

# Australian Journal of **EMERGENCY MANAGEMENT**

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## Our world, our say

Young people as creative agents of change

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# Australian Journal of Emergency Management

Vol. 35, No. 2, April 2020

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## About the journal

The *Australian Journal of Emergency Management* is Australia's premier journal in emergency management. Its format and content are developed with reference to peak emergency management organisations and the emergency management sectors—nationally and internationally. The journal focuses on both the academic and practitioner reader. Its aim is to strengthen capabilities in the sector by documenting, growing and disseminating an emergency management body of knowledge. The journal strongly supports the role of the Australian Institute for Disaster Resilience as a national centre of excellence for knowledge and skills development in the emergency management sector. Papers are published in all areas of emergency management. The journal encourages empirical reports but may include specialised theoretical, methodological, case study and review papers and opinion pieces. The views in the journal are not necessarily the views of the Australian Government, Australian Institute for Disaster Resilience or its partners.

Aboriginal and Torres Strait Islander peoples are advised that this publication may contain images of deceased people.

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**Cover image:** The Fireflies art project contributors at Towamba Public School.

Image: Towamba Public School

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Contributions in the Research section of the *Australian Journal of Emergency Management* are peer reviewed to appropriate academic standards by independent, qualified reviewers.

# Foreword

Dr Robert Glasser, Australian Strategic Policy Institute

In the not too distant future, when the history of the COVID-19 pandemic response is written, it will conclude that the world was woefully unprepared for the scale and effect of the virus—but not because of inadequate early warning.



Health experts have, for many decades, urged governments to take the threat seriously and the H5N1, H1N1, SARS and MERS outbreaks in the years preceding the pandemic should have increased the sense of urgency. A long-term, well-funded global plan was needed to reduce pandemic risk. Instead government funding was incremental and short-lived, triggered by the earlier novel disease outbreaks and fading as the crises caused by them subsided.

That's a pattern very familiar to the disaster management community. During and immediately following disasters, media and political interest is high and governments are under enormous pressure to act, including by demonstrating that they are reducing the risk of future similar disasters. The funding initially flows freely, but then dwindles as the attention and political pressures diminish.

Most of the global progress in disaster risk reduction over the past decades has proceeded in this way: incremental improvements made in the immediate aftermath of disasters. But this is clearly not the way to significantly reduce the risks of a global pandemic nor to implement the revolution in risk management called for in the *Sendai Framework for Disaster Risk Reduction 2015–2030*.

However, the scale and frequency of disasters can alter this equation. The bigger the disaster, the more likely the response will involve systemic and strategic improvements. This will almost certainly be the case after the (already) unprecedented global impacts of COVID-19, in areas such as improved disease surveillance, strengthened healthcare systems and rapid vaccine development and distribution. It also applies to Australia's recent unprecedented bushfires, which led the Prime Minister to announce initiatives to strengthen the Australian Government's authority in large disasters and its capacity to respond through changes to how it uses the Australian Defence Force.

Not surprisingly, countries that experience frequent natural hazards, such as The Philippines and Bangladesh, have already incorporated some aspects of disaster risk management fundamentally in their economic, social and development planning and investments. Queensland has moved further than other Australian states and territories in this direction because it is the most exposed to natural hazards. In the past three years,

for example, over half of the state's 77 local government areas have experienced three or more disasters requiring emergency financial support from federal and state levels.

Given that climate change is already increasing the scale and frequency of both sudden-onset and slow-onset hazards, pressure will build for many more strategic and systemic changes across jurisdictions to reduce disaster risk.

At the core of these efforts is the requirement to strengthen the resilience of Australian communities. Accomplishing this will require governments and other actors to engage closely with communities to identify challenges and design and support appropriate responses.

This issue of the *Australian Journal of Emergency Management* focuses on community-level engagement. It includes important insights from existing initiatives that are useful reference points for our efforts to build community resilience in the years ahead. Communities play an essential role in reducing the effects of disasters. We saw this in the recent bushfires, when neighbours helped each other battle flames, evacuate the vulnerable and feed and shelter the displaced. Over 90 per cent of firefighters were community-based volunteers.

Much government messaging in the current pandemic has focused on the need for 'social distancing' measures, such as prohibiting community gatherings, closing schools and quarantining suspected cases, which has inadvertently disempowered local community action. It has sent the subliminal message that 'community' itself is a threat. In spite of this, people in communities are finding ways to support each other by dropping off food and connecting virtually. No doubt this will be a conclusion reached in some yet-to-be-written history of Australia's response to COVID-19: in a pandemic governments need to support community engagement in the response and social distancing doesn't have to mean social isolation.

## Dr Robert Glasser

Visiting Fellow, Australian Strategic Policy Institute

Former United Nations Secretary-General's Special Representative for Disaster Risk Reduction

# International guide to value and engage children and youth in disaster risk reduction

Mami Mizutori, Special Representative of the United Nations Secretary-General for Disaster Risk Reduction and Head of the United Nations Office for Disaster Risk Reduction

In Australia, and around the world, disasters disproportionately and often severely impact on children and youth. New international guidelines have been developed and refined to give worldwide access to expertise, communities-of-practice and networks of disaster risk reduction practitioners.

Too often, events such as cyclones, bushfires, floods and slow-onset hazards such as sea-level rise and drought affect the health, education, living situations and decent work opportunities for children and youth—with lifelong implications. Seeing children and youth merely as victims can increase the potential for greater harm. While the effects of disasters can be tragically severe for children and youth, they must be viewed as important to stakeholders and agents of change. The perspectives of children and youth and their involvement are needed to reduce their exposure to risks and increase their personal resilience as well as the resilience of their families and their communities.



Muslima, age 18, from Somalia learns how to install a water pump at a centre that provides training to displaced youth in construction, engineering and plumbing.

Image: ©2019 UNICEF/UNI226037/Mark Naftalin

Responding to the increased frequency and severity of natural hazard events and the need to involve all of society in finding solutions, the United Nations Office of Disaster Risk Reduction (UNDRR) has published the *Words into Action guidelines: Engaging Children and Youth in Disaster Risk Reduction and Resilience Building*. The new guide offers practical ways for authorities, practitioners and young people around the world practical ways to work for and with children and youth to implement the *Sendai Framework for Disaster Risk Reduction 2015–2030*. The guide includes examples of how children and youth are already raising safety awareness in schools, homes and in their communities. This is improving areas of early warning systems and risk assessment technologies and motivating peers and adults to take action on climate change.

The guide is a comprehensive 132-page resource and offers:

- 300-plus disaster risk reduction-related resources and 60 case studies and web links to disaster risk reduction initiatives around the world
- values-based recommendations to safeguard children and youth to advance their rights and engage them
- expert advice on inclusive disaster risk reduction that focuses on gender equality, disability, age, socio-economic status, Indigenous Peoples and ethnic minorities, migrants and displaced populations
- priority actions for collective benefit in the areas of education, health and nutrition, water, sanitation and hygiene, social protection, child protection, livelihoods, the environment, public open spaces and placemaking as well as shelter, housing and human settlements.

More than 100 disaster risk reduction experts including youth, United Nations and non-government

organisations, government officials, academics and consultants worked to develop the guide. They were assisted by advisory team members from UNDRR, UNICEF, Save the Children, Plan International, the United Nations Major Group for Children and Youth, United Nations Women, the United Nations Population Fund, World Vision and the International Federation of Red Cross and Red Crescent Societies.

In the guide, child and youth representatives from the United Nations Major Group for Children and Youth offer readers guidance for its use. For example:

*Engaging youth and children, along with thoroughly comprehending the challenges faced and the solutions offered, while committing to full-fledged inclusion at every stage of planning and execution, is the route to effective and efficient solutions for children and youth and the world. This is what we need and how we want to achieve it. We want to leave the world a better place than we found it. So, are you actively listening? Are you ready to engage children and youth? Because together we can achieve a better and more sustainable future. Let's start now!*



Image: UNICEF Indonesia/Chizuru Iwata (see <http://bit.ly/2XRFFk0> and video: <https://youtu.be/KlqfKEd5-3Y>)

In Indonesia, adolescents took a change-maker role in local disaster risk reduction governance by identifying hazards and risks and offering solutions. In one community, adolescents developed ideas to install drilled wells with motor pumps. They did this to address water-supply issues. The children (often girls) have to fetch water far from home and this hindered school attendance. With parental support, the students advocated their ideas to the village council that responded by installing five wells in the village.

The guide was developed through a year-long collaborative process. UNDRR thanks the contributors, including UNICEF and Tamara Plush, youth from around the world and the guide's advisory members.

Download the guide and resources at [www.preventionweb.net/publications/view/67704](http://www.preventionweb.net/publications/view/67704).

Contact: [undrrcomms@un.org](mailto:undrrcomms@un.org)



Image: ©2018 UNICEF/UNI134464/Brian Sokol

# Child-Centred Urban Resilience Framework: a tool for inclusive city planning

Suresh Pokharel, Emergency Management Office, Tonga; Kirsten McDonald, Arup and Anna Saxby, Plan International Australia

Plan International and Arup developed the *Child-Centred Urban Resilience Framework* to involve vulnerable groups in planning processes. The framework guides organisations to design, plan and implement community resilience activities in urban settings.

Cities are transforming because of demographic and social changes, inequity and environmental risk. In response, signatories to the *New Urban Agenda*<sup>1</sup> made commitments focusing on vulnerable urban groups, including children. Child-centred organisations acknowledge they need to respond by increasing efforts to build resilience and align these efforts with global declarations, such as the *New Urban Agenda*. The *Child-Centred Urban Resilience Framework* (CCURF) was developed to assist the work of these organisations to build resilience in cities in support of children. The completion of the CCURF coincided with the United Nations Conference on Housing and Sustainable Urban Development, Habitat-III (October 2016) and was launched at Habitat-III by Gillian Bird, Permanent Representative of Australia to the United Nations.

## Approach

The CCURF is guided by urban systems thinking and aligns child and human rights and gender-sensitive approaches with urban development and promotes children as agents of resilience. The CCURF sets out four strategic action areas:

- Sustaining life for children by improving access to basic services, ensuring decent work and safeguarding survival and development.
- Mobilising the community to value the protection and promotion of child and human rights through increased security and protection (especially for girls) and calling for community and stakeholder involvement.
- Making safe places where children can live, play and grow by providing child- and gender-sensitive infrastructure as well as information that children can access.
- Promoting integration so that managing and planning cities is responsive to and inclusive of children.

## Need

As global populations urbanise, poverty and vulnerability affects more people. As a consequence, the work of international development organisations (e.g. multilateral development banks, bilateral and multilateral donors and international non-government organisations) needs to be directed towards urban centres and towards the effects of climate change. For organisations working in urban areas, understanding the nature of urban poverty, the increasing risks associated with urbanisation (including climate change) and the complexity of the urban context is critical. While some international development organisations have access to resources to take a systems-approach to their work, others do not. This 'gap' in resources to work at a systems-level to address the impacts of climate change on cities was acknowledged by Plan International, which inspired the development of the CCURF.

The CCURF is a combination of research, experience and expertise, in particular, research undertaken by Plan International with IIED (Brown & Dodman 2014<sup>2</sup>) and Arup's work with the support of the Rockefeller Foundation on the City Resilience Index.<sup>3</sup> While the City Resilience Index and other tools such as the 'The TEN Essentials for Making Cities Resilient'<sup>4</sup> by UNISDR and the 'City Resilience Profiling Tool'<sup>5</sup> by UN Habitat provide guidance for resilience planning at a city scale, there was a need for a simple tool for organisations working in urban communities with the poor and vulnerable that addressed the particular risks facing children. There was also recognition that each community, program and city was different due to local contexts and divergent shocks and stresses. Any tool needed to help users understand urban dynamics, stakeholders and areas of focus so as to maximise the impact on beneficiaries. The idea of the CCURF, and the framework, was to further international development efforts in urban resilience at local levels.

## Development

The CCURF draws on the experience and expertise of Plan International and Arup. Participation was achieved through semi-structured interviews where gaps and challenges were identified. Country-level workshops explored the concepts of resilience and systems thinking with reference to specific country contexts. A regional-level workshop synthesised learning using a framework to draw out priorities for action.



## Relevance

The CCURF reinforces the urban paradigm shift as called for by the *New Urban Agenda*, specifically the rethinking of the way cities and settlements are planned, financed, developed, governed and managed to include the perspectives of children. The CCURF reinforces the principle of 'leave no one behind' (one of the guiding principles of the *New Urban Agenda*) by including children as active agents resilience planning and implementation. Using the CCURF contributes to sustainable cities and communities in line with the United Nations Sustainable Development Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable, in particular, Targets 11.3 and 11.7.

## Application to date

Plan International used the CCURF to review its urban disaster risk reduction programs in Indonesia, The Philippines and Myanmar and to identify how these existing initiatives were contributing to 'urban resilience building' as described by the CCURF. The CCURF was used to design and implement urban resilience programs in cities including Jakarta, Manila and Yangon. These programs engage with children as target groups. Plan International used the CCURF to advocate for inclusive national policies and frameworks to cater to the specific vulnerabilities and needs of children. Arup has used the CCURF to assess the contribution of disaster risk reduction in urban projects for children and to develop its

'Child-Centred Crime Prevention through Environmental Design' approach.

The CCURF has wider applications for humanitarian, international and community development organisations, especially child-rights organisations. As a framework, the CCURF helps explain city systems and the intersection with people, especially children. Its development is a collaborative partnership between like-minded organisations and the framework is an example of systems that put children at the centre of program design and implementation.

## Application in the future

In Indonesia and the Philippines, Plan International is using the CCURF in conjunction with participatory-action-research approaches to include children in designing solutions. The CCURF will also be used to support capacity building of local governments in The Philippines to increase youth agency and participation in urban planning and governance activities.

In the rapidly growing cities of the Australasian and Pacific regions, children remain one of the most vulnerable groups (Brown & Dodman 2014). The CCURF is a useful tool for urban programming by organisations to bring together system-level thinking, child rights, gender-sensitive and strength-based approaches for collaborative and coordinated actions with and for children. As children's online and 'on-street' lives become increasingly intertwined, the CCURF may also support new designs for child protection and safety that reflect this reality. A child-centred approach to urban planning, safety and design helps tackle urban challenges in a holistic and integrated manner. This has all the potential to lead to inclusive, liveable and safer cities that work better for everyone.

For further information contact Plan International or Arup.

Plan International: [www.plan.org.au](http://www.plan.org.au).

Arup: [www.arup.com](http://www.arup.com).

1 New Urban Agenda, at: <http://habitat3.org/the-new-urban-agenda/>.

2 Brown & Dodman 2014, *Understanding children's risk and agency in urban areas and their implications for child-centred urban disaster risk reduction in Asia*. *Asian Cities Climate Resilience Working Paper Series 6: 2014*. At: <http://pubs.iied.org/106521IED.html>.

3 New Urban Agenda, at: [www.cityresilienceindex.org/#/](http://www.cityresilienceindex.org/#/).

4 The TEN Essentials for Making Cities Resilient, at: [www.unisdr.org/campaign/resilientcities/toolkit/article/the-ten-essentials-for-making-cities-resilient](http://www.unisdr.org/campaign/resilientcities/toolkit/article/the-ten-essentials-for-making-cities-resilient).

5 City Resilience Profiling Tool, at: <http://urbanresiliencehub.org/wp-content/uploads/2018/02/CRPT-Guide.pdf>.

# Our World, Our Say: children and young people lead Australia's largest climate and disaster risk survey

Megan Williams, World Vision Australia and Brigid Little, Australian Institute for Disaster Resilience

Over 1500 children and young people shared their thoughts in Australia's largest youth consultation on disaster risk and climate change. The results of Our World, Our Say will be published in a report developed in collaboration with young people.

Young people are feeling the effects of disasters more than ever. The Black Summer bushfires of 2019–2020 dominated the headlines during the school holiday period. Young Australians experienced the destructive impacts of fire on people, property and the natural environment in their own communities, in destinations they were visiting or passing through, and in smoke-polluted settings well beyond the fireground. On their return to school, bushfires, floods and cyclone had forced closures of schools and interrupted learning in many states.

The *Sendai Framework for Disaster Risk Reduction 2015–30* recognises that children and young people are agents of change and should be given the appropriate mechanisms to contribute to disaster risk reduction. The survey, Our World, Our Say, contributes to that obligation.

Will Mezner who leads youth engagement at World Vision Australia said, 'Children have the right to be safe, to be heard and to participate under both the Convention on the Rights of the Child and the Sendai Framework.

'Many children have faced evacuations, school closures or had other first-hand experiences of hazards. Even more have seen unfolding disasters in the media, imagining a future where this unpredictable fire, drought, hail and flooding is the new normal and wondering what leaders will do about it,' he said.

The survey was open to young people aged between 10 and 24 and included questions about climate change, natural hazards and disaster risk in Australia. The survey identified the actions that young people and their communities are already taking, their priorities for action as well as personal experiences and awareness of disaster risk. The survey also assessed whether young people felt their views and experiences had been listened to and respected by significant adults.

Will Mezner said children and young people are integral to the disaster risk and climate change conversation.

'We can't address climate and disaster risk without children and young people having a seat at the table,' he said.

The Our World, Our Say coalition was led by the Australian Institute for Disaster Resilience with World Vision Australia and in partnership with Oaktree, Plan International Australia, UNICEF Australia and Save the Children.

The survey results will be consolidated, analysed and published as a report on the views and perspectives of children and young people in Australia.

In a parallel process the views of around 10,000 young people across the Asia-Pacific region will be compiled in a regional report and used by child and youth delegates to advocate with governments and decision-makers from around the Asia-Pacific region at the conference.

Findings from Our World, Our Say, may also provide valuable evidence to guide and support work in advocating for and engaging with children and young people in Australia. Enabling the participation of children and youth in disaster risk reduction presents opportunities to identify and support children and youth and recognises the knowledge, skills and ideas that young people have right now.



# The Community Trauma Toolkit: helping adults and children before, during and after trauma

Jessica Masters, Australian National University

Exposure to disaster is unfortunately common for children. To help children and young people affected before, during and after these events, Emerging Minds and the Australian National University developed resources that provide information and activities to help people work with children during traumatic times.

In 2007, Save the Children estimated that during 2008–2018 there would be 175 million children per year affected by disasters relating to climate change.<sup>1</sup> In Australia, the past summer of 2019–2020 saw large numbers of people—even entire communities—acutely affected by drought, bushfires, flooding and tropical storms. The increase in unstable weather patterns, and the likelihood that these patterns will continue to increase in severity and frequency means the number of children and families who will experience disaster events is likely to increase within Australia and abroad.

Children are one of the most vulnerable groups during and after disaster events and they comprise approximately 30–50 per cent of all disaster-related mortalities.<sup>2</sup> Children are among the worst affected for a number of reasons. They are dependent on adults for safety and protection, are in formative periods of physical and psychological development and may be unable to recognise hazards on their own.<sup>3</sup> Further, children are less likely to have cognitive capacities and emotional maturity to effectively manage challenges that may arise after a disaster and usually require adult help to deal with their responses.<sup>4</sup> As such, the functioning of the family unit and the wellbeing of adults in children's lives are of paramount importance.

Exposure to traumatic events such as emergencies and disasters increases the risk of serious and long-term consequences for the social, psychological, emotional, cognitive and physical development of children. Depending on their age and circumstances, experiences of anxiety or depression, behavioural problems, declines in academic performance, social or interpersonal difficulties, extreme clinginess or other traumatic response symptoms may develop. Additionally, children may experience mental health difficulties such as Post-traumatic stress disorder or Acute stress disorder. However, unlike adults, children will need different approaches to treatment and care. Even children not personally exposed to the disaster may feel distress or fear when confronted with news footage or hearing people talk about the event.

Research on childhood stress has shown that while exposure to trauma can have long-term effects, these can be mediated by parent availability, care, support and family functioning.<sup>5</sup> Children may display symptoms of distress during and immediately after a disaster event, but these symptoms will usually lessen and resolve themselves over time. The research indicates that a majority of children experiencing a disaster will not develop mental health difficulties severe enough to require clinical intervention.

The significant fire and flood events experienced in Australia this past summer means that the number of children who may need intervention could be a large cohort. While children can be naturally resilient and most will overcome any initial distress over time, all children (regardless of circumstance) will need increased care and assistance from family and other adults.

With appropriate support and guidance from adults, children can be active agents in their preparedness and recovery. Labelling children as a 'vulnerable population' without acknowledging their potential for agency can disregard their capacity to take active roles in their family's and community's disaster preparation and recovery work. Studies have identified children as a 'community motivational reservoir'<sup>6</sup>, whose actions, in some instances, have saved lives. Children should be included in preparation and recovery activities. They can encourage and teach others, they have energy and creativity and they can learn good preparedness habits. These activities must be developmentally appropriate to the needs and responses of children so they can be actively involved.

## Upskilling workforces and communities

Children rely on the important adults in their lives to support their recovery after a traumatic event. However, this may be difficult when these adults have experienced the same event and may be overwhelmed. Researchers have described a 'chain of losses' that can occur after a

disaster event, with a series of negative events triggered by a disaster that stretches a family's ability to cope.<sup>7</sup> Therefore, upskilling workforces that work with children and families can improve their ability to identify, assess and support communities in need.

The Australian National University, in partnership with Emerging Minds and the University of Queensland, designed a Community Trauma Toolkit to assist individuals and workforces involved with children, families and communities before, during and after a disaster. The toolkit's purpose is to provide support to children to mitigate negative effects of disasters, support families who may be experiencing difficulty and promote long-term recovery.

## Toolkit development

The toolkit was co-designed with input from various workforces and community members who had lived experience of disasters. Interviews were conducted with relevant workforces and community members. These interviews reinforced the importance of a coordinated approach to community preparation, and recovery where organisations, workforces and the community work together to support children and families. The interviews exposed knowledge and practice gaps. For example, participants indicated they were uncertain how to engage with and support children who had experienced trauma and some recognised that experiences of vicarious trauma symptoms had an impact on their role as parents. The toolkit addresses these gaps by including training and resources specifically tailored to and designed for individuals, groups and organisations.

The toolkit is informed by Bronfenbrenner's ecological model of child development, which places the child at the centre of an interconnected support network spreading out from the family to other environments such as schools, sporting groups and the local community. It also draws on the theory that healthy children and families are supported by a cohesive network of social relationships. Combining lived experience and evidence-based research, the toolkit offers foundational information and practical ways to support children and families.

## Toolkit content

The toolkit is designed to be accessible at all stages of people's experiences. It is predicated on the idea that every community is, at some time, either preparing for, experiencing or recovering from disaster—or, as witnessed this summer, experiencing an overlap of severe fire and flood events.

The toolkit includes written guides, podcasts, videos, tip sheets, infographics and a series of train-the-trainer-style workshop modules. It is designed for flexibility, with capacity to select a package of resources suited to meet the community or workforce needs.

The toolkit is available online and resources are divided in a user-centric way (e.g. parents and carers, educators, first responders, general practitioners, health and social service providers and community members). Content

is also structured by timeframe (e.g. preparedness, immediate response and short-term recovery, long-term recovery as well as ongoing that covers cumulative or slow-onset disasters such as drought).

## Conclusion

Communities support the wellbeing of children who have experienced a disaster, however, appropriate information and training has not always been freely available. Plans designed for disaster preparation or recovery traditionally have focused on groups of people, sometimes failing to incorporate the needs of infants and children. The Community Trauma Toolkit addresses this need and provides the information and targeted actions to use. It encourages all adults, including people who do not have children or interact directly with them, to think about the indirect ripple effect of their actions when they work with communities experiencing disaster. Giving communities and workforces the skills to recognise and support reactions to trauma contributes to the resilience and recovery potential of individuals, businesses and communities and mediates the effects of disaster events on children and families.

The Community Trauma Toolkit is available at: <https://emergingminds.com.au/resources/toolkits/community-trauma-toolkit/>.

The Community Trauma Toolkit was co-developed by the Australian National University and Emerging Minds for the National Workforce Centre for Child Mental Health. The National Workforce Centre is funded by the Australian Government Department of Health under the National Support for Child and Youth Mental Health Program.

- 1 Save the Children 2007, *Legacy of disasters: the impact of climate change on children*. Retrieved 25 February 2020. At: <https://resourcecentre.savethechildren.net/node/3986/pdf/3986.pdf>.
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# Education for Young People program and network

Brigid Little, Australian Institute for Disaster Resilience

Disaster resilience education enables students to develop the knowledge and skills to take protective action before, during and after an emergency or disaster.

The Australian Institute for Disaster Resilience (AIDR) promotes a model for learning about natural hazards that brings students and teachers together with experts in hazard management to explore risks in their local environment and identify opportunities to enhance community resilience.

There are many opportunities to address disaster resilience in the classroom, particularly through the Australian curriculum learning areas of geography, science and health.<sup>1</sup> Increasingly, schools are taking an integrated approach to the study of hazards and emergencies through STEM-based (Science, Technology, Engineering and Mathematics) projects. Learning through STEM involves designing solutions to real-world problems, which is where learning about natural hazards becomes disaster resilience education.



Anglesea Primary School students present bushfire safety initiatives to the 'Shark Tank' community panel.

Image: Australian Institute for Disaster Resilience



Marymede Catholic College student presents at National DRANZSEN forum.

Image: Australian Institute for Disaster Resilience

The Education for Young People program is supported by a vibrant network of over 600 representatives from schools and education authorities; lifesaving and emergency service agencies; state and local government departments; community, environmental and wellbeing-focused organisations; research institutions and others. The Disaster Resilient Australia New Zealand School

Education Network (DRANZSEN) supports and promotes action-oriented, collaborative disaster resilience education initiatives across Australia. These are showcased in the program newsletter and at dedicated network events.

## Partnerships for learning: Survive and Thrive at Anglesea Primary

The Survive and Thrive program is a partnership between Anglesea Primary School and the Anglesea Country Fire Authority. This initiative continues to evolve and demonstrates an excellent model of learning and action for community resilience. AIDR filmed a case study of this initiative during 2019, where students showcased their innovative solutions to local hazard-related challenges. These solutions were presented to the community for endorsement and implementation.

