SUSTAINABLE FUTURES Policy Brief

Building Resilience: Imperative Questions for Caribbean Policymakers and Disaster Risk Management Practitioners

by Barbara Carby, Director, Disaster Risk Reduction Centre,
The University of the West Indies

Following the devastating impact of hurricanes Irma and Maria in 2017, there have been calls for increasing the resilience of countries in the Caribbean region. The importance of resilience is recognised and it is included in regional strategies and frameworks. However, critical reflection is needed on what is required to build a resilient region. This brief encourages policymakers and practitioners to reflect critically on several issues that affect the implementation of resilience programmes. These include whether there is a common understanding of the concept; how priorities for resilience building will be decided; whether societies are willing to make difficult decisions related to participatory decision-making and social equity; and what should be done differently in order to achieve more resilient societies.

The 2017 north Atlantic hurricane season was one of the most active ever experienced in the Caribbean. Between September 5 and 20, the region was affected by two Category 5 hurricanes, Irma and Maria, with devastating multi-island impact. Irma, with maximum wind speeds of 185mph, caused the loss of 40 lives and significant damage to Anguilla, Antigua and Barbuda, and the British Virgin Islands (BVI). St Kitts and Nevis, Montserrat, Turks and Caicos Islands, the south-eastern islands of the Bahamas and northern areas of Haiti were also affected.

Hurricane Maria achieved Category 5 status on September 18, having progressed from a Tropical Depression to a Category 3 storm within 48 hours. Eight hours later it became a catastrophic Category 5 hurricane, hitting Dominica on the night of September 18. Other islands – St Kitts and Nevis, Antigua and Barbuda and the Virgin Islands – were also affected by Maria. In between Irma and Maria, Jose – a Category 3 hurricane – posed a threat to the northern Leeward Islands, causing the Government of Antigua and Barbuda to evacuate Barbuda. Cuba, St Maarten and Puerto Rico were also seriously damaged by the hurricanes.

In the aftermath of the devastation from Irma and Maria the call for more resilient Caribbean states has become more urgent. With initial estimates of damage to Dominica approximately US$1.3billion or 200% of annual GDP, Prime Minister Roosevelt Skerrit announced the intention of making Dominica the world's first climate-resilient nation.[1] World Bank Vice President Jorge Familiar expressed support for Dominica in this quest.[2]

Bill Clinton, former president of the United States, encouraged the region to move towards renewable energy and climate change adaptation, stating support for the vision of the Caribbean becoming the first sustainable region in the world and Dominica's quest for climate resilience.[3] The Vice Chancellor of the University of the West Indies announced the appointment of a Resilience Coordinator mandated to advance a culture of resilience development for the region.[4] There is, therefore, clear convergence on the

[1] https://caricom.org/about-caricom/what-we-do/srtategic-priorities/building-environmental-resilience
[2] http://www.worldbank.org/en/news/press-release/2017/10/31/joint-statement-by-dominica-prime-minister-roosevelt-skerrit-and-world-bank -vice-president-for-latin-america-and-the-caribbean-jorge-familiar (not cited)
[3] http://www.jamaicaobserver.com/latestnews/Clinton_urges_region_to_move_towards_cleaner_energy,_become_more_climate_change_resilient?profile=1228
[4] http://www.open.uwi.edu/uwi-appoints-jeremy-collymore-implement-resilience-culture-and-planning

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need for the region to build resilience in the face of the threat posed by climate change.

Projections by climate scientists are that in the Caribbean, for upper ranges of greenhouse gas emissions, unprecedented climate norms will be experienced (Taylor et al. 2012). Temperatures will continue to increase, sea levels will rise and there will be variability in rainfall patterns. According to Taylor et al. (2012) the Caribbean is expected to warm up towards the end of the century by between 1 and 5 degrees, and to experience sea level rise of 1 to 2 metres for a 2.0 to 2.5 degree temperature increase under global warming. It is unclear whether there will be an increase or decrease in the number of hurricanes; however, they are likely to be more intense, with higher peak speeds and more precipitation (Taylor et al. 2012). Taylor (2017) notes that Irma and Maria presage a future without precedence, as these hurricanes fit the patterns projected by climate science (Fig. 1). Hurricanes are not the only worrying climate extreme for the region. Climate models predict variable rainfall, with drying by up to 30 percent across the region by the end of the century, suggesting longer and more intense droughts (Taylor et al. 2012).

