], there appears to be limited discussion of coercion within resilience and energy literature. A deeper understanding of coercion's role in just, resilient energy systems and their outcomes could help create systems that serve their users while allowing them to choose resilience for themselves or their community.

Abbreviations
CR   Coerced Resilience
SDG   Sustainable Developed Goals
UN   United Nations
UP   Upper Peninsula
US   United States

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