## Supporting schools in recovery: Black Summer fires

The bushfire crisis over the 2019–2020 Australian summer was distressing for young people, educators and communities. In recognition of this, AIDR, Emerging Minds and the National Workforce Centre for Child Mental



Anglesea Primary School students share their knowledge of bushfires.

Image: Australian Institute for Disaster Resilience

Health came together to develop some initial guidance for teachers on the return to school. The guidance document provides a simple list of tips to support student wellbeing in bushfire-affected communities, facilitate classroom conversations about bushfire and acknowledge the impact of widespread media coverage of the bushfires on the student population.

### Youth voice and participation

The Education for Young People program champions youth voices and participation in disaster risk reduction. In June 2020, AIDR will work alongside national and regional humanitarian agencies to enable young Australians to engage with decision-makers at the Asia-Pacific Ministerial Conference for Disaster Risk Reduction.

Before the conference, AIDR and World Vision led the development of a youth survey on climate change and disaster risk. The results of this survey will be compiled with others from across the Asia-Pacific region and presented in a report at a special pre-conference event in Brisbane, where young delegates will have the opportunity to develop their own recommendations for action.

### Education sector engagement

AIDR continues to engage with education authorities through professional teacher associations and networks with a focus on STEM and student voice. Climate change and extreme-weather-related hazards continue to dominate the agenda for engagement in disaster resilience education, reflecting concerns about this high-profile issue at a local, national and global scale. Young people, gathering in large numbers across the country continue to support the Schools Strike 4 Climate movement, stand to be disproportionately affected by the effects of climate change and are leading the call for



Anglesea Primary School students created a map of Anglesea showing fire 'safe spots'.

Image: Australian Institute for Disaster Resilience

action to ensure a safe, sustainable future for Australian communities and the planet.

Contact [brigid.little@aidr.org.au](mailto:brigid.little@aidr.org.au) to subscribe to our education newsletter or join the education network. Documents and teaching resources are at [www.schools.aidr.org.au](http://www.schools.aidr.org.au).

The Survive and Thrive video is available at [www.youtube.com/watch?v=594cHWSHH08](http://www.youtube.com/watch?v=594cHWSHH08).

Join the AIDR Education for Young People Program updates newsletter at <https://us17.campaign-archive.com/home/?u=5c8dd102bc632c7639cd0531&id=38154405e5>.

<sup>1</sup> Australian Curriculum, Assessment and Reporting Authority 2014, *Australian Curriculum*. At: [www.australiancurriculum.edu.au](http://www.australiancurriculum.edu.au) [25 February 2020].

# Fireflies art project at Towamba Public School

Nicola Grant, Towamba Public School and Vicki McCredie, artist

Towamba is a small village of around 150 people west of Eden in New South Wales, with a further hundred living in outlying areas. Towamba Public School has 21 students and an enduring tradition of community volunteering and participation, supported by an active, strong and forward-thinking Parent and Citizens Association.

In December 2019, the Border Fire took hold in the forests to the south of Towamba. Other fires blazed further west and along the coast. As the fires approached, Towamba residents acted upon the advice of authorities and enacted their bushfire survival plans. Many relocated well ahead of time to Eden and Merimbula. Then Eden was evacuated. While some volunteers and Towamba locals remained to protect their properties, others only returned home in mid-February, having been away for up to seven weeks.

In February 2020, the hills in almost every direction from Towamba were burnt, but the village was intact. Homes, shedding, pasture, fencing, animals and untold numbers of wildlife were lost in outlying areas. The bush was burnt from Eden to Towamba for 20 kms and beyond to the west as far as Bombala. School children at Towamba Public School live in areas surrounded by burnt bush, right up to the edges of their homes. Miraculous saves!



Towamba Public School students explore the impact of fire through art.

Image: Towamba Public School

Towamba families and school staff spent the holidays coping with uncertainty, displacement, smoke pollution, loss of communications and power, road closures and forced inactivity. The school opened for only two days before it became non-operational for almost two weeks due to the threat of fire and, later, flood. The school's main priorities were to welcome students and families back into a safe, clean environment, allow students to process their experiences and maintain predictable routines.

## The Fireflies art project

January 20: Volunteer art teacher Vicki McCredie invited three students for an art day. Given a choice of activities, the students chose to investigate the effects of the fires, taking photos of the area and collecting samples of bark and sticks. With guidance from Vicki, they returned and jointly painted a canvas they called 'Joy in the Struggle'. The students discussed artistic problems and solved them together. All had to agree when the work was finished and each provided their individual style while understanding that the artwork required its own resolution.

The result was an extraordinary success. Each contributor experienced the joy of sharing ideas, laughter, paint, food, cups of tea and even the critiquing of their contribution to the finished painting. The awe and delighted reactions of their parents, friends and peers to the artwork lifted the artists' confidence.

February 2: Vicki invited two students to make a thank you sign for the fire, forestry and park volunteers. The sign was taken to the homes of the village children who each added personal touches.

February 10: Vicki invited three more students to the art project. After looking at photos collected of the fires, sun and the sky colours, more artworks were created.



'Joy in the struggle' produced by Towamba Public School students in response to the December 2019 Border Fire.

Image: Towamba Public School

February 11: Four more students turned up and began the largest painting, not yet finished.

Towamba teacher, Nicola Grant, was sent images of the students' work and discussed the option of developing a program for the whole school. The Fireflies art project was born.

The students are the leaders of the project. Initial photos taken by students and parents have accompanied their children into the burnt areas. Students are creating works from their own experiences and sharing their stories by displaying the works. They listen to feedback from friends and family and are eager to continue on to their next creation.

As the project progresses, students intend to write poems and stories to accompany their artworks in an exhibition, alongside additional images contributed by the local community.

These children are keen observers. They are quick to tell you that not all the bush was burnt, that trees are sprouting, that things grow better after a fire. The children chat comfortably because the school environment is one where they feel loved and safe.

The type of language used has high impact upon how people respond. It is the time to talk about rebuilding, regrowth and renewal – words that encompass change – rather than recovery. The young people in Towamba are showing the way and telling us to change. By seeing children confidently and creatively tell the story of the fires with a focus on renewal, the community is inspired.

## Vale Kevin Ronan

It is with sadness that many in the sector learnt of the passing of Professor Kevin Ronan in late March.

Kevin was one of the leading researchers globally in child-centred disaster risk reduction and was well known to many authors in this edition of the *Australian Journal of Emergency Management*. As a former member of the journal's Editorial Advisory Board and a regular author of articles over many years, his contribution was immense.

Kevin was an inspiring mentor, leader and colleague to many from his base at Central Queensland University that reached out across Australia and beyond. His work as a key researcher in the Bushfire and Natural Hazards CRC adds to his lasting legacy. His dedication to the cause of the role that children can play in the reduction of disaster risk played out on the world stage where he was one of the lead authors on the science of child-centred disaster risk reduction input to the 2015 Global Assessment Review. This review fed into the UNISDR Sendai meeting and went on to form an integral part of the Sendai agreement.

Kevin's insight, knowledge and mentorship will be greatly missed. The team at the *Australian Journal of Emergency Management* sends their deepest condolences to Kevin's family as well as friends and his wide group of colleagues in academia and the emergency management sector.



# Disaster and renewal: Bobin Public School

| Sarah Parker, Bobin Public School

Bobin is a small village in the hinterland of the mid-north coast NSW. Our community hall and school have been central to community life for over 100 years. On November 8, the Rumba Dump fire roared through Bobin. Of the school buildings, only the library survived.

Fortunately, no students or staff were on campus when the fire came through that Friday. Our principal, Diane Myer, rang the night before saying, 'Sarah, I have a bad feeling about tomorrow. I'm going to have the school declared non-operational'. With no mobile reception or a satellite phone, it would have been very difficult to evacuate students quickly.

As the fire hit, the owner of the neighbouring property sheltered in the creek under a blanket with her dogs. Others ran for their lives or fought together for their homes as best they could. Bobin, Bulga and Pacific Palms Rural Fire Brigades were on the fireground until 4 am.

Power was disrupted for almost two weeks and the phones were off for seven. Three months on, trees were still smouldering. Eighteen homes, many sheds, fences and outbuildings were lost. Wandering livestock became a problem. Feed was scarce and most livestock had to be sold.

Our school's main priority during those first weeks was to hold together. Staff and students relocated to Wingham Public School, 20 kms away, for the remainder of 2019, and were accepted with open arms. It was a relief to be among familiar faces and re-establish learning routines, but difficult to think clearly. We monitored the students closely and they really adjusted well.

Meanwhile the whole village of Bobin watched in astonishment as our school was rebuilt in record time. Every detail was lovingly thought through, and when the students walked in on the first day of the school year, their faces were full of wonder.

We are planning a number of extracurricular activities this year and community members have offered their time and talents. Students want to learn more about the natural environment, and we have begun with a detailed study of eucalyptus trees. Understanding recovery in nature and recognising our delicate place in the ecosystem is an important part of our own recovery.

Most students were already aware of how to prepare their property for bushfire season and many are experts now. They know about pumps, generators, the need to remove flammable materials, how to wet down verandas and gardens, and defend from ember attack. We feel that

the landscape around here has changed. It was once a lush rainforest area with deep creeks and wet gullies. Increased logging in the upper catchments and recent droughts have changed the vegetation and we are now hotter, drier and more bushfire prone.

A few months on and the school has been rebuilt, students are beginning to open up about their experiences and the changes they are dealing with. As a group we have learned to slow down and take each day as it comes. We are focused on our learning, but also the skills to deal with each other's emotions and need for space.

The offers of help and donations we have received from all over the world has been astonishing.

- Wingham Public School donated backpacks of school supplies and provided hot lunches every day, a great relief for tired and traumatised parents.
- One woman drove eight hours with presents from her local craft group to attend our end-of-year school presentation, despite being seriously unwell with cancer.
- Students from Trinity College and Presbyterian Ladies' College in Sydney raised thousands of dollars in cash and vouchers that meant we could purchase extra classroom supplies immediately.
- Students from Gloucester Public School, working with Kids in Need delivered handmade dolls
- A group called Little Helpers on the Run brought presents and hampers.
- A school in the Netherlands held a fundraiser.
- Heart to Heart provided students with art boxes and an art therapy session.

The list goes on and on.

We have been amazed by the resilience of our students. They are renaming their favourite areas of the school and restoring magic to the playground. A student once said to me: 'Children write their songs upon the earth here'. And as they laugh and play on the freshly laid grass, under the remaining trees which are full of new growth, we know they will again.

# Australia's natural hazards risk profile

Andrew Gissing and Foster Langbein, Risk Frontiers

This summer's Australian bushfire crisis has stirred commentary around disaster mitigation investments and their efficacy. The Australia Government recently released a *National Disaster Risk Reduction Framework* with a key priority being accountable decision-making.

The *National Disaster Risk Reduction Framework*<sup>1</sup> includes a strategy to identify the highest priority disaster risks and mitigation opportunities. The strategy is based on the principle that it is not possible to reduce all identified risks and that investments must be targeted to minimise risks with the greatest potential effects.

The Australian Prudential Regulation Authority also outlined the importance of mitigation investment in increasing insurance affordability across north Australia. With billions of dollars of public monies invested in disaster recovery and the growing recognition of the need to adapt to climate change, a sound understanding of disaster risk is critical.

Catastrophe-loss models can be used to understand the relative risk profile of Australia. Catastrophe-loss models are decision-support systems used extensively in the (re) insurance industry to assist in pricing risk and aggregate exposure management.

Risk Frontiers developed a suite of Australian probabilistic catastrophe-loss models to quantify the impacts of flood, bushfire, hail, tropical cyclones and earthquake on Australian communities. These loss models have national coverage and are comprised of hazard, exposure and vulnerability modules. The models provide scientifically based damage estimates that can be used to rank the risk profiles of different communities nationally.

To identify the areas of Australia that pose the greatest risk of financial loss to insurable assets (residential and commercial property) the full suite of Risk Frontiers catastrophe models (hail, flood, tropical cyclone, earthquake and bushfire) were used to calculate average annual losses (AAL) for Australian postcodes based on exposure information derived from the NEXIS database. The AAL is defined as the sum of all losses divided by the number of years simulated. Figure 1 illustrates the results of the analysis. The top 20 priority postcodes across Australia are identified and listed in Table 1.

All the highest rated postcodes are in Western Australia, Queensland or New South Wales. The most significant perils are flood and cyclone. Bundaberg (4670) is rated as the postcode with the highest AAL relative to other

postcodes and its total AAL contributes 0.02 per cent of Australia's overall total AAL.

Postcodes were chosen to best represent Australian towns and suburbs. Results will vary depending on the loss metric used, for example a return period, AAL or probable maximum loss. They also vary depending on the geographic boundaries used, for example postcode, statistical area, local government area or electoral boundary. Using postcodes ignores potential losses attributable to regional scenarios. For example, potential losses due to flooding in the Hawkesbury Nepean Valley in New South Wales are greater than just the postcode of Windsor and are regarded as the greatest nationally by the insurance industry. Such comparisons of other scenarios should be considered in future analysis.

## Understanding Future Risk

Risks are likely to change into the future due to climate change and urban development. Future mitigation investment decisions should consider this. Given that the catastrophe-loss modelling framework can consider changes in hazard, exposure and vulnerability, it is ideally suited to analyse influences on future risk such as climate change, mitigation investment, increased development and changes to building codes.<sup>2</sup>

The catastrophe-loss modelling outputs provide a level of strategic insight into relative disaster risks across Australia. Future investment in disaster mitigation and climate change adaptation must be evidence-based and consider all possible hazards. This will mean looking beyond the recent bushfire crisis and developing a blueprint for future investment consistent with the risk profile of Australia.

1 National Disaster Risk Reduction Framework, at <https://knowledge.aidr.org.au/resources/national-disaster-risk-reduction-framework/>.

2 Walker GR, Mason MS, Crompton RP & Musulin RT 2015, Application of insurance modelling tools to climate change adaptation decision-making relating to the built environment. *Structure and Infrastructure Engineering*, pp.1–13.

### Legend

Relative Total AAL

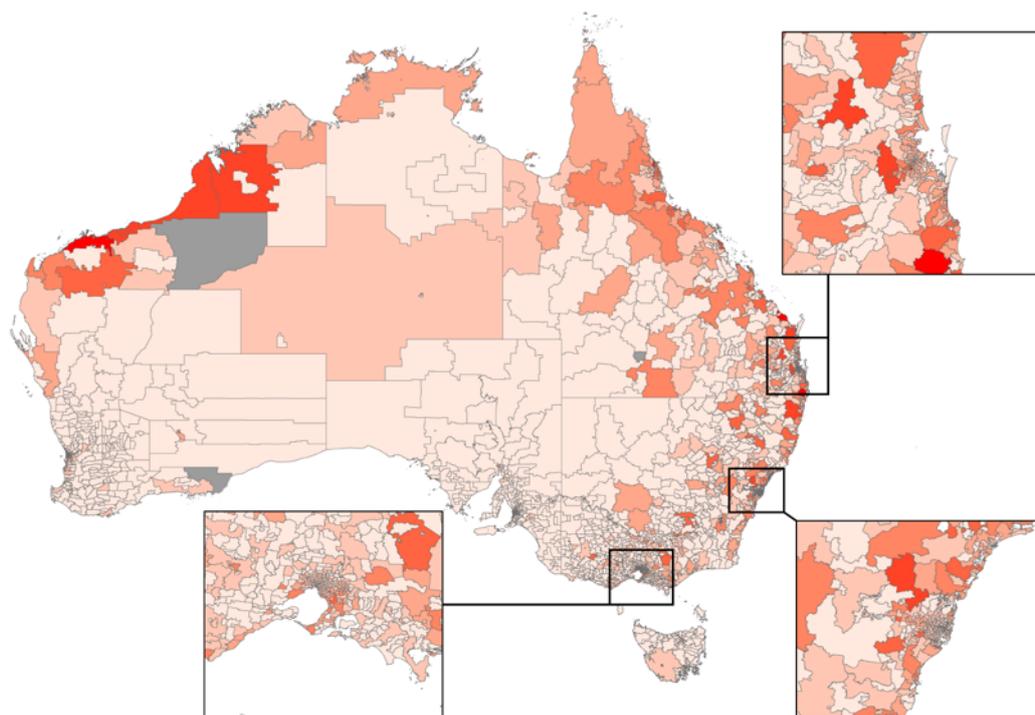


Figure 1: Australia's Natural Hazards Risk Profile.

Table 1: Australia postcodes ranked based on total average annual loss including damage from flood, bushfire, cyclone, earthquake and hail.

Rank	Postcode	Postcode description	State	Most significant peril
1	4670	Bundaberg	Queensland	Flood
2	2480	Lismore	New South Wales	Flood
3	4870	Cairns	Queensland	Cyclone
4	6714	Karratha	Western Australia	Cyclone
5	4106	Rocklea (Brisbane)	Queensland	Flood
6	6722	South Headland (Port Headland)	Western Australia	Cyclone
7	4740	Mackay	Queensland	Cyclone
8	4305	Ipswich	Queensland	Flood
9	2460	Grafton	New South Wales	Flood
10	4814	Townsville (western suburbs)	Queensland	Cyclone
11	6718	Roebourne (near Karratha)	Western Australia	Cyclone
12	4650	Maryborough	Queensland	Flood
13	6725	Broome	Western Australia	Cyclone
14	4306	Western suburbs of Brisbane	Queensland	Flood
15	2756	Windsor / Pitt Town / McGraths Hill	New South Wales	Flood
16	6728	Derby	Western Australia	Cyclone
17	6721	Port Headland	Western Australia	Cyclone
18	6720	Wickham	Western Australia	Cyclone
19	4818	Townsville (eastern suburbs)	Queensland	Flood
20	4810	Townsville (surrounding suburbs)	Queensland	Cyclone

## ABSTRACT

This article presents trends in policies related to comprehensive school safety in the Pacific region. Seven Pacific Island countries were surveyed in 2017. The majority had enabling policy environments that support school safety as well as specific policies supporting safe facilities, school disaster management and disaster-related education. Yet policy gaps were identified in all these areas. Respondents identified ongoing challenges such as poor integration of disaster management and education policies, a failing to address comprehensive school safety responsibilities, a lack of targets and indicators and resource scarcity. This survey provides insights into how to improve the design and implementation of policies used for risk reduction and resilience in the education sector of the Pacific region.

# Comprehensive School Safety Policy: trends in the Pacific Region

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## Introduction

When hazards strike, children are particularly vulnerable due to their physical fragility, their developing mental and emotional capacity and their dependency on adults for care (Peek 2008, Kar 2009). During emergencies and disasters, children's rights to safety and survival, protection, development and participation are all threatened. Thus, children can be significantly affected by disasters (Save the Children 2015, Kousky 2016). Effective and inclusive education systems are important to minimise the effects of disasters and emergencies on children.

Past disaster events have shown how unsafe schools can be when hazards strike. School collapses have been triggered by earthquakes, landslides and cyclones and have killed tens of thousands of children (Petal 2008, Bastidas & Petal 2012). Children, while perhaps not physically affected, have had their education severely and sometimes repeatedly disrupted when school buildings are damaged or inaccessible. Research indicates this disruption puts children at risk of depression, anxiety, sleeping disorders, dropping out of school and child trafficking (Bastidas & Petal 2012; Dwiningrum 2017; Fothergill & Peek 2015; Mudavanhu 2014; Peek 2008; Tong, Shaw & Takeuchi 2012).

In response to these risks, school safety advocates have developed and successfully advocated for a framework to address and reduce risk (Bastidas & Petal 2012, Paci-Green *et al.* 2018, IFC 2010). In 2012, the *Comprehensive School Safety (CSS) Framework* was introduced and endorsed by the Southeast Asian Ministers of Education Organization (ASEAN 2016). The concept was reinforced with the development of comprehensive school safety global targets and indicators by the Global Alliance for Disaster Risk Reduction and Resilience in the Education Sector (GADRRRES 2015). The CSS Framework conceptualises school safety as three overlapping 'pillars', being:

- Pillar 1: Safe Learning Facilities
- Pillar 2: School Disaster Management
- Pillar 3: Risk Reduction and Resilience Education.

These pillars are embedded within an enabling environment of education policies and plans as well as disaster management plans at different levels of government (GADRRRES & UNISDR 2017). Policies and practices in any of the three pillars, as well as the enabling environment, help reduce the impacts on the education sector from small-scale emergencies and larger-scale disasters, whether acute or chronic in nature. Together, these policies and

practices can address school safety comprehensively. To understand the national policies and practices that are in place to support school safety, a baseline survey was developed and conducted.

## Method

In 2016–2017, Save the Children, on behalf of the GADRRRES, with support from the Global Facility for Disaster Reduction and Recovery, conducted a global survey collecting baseline data on national comprehensive school safety policies and programs.

Save the Children developed the survey instrument based on the comprehensive school safety targets and indicators. The targets and indicators are a separate tool to measure progress towards the goals of the CSS Framework. The survey sought feedback from global coalitions, including GADRRRES and the Asia Pacific Coalition for School Safety, and advising academics. The survey consisted of 29, multi-part questions designed to assess national policies related to the enabling environment and the three CSS Framework pillars. The survey also asked respondents to identify facilitators and blockers of policy development and implementation.

Save the Children selected countries in Africa, Latin America, the Caribbean and the Asia-Pacific with a 'high' ranking in the 2015 World Risk Report and with whom it, or its partners, had established relationships in the government (Walter, Welle & Birkmann 2015). Save the Children trained consultants in each region to develop context-appropriate data collection methodologies. These methodologies included pre-populating the survey based on:

- Save the Children staff knowledge
- information from the Education Sector Snapshot (ESS) for CSS and Education in Emergencies (EiE) (if one existed)
- direct interviews with government officials, especially focal points within ministries of education and the national disaster management organisations.

Seven Pacific Island countries took part in the research; Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tonga, Tuvalu and Vanuatu. In five countries, responsible education sector officials, such as disaster risk reduction focal points within the Ministry of Education or National Disaster Management Organisation, responded to the surveys. In the remaining two, survey responses were provided by Save the Children. To assist, Risk RED was commissioned to identify trends in school safety-related policies.

This paper summarises the findings of the survey to understand school safety policy gaps in the Pacific region and provide insights into how governments might design and strengthen policy approaches to risk reduction and resilience in education sectors.

Respondents completing the survey were doing so as part of their professional capacity and reporting

on public policy, not individual behaviour nor personal opinion. As such, the research was exempt from human subjects review (ethics approval). However, good practice in human subjects protection was followed; the names of respondents were not included in the dataset and all data was stored in a secure location.

## Limitations

There were limitations in respondent familiarity with relevant policies and data gaps. There was also limited access to definitive policy documents. Thus, these data are indicative rather than conclusive. The survey covered the seven most populous Pacific Island countries and more than 90 per cent of the population of the small island states. However, it does not cover the nine least populous countries and two territories of the Cook Islands, the Federated States of Micronesia, French Polynesia, the Independent State of Samoa, the Republic of Nauru, the Republic of the Marshall Islands, New Caledonia, Niue, the Republic of Palau, Tokelau and the Territory of Wallis and Futuna Islands.

## School safety policy themes in the Pacific

The survey showed that Pacific Island countries are performing well and that some countries could improve. Governments and advocates may use this information to improve or scale-up current policies or develop new policies.

### Disaster risk reduction and education policies integration

High rates of emergency and disaster management policies across the Pacific region point to the successful achievements of the *Hyogo Framework for Action 2005–2015* (UNDRR 2005) as well as growing awareness by governments of the need for plans and policies addressing risks associated with emergencies and disasters. While all organisations surveyed had emergency response and disaster management policies in place, most policies were not fully integrated with the education sector.

Four countries had emergency and disaster management policies that referred to the education sector but only in the form of a single section or paragraph. Additionally, their education policies did not always incorporate school safety in a systematic way. Responses from five countries indicated they had education sector disaster management policies, EiE policies, or both. Yet, when asked what policy content countries covered in these policies, gaps emerged (see Table 1). Survey questions relating to 'response preparedness' and 'educational continuity planning' were addressed by the majority of responding countries. Concepts of 'the role of students and youth', 'standard operating procedures for disasters and emergencies' or systematic 'teacher training/professional development' in school safety

were addressed by very few. Notably, Papua New Guinea covered all policy topics listed in the survey.

**Table 1: School safety policy topics included in national policies.**

School safety topics included in national policies	Pacific Island countries that included the topic (N=7)
Risk assessment	3
Safer school facilities	3
School disaster management	3
Risk reduction and resilience education	3
Risk mitigation	3
Standard Operating Procedures for emergencies	2
Regular fire and/or hazard drills	3
Response preparedness	4
Education continuity planning	4
Role of students or youth volunteers	2
Teacher training in school disaster management	2

The successor instrument to the *Hyogo Framework for Action 2005–2015*, the *Sendai Framework for Disaster Risk Reduction 2015–2030* (Sendai Framework) (UNDRR 2015), set targets and indicators to achieve Sustainable Development Goals for education. It requires nations to look at policy outcomes in terms of minimising death and injury as well as assuring access to basic education. Most countries responding to this survey collect data on the damage to its education sector infrastructure (n=5), injuries (n=4) and deaths (n=4) as they relate to hazard events. However, data collection on long-term education outcomes (numbers of days of school closure and school attendance pre- and post-disaster) was not common (n=3).

### Availability of resources

Five of the participating seven countries reported having full-time school disaster risk reduction staff at the national and sub-national levels. Staff support schools in reducing risk and recovering from emergencies and disasters. Four of these also reported having full-time EIE staff to address educational continuity during conflict, emergencies and disasters. However, most responses showed there was no or only irregular funding to develop staff or to implement disaster risk reduction programs. Only Fiji reported a regular allocation for risk reduction

and resilience programs included in its national education budget as well as regular allocation for EIE programs.

While funding and human resources are important aspects of comprehensive school safety policy, children and youth appear to be an untapped resource. The Solomon Islands and Papua New Guinea were the only countries with education sector disaster management plans including guidance on how to encourage the participation of children in risk reduction and planning.