Foretelling of a Future Marked by the Unprecedented: Irma and Maria hint at what the future climate will be like!

Putting Irma and Maria in the picture

Projections(IPCC)	Irma	Maria
Rainfall rates will increase	Heavy rain: Leeward Islands to USA Totals > than 6inches (152.5mm) around storm, > 20inches (512mm) over Cuba	> 10inches (254mm) common along Maria's track > 20inches (512mm) over Puerto Rico
Increase in maximum wind speed by +2 to +11%	Peak intensity of 185mph (295km/h) Ties as the 2nd strongest Atlantic hurricane by wind speed (only after Allen of 1980	Peak of 175mph max winds in the eastern Caribbean 3rd strongest max winds in eastern Caribbean (after Irma and Allen in 1980)
Frequency unchanged but intense storms increase substantially	Since 2000, 11 of 33 cat 5 storms (from 1924). 2 in 2017	
Rapid intensification and maintenance of strength	Becomes Cat 2 hurricane in 24hours Sustained 185mph (295km/h) winds for 37 hours. Only tropical cyclone worldwide to have had winds that speed for that long	Explosive strengthening 70mph max wind intensification in 18hours
Poleward and extending farther east	First recorded Category 5 hurricane to affect the northern Leeward Islands	Maria followed closely the track of Irma

Fig. 1: Characteristics of Hurricanes Irma and Maria compared to the IPCC Projections

Source: Taylor (2017)

Given the variability being experienced, and projections for the future, the region prioritised climate change adaptation as a method of managing risk and various adaptation initiatives have been undertaken, including Caribbean Planning for Adaptation to Climate Change (CPACC), Adaptation to Climate Change and Mainstreaming Adaptation to Climate Change (MACC). The Caribbean Regional Strategic Programme for Climate Resilience (SPCR) was developed in 2012 under the Pilot Programme for Climate Resilience (PPCR) and sought to improve regional processes for data acquisition, analysis sharing and storage as well as climate modelling, scaling up of innovative climate resilience initiatives and replication of PPCR activities in non-PPCR states. Modelling outputs provide the scientific evidence of the need for adaptation and inform project and programme development at regional and national levels.

At the global level, the concept of resilience underpinned the Hyogo Framework for Action (HFA) 2005-2015: Building the Resilience of Nations and Communities to Disasters (UNISDR 2005). One of the Priorities for Action of the HFA was to "Use knowledge, innovation and education to build a culture of safety and resilience at all levels". The successor to the HFA, the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR), emphasises the importance of an integrated approach to disaster risk management in order to build resilience. The overarching goal speaks to integrated and inclusive measures that prevent or reduce vulnerability and increase preparedness in order to improve resilience (UNISDR 2015).

Resilience has been included in several regional strategies. The CARICOM Strategic Priorities 2015-2019 include building economic, environmental, technological and social resilience.[5] The regional Comprehensive Disaster Management Strategy and Framework 2014-2024, which is led by the Caribbean Disaster Emergency Management Agency (CDEMA), has as its overarching goal "Stronger More Resilient Caribbean States". Although the resilience dialogue has been widened by climate variability, recent weather events, projections on the impacts of climate change and the effects of recent hurricanes, and although there seems to be general acceptance that resilience is needed to ensure damage and loss reduction from the impact of hazards, and that increasing resilience is a good thing, the word is rarely defined or the meaning behind its use clarified.

If resilience building is to be the defining strategy in disaster risk reduction for regional governments within the framework of CARICOM, it would be useful to continue the journey with a common understanding, if not an agreed definition of the word. Further, the countries, having decided that resilience is a good thing and that it should be pursued, will need to make decisions and take actions to operationalise the concept of resilience. This paper, with a target audience of policy makers and Disaster Risk Management (DRM) practitioners, will pose some questions which the reflexive policy maker/practitioner should consider as resilience-focused risk management projects and programmes are rolled out across the region.

Are we on the same page?

The UNISDR, in its 2009 Terminology on Disaster Risk Reduction, defines resilience as "the ability of a system, community or society exposed to hazards to resist, absorb, accommodate and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions" (p.24). It further explains that resilience means the ability to "resile" or "spring back from" a shock; the resilience of a community in respect to potentially hazardous events is determined by the degree to which the community has the necessary resources and is capable of organising itself both prior to and during times of need. Inherent in this definition is the idea that the affected system must be robust enough to resist impact but also flexible enough to 'accommodate' or adapt to the impact and to recover.

[5] https://caricom.org/about-caricom/what-we-do/srtategic-priorities/

The 2016 update of the definition is similar: "The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management" (United Nations 2016). We see, however, that there is now the requirement that the system must be able to transform as part of its response to a shock. This notion of transforming, as we will see later, is important if social resilience is to be achieved. Note, too, that resilience-building is part of the risk management programme; as Matyas and Pelling (2014) point out, resilience should be built into risk management policy. Many pronouncements on the need for resilience do not connect it to ongoing programmes such as those in disaster risk reduction or climate change adaptation.

Reed et al. (2015) indicate that projects which promote climate resilience are "drawn from the same repertoire of development projects aimed at improving livelihoods, natural resource management or disaster risk reduction" (p1). The interconnectedness of all elements of sustainable development planning must be appreciated lest the warning of Matyas and Pelling (2014) of the danger that "resilience provides a new term but no new action on the ground" (p.52) proves to be prophetic.

The need for clarity in the use of the term resilience is noted by Davoudi (2012), who queries whether resilience risks becoming just another buzz word. Clarity is important as the definition of resilience varies according to the field or discipline in which it is being applied. Resilience in engineering means returning to the equilibrium state after a disturbance, the speed of return being taken as an indication of resilience. With regards to ecology the measure of resilience is the magnitude of the shock which can be accommodated before the system must change in response to the shock; resilience is a measure of how much shock can be withstood with the system remaining within critical thresholds (Davoudi 2012). For DRM it may not be desirable for the system to return to the pre-shock state. Hazards generally expose system weaknesses – expressed as vulnerability – which should be addressed if damage is not to recur. Hence the idea of 'building back better', which is now commonly used in DRM. In discussing the place of resilience in disaster risk management policy, Matyas and Pelling (2014) note the need for clarity and specificity in the change which is required to build resilience. They posit that resistance, incremental adjustment and transformation are three options to be considered by the DRM community. They describe resistance as seeking to avoid impacts and incremental adjustment as seeking to return to pre-disaster conditions. While these can be short-term measures, they do not address the weaknesses which make the system vulnerable. The concept of transformation signifies addressing deeper rooted changes which directly challenge power structures (Matyas and Pelling 2014).

In considering resilience in the DRM context it is necessary to describe the boundaries of the system, community or society which is to be resilient. Clarity is required as to whether social or ecological systems, or both, are to be included. Adger (2003) notes that social and ecological systems should not be separated and posits that for social-ecological systems resilience is measured by "the magnitude of the perturbations that they can absorb and still retain their overall function; the degree to which the system is capable of self-organisation; and the degree to which capacity can be built for learning and adaptation" (p.2). The livelihoods, economies and leisure activities of Caribbean states are dependent on our ecological systems. Coastal systems provide protection for the shoreline and a buffer for hotel developments. Any discourse on resilience must therefore include these natural systems and plans for ensuring their resilience should be explicitly stated.

Who decides priorities?

There are many facets to resilience building – economic, infrastructure, buildings, sectors, communities, to name a few. In resource-constrained countries such as the Caribbean SIDS, the issue of who defines priorities will have to be decided and they will have to be defined. Davoudi (2012) states that the act of establishing boundaries for resilience can itself be exclusionary as some aspects will receive focus while others are discounted. The paradox is that building the resilience of a society should be an inclusive process.

It is important that any resilience programme has a strong community base (Cutter 2014). A participatory approach is therefore critical with a clear understanding of the process for identifying priorities and opportunities at all levels for inputs to prioritisation. Given the continued growth of urban centres and projections for this trend to continue, urban resilience has received attention (Leichenko 2011; Tyler and Moench 2012). Concentration of physical, administrative and economic infrastructure in coastal cities in Caribbean countries means urban resilience should be a priority. Leichenko (2011) notes some of the challenges associated with achieving urban resilience; these include uneven patterns of resilience, costs associated with building resilience and the difficulty of harnessing innovations needed to foster resilience.