### Policy comprehensiveness

Governments surveyed had broad disaster management policies covering each of the three comprehensive school safety pillars. However, these policies did not cover all aspects of each pillar.

Most countries had policies addressing Pillar 1 - Safe Learning Facilities. Six of the seven countries had policies for safe design and construction of new schools as well as policies that require monitoring of school construction. Five had policies that require safe site selection. Three countries indicated that their government had a policy for the routine maintenance of school buildings and two had policies for the non-structural mitigation of school buildings, for example fixing heavy furniture to the wall in earthquake-prone areas or storing essential materials above the height of anticipated flooding. Only two countries reported having policies for the assessment of existing school buildings and the retrofit or replacement of unsafe buildings. One country indicated that policies were unfunded or had not been implemented. None had a policy addressing annual deferred maintenance.

Policy coverage regarding the use of schools as temporary shelters was limited. Only three countries reported having a policy limiting the use of schools as temporary shelters. Papua New Guinea and Fiji had guidance in place for how to manage these shelters or how to select schools for this purpose. None had policies for the reimbursement of costs when schools are used as shelters.

Most Pacific Island countries had substantial policy coverage for Pillar 2 - School Disaster Management. Five countries had national school disaster or emergency management policies that addressed risk assessment, risk reduction and response readiness. Four indicated that the policy included educational continuity. These policies give a solid foundation to incorporate the less well-covered elements of child participation in risk assessment, risk reduction and educational continuity planning.

Teachers and administrators need to be trained to effectively implement school safety policies. Only three countries provided schools with guidance and procedures for risk reduction. Five countries provided schools with guidance and procedures for emergency response and three provided schools with guidance and procedures for recovery. Only two countries, Fiji and Tuvalu, included school disaster management in teacher

training curricula. Three national education authorities required staff to complete professional development in disaster management in schools. More systematic integration of disaster management into pre-service training and opportunities for in-service training is needed.

Most Pacific Island countries had policies addressing Pillar 3 - Risk Reduction and Resilience Education. All respondents were proactive in promoting risk awareness both at school and to the public. All seven countries had public disaster risk reduction campaigns with consistent and action-oriented messages. Three countries (Fiji, Vanuatu and the Solomon Islands) had national key messages for public awareness and public education for disaster risk reduction (IFRC and Save the Children 2018). Most also reported having a national curriculum that included education on climate change (n=5), risk reduction (n=5) and resilience (n=4). However, fewer included climate change (n=4), risk reduction (n=4) or resilience (n=3) in teacher pre-service training. This indicates that, in some countries, teachers may be providing disaster risk reduction education with limited support. As such, the quality of school instruction on these topics may vary considerably.

## Facilitators and blockers

Pacific Island country respondents were asked what factors they believed facilitated and blocked school safety policy development and implementation. They selected from a list of 15 potential facilitators and 20 potential blockers. Though facilitators and blockers vary by country, and sometimes by local jurisdiction, general findings from the survey and from relevant literature are useful to consider.

### Facilitators

Of the seven Pacific Island countries, five responded to questions about factors that facilitated school safety policy development and implementation. Facilitating factors largely reflected themes of advocacy and evidence (see Table 2).

Pacific Island country respondents indicated that advocates were important to the development of a successful framework that identifies the problem, educates stakeholders and exerts pressure on authorities to develop and implement solutions. Research suggests that broad agreement on social values is a catalyst of policy (Pielke 2007). While education sector authorities are important, civil society and the emergency management sector seem to be instrumental advocacy catalysts for the Pacific Island country respondents. This is because education sector authorities are generally supportive of school safety policy but can only enact such policy when they form advocacy coalitions with civil society and emergency management authorities. Indeed, Asia and Pacific countries have strong sub-regional school safety mechanisms and advocacy efforts such as the ASEAN

Table 2: Top facilitators for both policy development *and* implementation.

Facilitating factor	Number of countries listing factor as an important facilitator N=5	
	Policy development	Policy implementation
Senior and mid-level disaster management officials use their position to advance school safety publicly.	3	3
There is strong evidence (proof) on the impacts of disasters on education, the dangers of unsafe schools, and/or the benefits of safe schools	3	3
Civil society groups use their position to advance school safety publicly.	2	3
School safety has become important for the government and public because of large disasters or frequent hazard impacts.	2	2

Initiative for School Safety and the Pacific Coalition for the Advancement of School Safety. Between 2015 and 2017, the latter brought education authorities and national disaster management organisations together with international non-government organisations and multilateral development organisations to identify priorities and advocate for recommended action plans that advance school safety across the region. It is expected that this effort will be relaunched during 2020.

'Evidence' was also selected as an important facilitator of school safety policy. Three Pacific Island countries indicated that strong evidence of disaster risk and effects was a major factor in policy action. Two countries indicated that large disasters had made school safety an important policy issue. The systematic collection of disaster risk data to document harm to children and staff as well as the destruction of school infrastructure and disruption of education, are vital to monitoring progress towards school safety goals, as well as towards the Sendai Framework and Sustainable Development Goal 4 (UNESCO 2016). Evidence can be presented through the formal education curriculum, the practice of school and community emergency drills or informal education mediums, such as public education campaigns.

The theory of 'punctuated equilibrium' (Baumgartner & Jones 1993) posits that policy for a specific issue

is characterised by long periods of no change, due to institutional restraints, powerful interests in maintaining the status quo and public disinterest or unawareness of the issue. This may help explain the roles of advocacy and evidence as facilitators for policy action. However, policy equilibrium can be disrupted by major shifts in a political system or in public thought. Advocacy for safe school policies and evidence for disaster risk in schools serve as powerful stimulants for policy change, particularly through influence of public opinion and to exert pressure on policymakers.<sup>1</sup>

### Blockers

Six Pacific Island countries provided answers about blockers to the development and implementation of school safety policy (see Table 3). Blocking factors largely overlap among Pacific Island countries and reflect the theme of resource scarcity and lack of capacity. These blockers are echoed in other studies (WestEd 2014).

The most frequent blocker to the implementation of policy reported was funding shortages. Five out of six countries listing it as a blocker of school safety policy. Three respondents also added that ‘funds to implement the policy are hard to access and not distributed on time’. Another prominent theme was the lack of technical capacity and human resources. Five respondents selected a ‘lack of technical capacity’ as a top blocker. Two respondents indicated that ‘the education sector staff who need to implement the policies do not understand them’ was a blocker.

A lack of technical capacity may be linked with insufficient government budgets for risk reduction-related technology acquisition and training. Some respondents indicated difficulties in developing and implementing school safety policies due to a lack of training or guidance as well as heavy workloads and high staff turnover. Insufficient technical capacity and inadequate budgets to implement risk reduction and resilience programs were intertwined. However, when sufficient technical capacity and budgets are available, implementation of school safety policy may be hampered because there is insufficient staff.

### Conclusions

This study identified that Pacific Island countries surveyed had made great strides over the past ten years in the development of disaster management policies and are gradually integrating these policies with those of its education sector. Most countries have policies in place that span the three pillars of the CSS Framework. These accomplishments indicate growing awareness of the responsibilities that education authorities bear for the safety and survival of children in schools. They also provide for children’s equal and ongoing access to a quality, basic education. It is promising that Pacific region governments have begun to cross-reference disaster management and education policies. Where policy exists,

Table 3: Top blockers for policy development and implementation.

Blocker	Number of countries listing factor as important blocker N=6	
	Policy development	Policy implementation
The government has not allocated sufficient funds to be able to carry out the policy activities.	4	5
The departments and staff are too busy, or change too often, to be able to conduct the activities to implement the policy.	4	5
The government does not have sufficient technical capacity or access to sufficient technical support for school safety.	2	5
Funds to implement the policy are hard to access and not distributed on time.	2	3
The government has no clear framework, ideas, approaches or steps on how to make schools safer.	1	1
The education sector staff who need to implement the policies do not understand them.	N/A	2
The policies are not aligned well with existing education sector strategies, priorities and standards.	2	0

efforts need to turn to funding for capacity building, training and integration into everyday practice of staff, students and school communities. From this strong base, comprehensive school safety policy will protect students and staff and ensure education continuity. It will also support a culture of safety that spreads from schools into communities and from communities to the nation.

<sup>1</sup> See the GADRRRES case study on Protecting Children in Emergencies by Law in the Philippines. At: [www.preventionweb.net/publications/view/61554](http://www.preventionweb.net/publications/view/61554).

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The following recommendations are based on this and are informed by the CSS Framework and Global Targets and Indicators (GADRRRES 2015).

### Integrate disaster management policies with the education sector better

Four out of seven countries have disaster management policies that refer to the education sector, however, it is typically in the form of a single section or paragraph. Comprehensive school safety topics are also rarely incorporated into education disaster management or EiE policies in a systematic way. This would help children's safety and survival in school as well as educational continuity following disasters.

### Make school safety a policy and funding priority

Funding shortages are cited as the biggest blocker for the implementation of school safety policy activities in the Pacific, with only Fiji reporting a regular allocation of funds for risk reduction and resilience programs in its national education budget. In order to fully develop staff capacity and effectively implement school disaster management or EiE programs, it is recommended that governments make school safety a policy and funding priority, and that sufficient funds be allocated in education budgets.

### Develop comprehensive school safety policies

Governments surveyed have instituted broad disaster management policies covering each of the three comprehensive school safety pillars. However, these rarely cover all aspects of each pillar. Lack of guidance on how to implement school safety activities within these policies was also cited by governments as a blocker to the implementation of school safety activities in the region. To address this, it is recommended that school safety policies be expanded to cover each aspect of the three pillars, and to incorporate implementation guidance and regulations.

### Develop workforce capacity

Five out of six countries cited a lack of technical capacity as a top blocker for school safety policy implementation, with some governments reporting difficulties in developing and implementing school safety policies due to a lack of training and understanding. Technical capacity is also needed to attract budgets necessary to carry out risk reduction and resilience programming. Thus, training and coordination of existing disaster and education sector staff at the national and sub-national levels is recommended.

### Increase student and teacher participation in school disaster management

Solomon Islands and Papua New Guinea were the only countries with education sector disaster management plans including guidance on how to encourage active child participation in risk reduction and planning. Students remain a largely untapped resource. Teachers, too, are an untapped resource; only half the countries surveyed require teachers to complete the professional development necessary to effectively guide and implement school disaster management. Increasing child participation in school disaster management, as well as systematically incorporating school disaster management into pre-service and in-service training, is recommended.

### Develop and sustain an ongoing national multi-stakeholder school safety platform

Continued advocacy for school safety was highlighted as a facilitating factor for school safety policy development in the Pacific. Advocates play a key role in the development of a successful school safety framework. While education sector authorities were certainly found to be important advocates, findings suggest that they are more effective in collaboration with civil society and disaster management authorities at national, regional and sub-regional levels. Each country needs an active and ongoing multi-stakeholder national school safety platform.

### Share disaster data, technical knowledge and skills.

Many respondents indicated that strong evidence of disaster risk and their effects were major factors in facilitating policy action around school safety. Surveys however, indicate that many countries do not systematically collect nor share this compelling data. To allow for evidence-based comprehensive school safety policy development, it is essential that data, as well as technical knowledge and skills, be shared between governments and civil society organisations and solutions developed in partnerships.

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## ABSTRACT

The effects of climate change are particularly acute for children. Not only do these effects pose risks to children's health, safety and survival in the near term, their younger age means they will be exposed to the increasing consequences into the future and for a greater proportion of their lives. As such, children are often presented in climate change debates, research and practice as being especially vulnerable and in particular need of support. However, this can lead to the portrayal of children as passive victims. This paper provides an overview of adaptation research and practice literature concerning children and young people, with a particular focus on whether and how child-centred responses to climate change can contribute to building the resilience of households and communities. In light of the increasing recognition of the roles of children and young people in climate advocacy, it is timely to consider how to more effectively include children in climate change adaptation action more broadly, and the consequences for them and their communities.

# Why focus on children: a literature review of child-centred climate change adaptation approaches

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## Introduction

It is well established that the impacts of climate change are already affecting the lives of children around the globe. The effects of climate change pose risks to children's education, health, family security, safety and survival (Children in a Changing Climate 2005; Gibbons 2014; Goldhagen *et al.* 2020; Mitchell & Borchard 2014; Plan International 2015; Rahman, Ahsan & Rahim 2013; Reinvang 2013; UNICEF 2017a), and children are often disproportionately affected (Burgess 2011, Cabot Venton 2011, Chatterjee 2015, Mitchell 2016, UNICEF 2017b). Mirroring this acceptance from climate academics and practitioners, recognition is emerging from across a range of dedicated disciplines: for instance, a number of recent health and medical publications highlight the particular and disproportionate risks that climate change poses to children, including psychological affects as well as physical. Children and infants are, for example, disproportionately affected by dehydration and heat stress as well as by diarrhoeal diseases and, thus, are more vulnerable to increases in temperatures and changes in rainfall patterns (American Academy of Pediatrics' Council on Environmental Health 2015; Goldhagen *et al.* 2020; Philipsborn & Chan 2018; Sheffield & Landrigan 2011; Stanberry, Thomson & James 2018; Xu *et al.* 2012). The direct and indirect consequences of climate change threaten children's mental wellbeing, with fear and anxiety caused from concern about their futures even in the absence of direct impacts, as well as extreme stress and PTSD from exposure to specific climatic events (American Academy of Pediatrics' Council on Environmental Health 2015; Burke, Sanson & Van Hoorn 2018; Goldhagen *et al.* 2020; Majeed & Lee 2017; Ojala 2016).

The equity concerns of climate change have also received increasing attention. The 'Fridays for Future' school strikes have helped to bring the issue of inter-generational justice to a mainstream audience (Warren 2019). Children have contributed least to the causes of climate change but will experience the effects long into the future. Climate change also impacts on different groups within society—and different kinds of children—differently, in ways that may exacerbate existing inequalities (Anderson 2010, Babugura 2016, Chatterjee 2015). For example, Johson and Boyland (2018) found that climatic changes and adaptation options are not uniform within a community, but varied depending on a multitude of factors. For instance, ethnicity, gender, marital status and age all affect whether migration in response to climatic changes is considered an available adaptation strategy within the communities they researched.

However, children are not passive victims; they can have agency, knowledge and capacity (Amponsem *et al.* 2019, Lawler & Patel 2012, Mitchell & Borchard 2014, Tanner 2010). Despite this, children's particular vulnerability to climate change in the academic literature is rarely accompanied by a recognition of their potential contributions to action nor of possible benefits to themselves and to their communities from child-centred adaptation actions. Beyond the oft-cited (and somewhat patronising) idea that children can contribute to community adaptation activities through their enthusiasm and energy (Bartlett 2008, Cocco-Klein & Mauger 2018, Lawler & Patel 2012, Mitchell & Borchard 2014, Polack 2010), substantive examples and explanations are largely lacking.

This paper addresses this gap by bringing together practitioner-focused experiences with the emerging body of literature on child-centred adaptation research to demonstrate whether and how child-centred responses to climate change contribute to building the resilience of children, their households and their communities. This paper begins by summarising the existing literature, highlighting specific examples of child-centred adaptation actions from various practitioners, especially in the Global South<sup>1</sup>, that demonstrate concepts from the academic literature. Practice-based recommendations are then outlined.

The reviewed research shows that children can be effective communicators of climate risks and information, including information that leads to behaviour change. Children possess unique perceptions of risks. They have distinctive knowledge and experiences and are capable of identifying and implementing viable, locally appropriate adaptation responses. However, barriers remain that can prevent their inclusion and full participation in resilience-building programming.

## Method

There is an emerging body of literature about child-centred adaptation, both from Australia and overseas. Search terms of academic literature included 'climate change', 'adaptation', 'resilience', 'youth' and 'child'<sup>2</sup>. Grey literature was predominantly sourced from the websites of child-centred, practice-based organisations such as Save the Children, Plan International, World Vision and UNICEF, supplemented by publications from organisations with a climate change action or research focus (e.g. Oxfam or the International Institute for Environment and Development, IIED) where their publications included the relevant focus on both adaptation and children. The focus for this literature review was on articles published within the last decade, though some older publications have been included where they proved foundational.

## Child-centred action on climate change: what works?

Relative to the substantial body of work on climate change, academic literature on child-centred adaptation is limited (Cocco-Klein & Mauger 2018, Mitchell & Borchard 2014). For example, a 2011 systematic literature review of English peer-reviewed academic literature on adaptation found that out of the 1741 articles that mentioned adaptation, only 87 were primarily about human-focused adaptation (as opposed to adaptation of natural systems, vulnerability, risk assessments, etc). Of those, only three papers explicitly mentioned children, the elderly or women (Berrang-Ford, Ford & Paterson 2011). While the corpus has grown somewhat since that systematic review, overall, the academic literature that focuses on child-centred adaptation remains scant. There is a larger, growing body of grey literature that documents practice-based interventions and the lessons learnt, predominantly focused on interventions in the Global South.

Some of the most effective and prevalent examples of improving children's resilience include:

- climate change education to build skills and knowledge on climatic risks and possible adaptation strategies (Anderson 2010, Kabir *et al.* 2015) as well as education more broadly (Kwauk & Braga 2017)
- conducting child-centred climate vulnerability and capacity assessments to identify the specific risks and hazards climate change poses to a particular group of children (Children in a Changing Climate 2015, Plan International 2015, Rahman *et al.* 2013, Schoch & Treichel 2015)
- advocacy by children at local, national or international levels (Morrissey *et al.* 2015, Polack 2010, Swarup *et al.* 2011, Warren 2019).

The literature is also clear that participating and taking action on climate change provides children with confidence and self-assurance that can, in and of itself, be a form of resilience-building (Bartlett 2009; Boyden 2003; Sanson, Van Hoorn & Burke 2019; UNICEF Office of Research 2014). However, Brown and Dodman (2014) note that when activities of this kind are carried out as stand-alone, child-centred projects in isolation, the interventions tend to be short-lived and the outcomes not integrated into the community. Mitchell and Borchard (2014) express a similar concern. The long-term benefits of discrete child-centred adaptation activities that are not integrated into community programming are thus uncertain.

<sup>1</sup> The authors recognise that this term can be problematic. It is used here in the sense described by Mahler (2018), to describe places that international aid agencies and non-government organisations implement projects, regardless of whether those places are located in the southern hemisphere.

<sup>2</sup> This does not include disaster risk reduction or emergency response literature, or child-centred development more broadly, unless these papers also explicitly included adaptation to climate change as a key concern.

Well-designed and child-centred interventions have multiple benefits. For example, including children in both climate risk assessments and in adaptation design helps to avoid the risk of maladaptation (Lawler & Patel 2012, Tanner 2010). Children possess unique perceptions of the risks they face as well as distinctive knowledge and experiences (Babugura 2016, Bartlett 2008, Lawson *et al.* 2018, Reinvang 2013, Tanner 2010). When their intimate understanding of their own lives and vulnerabilities is combined with appropriate information gained from external information sources, they are capable of identifying both relevant climatic risks and viable, locally appropriate adaptation strategies (Bartlett 2009, Boyden 2003, Brown & Dodman 2014, Gibbons 2014, Lawler & Patel 2012, Mitchell & Borchard 2014). For example, Polack’s study on children in Cambodia and Vietnam found that:

*Children are an integral part of household and community adaptation and are engaged citizens. Their identification of adaptation strategies is comparable to adults, and they often know clearly who is responsible for delivery. Evidence gathered from the children participating in this research demonstrated their aptitude for: absorbing new information; proposing adaptation strategies; acting on their future visions and the needs of future generations; taking action for the benefit of their community; and prioritising sustainable management of natural resources.*

(Polack 2010, p.36).

Similarly, Tanner’s research on child-led responses to climate change in El Salvador and the Philippines demonstrated that children:

*...have a close awareness of the risks facing their lives, identifying the complex mix of hazards as well as the people, families or geographical areas where greater vulnerability to these hazards exists.*

(Tanner 2010, p.343).

In research from Bangladesh, children were able to identify multiple appropriate adaptation actions they could take (Chatterjee 2015). Similarly, a 2015 Plan International report outlined that children in Fiji identified coastal erosion resulting from rising sea-levels as an issue for their community. The children determined that mangrove planting would be an appropriate response and, through a child-centred project, the children purchased, planted and maintained the mangroves to effectively recover the beachfront (Plan International 2015). In Zambia, a UNICEF child-led advocacy program has empowered approximately 1000 teenagers aged 11–17 years to become climate ambassadors who engage in peer-to-peer outreach and activities. The project claims many impressive results, including the planting of 30,000 trees, the construction of a floating school in an area susceptible to flooding and the uptake of conservation agriculture by small-holder farmers (UNICEF 2015). In Ghana, young people have worked with the National Disaster Management Organisation to conduct risk assessments and update early warning risk maps. They have also undertaken work that supports the



Sirajganj district in Bangladesh is prone to floods and other climatic hazards. Through technical sessions, children learnt about climate change and adaptation actions and were able to understand weather and flood information and forecasts and respond appropriately.

Image: Mohammad Badrul Alam Talukder, Save the Children

community by clearing drainage systems and building makeshift levees of sandbags (Amponsem *et al.* 2019). Integrating child-centred adaptation activities and interventions into the plans, policies and programs for the community can thus have benefits not only for the children involved, but also for their families and society broadly.

## Effective communicators: for households, communities and beyond

The literature reveals a body of evidence showing that taking a child-centred approach to adaptation can benefit children, their households and the community (Bartlett 2009; Cocco-Klein & Mauger 2018; Lawler & Patel 2012; Mitchell & Borchard 2014; Rahman, Ahsan & Rahim 2013; Tanner 2010). Child-centred activities can be an entry-point for other community activities (Mitchell & Borchard 2014). At a pragmatic level, education resources and activities developed for children can also be used by adults, particularly in contexts where understanding of climate science is low (Cocco-Klein & Mauger 2018). For example, in Bangladesh, a project implemented by Save the Children identified multiple benefits to children and the community from undertaking child-facilitated, awareness-raising activities. Project activities included children leading discussions with other children at school, children facilitating discussions with adults (both men and women) in their community, children writing and performing plays and debates about climate change and children implementing demonstration actions such as creating climate-resilient gardens. According to Rahman, Ahsan and Rahim (2013) these events not only built children's knowledge and skills, but also improved the understanding of members of the community of the causes, consequences and possible responses to climate change. Because information from children often permeates back through their families (Lawson *et al.* 2018; Mitchell, Tanner & Haynes 2009), this can also allow knowledge of climate risks to reach those who may not be exposed to other interventions (Schoch & Treichel 2015).

Children have also repeatedly shown themselves to be effective communicators of climate risks and information, including in ways that lead to behaviour change (i.e. adaptation) (Chatterjee 2015; Children in a Changing Climate 2015; Lawler *et al.* 2011; Turnbull, Sterrett & Hilleboe 2013). These changes might be in the behaviour of children (e.g. through peer education programs (Lawler & Patel 2012, Polack 2010)), or of their families and the community (Schoch & Treichel 2015). For example, in the Philippines, a child-centred adaptation program aimed to build children's knowledge and confidence on climate change, including through developing a community radio show hosted by children, called '*Bulilit Brodkasters*' (child broadcasters). During these shows, children facilitated discussions about the science and effects of climate change, disaster

preparedness and climate change adaptation efforts in communities and schools. Climate change and disaster experts were invited onto the show to be interviewed by the children and answer phone or text questions from listeners. The project implementers noted that 'research has found that such interactive programming creates a platform for two-way exchanges and learning, boosting the uptake of information' (Schoch & Treichel 2015, p.28).

Another example is an energy and water-saving campaign from rural Vietnam. Children were taught simple resource-saving techniques that could be applied at home, such as switching off electrical appliances or ensuring water taps were fully closed. This allowed children to advocate to their parents about environmental issues and also provided their families with potential ways to save money. The children analysed their household bills to monitor progress. In the first three months of the project, the participating communities saved over 8.4 million VND (USD\$388). The children's efforts provided a financial saving for families with co-benefits for the climate (Schoch & Treichel 2015).

These practice-based examples are supported by developments in academic literature. For example, a recent paper in *Global Environmental Change* explored child-based communication for climate change action and noted that children's ability to influence their parents' behaviours has been well documented in other environmental fields. The authors go so far as to say that (at least in the United States):

*...children appear to be the ideal conduit for climate change communication to their parents, as they are capable of understanding and acting on the subject more effectively than parents and are more trusted by parents than other information sources.*

(Lawson *et al.* 2018, p.205).

As well as being effectual activists for climate action in their households, children can be successful advocates within and beyond their communities (Gibbons 2014, Lawler & Patel 2012). A clear and topical example is the school strikes led by Greta Thunberg that began in 2018. By early 2019, these had gained international attention and support. For example, on 15 March 2019, an estimated 1.4 million students in 112 countries joined in a strike and protest and more than 12,000 scientists signed a letter in support of the students' demands (Cohen & Heberle 2019, Warren 2019). While Greta Thunberg is well-recognised internationally, there are many other youth activists globally, including Leah Namugerwa from Uganda (Sarwar 2020, The Green Market Oracle n.d.) and Brianna Fruean from Samoa (The Pacific Community n.d.).

An example from Papua New Guinea illustrates that children can be effective when adults are not. Plan International documented a local children's group's success in securing government assistance for their community after several unsuccessful funding applications by community leaders. The children's group produced a short video and poster in which they outlined



In September 2019, children from around the world participated in global strikes and marches, calling for action on climate change. In Bangladesh, more than 3000 children and their supporters gathered in front of Parliament in Dhaka urging world leaders to act.

Image: Emdadul Islam Bitu, Save the Children

how climate change is impacting on their lives and their community. They were able to show these to a Member of Parliament who 'immediately approved a start-up fund required to begin a project to build a sea wall' (Plan International 2015, p.10).

## A rationale for inclusion

The economic benefits for communities as a result of child-centred initiatives are also highlighted in the literature as a rationale for undertaking more child-centred adaptation actions. For example, because many of the impacts of climate change will be felt in the future, investing in children's resilience now helps to ensure the resilience of the community in the medium- to long-term (Cabot Venton 2011; Children in a Changing Climate 2015; Gibbons 2014; Schoch & Treichel 2015; Turnbull, Sterrett & Hilleboe 2013). The high vulnerability of children to the effects of climate change means that measures to reduce those vulnerabilities are also offsetting potential future costs to the community, particularly in terms of health and protection, and so are underscored as a wise economic investment (Cabot Venton 2011). Children are often one of the largest groups within a developing country's population. Targeting their specific needs means the effects of climate change across a significant proportion of the vulnerable population can be reduced, thereby improving the efficacy of resilience projects (Children in a Changing Climate 2015).

Despite evidence of children's competency identifying and implementing appropriate adaptation actions, there are significant barriers to achieve the full benefits of child-centred adaptation. Notwithstanding the above findings that children can be effective communicators of climate risk, children's voices are often not heard at community or the household level, nor are their views taken into account in climate change decision-making (Babugura 2016, Tanner & Seballos 2012). At the government and policy level, children are often only considered in terms of their vulnerabilities, if they are included at all (Amponsem *et al.* 2019, Berse 2017, Mitchell 2016, Polack 2010). A recent publication from the Brookings Institute found that only 67 out of 160 countries' Nationally Determined Contributions (a country's formal submission to the *United Nations Framework Convention on Climate Change* (UNFCCC)) explicitly mentioned children or youth (Kwauk *et al.* 2019). Similarly, Thew and colleagues (2020) noted many challenges to meaningful youth participation in the UNFCCC, including difficulties gaining adequate recognition of young people's role in the negotiations and a perceived 'lack of formalized opportunities for them to provide input' into the negotiations. Even within the increasingly large number of adaptation and resilience-building projects being implemented globally, children's active participation remains limited (Berse 2017, Mitchell & Borchard 2014). Importantly, Mitchell, Tanner and Haynes (2009) noted that children may have valid concerns or motivations that limit their participation and that need to be overcome.

## Recommendations

Much of the child-centred adaptation literature includes recommendations for effective child-centred adaptation actions, including as outputs from evaluations of implemented interventions. A summary of the primary recommendations is provided, many of which have direct practical applications for future program design and execution.

- **Child-centred adaptation projects need to integrate activities for children and their communities from the outset (i.e. the design phase):** Children's capacity to be effective change agents (for themselves and for their community) is limited if activities do not target their families as well as the children themselves (Plush 2008, Tanner 2010). Child-centred adaptation approaches should be equally about increasing the participation of children and engagement with households, communities, local and national governments and international organisations to ensure the effects last (Mitchell & Borchard 2014, Save the Children 2015). Moreover, while it is imperative that children be engaged in adaptation planning and decisions that affect them, it is also important that responsibility for solving the climate crisis is not left to children. This underscores the need for community-wide involvement.
- **To ensure efficacy of activities, engage with existing structures and institutions (where these exist) (Chatterjee 2015):** Several articles show that children can be effective agents of change when they have the adequate support and formal structures to do so. Tokenistic participation does not lead to enduring change (Brown & Dodman 2014, Tanner 2010).
- **The active participation of targeted beneficiary groups is essential for long-term impact:** In order for solutions to be appropriate for the context and to engender a sense of ownership from beneficiaries, adaptation actions need to be produced through participatory processes (Schoch & Treichel 2015). Predetermined, stand-alone or externally imposed solutions are unlikely to have lasting effect (Brown & Dodman 2014). Moreover, children and their local communities often know their own climate and climatic changes well (Tanner 2010), so including children and their communities in the design of adaptation actions allows responses to be developed that focus on the underlying drivers of vulnerability.
- **Ensure adaptation activities target all children, including girls, boys, children with disabilities, ethnic minorities and others who may be overlooked (Johnson & Boyland 2018):** Programs need to go beyond the assumption that certain groups—like children—are more vulnerable and begin to target the underlying barriers and constraints that make these groups more vulnerable in the first place.
- **Understanding vulnerabilities (political, cultural, socio-economic, as well as climatic) is as important as technological innovations:** Instead of focusing on externally provided 'technological' tools, resources

should be focused on identifying and reducing underlying causes of vulnerability (Polack 2010). As Tanner (2010) noted, 'no single model of child participation is universally appropriate for tackling ... climate change' (p.346). There are also multiple examples of the differences between rural and urban children's contexts, noting that interventions that might have been appropriate in one of these geographies are inappropriate in the other (Brown & Dodman 2014, Chatterjee 2015, Lawler & Patel 2012).

## Conclusions

There is an emerging body of evidence that indicates well-planned projects that integrate child-centred initiatives into the community in which they live can and do build the resilience of households and communities as well as the children themselves. Relative to other aspects of climate change, however, adaptation actions for children remain significantly under-researched.

The continued documentation and dissemination of examples of child-centred adaptation initiatives, both their successes and the lessons learnt, will be incredibly valuable, particularly within the academic literature. Areas for future research that would support these kinds of interventions include the characteristics of children's vulnerability, their adaptive capacity and the resilience of communities (Lawler & Patel 2012, Sanson *et al.* 2019). In particular, examples that expressly showcase how different responses have been developed to respond to different kinds of child vulnerability would help to bolster knowledge in this area. Additional research to explain the critical features of successful child-centred adaptation programs, including the enabling environments that allows them to be replicated and sustained over time, would also be of great value (Mitchell & Borchard 2014).

Given that the effects of climate change are increasingly being felt, and the growing recognition of children and young people's capacity to be effective advocates on the issue of climate change, it is time to increase children's active participation in their own adaptation.

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## About the author

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## ABSTRACT

In recent years, new forms of participatory mapping have emerged that foster the participation of children in disaster risk reduction. Participatory mapping enables children to produce insightful representations of their local area, including their perceptions of hazards, vulnerability and capacities. This caters for a diversity of knowledge and perceptions on hazards and disaster. Such maps provide a way that children can participate in decision-making processes about disaster risk reduction with adults. Furthermore, technology and games using devices such as global positioning systems, mobile phones, digital cameras, virtual reality and video games provide opportunities to conduct participatory mapping with children. This paper reviews different forms of participatory mapping and their purpose and associated strengths and weaknesses in children's participation in disaster risk reduction activities. Drawing on case studies of participatory Minecraft and LEGO mapping, this paper discusses new opportunities and related challenges to conducting participatory mapping with children.

# Participatory mapping 2.0: new ways for children's participation in disaster risk reduction

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## Children's participation in disaster risk reduction: what for?

Disaster risk reduction (DRR) should actively involve an array of stakeholders to integrate different forms of knowledge and initiatives and tackle the root causes of people's vulnerability while improving their capacities to face hazards and overcome disasters. Participation is at the core of DRR and can be thought of as a voluntary process by which people, including those disadvantaged, marginalised or excluded from mainstream debates and actions, can shape or control the decisions that affect them (Saxena 1998). Since the 1990s, academics, practitioners and policy makers have advocated for the participation of children and young people<sup>1</sup> in DRR (Hart 1992; Sinclair 2004; Mitchell, Tanner & Haynes 2009, Lopez *et al.* 2012). Children have relevant knowledge about natural hazards such as floods, fires, tsunami or earthquakes in their surrounding area (Peek *et al.* 2018). They are creative and knowledgeable about local capacities such as emergency services and resources in their neighbourhood. Children can identify those most vulnerable in the place where they live including people with disabilities, the elderly, homeless people and households highly exposed to natural and other hazards. They are able to engage in disaster risk assessments and should participate in the initiatives geared towards DRR (Mitchell, Tanner & Haynes 2009).

Nonetheless, children's participation in DRR rarely takes place for many reasons. Adults tend to perceive children as weak and passive in the face of hazards, not as potential contributors of DRR (Wisner *et al.* 2018). Children's knowledge is usually related to the areas where they live, reflects cultural values and is rooted in their social practices and customs (Peek 2008, Walker *et al.* 2012, Mort *et al.* 2008). Making children's knowledge tangible, usable and communicable to outside stakeholders (i.e. government agencies, scientists and non-government organisations) and adults living in the surrounding area is therefore challenging. Children are also not a homogeneous group but vary in age, ethnicity, socio-economic level, geographic location, learning capacities and interests (Sinclair 2004, Lopez *et al.* 2012). Practitioners often lack appropriate tools to effectively foster diverse children's participation and cater for such diversity.

<sup>1</sup> The term 'children' is used to refer to both children and young people/youths.

Participatory mapping has emerged as an effective way to foster children's participation in DRR. Maps are a compelling tool that gives visual expression to realities that are perceived, desired or considered valuable, thus providing means for communicating information beyond the realms of those who produce them (Chambers 2008). Different forms of participatory mapping have traditionally been used for DRR, including ground mapping, sketch mapping, 2-D scaled mapping, Global Positioning System (GPS) mapping and interoperable Geographical Information System (GIS) mapping (Cadag & Gaillard 2012). Recent advances in technology with devices such as mobile phones, digital cameras, tablets, virtual reality and video games provide new opportunities to conduct participatory mapping with children, yet, these remain largely unexplored. This paper reviews existing forms of participatory mapping, its purpose and associated strengths and weaknesses for fostering children's participation in DRR. Drawing on case studies of participatory Minecraft and LEGO mapping, this paper discusses new opportunities and related challenges to conducting participatory mapping with children.

## Participatory mapping with children: a review of approaches and tools

Different approaches to participatory mapping have been used to foster the participation of children and other marginalised groups in DRR (e.g. Wisner 2006; Bartlett 2008; Manyena, Fordham & Collins 2008; Molina *et al.* 2009; Gaillard & Pangilinan 2010; Shiwaku & Fernandez 2011; Gaillard, Hore & Cadag 2015; Ronoh, Gaillard JC & Marlowe 2015; Crocetti, Tofa & Petal 2018; Plan International 2018). Table 1 provides a non-exhaustive list of these approaches, which include ground mapping, 'stone mapping', sketch mapping, mapping on aerial photos or satellite images, balloon and kite mapping, GPS mapping, drone mapping and interoperable GIS mapping.

Ground and stone mapping are easy to conduct and are flexible and playful forms of participatory mapping. They require limited resources such as sand, stones, leaves and branches that can be found wherever participatory mapping is conducted. Children can use these materials to draw features on the ground, identifying hazard-prone areas and important local resources. These resources may be vulnerable to natural hazards but may provide invaluable capacities to local people. These forms of participatory mapping are ephemeral and dependent on environmental conditions such as wind, rain and tide.

Practitioners of DRR often rely on sketch maps when helping children participate in DRR. Children use marker pens to draw spatial features on large pieces of paper. These activities are easy to conduct, colourful and permanent. However, these maps hardly facilitate the integration of children's knowledge, resources and skills with those of adults, especially people from outside the area being mapped. Sketch maps, as well as ground and stone maps, are neither scaled nor geo-referenced

(i.e. associated to specific locations on the Earth's surface through longitude and latitude coordinates). This may lead to these maps being dismissed by adults, government organisations and scientists who may challenge the relevance and accuracy of the data.

GPS, interoperable and GIS approaches to participatory mapping are often designed to overcome these issues by using maps that are scaled and geo-referenced. However, they require technological resources that are not always available. They are also complicated to initiate and may prove difficult for children to take the lead. When successful, children draw hazard-prone areas and identify people and resources using a balloon, a kite, a drone, a GPS device or directly onto an editable map available on a web-based platform. These forms of participatory mapping rely on GIS that may not be available locally nor accessible to children. Furthermore, data are often stored, analysed and used by adults who have control over the database.

Since 2000, Participatory 3-Dimensional Mapping (P3DM) has emerged to address the challenges of other forms of participatory mapping. Children can build large, stand-alone and scaled relief maps using locally available and cheap materials (e.g. cartons, paper, cork) over which they add thematic layers of spatial information. Using push-pins (points), yarn (lines) and paint (polygons), they can plot topographic landmarks, land cover and use, hazard-prone locations as well as social and cultural features to capture people's vulnerabilities and capacities. P3DM provides children with a tangible basis to discuss disaster risk and actions with adults. However, it often requires external facilitation, especially to produce the initial base map that is often alien to children and may take time to prepare.

An array of quicker and less demanding approaches has been derived from fostering children's participation in DRR through P3DM. To hasten the process, facilitators can pre-prepare a base map upon which children plot and delineate spatial information, including hazard-prone locations and features that reflect people's vulnerability and capacities, using push-pins and yarns. A similar approach may be taken on printed aerial photographs and satellite images of places children are familiar with.

All these approaches have strengths and limitations and none should be considered as a silver bullet in conducting participatory mapping with children. The choice of the most appropriate tool and approach is guided by the local context, the time available and the objectives of the activity. New approaches developed since 2015 broaden the available opportunities.

## Exploring new opportunities through Minecraft and LEGO

Participatory mapping using LEGO and Minecraft tools are exploratory and the strengths and difficulties associated with their implementation are highlighted. In this case study, participatory mapping with children

Table 1: Types of traditional participatory mapping and their strengths and weaknesses.

Types of participatory mapping	Principles	Strengths	Weaknesses
Ground mapping	Children draw the map in the sand or on the ground with a stick or their fingers.	<ul style="list-style-type: none"> <li>• very easy to set up and cheap</li> <li>• familiar to most people</li> <li>• less eye contact</li> <li>• flexible (easy correction and adjustment)</li> <li>• playful</li> </ul>	<ul style="list-style-type: none"> <li>• temporary</li> <li>• limited semiology</li> <li>• neither scaled, nor geo-referenced</li> <li>• value often dismissed by adults, government officials and scientists</li> </ul>
Stone mapping	Children draw the map using stones, branches, paper and other locally available materials.	<ul style="list-style-type: none"> <li>• easy to set up and cheap</li> <li>• familiar to most people</li> <li>• less eye contact</li> <li>• flexible (easy correction and adjustment)</li> <li>• playful</li> </ul>	<ul style="list-style-type: none"> <li>• temporary</li> <li>• neither scaled, nor geo-referenced</li> <li>• value often dismissed by adults, government officials and scientists</li> </ul>
Sketch mapping	Children draw the map on a sheet of paper with coloured marker pens.	<ul style="list-style-type: none"> <li>• relatively easy to set up and cheap</li> <li>• permanent</li> <li>• large semiology</li> <li>• most often stored locally</li> </ul>	<ul style="list-style-type: none"> <li>• rigid (difficult to correct and adjust)</li> <li>• neither scaled, nor geo-referenced</li> <li>• value often dismissed by adults, government officials and scientists</li> </ul>
GPS mapping	Children walk around the area to be mapped and plot features with GPS. Data are eventually included into a GIS.	<ul style="list-style-type: none"> <li>• permanent</li> <li>• large semiology</li> <li>• scaled and geo-referenced</li> <li>• reliable to government officials and scientists</li> </ul>	<ul style="list-style-type: none"> <li>• unfamiliar to most children and often to adults too</li> <li>• costly and difficult to set up</li> <li>• require an external facilitator to train children</li> <li>• children seldom include the data themselves into the GIS</li> <li>• flexible only to those who master the technology</li> <li>• May be manipulated by facilitators</li> <li>• most often stored externally</li> </ul>
Balloon and kite mapping	Children use a camera attached to a balloon or kite to capture aerial photographs. Data may eventually be included into a GIS or overlaid on existing maps.	<ul style="list-style-type: none"> <li>• accuracy</li> <li>• permanent</li> <li>• the balloon/kite component is relatively easy to set up and fairly cheap</li> <li>• large semiology (if using GIS)</li> <li>• scaled and geo-referenced</li> <li>• reliable to government officials and scientists</li> </ul>	<ul style="list-style-type: none"> <li>• unfamiliar to most children</li> <li>• requires an external facilitator to train children</li> <li>• dependent on weather conditions and difficult to use in forested areas</li> <li>• the GIS component is costly and difficult to set up</li> </ul>
Drone mapping	Children use a camera attached to a drone to capture aerial photographs. Data may eventually be included into a GIS or overlaid on existing maps.	<ul style="list-style-type: none"> <li>• accuracy</li> <li>• permanent</li> <li>• large semiology (if using GIS)</li> <li>• scaled and geo-referenced</li> <li>• reliable to government officials and scientists</li> </ul>	<ul style="list-style-type: none"> <li>• unfamiliar to most children and often to adults too</li> <li>• costly and difficult to set up (e.g. flight paths)</li> <li>• requires an external facilitator to train children</li> <li>• the GIS component is also costly and difficult to set up</li> <li>• some drones are dangerous to manipulate</li> </ul>

Types of participatory mapping	Principles	Strengths	Weaknesses
Web-based and interoperable GIS mapping	Children contribute to a web-based GIS database using their own computer.	<ul style="list-style-type: none"> <li>• permanent</li> <li>• scaled and geo-referenced</li> <li>• flexible for correction and adjustment</li> <li>• credible to government officials and scientists</li> </ul>	<ul style="list-style-type: none"> <li>• unfamiliar to most children and adults</li> <li>• costly and difficult to set up</li> <li>• semiology controlled by facilitators</li> <li>• May be manipulated by facilitators</li> <li>• stored externally</li> </ul>
Scaled 2-D mapping	Children draw a scale-based map of their place and plot spatial data with push-pins and yarns.	<ul style="list-style-type: none"> <li>• relatively easy to set up and cheap</li> <li>• playful</li> <li>• permanent</li> <li>• large semiology</li> <li>• flexible (easy correction and adjustment)</li> <li>• scaled</li> <li>• enable dialogue with adults, government officials and scientists</li> <li>• most often stored locally</li> </ul>	<ul style="list-style-type: none"> <li>• often require an external facilitator to provide the base map that is usually alien to children</li> </ul>
Aerial photograph or satellite image mapping	Children plot spatial data with push-pins and yarns on top of an aerial photograph or a satellite image of their place.	<ul style="list-style-type: none"> <li>• relatively easy to set up</li> <li>• playful</li> <li>• permanent</li> <li>• large semiology</li> <li>• flexible (easy correction and adjustment)</li> <li>• scaled</li> <li>• enable dialogue with government officials and scientists</li> <li>• most often stored locally</li> </ul>	<ul style="list-style-type: none"> <li>• unfamiliar to many people when access to the Internet is limited</li> <li>• aerial photographs and satellite images may be outdated</li> <li>• often require an external facilitator to provide the base map that is usually alien to children</li> </ul>
P3DM	Children build a 3-dimension model of their place with locally available materials. They then overlap thematic layers of geographic information.	<ul style="list-style-type: none"> <li>• relatively easy to set up and cheap</li> <li>• playful</li> <li>• permanent</li> <li>• flexible (easy correction and adjustment)</li> <li>• large semiology</li> <li>• scaled and geo-referenced</li> <li>• reliable to adults, government officials and scientists</li> <li>• enable dialogue with government officials and scientists</li> <li>• most often stored locally</li> </ul>	<ul style="list-style-type: none"> <li>• often require an external facilitator to provide the base map</li> <li>• base map may be alien to children</li> <li>• may be time-consuming</li> </ul>

took place in a school in rural New Zealand. The local area is isolated with limited to no mobile phone coverage. The local people are exposed to drought, bushfires, earthquakes and floods. In 2007, children and teachers were evacuated after the school was flooded. As such, the local school was very interested in taking part in a participatory mapping initiative. This involved technology and games such as Minecraft and LEGO that could be integrated into the school's disaster education stream. A total of 90 students from Year 5 to Year 8 (aged 8–13 years) was involved. The students could choose smaller 'project groups' from which they could participate in Minecraft and LEGO mapping. A total of 13 children, aged 10–12 years, took part in the participatory mapping with LEGO and 20 children, aged 8–11 years and 11–13 years, chose participatory mapping with Minecraft. The other students chose activities such as filming, 3-D printing or robotics. Both initiatives were balanced in terms of gender and ethnicity. This research received ethics approval from Auckland University of Technology (#17/263).

### Rationale and description of the process

Minecraft and LEGO were chosen based on their popularity with children. Both offer opportunities to map physical and social features in a creative and playful way. In May 2019, Mojang, developers of the bestselling video game Minecraft, announced that 176 million copies of

Minecraft had been sold worldwide (Persson 2019). LEGO is a symbol of childhood in western culture. LEGO started in Denmark with wooden toys in 1934 and became most famous for its building bricks. Over the past 20 years, LEGO has expanded its products to engage children and foster their creativity. This has included LEGO Mindstorms as well as movies, cartoons and books. LEGO has also featured in TV reality shows, for example LEGO Masters Australia and international contests such as the LEGO league.

Before any mapping could start, several participatory activities were conducted to reflect on previous hazardous events and discuss what and who was affected. The purpose was to identify children's knowledge about their surrounding area and build dialogue and trust. It was also to discuss aspects that are central to participatory mapping, including scale, elevations and the information that would be plotted on the maps with features like hazards, vulnerabilities and capacities. Once the information was defined, actual mapping commenced.

For Minecraft, the researchers produced a geo-referenced and scaled Minecraft world that provided an initial spatial environment ready for students to map the local area and plot information they identified. This base layer included building outlines, elevations and other geographical features and characteristics such as roads and rivers. All geospatial input data was freely



LEGO participatory mapping with children in New Zealand.

Image: Loïc Le Dé

available from Land Information New Zealand with no usage restrictions. Due to server limitations, a maximum of 14 avatars (in-game representations of the player; two children could be represented by one avatar) could be hosted simultaneously to play and build within the Minecraft game world.

Three participatory Minecraft mapping trials were conducted with varying processes as informed by the Beyond Stop Disasters 2.0 research (see Gampell *et al.* 2020). Children in the first trial had limited guidance from facilitators and were provided with past information and paper maps from earlier sessions to help plot information. The second trial included more hands-on guidance and provided children with targeted building goals taken from their earlier activities alongside the paper maps. The third trial allowed children to work with minimal guidance with access to earlier material if they wanted.

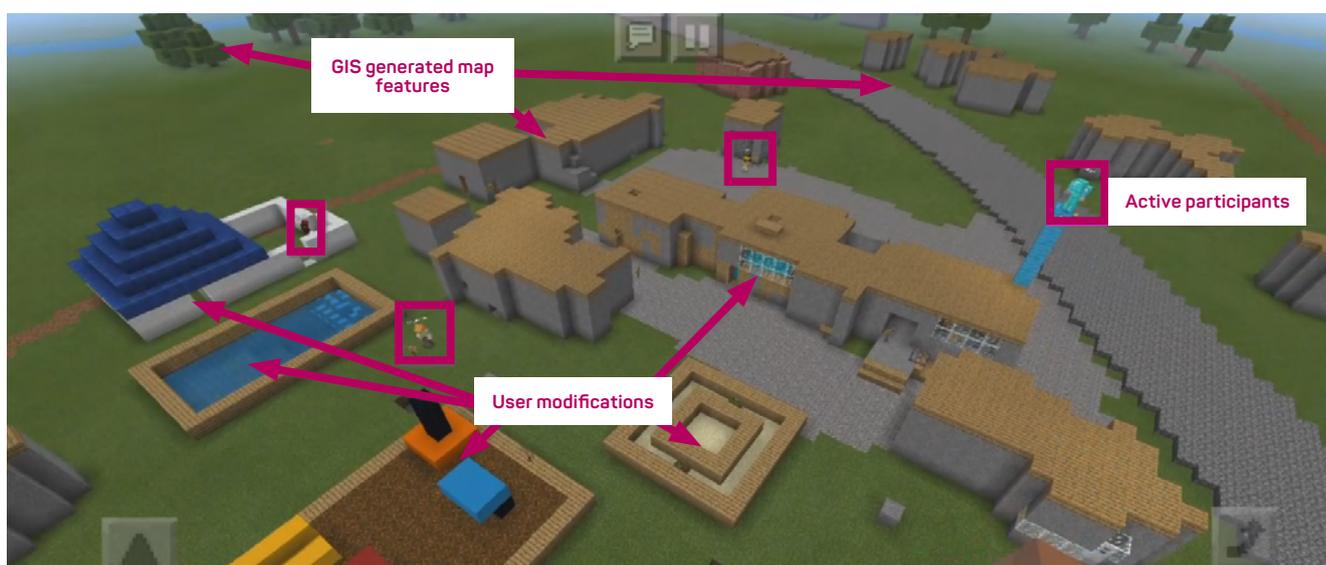
Debriefing sessions occurred halfway through each trial. These sessions showed progress and were an opportunity for the children to reflect and correct any misplaced buildings and hazards. Children involved in all three trials wrote on in-game signboards next to their creations to identify what they had built and connected these to categories of hazards, vulnerability or capacities. For example, a fire station was identified as a capacity that could provide resources and skills in the face of natural hazards, like wildfire. At the same time, the children identified that the fire station was a vulnerable asset because it was located close to a flood zone. Children examined their maps at the end of each session through group discussions lasting 5 to 10 minutes. They could provide anonymous feedback to the facilitators via a 'Stop-Go' jar that was left in the classroom and collected at the end of each session. Students could provide feedback about things they enjoyed and things they wanted the facilitator to stop doing. A final session using a Strengths, Needs,

Opportunities, Challenges (SNOC) analysis and participatory ranking method was conducted so children could provide feedback on the overall process and its outcomes.

For LEGO, a base map with elevation contours of 190 cm x 114 cm representing an area of 3.12 km x 1.92 km was printed. These were the 'community boundaries' identified by the children. For this exercise, children could produce a geo-referenced and scaled 3-dimensional map of the surrounding area, including their school. Children then overlaid the LEGO base plates on top of the topographic map, creating grid lines for each base. Each child then chose a LEGO base plate to work on. Each session lasted about 90 minutes. At the start of the session children collectively discussed how they would work as a group, self-assigning the tasks and responsibilities. At the end of each activity they reflected on the process and the tool, identifying strengths and difficulties and ways to overcome them. The LEGO map took a total of 12½ hours of building time to complete and used an estimated 30,000 LEGO bricks.

### Outcomes of this participatory mapping

Minecraft and LEGO are engaging, playful and stimulating tools for children to identify and map potential disaster risks in a participatory way. Trialling Minecraft and LEGO in a rural community in New Zealand sparked children's interest and enabled 'handing over the stick' to children with the mapping process. All the children involved in these activities had prior experience using Minecraft and LEGO. This familiarity with the tools meant children could confidently contribute to the mapping process. In a way, the children were the 'experts' as they generally had more and recent experience with Minecraft and LEGO than the facilitators. Participatory mapping using Minecraft and LEGO enabled children to demonstrate and



Participatory mapping using Minecraft where children built their school and surrounding area.