It could also be argued that, considering the need to retreat from the coastline and for diversification of economies, building resilience into rural development should therefore be a priority. Convincing arguments can also be made for the business sector and certainly for emergency response and infrastructure such as hospitals, fire stations, shelters and road networks. How then will priorities be decided and can this process be truly inclusive? This is a potentially contentious issue which must be resolved.

How will we know if we are becoming more resilient?

Nalau et al. (2016) refer to the difficulty of demonstrating progress in resilience without adequate mechanisms for monitoring and evaluation. Embarking on a journey to build resilience requires a detailed road map with targets and milestones as well as a method of measuring progress. Measuring resilience presents certain difficulties as there is no general agreement on methods of measurement. Cutter (2016) reviewed 27 resilience assessment tools and scorecards. Twigg (2009), in defining the characteristics of a resilient community, lists five thematic areas and 28 components. Ludin and Arbon (2017), working with communities in Malaysia, applied the Australian Community Resilience Scorecard of four domains and six indicators. Joerin and Shaw (2011), in their work on disaster resilience of cities, applied five dimensions with five parameters, and 125 variables.

Ostadtaghizadeh et al. (2015) note the diversity of approaches in attempts to assess community disaster resilience (CDR), and conclude that the level of conceptual diversity indicates limited agreement about how to operationalise the concept. They suggest five domains and note the necessity of identifying appropriate methods for assessing and weighting them, and analysing how they inter-relate to contribute to resilience. Ludin and Arbon (2017) state the importance of any assessment method being culturally and contextually suitable. For participating states of the CDEMA mechanism, there would be value in standardising the method for measuring gains in resilience, with the method then being adapted for application in different countries.

Is resilience conceived as a process or an end point to be achieved?

Funfgeld and McEvoy (2012) note that resilience framed through an engineering lens, which aims to return to an equilibrium point after a disturbance,

is conceived as an endpoint. However, for disaster risk management resilience is best viewed as a process which includes resistance, adaptation and transformation (Matyas and Pelling 2014; Funfgeld and McEvoy 2012).Transformation suggests change in the status quo, including relationships of power and politics, and signifies deep-rooted changes in individuals, institutions, regimes and infrastructure (Matyas and Pelling 2014). It is these deep-rooted changes which are required if the drivers of exposure and vulnerability are to be addressed and progress made in resilience building. Transformation of Caribbean societies is imperative if we are to achieve resilience.

What do we need to do differently?

Since the formal establishment of a regional mechanism for disaster risk management there have been a multiplicity of projects and programmes aimed at improving preparedness, reducing hazard impacts, incorporating risk reduction into development and reducing losses across CARICOM states. Additionally, development partners have provided funding for bilateral DRM projects. Non-governmental organisations have also implemented projects aimed at preparedness and building resilience. Each disaster is followed by pronouncements on the need to reduce vulnerability, to build back better and, more recently, to be resilient. Disaster risk management is present in various forms in curricula of schools and tertiary institutions. A considerable body of research on DRM exists with which to pursue evidence-based resilience programmes. Despite good intentions, great effort and investment of funds, countries continue to suffer high levels of damage from hazard impacts. The question is self-evident: what should be done differently? Do we need a radical departure from the well-tested but seemingly ineffective approaches which have been employed historically? Matyas and Pelling (2014) suggest that to be useful to policymakers, there must be clarity on the change required to build resilience. Many discussions on resilience include the idea of transformation (Matyas and Pelling 2014; Shaw 2012; Davoudi 2012). Adger (2003) argues that "Promoting resilience means changing, in particular, the nature of decision-making to recognise the benefits of autonomy and new forms of governance in promoting social goals, self-organisation, and the capacity to adapt." (p.2). Shaw (2012) views resilience as a contested, politically laden discourse and suggests that reframing is needed which will "allow values to be identified, choices to be made and political pathways to be identified" (p.309). This is consistent with the view that transformation must be included in any discourse on resilience (Matyas and Pelling 2014; Shaw 2012).

Transformation, however, may not be a comfortable process. Resilience should be seen as an opportunity for "a more radical and transformational agenda, that opens up opportunities for political voice, resistance and challenging power structures and accepted ways of thinking" (Bay Localize in Shaw 2012, 309). Paton and Johnston (2001) stress the importance of community empowerment in achieving resilience. They argue that community empowerment includes participation, enhancing perceived control, facilitation of community problem identification and solving in ways which are consistent with community values and needs, and that sustaining empowerment requires a participatory approach to decision-making. This necessitates resilience programmes tailored to community needs and communities being given a voice in decision-making, including deciding on priorities and resource allocation.