Image: Anthony Gampell

Table 2: Outcomes and challenges of participatory mapping using Minecraft and LEGO.

	Positive outcomes	Challenges
Participatory LEGO mapping	<p>Active participation since the process was fun and enjoyable.</p> <p>All children were familiar with LEGO so they could take ownership over the process.</p> <p>Inclusiveness of participatory LEGO mapping engaged children of different ages, ethnicity, gender and capacities.</p> <p>Children became 'experts' using LEGO mapping and were equipped with the data produced and the tool.</p> <p>Children's knowledge became tangible and communicable to outsiders.</p>	<p>High number of bricks required added to cost.</p> <p>Takes time to build the base map, which can affect the participatory process.</p> <p>Children's ages needs to be considered.</p> <p>Shape of LEGO bricks can limit the reproduction of features to scale.</p> <p>LEGO bricks require logistic and space to build and to store large maps.</p>
Participatory Minecraft mapping	<p>Process is fun, active and engaging.</p> <p>Children's familiarity with Minecraft allows ownership over the process.</p> <p>Requires creativity, dialogue and critical thinking and making sure children work as a team.</p> <p>A tangible outcome is created, built from the understanding of children.</p> <p>Can transcend boundaries allowing play in school, home and the community if technological resources are available.</p> <p>Does not require physical storage.</p>	<p>Technology can prove difficult – firewalls, software updates, server connectivity – pro-action and knowledge to overcome these issues is needed.</p> <p>Costs for the software, device but also time.</p> <p>Geo-referenced base layer but outcomes can show scale and accuracy issues. Inside the world can be difficult to orientate without references.</p> <p>Age can change the gameplay, leading to how to deal with social interactions both inside and outside Minecraft.</p> <p>How to connect Minecraft with external stakeholders who may be as familiar as children.</p>

Note: the information in the table is based on children's and teachers' evaluations using focus group discussions alongside researchers' reflections on the overall participatory mapping process.

share their knowledge as well as build social connections and collaborate with peers. When finalised, the maps were a platform for dialogue about DRR with teachers, local people and practitioners. Children could share ideas about DRR planning and evacuation scenarios for their school and other local areas.

### Challenges of this participatory mapping

The opportunities associated with these participatory mapping tools posed a number of challenges for both children and facilitators (see Table 2). The benefit of producing a LEGO map is that it can be taken apart and reconstructed. As such, the school could reuse the exercise in beneficial ways, for example as an interactive teaching tool. However, a challenge identified by children was the limited availability of the LEGO bricks to reproduce geo-referenced features. The pre-determined shape and size of the bricks made it difficult to accurately reproduce the contours in the landscape and the elevation of the hills. However, this stimulated group discussions and made the children work together to reach a consensus on how they would overcome such issues. For the teachers, the main difficulty related to the number of sessions required to complete the LEGO map. From a researcher's perspective, the biggest challenge was the logistics, particularly in sourcing LEGO bricks of the same colour and size.

Using the Minecraft 'game world' allowed for easy moving of elements in cases of inaccurate information plotting. However, without the visual cues of the outside world, children found it difficult to know whether they were in the right location and this affected accuracy and scale. Using technology has issues related to server capacity, connectivity, software updates and firewalls that require facilitators to be knowledgeable and proactive to overcome any challenges. Teachers may not be able to dedicate adequate time. There is also cost involved to purchase the software. This is, however, a one-off cost and provides near limitless building potential without the need for physical storage space. In addition, popular culture changes over time and other games may grow in popularity and Minecraft may become considered as 'old', though this may not always affect children's levels of engagement.

Conducting participatory mapping in a school setting presented challenges to achieving genuine participation. For example, the participation of the children was required due to it being part of the school curriculum. To overcome this, the students could choose other project teams (e.g. filming and 3-D printing) and could opt-out at any stage during the process. Facilitators strived to create an environment that was informal and had flexibility compared to more traditional classroom settings. Nonetheless, some of the challenges associated with participatory mapping in a school setting were difficult to overcome. For example, when children

decided they should also conduct participatory mapping outside scheduled times (i.e. weekends and after class hours). This was rejected by the school as it required the presence of teachers. Such a challenge is not linked to participatory mapping with LEGO and Minecraft, but with any participatory project conducted within a school environment.

## Participatory mapping 2.0: opportunities for children's participation in DRR

Participatory mapping using evolving technologies offers a myriad of options that are still to be tested. For example, mobile phone applications provide relevant means to conduct participatory mapping as they can update and upload real-time information about hazards, vulnerabilities and capacities. Most children and parents in Australia and New Zealand are familiar with mobile phones. These are affordable devices that connect multiple users simultaneously. Virtual reality and augmented reality have also become affordable options to conduct participatory mapping. For children, these tools are playful and engaging and can map large geographical areas and have the potential to include scenarios of tsunamis, floods and earthquakes. Participatory mapping tools, games and technology can also be combined in a creative and effective way to suit objectives. As an example, participatory 2-D mapping can be combined with LEGO bricks for land-use planning (e.g. adding bridges, roads and buildings on an existing 2-D map). The possibilities for conducting participatory mapping with children has great potential and application.

The choice of tools and materials to conduct participatory mapping with children should not be guided by the desire to create a nice map nor for the sake of innovating, but by the available time, budget, age of the children and objectives of the project. Particular aspects should be considered when conducting participatory mapping with children:

- The technology, game or material used for participatory mapping needs to be available locally and be socially and culturally suited to the local context. For instance, LEGO, Minecraft or virtual reality might be highly relevant in a certain context and unsuitable in another.
- Maps need to be understandable and usable by potential audiences (children, adults, DRR practitioners, teachers, scientists, etc.).
- Participatory mapping needs to be enjoyable and fun as children's participation is enhanced when play is encouraged.

It is essential that any participatory mapping initiative, whether it is traditional or 2.0, is not an end and should not be conducted with the sole objective of doing participatory mapping. The aim is to facilitate the exchange of information and dialogue between children and adults in their community, DRR practitioners

and researchers (Gaillard & Mercer 2013). Children's knowledge is often regarded as inferior compared with that of adults and children may not have the same competence in communicating as do adults. However, this does not mean that the contribution of children is invalid and that they cannot participate in the decision-making process related to DRR. Participatory mapping 2.0 seeks to equip children with information, knowledge and the tools needed to help them communicate better with adults, including practitioners and policy makers.

Assessing the outcomes of a participatory mapping initiative can be difficult as many outcomes are intangible and may not match with outsiders' agenda, existing expectations or reporting templates. However, measuring the outcomes of participatory mapping should focus on:

- active participation of children, allowing for diversity of age, background, ethnicity and education
- fostering children's learning and awareness about their knowledge of hazards and disasters
- dialogue between children and with adults
- equipping children with the knowledge and tools to participate in decision-making for DRR.

Both traditional and newer ways of participatory mapping can be combined with other participatory approaches and techniques, especially to capture the more intangible aspects of hazards, vulnerabilities and capacities. These include social networks, transnational exchanges and temporal patterns, which are difficult to plot on a map. In addition, as for any participatory tool, the contribution and sustainability of a mapping initiative depends on the process of participation and the respect for children's concerns and aspirations. Children should be involved in every stage of the process, from choosing the tool to analysing the data as well as evaluating the outcomes of a participatory mapping project.

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## ABSTRACT

# Fostering student participation in disaster risk reduction through disaster video games

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## Introduction

The Sendai Framework encourages a broad range of stakeholders, from government officials to local people at risk, to pool their knowledge and understanding of disaster risk to design inclusive policy and practice. While the Sendai Framework refers to the importance of education for reducing disaster risk throughout, Petal (2007) and Luna (2017) concur that DRR formal education remains largely top-down, with bottom-up perspectives (from teachers and students) lacking. Teachers are explicitly missing from the Sendai Framework, the *Australian National Strategy for Disaster Resilience* (Attorney-General's Department 2011) and also many Sendai Framework-inspired national policies like the *New Zealand National Disaster Resilience Strategy* (Ministry of Civil Defence and Emergency Management 2019). Nonetheless, the Australian national strategy has two mentions of schools; one for understanding risk by including risk reduction knowledge in education programs and another to empower individuals and 'communities' to exercise choice and take responsibility by having school programs actively encourage volunteering. Contrastingly, New Zealand's national strategy does not explicitly mention schools in any of the 18 specific objectives outlined to achieve the overarching goal of the strategy. However, under the enabling, empowering and supporting community resilience section (p.31), schools are fleetingly mentioned as one possible component of a community to action foundational resilience efforts. Such policies do little to indicate how to design these educational programs to achieve the intended aims for DRR.

The *Australian Curriculum* and the *New Zealand Curriculum* share similar aims for young people to become lifelong learners, promoting values, capabilities and competencies (ACARA 2019). While the *New Zealand Curriculum* is an outcome-based curriculum, the *Australian Curriculum* takes an integrative approach (ACARA 2019; Moss, Godinho & Chao 2019). Both provide flexibility in implementation to allow schools to tailor what they teach for the local context and students' needs.

New Zealand and Australia are exposed to a range of hazards, including natural hazards, biological hazards and anthropogenic hazards. Problematically, while disaster awareness and DRR is a national priority, students can complete their education without being exposed to disaster preparedness in schools (Johnson 2011, Selby & Kagawa 2012). However, teachers are expected by current policy, teaching practices and curricula

The *Sendai Framework for Disaster Risk Reduction 2015–2030* (Sendai Framework), the *New Zealand National Disaster Resilience Strategy* and the *Australian National Strategy for Disaster Resilience* fully integrate the concept of education into the overall goal of disaster risk reduction (DRR). While the links between the two overarching strategies could be more significant, especially considering the social construction of disasters, the flexibility offered by both curricula to how teachers approach the subject allows for a stronger inclusion of DRR activities. While it is acknowledged that children are greatly affected by disasters, the perspectives of children are often the least heard and included in DRR. Research into the use of disaster video games as learning tools brings together the perspectives of teachers and students to consider how to foster children's participation in DRR and support the aims of the Sendai Framework. This paper summarises a video game research project using three series of case studies. This process has led to genuine and meaningful outcomes based on the needs of teachers and students and offers a potential pathway to address gaps in policy and practice to reduce the risks associated with disasters.

to help students to reduce their vulnerabilities while enhancing their capacities.

Selby and Kagawa (2012) comment that teachers and school leadership will generally refer to their national education authority for information and guidance (i.e. the Ministry of Education). The Australian curriculum incorporates disaster and DRR concepts from foundation to Year 10 (ages 5-16) through the learning areas of science, social science, technology and languages, including Auslan (Australian sign language). Senior secondary geography students focus on risk identification and management concerning DRR concepts of prevention, mitigation and preparedness. Though the misnomer 'natural' disaster is found within the Australian curriculum, the inclusion of disaster and DRR terminology indicates there are efforts by the national authority to support the delivery of DRR within the national curriculum.

Contrastingly, an analysis reveals that the *New Zealand Curriculum* does not explicitly define disaster or DRR anywhere. Learning units like the level 3 cross-curricula learning unit 'We Will Rock You' also contain outdated terminology like the use of 'natural' disaster in comparison to current academic literature (Kelman 2018). In addition, the content studied by senior secondary geography students in NCEA (National Certificate of Educational Achievement) is heavily hazards focused with limited consideration to the social dimensions of disasters. While the Ministry of Education embraces the 'What's the Plan, Stan?' resource developed by education consultancy Educating NZ on behalf of the New Zealand National Emergency Management Agency, they do not proactively reinforce this initiative that provides schools, teachers, students (Years 1-8, ages 5-13) and parents with the support to develop the knowledge and skills to prepare for natural hazards (Selby & Kagawa 2012). Johnson (2011) advocated that the Ministry of Education should play a significant role in supporting disaster education with a nationally implemented outcomes-based strategy to help students receive the necessary exposure to disaster education (Selby & Kagawa 2012). Selby and Kagawa (2012) also comment that a DRR curriculum calls for active, interactive and action-oriented learning with connections to local experiences.

This paper summarises a disaster video game research project built on three series of case studies. Desk research identified relevant video games both 'serious' and mainstream, assessing their main features and potential to inform learning about disaster and DRR. Secondly, three 'serious' disaster video games (Earth Girl 2, aka Earth Girl Tsunami, Sai Fah – The Flood Fighter and Stop Disasters!) were trialled with school students and teachers in Hawke's Bay, New Zealand to understand their concerns and priorities. Finally, insights gathered from the trials informed a larger project involving the video game Minecraft, deemed more appropriate by the students than the trialled video games to learn about disaster and DRR. Ultimately, the inclusion of video games within the curriculum offers not only an innovative teaching approach for teachers

but also serves as a valuable tool for practitioners and researchers.

## Reviewing 'serious' disaster video games for learning about disaster and DRR

DRR scholars, practitioners and educators propose video games as an innovative teaching method to engage students in learning about disaster and DRR. 'Serious' games refer to games designed for education rather than entertainment (Abt 1970). Theoretically, video games can be connected to constructivist learning theory. As such, video game design aligns within the player's zone of proximal development, referring to the gap between what learners can do without help and what is achievable with guidance and assistance from a more knowledgeable other (Schunk 2012). Video games provide players with 'scaffolding' to support the player through the zone of proximal development to overcome the presented challenge(s) (Loparev & Egert 2015).

To understand the benefits of using video games within the classroom, one must understand how students approach video games both inside and outside of the classroom environment. Since people typically play video games for entertainment, it is essential to consider how video games can and are being used by educators to foster student learning (Dezuanni & O'Mara 2017). Solely focusing on game content is therefore inadequate when considering the possible contribution of video games to learning within a classroom and school environment. In simple terms, video games comprise several components being game content, game mechanics, the skills players need or can build through gameplay, player motivations for initial and continued gameplay and the social interactions players experience inside and outside the game environment (Gampell & Gaillard 2016, Gampell *et al.* 2017). Therefore, video games are not only engaging tools that align with learning theory but also offer opportunities to connect to the education curriculum.

A plethora of researchers, international organisations (e.g. UNESCO, United Nations Office of Disaster Risk Reduction), governments (Canada), non-government organisations (e.g. Save the Children, Christian Aid) have developed numerous educational disaster video games. These video games convey disaster and DRR messages, including portrayals of hazards, vulnerabilities, capacities and DRR (prevention, mitigation and preparedness). Table 1 provides a non-exhaustive list of disaster video games that connects 'serious' disaster video games to concepts of DRR. Disaster video games from non-government and other organisations are often one-off deliverables developed for a specific project. Research to consider the usefulness of these video games as valuable tools is limited. Significantly, scepticism for whether disaster video games could build disaster awareness in players will be maintained without research to support the beneficial opportunities for learning available.

Table 1: Disaster risk reduction content analysis of educational disaster video games.

	Disaster Risk Reduction													
	Prevention					Mitigation					Preparedness			
	Use of man-made structures	Land-use regulations	Basic need and services provision	Engineering design	Engineering techniques/hazard resistant construction	Environmental policies	Public awareness	Disaster risk analysis	Early warning systems	Stockpiling equipment and supplies	Coordinated evacuation	Emergency operations	Public information	Training and field exercises
Beat the Quake	X			X	X			X						
Before the Storm														
Build a Kit										X				
Citizen Ship			X											
Disaster Master			X		X		X		X	X	X		X	X
Disaster Watch	X						X	X			X			
Earth Girl								X	X					
Earth Girl 2/Earth Girl Tsunami	X			X	X		X	X	X		X		X	X
Earth Girl Volcano	X			X	X		X	X	X	X	X		X	X
Earthquake Response			X							X		X		
FloodSim	X	X	X	X	X	X	X	X	X	X		X	X	
Hurricane Strike!	X			X	X			X	X	X	X		X	X
Inside the Haiti Earthquake								X		X		X		
Monster Guard			X					X		X	X			X
Quake Safe House	X			X	X			X						

Source: Adapted from Gampell & Gaillard (2016)

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## Methodological approach to examine disaster video games within the classroom

Research reveals that teacher and student involvement is lacking in the video game development process, as are disaster survivors (Gampell & Gaillard 2016). This lack of involvement indicates that 'outsiders' are designing and developing these games without necessarily considering nor addressing the actual needs of the target audience (Gampell & Gaillard 2016). Significantly, Gampell, Gaillard and Parsons (2019) conceptualised and used a methodological approach reflecting the principles of constructivist learning theory and aligning with the participatory and playful nature of video games.

This project was conducted with 171 students from two intermediate school classes (Years 7–8, ages 10–13) and seven high school classes (Years 9–13, ages 12–18). In addition, two workshops were held with social science teachers from around New Zealand at the New Zealand Social Sciences Conference in 2017 (SocCon17) and 2019 (SocCon19). The suggested approach, built upon participatory toolkits, allowed for flexibility to fit local needs and requirements. Other teachers can reproduce this approach in their own classrooms. This research received ethics approval from University of Auckland Human Participants Ethics Committee (#017988).

Within a classroom setting, students were given video game access during the lesson on an appropriate device (i.e. laptop, tablet, iPad). For these particular trials, three 'serious' disaster video games (Earth Girl 2 aka Earth Girl Tsunami, Sai Fah – The Flood Fighter and Stop Disasters!) were used based on a hazard fitting the local context. Teachers and researchers selected the specific video game played ensuring the video game aligned with their lesson plans and connected to curriculum expectations. Students worked on individual devices or with a partner; two players per device was preferable if playing together. Students had autonomy over the gameplay process. There were no other guidelines except to play the video game. As such, students could decide whether they played the tutorial or not as well as the game difficulty or hazard scenario.

Gameplay should occur with minimal facilitator interference or rules governing the process. This approach stimulates a learning environment where students self-regulate their learning and actively engage in gameplay. Students could collaborate to achieve the game objectives. Students considered some classmates to be more knowledgeable others, providing support and advice to their peers. Students also considered the teacher a more knowledgeable other. However, interactions between the teacher and the student rested with the student. Such interactions support the students by providing advice and minor demonstrations that allow students to observe and replicate the teacher's actions.

Following gameplay, students participated in a carousel group activity to allow for the co-construction of knowledge through social interaction (Schunk 2012).

In this case, the carousel activity focuses students on topics such as hazards, vulnerabilities, capacities and DRR, including prevention, mitigation and preparedness in the local context. Teachers played a facilitation role. They could help students unpack their ideas to be added to the flipchart without explicitly directing the students to a specific response. The carousel activity was chosen to allow students to discuss and provide responses in a group setting to align with constructivism. Students recorded information on flipcharts using text and pictures. The flipcharts were photographed at the end of the session as a record.

Such activities require a debrief, allowing students to draw verifiable conclusions based on classroom perceptions. This helps students consolidate their new information in a public setting (Joplin 1981). Students were given control of the debrief. They read aloud the comments written on the flipcharts that lead to a participant-regulated discussion to critically reflect on the information, interact with and question each other. This helped to limit facilitator and teacher-directed conversation except when elaboration was required. Teachers could emphasise specific points or patterns from the carousel if students had difficulty unpacking their responses.

This research approach used a combination of tools to facilitate a process where the usually absent perspectives of the participants (teachers and students) could be brought to the forefront. For teachers, this process allows student perceptions and understandings to be collected. These can be used in subsequent classes to build from or as a reference for students later.

## Current contributions of disaster video games in the classroom

Table 2 summarises the findings reported from classroom trials with students, perspectives from the supervising teachers in the classroom and teachers' perspectives from SocCon17 and SocCon19. Teachers involved in classroom trials and in both SocCon workshops made valuable contributions to how video games can be used within the classroom. Overall, the findings indicate that teachers and students share similarities in what they perceive to be necessary aspects of a video game for the classroom. Significantly, the data collected comes directly from the intended audiences of 'serious' disaster video games rather than from outsiders making assumptions about what teachers and students need. Video games developed for learning in the classroom require a dialogue with teachers and students to identify rather than assume their needs. This information builds a greater understanding of what teachers and students require so that practical, appealing and useful disaster video games can foster disaster and DRR awareness among school students.

The findings suggest that video game sessions should not be one-off activities but should allow students to test their skills and experiment with new knowledge

through multiple gameplay sessions. Importantly, prior video game experience and familiarity should not be assumed. Time for 'pure play' increases player comfort, allowing skill development and understanding of the game mechanics and rules. Gameplay sessions should allow time post-gameplay for students to debrief their experiences in a group setting. While video games are preferred to reflect aspects of reality, unrealistic portrayals (i.e. in *Earth Girl 2*, babies crawled to evacuation points, wheelchair users went upstairs) encourages discussions about the social dimensions of disasters. Some mainstream video games incorporate academic research into the game world. Mainstream video games like *Assassin Creed Origins* and *Assassin Creed Odyssey*, have educational game modes that remove certain game mechanics like 'combat' while introducing 'tours' for players to explore various dimensions of ancient Egypt and Greece. Mainstream video games could prove an effective method for learning too.

## From research to practice: Minecraft as a disaster and DRR learning tool

The insights and perspectives gathered from teachers and students directly informed a subsequent project using Minecraft to foster children's participation in DRR (Le Dé *et al.* 2020). As teachers and students are frequently left out of discussions regarding disaster risk education, even though they should be regarded as critical stakeholders, the research team emphasised

their inclusion alongside the local emergency management group in a co-designed process to inform the development of the area's emergency plan. It was important that both teachers and academic researchers worked together to build a lesson plan with targeted learning objectives that could align with the curriculum and the local context rather than imposing outsider assumption and perspectives upon the teachers and students.

The rationale for using Minecraft stemmed from students indicating they commonly played Minecraft, and therefore, they were highly familiar with the video game. In addition, Minecraft could address several requirements as outlined in the previous research findings. Minecraft allows cooperative play within the same game environment and can reflect real-life situations. The mainstream popularity of Minecraft (having sold 176 million copies worldwide over ten years) indicates the game's ability to motivate and engage students, while also having underlying educational advantages.

A geo-referenced 3-D Minecraft game world of the local Maraekakaho area, developed by researchers, contained geographical features such as roads, buildings and rivers served as the base layer for students to plot local hazards, vulnerabilities, capacities and DRR actions identified in the prior participatory activities. The finished Minecraft game world could be modified to reflect local hazards like flooding. This provided students with realistic visualisations of potential hazards within their local surroundings.

Three classrooms of approximately 20 students (Years 5-8) each played within the geo-referenced

Table 2: Perspectives and ideas of students and teachers about integrating video games into the classroom, categorised by group.

Students	Students and teachers	Teachers
Text-heavy games (i.e. Stop Disasters!) are less motivating and leads to information overload.	The video game should be highly engaging, interactive and fun.	Video games, as teaching tools needs to occur in the context of specific curricula area.
Voice-overs should be included in narrative-driven games (i.e. Sai Fah) to provide interactive, visual and aural stimulation and engagement.	The video game needs to be collaborative, cooperative and competitive to encourage social discussion and evaluation of approaches.	Students are focused on playing the game, therefore do not realise they are learning about DRR.
Video game feedback is useful to show areas of improvement – but does not indicate whether the student has achieved the necessary skills to tackle harder challenges	The video game should be easy to use – clear objectives, purpose, instructions and tutorial.	Video games offer both teachers and students opportunities to develop 21st century skills.
	Realistic content and relation to real-life case studies – show the consequences of player (in)action to better translate and apply knowledge/ skills to reality.	Transform teaching and learning practices by allowing students to engage in contents and contexts at higher levels.
	Video games cannot substitute for a teacher or traditional teaching practices.	Able to be used offline, online and across devices.
		Ability to encourage problem-solving and thinking (and vice versa).
		Foster partnerships not seen in the everyday classroom.
		Ability to foster school-home-community engagement.



Figure 1: Strengths, Needs, Opportunities, Challenges matrix of lessons learnt.

Minecraft world for 90 minutes. Students were given complete control over the gameplay process. Within their classroom cohort, students designed a key, or legend, to indicate how various hazards, vulnerabilities, capacities and components of DRR would be identified. Students designated specific bricks or even used in-game signs with written information upon them to show what they had built and associated category. Students decided what they included in the game world. Many focused on aspects close to the school, their homes and included local features like the memorial, woolshed and restaurant. Students used information they had recorded in earlier preliminary scaffolding lessons via several participatory activities, such as one-word, carousel and participatory 2-D mapping to check what may be missing from the game world, the approximate locations or to check what they had categorised as hazards, vulnerabilities and capacities.

Students debriefed all activities to allow discussions on the overall process. These discussions highlighted the students' unique perceptions of hazards, vulnerabilities and capacities that adults may not have been aware of or had previously considered (i.e. the capacities of the swimming pool complex to provide toilets, showers and a substantial body of water). These discussions helped students contribute their ideas to the community resilience plan, fostering a platform for students to hold a dialogue with teachers, parents, practitioners and policy-makers. Teachers and researchers also debriefed after each session, discussing the outcomes of the session, reviewing the plan for the next session and discussing

any alterations that should be implemented. Overall, the use of Minecraft to foster student learning about disaster and DRR is in its infancy. Figure 1 presents an overview of some of the lessons learnt in the form of a Strengths, Needs, Opportunities and Challenges matrix.

Figure 1 shows several opportunities for using Minecraft as a tool to foster participation in learning about disasters and DRR. A significant advantage of Minecraft is the one-off cost to purchase the game that allows unlimited building potential compared to other methods using physical materials. Additionally, the game world can be backed up to a hard-drive or to cloud storage after each session, resulting in a number of world save states.

For a teacher unfamiliar with using video games, Minecraft may be considered complex, but students will possibly have more knowledge and experience than the teachers or facilitators, helping the students take ownership over the process. Educators can use in-game mechanics to maintain a sense of control within the Minecraft world, like teleporting players to specific areas of the world or removing players from the game.

The Minecraft world can be continually updated with information from various subjects. This process enables an integration of other subject areas of the curriculum and connectivity between subjects and students' understandings of the world. With future iterations of Minecraft including Minecraft Virtual Reality and augmented reality mobile game Minecraft Earth, learning can transcend and make connections between the

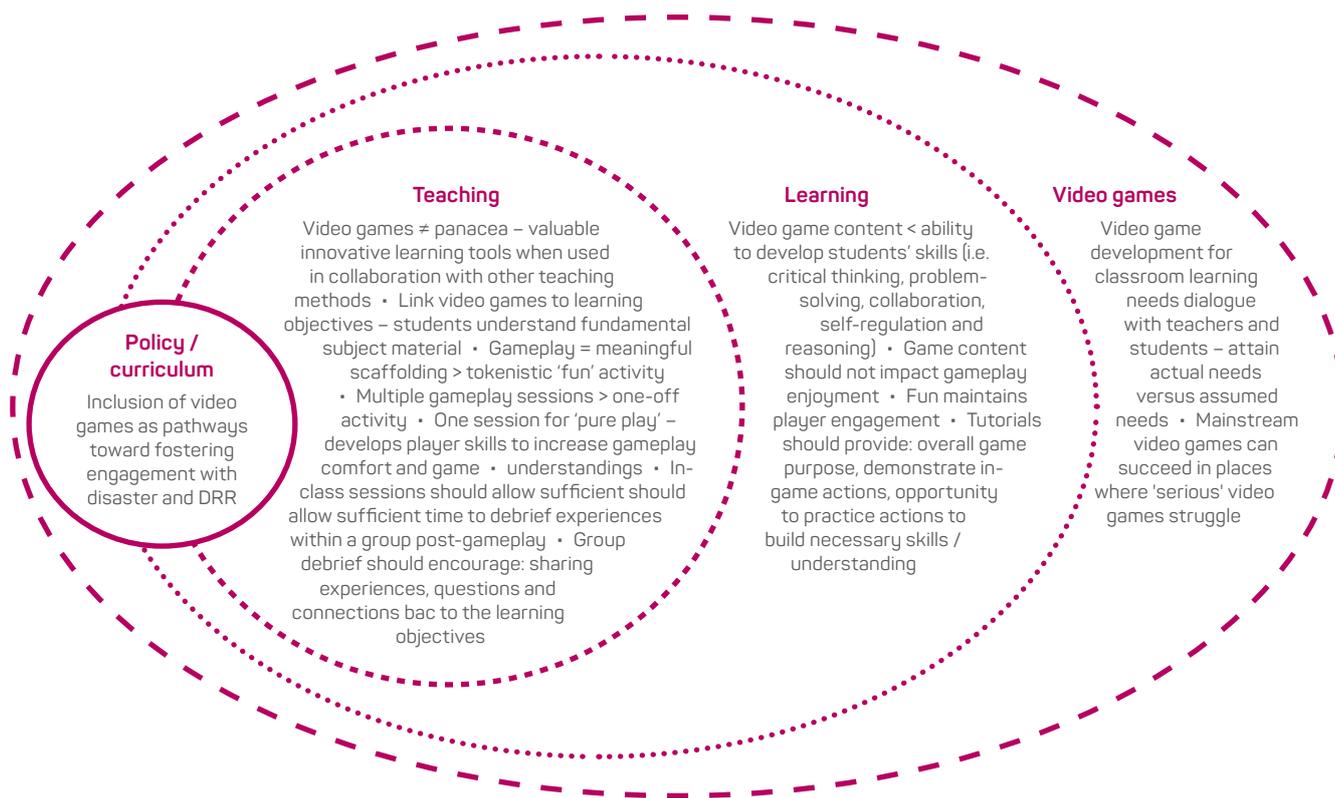


Figure 2: Recommendations for disaster video games in the classroom.

classroom environment, home and even lead to Minecraft field trips using augmented reality.

## For the advancement of learning: recommendations for bridging the gap

The Sendai Framework, New Zealand’s *National Disaster Resilience Strategy* and the Australian *National Strategy for Disaster Resilience* encourage the development of children’s understanding of disaster risk. However, to foster the genuine participation of children as DRR leaders and change-makers, a reconfiguration of the existing educational framework may be required to better consider and integrate DRR in a meaningful way. Scholarship highlights the need for education authorities to take proactive and leading roles in supporting DRR initiatives in schools (Johnson 2011, Selby & Kagawa 2012). To shift thinking and discourse around the complex root causes of disaster, both the nature and consistency of messages could be delivered to students through the curricula (Chmutina *et al.* 2017). To address gaps within curricula, a collaborative and inclusive effort by stakeholders could include consistent messaging, understandings and the use of terminology that can be implemented by educational authorities.

Video games can become valuable teaching tools for teachers, and in collaboration with other tools to encourage participation, can be a potential pathway

towards building greater awareness surrounding disaster and DRR. Academics and practitioners, among others, who wish to use video games to spread specific disaster messages and build disaster awareness must realise that video games are not merely products or activities for educational purposes. Significantly, the gaming process underpins the viability of using video games for learning rather than the belief that directly engaging with a ‘serious’ video game will foster learning. As such, existing ‘serious’ disaster video games are often unable to achieve the outcomes made possible by a mainstream game like Minecraft. Hence, video games cannot be developed as a deliverable disassociated to the needs of the target audience just to satisfy a checklist. Nor should a video game be used within a classroom because it is considered an innovative approach to learning. Instead, a process inclusive of all stakeholders can appropriately assess needs, which can lead to genuine and meaningful learning outcomes.

Reflecting on the research conducted into the learning potentials of disaster video games, Figure 2 provides several recommendations instilled from teachers and students to help inform decision-makers regarding the implementation of a DRR curriculum. Figure 2 attempts to broaden current perspectives to consider how video games and the process of gaming can help support not only the aims of national curricula, the Sendai Framework and other national policies, but also serve as engaging teaching and learning tools. As such, using video games to support formal education can also enable

opportunities to transcend and make connections between the classroom, home and in the local context.

Video games should not be considered a panacea to bridging the gap between policy, curricula and teaching practices but as one possible pathway to address current gaps. Moving forward, attention and consideration should be given to acknowledging and promoting video games as an example of a learning pathway in policy and curriculum, developing resources that are inclusive of stakeholders to support teachers using video games in the classroom (video game, lesson plans, suggestive teaching approaches) and developing video games to foster and encourage students to engage with disaster and DRR versus detracting from engagement with a focus on content.

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## ABSTRACT

# Latrobe Youth Film Festival: promoting the voice of young people through film

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## Introduction

In February 2014, the Hazelwood open-cut coal mine in the Latrobe Valley, 150 kms east of Melbourne, was set alight as a result of embers from nearby bushfires. The eastern and south-eastern batters of the mine as well as the floor were on fire and more than 7000 fire services personnel from across Australia fought the blaze for 45 days. Finally, on 25 March 2014, the fire was officially declared extinguished (Teague, Catford & Petering 2014). During the fire, a significant amount of ash was produced that caused physical and mental-health issues for surrounding communities. These issues arose while the mine fire burned and remained during the subsequent investigation and inquiries. In response, the *Hazelwood Mine Fire Inquiry 2015–16* (Teague, Catford & Roper 2016) recommended that the Victorian Government must work differently with Latrobe Valley communities to address these issues. Importantly, the Inquiry highlighted the need to involve communities in decisions to enhance their long-term health and wellbeing and re-establish the lost trust between residents and government officials. In response, Latrobe City was designated a Health Innovation Zone by the Victorian Government. The Latrobe Health Innovation Zone is the first of its kind in Australia. It has two key structures being the Latrobe Health Assembly (Assembly) and the Latrobe Health Advocate (Advocate). Together with the Assembly and Advocate, the Latrobe Health Innovation Zone creates opportunities for community members to voice their aspirations in the planning and delivering of better health and wellbeing outcomes.<sup>1</sup>

Good health and wellbeing are not only important for people to live full and active lives, they are also critical factors in enhancing people's resilience. At the Third UN World Conference on Disaster Risk Reduction in Sendai, Japan, the World Health Organization outlined that 'Health and disaster risk reduction are deeply connected; healthy people are resilient people and resilient people recover more quickly from disasters' (UN News 2015). The results of the conference and the subsequent *Sendai Framework for Disaster Risk Reduction 2015–2030* (UNDRR 2015) led to a much greater focus on people's health and wellbeing in disaster risk reduction compared to that of the *Hyogo Framework for Action 2005–2015* (Aitsi-Selmi *et al.* 2015). It is therefore not surprising that Cutter (2016), through a review of existing tools used to assess community resilience, revealed human health to be a key measurement category.

A disastrous fire at the Hazelwood coal mine in 2014, and subsequent government inquiries, revealed the inequalities and disadvantage experienced by communities in the Latrobe Valley. Following the inquiry, the Victorian Government implemented a place-based approach to support people's health and wellbeing, particularly the Latrobe Valley's youth. In December 2019, a six-month project culminated in the inaugural Latrobe Youth Film Festival Red Carpet event. The Latrobe Youth Film Festival project is a collaboration between Latrobe Youth Space, We Are Latrobe and the Victorian Government Department of Health and Human Services Latrobe Health Innovation Zone team. The project's primary aim was to promote the voice of young people in matters that are important to them. This paper outlines the development and implementation of the project.

<sup>1</sup> As mandated in the Latrobe Health and Wellbeing Charter at: [www2.health.vic.gov.au/about/health-strategies/latrobe-health-innovation-zone/latrobe-health-and-wellbeing-charter](http://www2.health.vic.gov.au/about/health-strategies/latrobe-health-innovation-zone/latrobe-health-and-wellbeing-charter).

To these ends, this paper outlines the development and implementation of the Latrobe Youth Film Festival project. The project was conducted to improve the health opportunities for youth in the Latrobe Valley and provide policy makers with youth perspectives. The project may also guide people wanting to develop similar youth-focused participatory film projects.

## Project purpose

Recognising the important role that young people have in communities, the Latrobe Health Innovation Zone established the Latrobe Youth Film Festival project with aims to:

- promote young people’s voices in matters that are important to them
- raise awareness about health and wellbeing opportunities in the Latrobe Valley
- strengthen young people’s confidence in advocating for social change.

The project was not established as a research undertaking. Rather, it draws on participatory video methodologies as described by Haynes and Tanner (2015) as a tool to develop a youth-led, adult-guided program through Latrobe Youth Space.<sup>2</sup> Participatory video projects are designed to empower youth in research and advocacy and promote the voices of young people in policy debates; an area where they are often not heard. This aligns with the Convention on the Rights of the Child (United Nations 1989) in that children have valuable knowledge and ideas, they have the right to share their knowledge and ideas and be involved in decisions that affect them. Through participatory video projects, young people can gain greater knowledge and awareness of issues as well as increased confidence in questioning policy makers on underlying social causes and possible solutions (Haynes & Tanner 2015). To achieve this, a critical component of the project was linking in with and creating dialogue between youth groups and health and wellbeing advocates, practitioners and professionals (i.e. the Assembly, Advocate and others working within the Latrobe Health Innovation Zone). Furthermore, by engaging and supporting Latrobe Valley youth in developing short films on their interpretations of what health and wellbeing means to them, the filmmaking process provided a clear, accessible and entertaining way to communicate improvement opportunities. The findings of Haynes and Tanner (2015) that youth styles in creating participatory films are ‘emotional, credible, reliable and encouraging’ (p.367) have significant potential to drive social change. However, it is not only the end-product that facilitates social change but also the filmmaking process. Through film creation, showings and community dialogue, policy-makers can gain an in-depth understanding of how young people view critical issues within their communities (Haynes & Tanner 2015).

## The process: development and implementation

The project adopted a five-stage approach (Table 1). The description of each stage is not exhaustive and it includes key ingredients for success as viewed by the project team, participants and their families. This anecdotal evidence has been drawn from discussions among the groups during the filmmaking process and Red Carpet event.

**Table 1: Latrobe Youth Film Festival project five-stage approach.**

Stage	Brief overview
Garner commitment, develop and refine the project plan	<ul style="list-style-type: none"> <li>• secure support from youth groups and key institutions and agencies</li> <li>• refine and confirm project plan</li> </ul>
Develop awareness and upskill, ensure safeguarding protocols are in place	<ul style="list-style-type: none"> <li>• garner understanding of the issues and opportunities youth groups face and see</li> <li>• create dialogue between youth groups and health and wellbeing advocates, professionals and practitioners</li> <li>• youth groups to undergo specialised filmmaking training</li> <li>• ensure participants understand the need for a safe environment and adhere to relevant safety checks</li> </ul>
Shape ideas	<ul style="list-style-type: none"> <li>• youth research issues of interest and identify and workshop particular issues that they would like to focus on in their short films</li> </ul>
Create content	<ul style="list-style-type: none"> <li>• youth create content through filmmaking and editing</li> </ul>
Launch films	<ul style="list-style-type: none"> <li>• hold community screening events in locations around Latrobe Valley</li> <li>• publish films online through all available platforms</li> </ul>
Support dialogue	<ul style="list-style-type: none"> <li>• support dialogue between the film makers and decision makers to address the wellbeing concerns raised in the films</li> </ul>

### Stage 1: Garner commitment, develop and refine the project plan

The festival project was a collaboration between Latrobe Health Innovation Zone and partner organisations. Discussions with We Are Latrobe (the social marketing

<sup>2</sup> Latrobe Youth Space is led by the YMCA as part of a consortium of organisations providing activities and services to young people in the Latrobe Valley.

team positioned with the Assembly) revealed that they and Latrobe Youth Space (a YMCA youth-led, adult-guided initiative for young people) had raised the creation of a youth film festival as a possible, positive experience for youth. This arose at the same time as a recently established Movie and Drama Club at Latrobe Youth Space. Considering this, a project team was developed and a draft plan was created. The draft plan was critiqued and subsequently fully endorsed by the Latrobe Youth Space Youth Governance Committee.<sup>3</sup> This was an important step to ensure young people were part of the decision-making process. Without their approval, the project would not have proceeded. To promote a participatory two-way learning process, commitment (in terms of access to health and wellbeing professionals) was also garnered from the Advocate<sup>4</sup> and from the Department of Health and Human Services (DHHS).

A call for Expressions of Interest was sent to four local film production studios in early 2019. Local organisations were approached to keep the project in-line with DHHS place-based requirements (DHHS 2018) and to strengthen local partnerships and support local businesses. One of the challenges for responding film producers was their capacity to provide training and resources to a group of (at that stage) unidentified participants. As such, a studio that could offer flexibility in responding to young people's capabilities, interests and schedules was preferred. The successful applicant was Nanoo Nanoo and they were brought into the project team to refine the draft project plan. The team met regularly to ensure the project met its core deliverables while exercising flexibility around structure and timelines based on feedback from the young people participating. This feedback, consisting of written submissions and verbal communication, was collected by a YMCA mentor from Latrobe Youth Space.

The project team agreed that rather than applying strict guidelines around film production, participants would be encouraged to share their personal perspectives particularly around:

- what health and wellbeing in the Latrobe Valley means to them
- the issues they face and opportunities they see in terms of health and wellbeing
- the actions they would like to see to help improve the health and wellbeing in their community.

A critical aspect of Stage 1 is to identify a single coordination point. Due to work commitments, the project team shared responsibilities throughout the project. This caused some confusion in relation to who was taking ownership of what. This role should be clearly defined at the start of the project and maintained throughout.

## Stage 2: Develop awareness and upskill, ensure safeguarding protocols are in place

Potential participants were invited to attend a two-hour introductory session using radio, newspaper, social

media, flyers and by word-of-mouth. Through the very nature of the Latrobe Youth Space programs (Rainbow Club, young parents group, multicultural street games and study group) and its consortia (Berry Street, Centre for Multicultural Youth, Quantum Support Services, National Disability Condition Officer, The Gathering Place and Victorian Aboriginal Child Care Agency) a wide diversity of young people was invited to participate. The session was hosted by Latrobe Youth Space with DHHS providing context of the project and Nanoo Nanoo leading discussions on filmmaking. During this session, the project team identified the areas of interest relating to filmmaking that would form the six, three-hour training sessions on acting, animation, camera skills, directing, editing and script writing.



The young participants learning the art of acting.

Image: Latrobe Youth Space

A critical part of these training sessions was to ensure each one was a safe environment for participants to ask questions and explore ideas. A 'My Pledge' was signed by participants (and their guardian if they were under 18 years of age) at the start of the project. The group work enabled participants to form friendships and discover each other's talents and areas of interest.

*With the acting workshop, the feeling of emotions that we expressed through personal thoughts and experiences while also imagining what they may be like, it felt really good to experience that and its definitely something you can take away and use.*

(Jordyn, participant)

Ethics standards were important to ensure all adults had a Working with Children Check and had completed the Australian Childhood Foundation's Safeguarding Children and Young People training course (a critical component

<sup>3</sup> As noted by Erin Byrne in the 'Latrobe Youth Space ... our first year' booklet (p.5), 'Our Youth Governance Committee is made up of young, passionate individuals who collectively represent the young voices of Latrobe Valley'.

<sup>4</sup> The Latrobe Health Advocate's role is to provide independent advice to the Victorian Government on behalf of Latrobe Valley communities on system and policy issues affecting their health and wellbeing.

of the YMCA Safeguarding Children and Young People Policy). This is also in line with the safeguarding principles of the *Convention on the Rights of the Child* (United Nations 1989). Adequate time had to be allowed for these checks and measures to be in place. Without them, the project could not proceed as planned.



During scriptwriting sessions, participants learnt about character- and action-driven stories, motivations, obstacles and artistic methods of script writing.

Image: Latrobe Youth Space

### Stage 3: Shape ideas

Although ideas shaping is listed as Stage 3, participants had begun shaping ideas at the announcement of the project, or even in the months before. Throughout the project, participants continually explored their topics of interest by researching and bouncing ideas off their peers and the project team as well as accessing information from health and wellbeing advocates and professionals. This was an important step as it encouraged participants to think holistically about the issues they wanted to focus on. Flicker and colleagues (2008) note that the process of holistically envisaging better health outcomes can have a far greater impact on young people than singular health-prevention strategies alone. This is achieved through greater learning, where young people identify the key issues they would like to prioritise for investigation, debate these issues with their peers and undertake further research to solidify the message they would like to communicate through their films (Haynes & Tanner 2015).

While peer-to-peer support was evident during group discussions, participants did not request access to other service providers (e.g. Headspace). Rather, they chose to draw from their own experiences, debate these issues with each other and conduct their own research. However, the project team was on hand to provide guidance as needed. This maintained the project's youth-led, adult-guided approach.

My Pledge,

I, \_\_\_\_\_  
\_ hereby make the following pledge to the Latrobe Youth Film Festival project:

To myself, I commit to maximising this opportunity to try new things, test ideas and to live with occasional discomfort as I develop new skills. I will persevere and have fun along the way.

To my team, I commit to making time to ensure we get the most from our film project, I will prioritise my personal commitments to the team and I will be present and supportive during our time working together.

To the cohort of film makers, I commit to making this a safe space, to share doubts and concerns, to suspend judgement and to recognise that everyone's journey will be different.

To the Latrobe Youth Film Festival project team, I commit to be an active part of this learning environment and to provide constructive feedback on my experience.

I understand that the intellectual property rights of each of the films produced during this film project will sit with the Latrobe Youth Space.

I understand that I will be acknowledged for any significant contribution I make to an individual film. This acknowledgement will be included in the end credits of the film.

I understand that individuals will have the right to use all or part of the films they have made a significant contribution to for use in job applications or on their resumes or as part of an application for further education within a related field of study.

The 'My Pledge' was signed by participants at the start of the project.

Source: 'My Pledge' was modelled off that used by the States of Change program (Barling-Luke 2019)

*My initial ideas have transformed into something much better than what I could have come up with alone.*

(Brad, participant)

To help finalise the shaping of ideas, three pitch preparation sessions were conducted involving discussions on themes, storylines, genres and opportunities. During these sessions, the 35 young people in the program<sup>5</sup> formed six groups varying in size from one to three people undertaking the writer and director roles with remaining participants adopting acting positions.

The shaping of ideas culminated in a Pitch Presentation session where the six groups presented film ideas to a Pitch Presentation panel consisting of a Youth

Governance Committee member, the Latrobe Health Advocate and the DHHS Manager of Place Based Programs. They considered all pitches worthy to progress to Stage 4.

*We did the pitch presentation, finally. It took me a lot of nerve to get up and everything but I felt pretty good once I started doing it.*

(Dean, participant)

[After the Pitch Presentation] *I felt really confident, it made me feel really good. I didn't 100% know what I was looking forward to but after seeing everyone on that night, everyone having a good time, it sort of showed me that this is going to end up being something great.*

(Connor, participant)

### Stage 4: Create content

Each film team designated itself as a production 'studio' with a designated Studio Head (a Latrobe Youth Space staff member or volunteer) to help coordinate film-making activities. Each studio team developed their scripts, narratives or story boarded animations. This work coincided with location scouting, film scheduling (over days, nights and weekends) and booking actors who commenced work on character development.

Filmmaking support was provided by facilitators during all activities and social support services were on-hand for health and wellbeing advice as needed. Even though participants were exploring issues of bullying, diversity, mental health and social isolation in their films, they did not approach these services for assistance during the project. Nevertheless, it was important that these services and trained staff were available. As such, the designated Studio Heads were all trained youth workers or staff from the social welfare sector with knowledge and expertise in working with young people. Studio Heads maintained connection with their groups throughout stages 4 and 5 and liaised with Nanoo Nanoo to check that participant needs were addressed and key tasks were completed on time and within budget.

The filmmaking needs of each group was quite diverse. While some studio teams were keen to do all their own camera work, others called on Nanoo Nanoo or other participants to help out. This highlighted the supportive connections established between the participants where skillsets could be shared. This became an important aspect for producing six films among a cohort of 35 participants. External in-kind support also helped the teams meet their filming requirements. This included support from local makeup artists and costume designers as well as cafés, schools, shops and sports facilities offering their space as film locations. Having a single coordination point is critical at this stage to oversee proper timetabling of activities between and within groups to ensure everyone has enough time to complete filming without unnecessary pressure.

Table 2: The six films produced by young people who participated in the project.

Film	Credits*	Description
<i>Broken Mirror</i>	Director: Jacob Writers: Jacob, Angus Actors: Angus, Jordyne, Kenzie, Riley, Scott	Imagine a world where your physical body can live forever but your mental health is not talked about. <i>Broken Mirror</i> is about a person living with mental illness and the realities of what this might look like.
<i>Clicker Troubles</i>	Director: Quinn Writer: Quinn Actor: Harry	<i>Clicker Troubles</i> is about a man inside a computer who prefers solitude and gets disturbed when the computer is turned on.
<i>Deviant</i>	Directors: Brad, Megan Writer: Brad Actors: Alana, Lucas, Allourah, Angus, Ashleigh, Brenton, Britney, Dancey, Danica, Emerson, Harry, Jason, Jay, Megan	A futuristic world where android robots are forced to work in factories as slaves. <i>Deviant</i> is about being unique and breaking free from expectations.
<i>Empty Inside</i>	Director: Connor Writer: Dean Actors: Alicia, Andrea, Grady, Sean ors: Brad,	<i>Empty Inside</i> is a story of overcoming social isolation, where social media is the focus of the main character's life.
<i>S.A.D.</i>	Directors: Hollie, Megan Writer: Catherine Actors: Daved, Harry, Hollie, Jay, Paige, Scott	<i>S.A.D.</i> (Sad, Angry, Depressed) is a film about bullying, unity and acceptance. The film has two intersecting storylines of a boy who comes out to his high school friends and a socially isolated girl who is being bullied.
<i>Timeless</i>	Director: Jordyn Writers: Jordyn, Madeline Actors: Angus, Kimberley, Madeline	<i>Timeless</i> is a time travelling love story about falling in love across time and space.

\* Full names of participants withheld.

5 On project completion, total participants numbered 32.

The editing process began as soon as the first filmed scenes were ready. Some teams opted to edit their own films while others requested assistance. Where possible, assisted editing was carried out in the studio between the young people and film editors. Where the young people were unable to be in the studio, all edits were critiqued and approved by the film's writers and directors before being finalised. This involved considering aspect ratios, vision choice, audio editing, colour grading, titles and final output.

*Together we worked out a way to flip the scene around ... it worked out so well.*

(Megan, participant)

## Stage 5: Launch films

Table 1 lists the project's six short films that ranged in length from one and a half minutes to just over nine minutes. These were showcased at the Red Carpet event and local media and photographers along with parents and friends cheered on the participants who arrived in limousines. Participants had requested they all be transported together in limousines, an opportunity they had never had before and may not ever have again. The expense was met by Latrobe Youth Space with in-kind support from the limousine company.

In addition to the short films, a documentary film was made of the film festival project process covering the training activities, participant motivations and the film-making process. Short snippets from each film as well as the final Red Carpet event were included. The purpose of the documentary was to record the purpose and process of the project to inform future work. It is due for release during 2020.

## Stage 6: Support dialogue

As a final (continuous) step, it is critical to follow up on the films' themes to check that ideas are creating dialogue between the young people and the people who can respond in meaningful ways to address youth health and wellbeing, especially in times of recovery.

## Health and wellbeing outcomes: benefits and opportunities

At the time of publication, an outcome evaluation had not been completed to assess the degree to which the project had met its intended goals. Therefore, this paper does not provide a rigorous review of the benefits and challenges of the project. Also, this paper does not delve into participatory filmmaking theories and does not critique the use of film in participatory research nor does it explore the participatory process of filmmaking. Milne and colleagues (2012) can provide detail in these areas. Nevertheless, this paper provides a reflection on the three aims of the project in light of anecdotal evidence from the filmmaking process and Red Carpet event.

The completion of the six films is a significant output of the project that promoted young people's voices. Their voices reached much further than anticipated, through interactions and discussions with their peers, including family and friends, as well as health professionals during the filmmaking process. The Red Carpet event that featured the six films was attended by around 100 people as well as the Advocate, who actively supported the project throughout its duration.

The young people's voices extended beyond the Red Carpet event. People across the Latrobe Valley could tune into the live broadcast on Gippsland FM Community Radio. This shows the value of developing partnerships throughout the life of the project, which provided a greater reach of the films beyond the festival screening.