Matyas and Pelling (2014) note that transformation involves fundamental restructuring and pushing the system to a new status quo. This suggests challenging the existing status quo – those systems and processes which cause accumulation of vulnerability and which must be identified and changed if the root causes are to be addressed and societies transformed. The Caribbean and other SIDS must consider what political, governance and cultural changes must be made in order to build more resilient,

transformed societies in which the root causes of vulnerability are not only identified but addressed.

Each society must create its own vision of what its resilient version will look like, and must map the pathways to achieve resilience. It must be recognised, however, that achieving resilience is a complex undertaking. Cutter (2014) points out that in resilient systems, the various components, inter alia infrastructure, social, institutional, environmental, are integrated and mutually supportive. Allenby and Finck (2005) posit that resilience should be built across the whole social unit and should address varying threats. Thus, although the resilience discourse has been triggered by climate-related events, the inclusion of other threats, both of anthropogenic and natural origin, is important. Twigg (2009), in identifying characteristics of resilient communities, suggests five thematic areas: governance, risk assessment, knowledge and education, risk management and vulnerability reduction, and disaster preparedness and response.

CDEMA and its participating states have, over the years, placed emphasis on reducing exposure and vulnerability, on managing risk, improving knowledge management and preparedness and response systems; and much progress has been made (Collymore 2011; Carby 2017). While work must continue in these areas, I suggest that it is the area of governance that provides the greatest potential for achieving resilience through transformation. Twigg (2009) states that characteristics such as vision, consensus, long-term thinking, commitment and enthusiasm are important for building resilience. This suggests that in addition to enforcing laws and regulations which promote strong buildings and robust infrastructure, reduce exposure and promote risk reduction and sustainable development, governance systems must also include ways of mobilising populations and fostering and capturing the creativity which will lead to innovations that will ensure adaptation to adverse circumstances. Strong leadership from government and civil society and reform of policy and practice are identified by Cutter (2014) as being desirable for resilience building. One role of strong leadership may be changing political and cultural practices which are counter to building resilience. Another is to ensure that all citizens have a voice in decision-making, that there is social equity and that validity of all knowledge is recognised. Nirupama, Popper and Quirke (2014), in highlighting the role of social resilience in mitigating the impact of disasters, call for sharing of traditional knowledge as part of resilience-building strategies. The CARICOM Strategic Priorities 2015-2019 include developing arrangements for participatory governance. I suggest that participatory governance is essential for transformation. It is critical, therefore, that CARICOM member states lay out the roadmap for true participatory governance as part of their resilience-building strategy.

Conclusion

Though highly desirable, essential even, and the subject of general agreement, building national and regional resilience to hazards will be fraught with challenges. The process will require making difficult choices. Matyas and Pelling (2014) note the need for critical reflexivity when considering resilience. Choices must be made in resource allocation with regards to resistance, which can be interpreted as defending existing investments in protection; incremental adjustments – such as improving warning systems and contingency plans; transformation – challenging existing paradigms and power structures which are the cause of vulnerability; and empowering citizens to self-organise and truly participate in decision-making. Solutions are likely to be a mix of all three and should be tailored to local contexts and cultural values. However, even at the community level there may be competing priorities. At the national level policy trade-offs will have to be made – some investments which need to be made now will pay off only in the future. Undoubtedly some necessary decisions will challenge vested interests. The need for foreign direct investment may have to become secondary to enforcement of set-backs and sound environmental management practices. Importantly, the temptation to merely repackage an existing approach that has been ineffective in addressing structural factors which lead to vulnerability (Levine et al. 2012) must be avoided. Speaking the language of building a resilient future is not enough. The region must critically and carefully reflect on the challenges likely to be encountered on this journey and the commitment which will be required to achieve that future.

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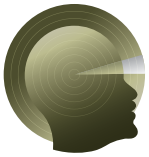

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The University of the West Indies
Mona Campus, Kingston 7,
JAMAICA, West Indies
Tel: (876) 927-1020 / 927-1234
Email: salisespolicybrief@uwimona.edu.jm

@SALISESMona