A key outcome of the project was the connection between the young people involved and the Advocate (who reports directly to the Victorian Minister for Health and provides advice to health services and decision-makers). The strengthened relationship has developed trust and young people have the confidence to approach the Advocate and discuss the issues that are important to them and advocate for social change. The project also allowed the Advocate to gain a better understanding of young people's priorities in the Latrobe Valley as well as their skills and expertise.

*I expect a lot of these young people don't get the opportunity to have a voice and what a great way that they are able to provide a view on what their experience is and through that they are showing how society needs to respond.*

(Jane Anderson, Latrobe Health Advocate)

The project adopted processes that helped young people develop social skills and overcome social isolation. The project participants used leadership skills through the filmmaking process and that built confidence in other aspects of their lives. The project offered a safe environment and many participants gained confidence to be themselves. Strong friendships have evolved, with one participant saying 'we have found our people'.

There is evidence of increased interest and participation in other Latrobe Youth Space activities. Film festival



Participants received a standing ovation at the Red Carpet event.

Image: Latrobe Youth Space

participants have signed up as new volunteers and there has been increased participation in other youth programs. This has the potential to expose them to other health and wellbeing opportunities available in the Latrobe Valley.

The completion of the project in creating films for a festival focused on youth health and wellbeing is credited to the ongoing participation and motivation of the young people involved. Critical to this was having committed partners, such as Latrobe Youth Space, whose staff and volunteers supported the participants to produce the high-quality films. To help youth continue to represent themselves, two film kits have been donated to Latrobe Youth Space for young film makers to borrow and use.

## Conclusion and next steps

This paper outlined the methods of the Latrobe Youth Film Festival project. The project was an initiative developed by practitioners and government officials working with marginalised young people to help identify and articulate their perspectives of issues relating to health and youth identity. While the issues raised in the resulting short films are prevalent in mainstream discourses, it is important to ensure these young people had and continue to have opportunities to share their thoughts and ideas on matters that affect them. This project showed that Latrobe Valley youth are concerned about bullying, stigma associated to diversity, mental health and social isolation. Importantly, they have the courage to share these concerns with their family, friends and health professionals, including the Latrobe Health Advocate.

The Latrobe Youth Film Festival participants and the project team are planning a film festival roadshow during 2020 to promote health and wellbeing opportunities. It is hoped the next cohort of participants will be enticed to participate in the 2020 film festival project. Latrobe City Council have expressed interest in showing the short films at other locations during 2020 Youth Week celebrations. The short films will be available through Latrobe Youth Space's social media channels. The LYFF project team agreed this was an excellent outcome for the talented young people who participated in the project and for the overall health and wellbeing opportunities for youth in the Latrobe Valley.

## Acknowledgements

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## ABSTRACT

Recent events in Aotearoa New Zealand, such as the Canterbury earthquakes in 2010 and 2011 and the Kaikōura earthquake in 2016, highlight the need for comprehensive and inclusive disaster education programs that are geographically and contextually relevant. Disaster risk reduction activities in Aotearoa New Zealand have historically adopted a top-down, expert-driven approach. They have also employed relatively homogenous methods for how communities in New Zealand can prepare for and respond to disasters. As a result, the inclusion of Māori communities and voices within traditional disaster risk reduction planning has been sparse. In addition, there is a lack of preparedness materials for tsunami designed specifically by Māori with Māori community needs front and centre. This paper documents a pilot education project taking an inclusive approach to increasing the knowledge and preparedness of tamariki (children) and rangatahi (youth) in coastal areas of Aotearoa New Zealand that are vulnerable to tsunami. Research was undertaken to develop a toolkit with kura kaupapa Māori (Māori-language immersion schools) and schools located in tsunami evacuation zones in Hawke's Bay, on the east coast of the North Island. A Māori-led, bi-cultural approach to developing and running the activities was taken. The aim was to create culturally and locally relevant materials for ākonga (students) and kura kaupapa Māori as well as giving ākonga a proactive role in making their communities better prepared for a tsunami event.

# Kura e Tai Āniwhaniwha (schools and tsunami): bi-cultural and student-centred tsunami education in Aotearoa New Zealand

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## Introduction

Aotearoa New Zealand is exposed to natural hazards such as earthquakes, volcanic eruptions, floods and landslides (Crozier & Aggett 2000). These hazards are linked to New Zealand's location on the boundary of the Australian and the Pacific tectonic plates and Ranginui (Sky Father) and Papatūānuku (Earth Mother). The National Hazardscape Report (Officials Committee for Domestic and External Security Coordination 2007) and *National Civil Defence Emergency Management Plan Order 2015* (Ministry of Civil Defence and Emergency Management [MCDEM] 2015) identify the most prevalent hazards from a traditional science perspective. Therefore, most mainstream hazard education resources take a similar approach to sharing science knowledge and, in the main, do not recognise Mātauranga Māori. This is despite the extensive knowledge Māori have of their local area and the history of hazards from both the land and from the sea.

Building natural hazard risk awareness, risk literacy and risk management capability is a focus of the *National Disaster Resilience Strategy* (MCDEM 2019). As such, emphasis is being placed on natural hazards education, particularly within schools.

Most schools in Aotearoa New Zealand teach the national curriculum and are secular (non-religious). In the late 1980s, kura kaupapa Māori were established to support Māori tamariki and their families to reinforce cultural identity by enabling Māori language and culture to flourish in education. These schools operate fully or partially under Māori custom and have curricula developed to include Te Reo Māori and Tikanga Māori (Māori language and cultural practices). Māori kaupapa (values), Mātauranga Māori (Māori knowledge) and Te Reo (language) are crucial considerations for the development of education resources developed for kura, bilingual and mainstream schools.

A glossary of Māori words is included at the end of this paper.

The impetus of this research was to develop culturally appropriate tsunami education resources for kuru and schools while also promoting tsunami risk reduction. This Māori-centred research takes a school community-based-participatory approach, framed by qualitative and kaupapa Māori research methodologies and uses a range of data collection methods including interviews, focus groups and surveys. Researchers collaborated with Māori education stakeholders, kaiako (Māori teachers), senior Māori researchers and whānau (family) throughout the project to ensure it aligned with the school kaupapa values and national curricula. The education program applied a tuākana/tēina mentorship Māori teaching-and-learning approach in which high-school-aged ākonga (tuākana) developed tsunami preparedness activities to run with primary-school-aged ākonga (tēina). At the end of the education program, ākonga in high schools were asked to reflect on their participation, what they had learnt and what they had enjoyed during the activities.

## Background

Schools play a crucial role in raising awareness of natural hazards, risk and risk reduction among students, teachers and parents (Shaw *et al.* 2004). In the literature concerning disaster risk reduction, it is suggested the importance of disaster education at school is increasing because:

- children are one of the most vulnerable groups of a society during a disaster
- children represent future resilience
- schools serve as central locations within communities for meetings and group activities
- effects of education can be transferred to parents and the community (Shiwaku 2009).



Tamariki (children) building tsunami resilient structures.

Image: Lucy Kaiser

There are several studies in New Zealand that recognise the value of hazards education programs in schools and the benefits to children who are repeatedly involved in hazard education activities (Ronan & Johnston 2001). King and Tarrant (2013) also suggest that there are numerous benefits of integrated school hazard education programs. These include increased awareness of risks (Mitchell *et al.* 2008, Ronan & Johnston 2001) and motivating preparedness actions (Shaw *et al.* 2004).

The literature indicates that knowledge is a key aspect of positive coping. It can assist young people to understand the processes of a natural hazard event and its effects and they can feel less stressed and less out-of-control following such events.

*Children's knowledge of safe practices regarding earthquakes and tsunami was confirmed as a key aspect of their belief that they would be able to cope in the event of an earthquake.*

(King & Tarrant 2013, p.24).

Additionally, Peek (2008) argued that programs within schools have the potential for great impact on communities. Additional studies confirm that children who participate in school-based hazards education programs have more accurate knowledge of hazards, reduced levels of fear and realistic risk perceptions compared to their peers (Johnson *et al.* 2014)

## Hikurangi subduction zone and tsunami risk reduction

The Hikurangi subduction zone lies off the east coast of the North Island and poses a significant risk to local communities. From a social science perspective, little is known about how communities relate to and interpret education resources and their correlation to changing preparedness behaviours in relation to earthquakes and tsunami along the Hikurangi subduction zone. As a result, there is ample opportunity for the creation of culturally appropriate and location-specific tsunami risk reduction educational activities for at-risk areas of Hawke's Bay region (one of the regions most likely to be affected by a large earthquake and tsunami from the Hikurangi subduction zone).

## Local tsunami education research activities

This project was designed to align with two existing programs that were developed in Hawke's Bay; Me Noho Takatū and Tsunami Safer Schools. Both projects increase the participation of schools and children in disaster risk reduction and increase local knowledge of tsunami risk. While both projects are inclusive of all schools and early childhood education centres in the region, Te Hikoi a Rūamoko is developed by Māori and places indigenous knowledge and indigenous audiences at its centre.

A multi-year project, Me Noho Takatū 'Be Prepared', was developed and piloted in Hawke's Bay led by the Hawke's Bay Civil Defence and Emergency Management



Figure 1: Te Hiko a Rūamoko tsunami education project materials.

Image: Courtesy of East Coast LAB

Group. Through this project, a bilingual pukapuka (book) was produced, *Te Hiko a Rūamoko* (*Rūamoko's Walk*) based on Ngāti Kahungunu iwi (tribe) pūrākau (stories) that relate to earthquake and tsunami warnings and preparedness within their region (Ehrhardt 2014). The project was considered a success for increasing hazard resilience for tamariki, educators and wider whānau. Project materials were received positively (see Figure 1). The pukapuka will be digitised into an interactive medium with animation and informative pop ups.

The Tsunami Safer Schools project (Johnston *et al.* 2016) was led by the East Coast LAB. The project developed a toolbox for Civil Defence Emergency Management groups to use to help early childhood education centres and schools become tsunami safer schools. Early learning services and schools in Gisborne, Napier and Wellington provided input for the guide. The toolbox includes practice guides and templates for response procedures, guidelines for communicating with families and emergency services agencies, information sheets for parents and teachers as well as guidelines to carry out annual tsunami evacuation walks.

## Methodology

This project used a school-based participatory research model so it was important that the school community was involved. The research was structured using discussions in hui (Māori-medium meetings and workshops) with school staff and kaiako and the content and direction of lessons were informed by feedback from the students involved. The project was conducted in accordance with a kaupapa Māori methodology ensuring that the research was designed by and for Māori, addressed Māori concerns, was implemented by Māori researchers and conducted in accordance with Māori cultural values and research practices (Smith 2013). Some of the principles of Smith's work were adopted and four kaupapa Māori values were identified to determine that holistic long-term community resilience projects contribute to:

- Mōhiotanga (capable): people understand the risks they face and know how to reduce and manage these risks. Participants know what to do and how to help each other in the event of an emergency.
- Whanaungatanga (connected): there is a strong community spirit. People are connected and have relationships with other people within, and outside, their community.
- Manaakitanga (caring): people, families and communities look after each other. They ensure that everyone is cared for physically and emotionally.
- Kotahitanga (collaborative): people, households and communities work together. They reduce their risks together, get ready together, respond to emergencies together and recover together.

Culturally, it was important that, as often as possible, meetings were conducted 'kanohi ki te kanohi' (face-to-face). Cultural and educational guidance and expertise were provided by two senior academic mentors who provided peer review throughout the project. To ensure human ethics requirements were followed, a low risk ethics notification was lodged via Massey University for this project (Ethics Notification Number: 4000018005).

Data collection methods included a combination of hui, focus groups, observation and qualitative surveys using a bricolage approach that draws from thematic and content analysis methods (Denzin & Ryan 2007). Evaluation at the beginning and the end of the project was conducted using a combination of informal discussion and surveys. Transcripts and surveys were coded thematically by the research team to develop core themes (Saldaña 2009).

There were limitations to this research. In terms of engagement, only one member of the research team was based full-time in the community, therefore kanohi ki te kanohi (face-to-face) meetings were not possible as often as liked. Additionally, at the outset of the project researchers did not have established relationships and the team had limited time to engage with kura, kaiako and ākonga. As this project was a small pilot project, the



Classroom sessions were facilitated by East Coast LAB.

Image: Lucy Kaiser



team did not conduct a comparative program at different schools in the region to compare and contrast the findings. However, a similar program was conducted with a Kura in Wellington (concluding in April 2020) that used the findings from this research. This project involved a small number of participants and there was little capacity to conduct in-depth quantitative or qualitative analysis that would offer statistically significant data. However, reflections and feedback from participants provided insights for future project iterations.

## Activity design

Before developing the kete of activities, the research team and the principal of the kura wanted to find out what would be most useful for the kura and school communities. To do this, a hui was co-facilitated with kura and school staff to provide specific information about tsunami risk in their community to understand what kaiako already knew about tsunami risk and what activities and knowledge they would consider useful for their ākonga. A focus group workshop with 17 participants including school staff, kaiako, kōhanga reo kaiako (early childhood education teachers) and whānau (family members) was carried out with guided group discussions of a series of thematic questions. Participants were asked what activities their ākonga found most engaging. A range of activities was identified such as waiata (songs), drawing, creative writing, physical activities and art. These were included in the activity design to reach the broad range of ākonga.

The structure of the activities was framed using a Te Ao Māori kaupapa framework, a holistic approach to tsunami resilience adapted from Durie's public health model, Te Whare Tapa Whā (Durie 1994) that is addressed in the kura curriculum. In order to support tsunami resilient communities, the kura and the school community filled four kete (baskets) with contextually appropriate

activities that improve tsunami awareness, preparedness and knowledge (see Figure 2).

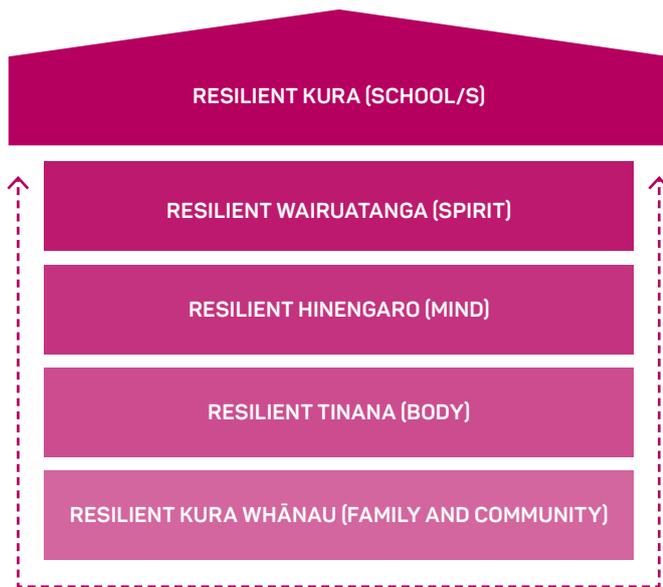
The five learning sessions consisted of several modules to learn more about tsunami and tsunami preparedness as well as interactive activities including creative writing, singing, drawing and group discussion. Mātauranga Māori (Māori knowledge) and Māori kupu (words) were integrated into the sessions. The first four sessions were conducted in the classroom of the high school ākonga while the fifth and final sessions included a visit to the primary school to run the activities that the ākonga had designed. While the initial lesson plan framework was created in collaboration with the kaiako and the kura staff, the ākonga informed the content of the lessons and had autonomy for designing and facilitating their tamariki activities. At the conclusion of the two-week program, the high school ākonga completed a survey and reflected on what they had learnt.

## Findings

### Student pre-program exercise

An activity was conducted at the outset of the sessions with the ākonga to benchmark what they knew about tsunami, what they were interested in learning about and what their classroom rules would be (see Figure 3). The evaluation was run in groups of two for discussions that was followed with classroom discussions. Responses from ākonga were recorded on large pieces of paper that were revisited at the conclusion of the classroom sessions to stimulate reflection.

In terms of what ākonga already knew about tsunami, there was limited knowledge of how tsunami occur and the science behind them. Additionally, awareness about civil defence messaging for tsunami such as 'if it's



**Whakaoranga Tinana Kete (Resilient Body):** This kete enhances bodily safety of people in the event of a tsunami through the practice of physical drills to collect data for the citizen science component of this research

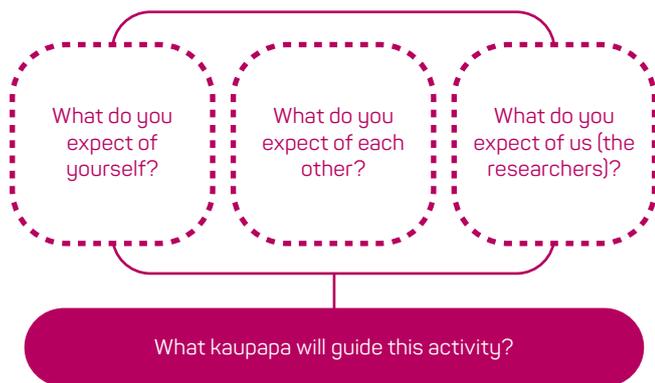
**Whakaoranga Hinengaro Kete (Resilient Mind):** This kete increases knowledge on the 'how' and 'why' of tsunami, the history of the whenua and moana in the rohe and sharing knowledge of tsunami with others.

**Whakaoranga Wairuatanga Kete (Resilient Spirit):** This kete protects and fosters wairua to help people build psychological resilience and encourages the idea that it is ok to be scared but by being prepared and having a plan we can become resilient.

**Whakaoranga Whānau (Resilient Family and Community):** This kete is focused on enhancing tsunami safety for the wider whānau and community by identifying ways communities can work together to make evacuations quicker and safer.

Figure 2: Whakaoranga Kura (resilient school) framework.

Split up into pairs and think about the following questions:



What do you already know about each of the topics?

What do you want to know about each of these topics?

- |                 |                  |
|-----------------|------------------|
| Preparedness    | Science          |
| Earthquakes     | Emergencies      |
| Vulnerabilities | Community        |
| Tsunami         | Mātauranga Māori |

Figure 3: Pre-program exercise questions.

long and strong get gone' and what to do in the event of a tsunami was low among the ākonga. Earthquakes were mentioned frequently by ākonga, which may have been due to experience of semi-regular earthquakes of moderate size in the region (Becker *et al.* 2017, p.4), prolific media attention on the 2010, 2011 and 2016 earthquakes (Carter & Kenney 2018) or regular public and school-based campaigns on earthquake preparedness. Confidence of ākonga discussing mātauranga Māori and using Te Reo was also mixed with some ākonga happy to discuss pūrākau (oral histories) and speak in Te Reo, while others were more reluctant.

### Student post-program reflections

The high-school-aged students (N=31) completed a short survey evaluating the education program. There were

three open-ended questions used to understand the ākonga thoughts and reflections on the activities and to improve the development and facilitation of future kura-centred tsunami education activities. The questions were:

**Q1-What is something new you have learnt about tsunami over the last five sessions?**

**Q2-What is something you have learnt while designing and carrying out your activity with the tamariki?**

**Q3-What was your favourite part of the project?**

Several ākonga addressed multiple points in a single answer while others responded to one or two of the open-ended questions.

### *Q1-What is something new you have learnt about tsunami over the last five sessions?*

Ākonga discussed a range of tsunami-related learnings particularly in the civil defence and preparedness realm. Answers included that they knew 'to go inland or to higher land', 'if an earthquake is long and strong, get gone', 'our school would have less than 30 minutes to evacuate in the event of a near-source tsunami', 'we need to have a family discussion about emergencies', 'do not wait for tsunami sirens' and 'what to have in a survival kit (only the necessities; torch, radio, medication)'. Ākonga were also aware of the location of evacuation zones; what the different colours meant on evacuation maps and where they could find maps online. Much of the civil defence and preparedness information was disseminated in the form of interactive activities and discussions as opposed to lectures. As such, the experiential nature of these activities could be a potential contributing factor for ākonga retaining this knowledge.

### *Q2-What is something you have learnt while designing and carrying out your activity with the students?*

Student answers to this question were largely focused on group dynamics and their interactions with the younger students. Respondents discussed their ability to work in groups and be productive when they weren't supervised: 'it wasn't as easy as it may seem to teach [tamariki] new things' but 'once you're organised and ready it's easy to teach children', '[tamariki] love giving things a try' and that they 'listen well and would act quick if there was a tsunami'. They also reported that '[tamariki] learn easier through hands-on activities' and that it was 'important to make activities interactive'. Some ākonga who were initially reluctant to work with younger students reported that tamariki are 'really nice to work with' and they enjoyed the experience.

### *Q3-What was your favourite part of the project?*

The majority of all responses showed that the trip to the school to teach the tamariki the activities was their favourite part of the project. Many of them enjoyed meeting the tamariki and expressed a wish to return to the school in the future for another activity. One ākonga reflected that these activities were important because it showed that 'we should take things seriously for younger ones'. Several ākonga identified that learning and teaching the tsunami rap to the ākonga and performing it as a big group was a highlight for them and they were proud to see the results of their work.

This feedback was useful for understanding participant thoughts on some of the research outcomes. However, feedback was not analysed in-depth for themes due to the short and informal nature of the survey and the small number of participants. Still, it gives a broad understanding of the ākonga' reported experiences. Formal evaluation of the primary-school-aged tamariki did not occur as it was not within the approved ethical parameters of this project. Kura staff indicated that tamariki found the activities enjoyable, however, a single

session was unlikely to make a significant impact on their personal tsunami resilience.

## Reflections

Classroom management was a challenge due to the number of ākonga and the amount of semi-unsupervised group work that meant it was hard to keep everyone on track. The support of the kaiako was extremely helpful to maintain order in the classroom. For future iterations of the program, a smaller group size is recommended.

Time management was also difficult. The initial lesson plan was developed in collaboration with the kaiako to comply with the classroom curriculum and to be responsive to what the ākonga reported they wanted to learn. However, all planned activities could not be conducted across the first few sessions as more questions were raised than anticipated. It was clear that the lecture style of presentations was not very engaging for some of the ākonga. This was anticipated to some degree based on feedback from the kura hui as well as by previous experiences working with ākonga. Future lessons would benefit from a balance of presentations and interactive activities.

Finally, for ākonga-run activities, the groups prepared at different levels and, as multiple activities were run concurrently, it was hard to maintain structure and order as well as provide assistance to each group. Better planning and supervision of the groups, as well as backup activities to keep everyone engaged, is required. Fortunately, the tsunami rap could be adapted for any group size so ākonga who lost focus could be directed to join this group and contribute.

Including kura kaiako and staff in the development and implementation of education activities is crucial to the success of such projects. It is important to engage members early and often to ensure that activities can be accommodated into school calendars.

## Conclusions

The reflections provide guidance to the suitability of the four holistic outcomes as aspirations for future programs as well as what resonated with ākonga. In terms of *mōhiotanga* (capability), what to do in the event of a tsunami and preparedness actions were front of mind for many of the respondents. Further research into the reasons why this information resonated with ākonga could reveal motivations to act. In terms of *whanaungatanga* (connectedness), many of the ākonga were ex-pupils of the kura or had younger siblings. There was an observed enthusiastic performance of *waiata* and *haka* at each of the schools, which indicated a sense of cultural pride and connection. In terms of *manaakitanga* (caring), some of the ākonga discussed feeling a responsibility to ensure that tamariki are safe in the event of a tsunami and saw fostering resilience for others as important. In relation to *kotahitanga* (collaboration), this was facilitated through group work

and working with both schools. Based on the desire of some of the ākonga to return to the kura (and the kotahitanga that already exists between the schools), there are opportunities for further work using a tuākana/tēina model for increasing tsunami preparedness.

This project was small in scope but offers opportunity for work in this area with the same or other schools to develop tsunami activities that embrace Māori kaupapa and bi-cultural learning. This aim is to enhance the resilience of our coastal communities, schools and students to tsunami and other natural hazards.

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## Glossary

Te Reo Māori	English
Ākonga	students
Hikoi	to walk, trek, journey
Hui	to gather, congregate, assemble, meet
Iwi	tribe
Kaumātua	elder - a person of status within the whānau
Kai	food, to share a meal
Kaiako	teachers
Kanohi ki te kanohi	face-to-face, in person
Karakia	to recite ritual chants, say grace, pray, say a blessing
Kaupapa	topic, policy, purpose, matter for discussion
Kaupapa Māori	Māori approach, Māori topic, Māori customary practice, Māori institution, Māori agenda, Māori principles, Māori ideology; a philosophical doctrine, incorporating the knowledge, skills, attitudes and values of Māori society
Kawa	specific karakia and customs for the opening of new houses, canoes and other important events
Kete	basket, kit
Kia Takatū	to prepare, get ready (people)
Koha	Gift, contribution
Kōhanga reo	early childhood education centre that uses Māori kauapa values, tikanga, kawa and aspirations to guide their practice
Kōrero	discussion
Kura	school
Mahi	work, accomplish, practise
Mana	prestige, authority, influence, status, influence
Māori	Indigenous people of Aotearoa New Zealand
Mātauranga Māori	Māori knowledge - the body of knowledge originating from Māori ancestors, including the Māori world view and perspectives, Māori creativity and cultural practices
Mihi	to greet, pay tribute, acknowledge, thank
Rangatahi	younger generation, youth
Rūaumoko	a Māori ancestor with influence over earthquake, volcanic and geothermal activity
Rohe	area of land, boundary, territory,
Rōpū	Group, committee
Parawhenua	the personified form of the waters of earth, associated with tsunami
Pukapuka	book
Pūrākau	cultural stories passed down through ancestral lines
Tamariki	children
Tangata Whenua	Indigenous people - people born of the whenua (i.e. where the people's ancestors have lived and where their placenta are buried)
Te Ao Māori	a Māori worldview
Te Reo Māori	Māori language
Tēina	younger brother, sister
Te Whare Tapa Whā	a model for understanding Māori health
Tikanga	customary protocols - the customary system of values and practices that have developed over time and are deeply embedded in the social context
Tuākana	elder brother, sister
Waiata	song
Whakapapa	genealogy, lineage, descent
Whānau	extended family

## ABSTRACT

The world is rapidly urbanising. In 1950, only 30 per cent of the world's population lived in urban areas. That proportion has increased to 55 per cent in 2018 (United Nations 2018a) and is predicted to reach 68 per cent by 2050 (United Nations 2018b). Governments are struggling to cope with the pace of urbanisation as well as maximising the opportunities urban centres can offer. In Australia, urbanisation has created issues including economic, environmental, social infrastructure, waste disposal, energy and natural resources. The United Nations Conference on Housing and Sustainable Urban Development (Habitat-III), held in October 2016 in Quito, Ecuador, generated the *New Urban Agenda* (United Nations 2016a) that is a shared vision of the global community and a global framework for sustainable urban development and urbanisation for the next 20 years. This paper discusses the main features of the *New Urban Agenda*, its development, key elements and relationships. The paper highlights Australia's role in implementing the *New Urban Agenda* and considers how Australian cities are preparing for sustainable and equitable growth.

# Habitat-III and the New Urban Agenda: implications for Australia

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## Introduction

Urban centres offer the economic opportunity and prospects of higher living standards. But unplanned urbanisation exposes populations to social, physical, environmental and political risks. Cities that are growing fast in mid-low-income countries are experiencing increased concentrations of poverty and lower quality of life. The cost of living, especially of housing, has pushed the poor to settle in hazardous areas, areas exposed to flood and fire risks and in slums or in informal settlements.

In recognition of poor living conditions and the growing need for improved human settlements, especially in developing countries, the first United Nations Conference on Human Settlements, Habitat-I, was held in Vancouver, Canada in 1976. Since then, Habitat conferences have been held every 20 years; Habitat-II in 1996 in Istanbul Turkey and Habitat-III in Quito, Ecuador in 2016. Habitat-IV is planned for 2036.

Habitat-III adopted the *New Urban Agenda*, which was endorsed by the United Nations General Assembly in December 2016. The agenda is an expression of the global realisation that, if well-planned and well-managed, urbanisation can be a powerful tool for sustainable growth for developing and developed countries. The *New Urban Agenda* is closely linked with many other global frameworks and goals, especially the *Sendai Framework for Disaster Risk Reduction* (United Nations Office for Disaster Risk Reduction 2015) and the Sustainable Development Goals (United Nations 2015).

The internationally respected *The Sphere Handbook* (Sphere Association 2018) defines common principles and incorporates the Core Humanitarian Standards (Core Humanitarian Standard 2014) that reflect the quality and effectiveness of humanitarian responses. In late 2016, a companion publication, *Using the Sphere Standards in Urban Settings*, was released. This responds to the realisation that:

*...humanitarian response in urban situations is substantially different from what it is in rural situations, and that the number and scale of urban humanitarian responses will continue to grow as more of the world's population move to towns and cities.*

(Mountfield 2016)

The Habitat process and the content of the *New Urban Agenda* seem under-discussed in the Australian context. This paper aims to:

- build an understanding of the *New Urban Agenda* to guide the urbanisation process in Australia, as well as Australia's international engagement
- identify the development of the Habitat process and the key elements and commitments of the *New Urban Agenda* and discuss the global

relationships in development practices, especially in managing urbanisation

- consider three specific influences of Habitat-III and the *New Urban Agenda* in the Australian context, namely Australian cities design policy and planning, Australian Government aid to developing countries and the international development activities of Australian institutions and companies.

## Urbanisation

There is no standard definition of city or urban area. The criteria used by countries to define a place as 'urban' includes population size, population density, type of economic activity, physical characteristics, level of infrastructure or a combination of these and other criteria (Deuskar 2015). The 'city' is generally characterised by large human settlements with infrastructure, communication, transportation, industries, businesses, utilities and other services. 'Urban' is the expression of life in the city.

Urbanisation is a process whereby a society changes from a rural to an urban way of life. It refers also to the gradual increase in the proportion of people living in urban areas. Urbanisation is a process where people and society move from a traditional and rural way of living to a modern way of living by accessing market services and facilities in cities (Pawan 2016).

Urbanisation and urban centres offer hope for a better life, education, health and access to modern services and facilities. When urbanisation goes wrong, it can create many economic and environmental problems and social tensions and makes the population vulnerable to a variety of hazards.

Additionally, the poorer and socially disadvantaged communities are disproportionately adversely affected by disasters. As many cities are situated in flood plains, on coastal zones or sitting on tectonic fault lines, a greater number of vulnerable people are exposed to the risks of disasters. Former United States Federal Emergency Management Agency administrator, Craig Fugate, suggested that, with increased urban sprawl, more people are living in the urban-wildland interface and are at increased risk of bushfires (McKay 2009). Fugate (2017) promotes the perspective that 'floods and hurricanes happen. The hazard itself is not the disaster—it's our habits, our building codes. It's how we build and live in those areas — that's the disaster'.

Sustainable urbanisation has become a priority for the global community and governments from both developing and developed countries to deliver a quality life for people as well as to maximise economic and technological opportunities. Habitat-III, therefore, focused on cities, city planning and life in cities. Habitat-III was a paradigm shift of urbanisation as a tool for development. The conference conveyed a clear message that the pattern of urbanisation needs to change in order to better respond to challenges and address issues such as inequality, climate change, informality, insecurity and

the unsustainable forms of urban expansion (United Nations n.d.).

## Methodology

A review was undertaken to identify outcome documents of the Habitat process, especially the declarations from Habitat-I, Habitat-II, Habitat-III and the *New Urban Agenda*. Using these documents, a thematic analysis identified development, key elements and relationships. A limited review and reflection on the commentary and follow-up actions generated in Australia and internationally complemented the thematic analysis. This paper is also informed by personal experiences, observations and engagement in the Habitat processes, the Quito Conference, the *New Urban Agenda* and its implementation.

## Development of the Habitat process

The Habitat process started with the UN Conference on Human Settlements, held in Vancouver, Canada in 1976. The conference was organised in response to a growing recognition of the deteriorating conditions of human settlements, especially in less-developed countries. It acknowledged the need to improve living conditions to satisfy basic human rights, health, education and shelter. The conference outcome was the Vancouver Declaration and Vancouver Action Agenda (United Nations 1976).

In 1996, the second UN Conference on Human Settlements, Habitat-II, was held in Istanbul, Turkey and generated the Istanbul Declaration (United Nations 1996). Habitat-II and the Istanbul Declaration were a clear recognition of urban issues, challenges and opportunities.

The UN Conference on Sustainable Housing and Urban Development, Habitat-III, was held in Quito, Ecuador in 2016. Habitat-III generated the Quito Declaration on Housing and Sustainable Urban Development, now called the *New Urban Agenda* (United Nations 2016b). An extensive, structured, multi-year planning and consultative process underpinned the conference. Over 30,000 conference participants came together to collaborate on this common vision for sustainable urban development; the biggest ever in the history of these global conferences. Habitat-III was a unique opportunity to discuss the important challenge of how cities, towns and villages are planned and managed in order to fulfil their role as drivers of sustainable development and shape the implementation of new global development and climate change goals.

The three Habitat conferences are summarised in Figure 1.

Due to rapid urbanisation and population growth, global demography is changing. Figure 2 illustrates the changes in urban population over time (United Nations 2018b).



### 1976, Vancouver, Canada

Outcome - The Vancouver Declaration on Human Settlements and Vancouver Action Plan.

- Recognises the need for sustainable human settlement and sustainable urban development and that shelter and urbanisation are global issues to be addressed collectively.
- Creation of the United Nations Center for Human Settlements (UNCHS-Habitat).

### 1996, Istanbul, Turkey

Outcome - the Istanbul Declaration and adopted Habitat Agenda as a plan of action to drive development in an urbanising world.

- Recognises that cities are the engines of global growth, urbanisation is an opportunity and calls for a stronger role of local authorities.

### 2016, Quito, Ecuador

Outcome - the Quito Declaration, the *New Urban Agenda*.

- Builds on the Istanbul Declaration and Habitat Agenda.
- Recognises the correlation between good urbanisation and development.
- Highlights the connection of the New Urban Agenda to Sustainable Development Goals and *Sendai Framework for Disaster Risk Reduction 2015–2030*.

Figure 1: Summary of the Habitat conferences.



## The New Urban Agenda

The *New Urban Agenda* was adopted by 167 nations at the Habitat-III Conference and endorsed by the United Nations General Assembly in December 2016.

The *New Urban Agenda* is a collective vision and political commitment by governments

and the international community for sustainable urban development that recognises the role cities and human settlements play in leveraging opportunities for sustainable development. The *New Urban Agenda* lays down a global framework for an equitable distribution of urban opportunities and sustainable urban development. Hence, it is important that practitioners and academia are informed by the *New Urban Agenda* and its influences on urbanisation.

The *New Urban Agenda* is equally applicable in developed and developing countries. Its theme is consistent with related international frameworks, mainly the Sustainable Development Goals (United Nations 2015), the *Sendai Framework for Disaster Risk Reduction* (United Nations Office for Disaster Risk Reduction 2015), the *Paris Agreement on Climate Change* (United Nations Climate Change 2018) and World Humanitarian Summit (United Nations 2016b).



Permanent Representative of Australia to the United Nations, Gillian Bird, and Suresh Pokharel participated in the Urban Resilience networking session organised by Plan International Australia, and Planning Institute Australia, supported by Arup.

Image: Arup

## Elements and global commitments of the *New Urban Agenda*

The global community has expressed commitment to improve the way cities are planned and acknowledges the role of governments. The promise is for a 'people centric' approach to establish urban governance and implement urban policies and planning.



Figure 2: Urban population at the time of the Habitat conferences.

The *New Urban Agenda* has three main guiding principles:

1. Leave no one behind: ensure urban processes are inclusive of all sectors and segments of societies including governments; the private sector; civil societies including vulnerable groups, children, women and girls, people with disabilities, older people and Indigenous communities and that urban benefits are distributed equally to all groups and people living in cities.
2. Achieve sustainable and inclusive prosperity: urban economies include urban growth with proper spatial planning; economic growth that relies on productive capital and sustainable consumption, creation of jobs and employment opportunity and equal access to infrastructure and services.
3. Ensure environmental sustainability: include greener

technology, low-carbon economies, ecosystems-based economy, urban development and urban resilience.

Table 1 presents the transformative agenda and global commitments endorsed through the *New Urban Agenda*.

The United Nations Human Settlements Program (UN Habitat) is a focal organisation within the United Nations on sustainable urbanisation and human settlements. UN Habitat coordinates the implementation of the *New Urban Agenda* and provides a range of free-access resources to support urbanisation processes. UN Habitat's 2020–2025 Strategic Plan adopts a 'Theory of Change' to articulate the relationship of sustainable urbanisation with the overall notion of sustainable development'. The plan puts forward four 'Domains of Change/Focus Areas' (see Figure 3), each being

Table 1: Transformative agenda and the global commitment of the *New Urban Agenda*.

Transformative agenda	Global Commitments to support the <i>New Urban Agenda</i>
Sustainable urban development for social inclusion and ending poverty	Integrated, age- and gender-responsive, disability inclusive policies for infrastructure and services. Affordable, sustainable and equitable access to urban infrastructure. Institutional, political, legal and financial mechanisms Support to national, provincial and local governments in fulfilling their role. Safe, healthy, inclusive and secure environment.
Sustainable and inclusive urban prosperity and opportunities for all	Sustained, inclusive and sustainable economic growth with full and productive employment and decent work. Affordable housing and finance for housing. National, provincial and local institutions to support local economies. Territorial systems that integrate urban and rural functions. Sustainable transport and mobility as well as technology and communications networks and infrastructure. Use of renewable and affordable energy, efficient transport infrastructure and services.
Environmentally sustainable and resilient urban development	Sustainable management of natural resources. A smart-city approach that makes use of opportunities from digitalisation, clean energy and technologies. Promoting the ecological and social function of land. Environmentally sound water and waste management. Sustainable, renewable and affordable energy. Disaster risk reduction, climate change mitigation and adaptation at all levels. 'Resilience building' and integration of the 'build back better' principles.
Building the urban governance structure: establishing a supportive framework	Participatory urban policies, coordination and cooperation among national and local governments. Legal and policy frameworks based on the principles of equality and non-discrimination. Inclusive governance at all levels and reliable financing mechanisms. Partnerships with communities, civil society and the private sector. Participatory age- and gender-responsive urban and territorial policy and planning processes.
Planning and managing urban spatial development	Integrated planning to balance short-term needs and long-term goals. Urban and territorial planning integrating disaster risk reduction and climate change adaptation and mitigation. Measures for urban safety, prevention of crime and violence, terrorism and extremism. Compliance with legal requirements through strong and inclusive management frameworks and accountable institutions. Land-use planning, improved building codes and standards, development permits and decentralised decision-making.

underpinned by four measurable outcome areas cross-referenced to the Sustainable Development Goals. There are four critical social inclusion areas and two cross-cutting themes to support the implementation of the *New Urban Agenda* (United Nations n.d.).

UN Habitat works in close collaboration with other UN agencies to complement the Sustainable Development Goals monitoring process by including specific components of the *New Urban Agenda* that are not covered by Sustainable Development Goals indicators. UN Habitat is developing guidelines for country-led, voluntary reporting on the implementation of the *New Urban Agenda*. The lead role in reporting lies with national governments. In the lead-up to Habitat-IV in 2036, UN Habitat will work with countries and other stakeholders to monitor progress and develop quadrennial reports to cover the progress in implementing the *New Urban Agenda* (United Nations 2018c).

## Relationships of the *New Urban Agenda* to other global frameworks

The basic premises of the *New Urban Agenda* is that, if well-managed, urbanisation offers great benefit to people and countries and can be a powerful tool to achieve sustainable development. The *New Urban Agenda* is an extension of the United Nations *Transforming our world: the 2030 Agenda for Sustainable Development*, the Sustainable Development Goals and the *Sendai Framework for Disaster Risk Reduction* (United Nations Office for Disaster Risk Reduction 2015) in urban centres and especially reflects the Sustainable Development Goals shown in Table 2.

The Sustainable Development Goal 11 strongly aligns with the *New Urban Agenda*, which provides the vehicle to achieve the goals and meet targets of sustainability.

## The *New Urban Agenda* and Australia

At Habitat-III, Australia was represented by Ambassador and Permanent Representative of Australia to the United Nations, Ms. Jillian Bird. Australia has adopted the *New Urban Agenda* along with the other 167 countries (Australian Mission to the United Nations n.d.).

Australia is already one of the world's most urbanised countries with almost 90 per cent of people living in urban areas, mainly on the eastern seaboard, which is exposed to a range of stresses and shocks. Projections suggest that by 2051 Melbourne will be home to approximately 7.7 million people and is likely to be Australia's largest city (City of Melbourne 2016). In addition, 1.6 million new dwellings will be required for Melbourne residents over the coming 35 years (Department of Transport, Planning and Local Infrastructure 2017). The existing infrastructure and

Table 2: Sustainable Development Goals linked with *New Urban Agenda*.

Sustainable Development Goals	<i>New Urban Agenda</i> themes
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all.
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
Goal 11	Make cities and human settlements Inclusive, safe resilient and sustainable.

services, for example roads and transportation, schools and hospitals are already stretched and demand will grow for new capacity. The number of people who are homeless in major cities in Australia equals 50 in every 10,000 people (Homelessness Australia n.d.). These numbers, as well as issues linked with homelessness, are indicators to rethink city planning or management or both. Australian city planners need to plan for continued growth, to capitalise on opportunities and manage impacts on social services, infrastructure and the natural environment as well as building resilience to natural hazards and disasters. The *New Urban Agenda* provides a new lens to approach city planning and urban development to respond to current issues and accommodate the future growth of cities.

The Sustainable Development Goals Index and Dashboards Report 2018 ranked Australia 37 out of 156 countries (Stiftung & Sustainable Development Solutions Network 2018). The Australian Government has produced a progress report, Implementation of Sustainable Development Goals (Department of Foreign Affairs and Trade 2018), however, reference to the *New Urban Agenda* is missing in this report.

In February 2019, the Australian Government Senate Report on the Sustainable Development Goals listed 18 recommendations, all of which demand a whole-of-government proactive response to design and implement policy and planning mechanisms to achieve the Sustainable Development Goals. This highlights the need for inter-departmental coordination as well as cooperation with the private sectors and communities (Parliament of Australia 2019). It is estimated that up to 65 per cent of the Sustainable Development Goal targets will need to be met in or by cities. By this account, the implementation of the *New Urban Agenda* is both 'means' and 'goal' for sustainable development in Australia.

There has been some progress in the implementation of the *New Urban Agenda* in Australia. The cities of Melbourne and Sydney, as a part of 100RC project (100 Resilient Cities) have developed the *Resilient Melbourne*



Figure 3: Domains of change, social inclusion areas and crosscutting themes guiding the *New Urban Agenda*.

*Strategy* (City of Melbourne 2016) and the *Resilient Sydney Strategy* (City of Sydney 2018), respectively. These strategies could embrace the *New Urban Agenda*. In 2017, an international conference addressing the implementation of the *New Urban Agenda* in Australia was held in Melbourne with a second conference in Newcastle in 2018. These activities have created some momentum in delivering on the *New Urban Agenda*. A third conference was held in Melbourne in 2019 in recognition that the *New Urban Agenda* has drawn only limited attention from academics and development practitioners (World Urban Campaign 2017).

Australian-based development and humanitarian organisations are engaged in the development and implementation of the *New Urban Agenda*. Organisations like Plan International Australia have developed a Child-Centred Urban Resilience Framework (Plan International and Arup 2016) that supports the *New Urban Agenda*. The product was formally launched during Habitat-III. Other organisations, for example Save the Children, World Vision, Habitat for Humanity as well as private sector organisations are also engaged in their own capacities.

In *Understanding Drivers of Disaster* (Attorney-General's Department 2017), the *New Urban Agenda* is named, among others, as an international framework to which the Australian Government has committed. Urbanisation itself can be a 'driver of disaster' if not managed well. It is necessary for Australian disaster risk and emergency management policies, strategies and frameworks to be informed by the *New Urban Agenda* and reflect its commitments during implementation. The *New Urban Agenda* is perfectly positioned to inform two significant initiatives of the Australian Government; the *National Disaster Risk Reduction Framework* (Department of Home Affairs 2017) and *Profiling Australia's Vulnerability* (Department of Home Affairs 2018).

## Conclusion

City development and expansion policy and planning should be inclusive and engage people. To allow for sustainable growth and maintain long-term prosperity, cities in developed countries should harness opportunities for well-planned urbanisation. Urban growth can offer benefits and also manage risks and challenges of urbanisation.

Through the *New Urban Agenda*, leaders, including from Australia, have committed to provide basic services for all citizens; providing equal access to opportunities and eliminating discrimination; promoting measures that support cleaner cities by strengthening resilience to reduce the risk and the effect of disasters; addressing climate change by reducing greenhouse gas emissions; respecting the rights of refugees, migrants and displaced people regardless of their migration status; improving connectivity and supporting innovative and green initiatives and promoting safe, accessible and green public spaces.

There is a need to rethink the way we plan, build and manage urban spaces. The *New Urban Agenda* provides a guide to manage urbanisation for sustainable development and offers a vision of cities at present and in the future. The implementation of the *New Urban Agenda* is not an option, but an imperative for governments and the international community.

The review of the existing literature and practices shows Australia is yet to fully embrace the *New Urban Agenda*. Australian governments, at all levels, should deliver policy and planning that translates the *New Urban Agenda* into the managing of cities and urban processes. The *New Urban Agenda* offers a pathway for sustainable urbanisation and urban development to ensure that Australian cities remain highly ranked as the most liveable cities in the world.

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## ABSTRACT

# Search and rescue team classification: BASARNAS of Indonesia

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## Introduction

The INSARAG was established in 1991 from the lessons of the 1988 Armenian earthquake where the international teams could not operate effectively because of a lack of coordination. Under the United Nations umbrella, the group establishes specialised international urban search and rescue (USAR) to make emergency response and preparedness effective and to save more lives. International USAR teams are supported by guidelines on common procedures and organised meetings and exercises (Department of Humanitarian Affairs 1991).

INSARAG Guidelines were recognised by the United Nations General Assembly Resolution 57/150 as a reference for disaster preparedness and response. The Resolution encourages cooperation among member states to work on capacity building at all levels; internationally deployed teams as well as national and local first responders (United Nations General Assembly 2002). This was reiterated by the INSARAG Hyogo Declaration, adopted in 2010, that encouraged member states to support national and local capacity building efforts (INSARAG 2010). In addition, INSARAG, with support from the International Federation of Red Cross and Red Crescent Societies, developed the INSARAG First Responder Training Programme.

Since 2005, INSARAG has used a classification system, called INSARAG External Classification (IEC), to define and implement the minimum standards for international USAR teams (INSARAG 2015). Once IEC classified, search and rescue teams go through reclassification (IER) every five years. The INSARAG Hyogo Declaration encourages internationally deployed USAR teams to complete the IEC process and to adopt minimum operational standards. It also encourages receiving countries to prioritise using IEC-classified teams (INSARAG 2010). Although having an IEC certification is not mandatory, there are more than 50 teams already classified, and many teams are in the process of classification.

Although IEC has been established for 15 years, the effects of its introduction are not very clear despite the huge cost for international search and rescue deployments. In the 2015 Nepal earthquake, 16 people were rescued by international USAR teams, and 11 out of these 16 were rescued by the neighbouring Indian teams that were non-IEC-classified (Katoch 2015). IEC-classified teams did not arrive in Nepal sooner than non-classified teams. This indicates that assistance by IEC-classified teams was not prioritised to be sought by Nepal (Okita & Shaw 2019).

In general, there is a lack of studies on INSARAG and IEC effectiveness. Glassey (2013) conducted a study on INSARAG building markings applied during the Christchurch earthquake in 2011. The study analysed if responding teams adhered to INSARAG methodologies. However, the study did not

The network of international search and rescue teams, International Search and Rescue Advisory Group (INSARAG), has had a classification system since 2005 known as the INSARAG External Classification (IEC). The purpose of IEC is to ensure that all the international urban search and rescue teams acquire the minimum operational standards set by INSARAG. The National Search and Rescue Agency (BASARNAS) of Indonesia is applying for IEC certification in November 2019 with support from Singapore. This paper reviews the IEC process for BASARNAS and critically evaluates the effectiveness of IEC as a tool for urban search and rescue capacity building. Through the preparation for IEC, the internationally deployed BASARNAS team successfully strengthened its search and rescue capabilities. The IEC process identified gaps in current levels of operation and INSARAG requirements. Having an IEC-classified team in Indonesia would lead to strengthening capability of domestic first responders.



USAR teams conduct a coordination meeting at an On-Site Operations Coordination Centre during the IER for the Singapore Civil Defence Force in 2018.

Image: Yosuke Okita

differentiate between IEC-classified and non-IEC-classified teams (the New Zealand Government mainly received IEC-classified teams). Bookmiller (2015) points out that humanitarian relief, such as search and rescue and medical response, can be improved by responders adhering to professional and technical standards, including IEC. However, this is not supported by any actual case studies. Okita and colleagues (2018) compiled a case study on capacity building of Japan's internationally deployed team through the IEC process. Japan is one of the most prepared countries for natural hazards and the damage they cause. The country already possesses skilled and trained teams. Case studies on the effects of IEC in less prepared and disaster-prone countries are worthy of examination.

The National Search and Rescue Agency (BASARNAS) of Indonesia is preparing for IEC in November 2019. This paper considered the effectiveness of IEC as a method to improve search and rescue capacity building. Putra (2019) conducted a study on the internal capacity building process of BASARNAS in accordance with INSARAG standards. Further to that, this paper focuses on how international support brought by IEC facilitates the capacity building process.

## The certification process

To be classified in IEC and IER, USAR teams must meet the requirements listed in the IEC/IER Checklist as published in Volume II, Manual C of the guidelines developed by INSARAG. Checklist items are not limited to USAR techniques. Teams must establish arrangements for international deployment such as legal and logistical arrangements. They must also contribute to USAR

coordination activities led by the United Nations Office for the Coordination of Humanitarian Affairs (OCHA) such as Reception/Departure Centre and On-Site Operations Coordination Centre.<sup>1</sup> OCHA manages the website for the Virtual On-Site Operations Coordination Centre that enables responding officers to exchange information after a disaster happens. The IEC/IER Checklist requires USAR teams to use the Virtual On-Site Operations Coordination Centre.

During IEC/IER, USAR teams are classified as 'heavy' or 'medium' level teams depending on the scale of operations. For example, heavy teams must be able to conduct search and rescue operations for 24-hours at two separate sites for 10 days and must have the capability for both technical and canine search. Medium teams must operate for 24-hours at one site for seven days and should have either technical or canine search capability.

Before applying for IEC, USAR teams must be mentored from other IEC-classified teams or by highly experienced individuals. The mentor will assess the team and write a report about the team's readiness for IEC. The team submits an Abbreviated Portfolio of Evidence (APoE) with the mentor report to the INSARAG Secretariat for assessment. The INSARAG Secretariat reviews the application and sets a tentative IEC date after two years. Approximately 10 months before the tentative date, the USAR team must submit a Comprehensive Portfolio of Evidence that includes many supporting documents such as training records and memoranda of understanding with partner organisations.

<sup>1</sup> On-Site Operations Coordination Centre: At [www.unocha.org/our-work/coordination/site-operations-coordination-centre-osocc](http://www.unocha.org/our-work/coordination/site-operations-coordination-centre-osocc).

The IEC is a peer-review process and classifiers are engaged from IEC-classified teams to undertake assessments. During an IEC event, USAR teams conduct 36-hour field simulation exercises and the classifiers check the items against the Checklist and evaluate the work of each team.

## Methodology

This research took a case-study approach and considered the IEC process for BASARNAS chronologically. BASARNAS attempted IEC certification in 2014 but that was postponed. They recommenced preparation in 2016 with support from Singapore as their mentor. BASARNAS is now targeting IEC in November 2019. This paper illustrates the difference in the two attempts.

In evaluating the effectiveness of IEC as a method for capacity building, the United Nations Environment Programme established six ways to improve the effectiveness of capacity building (United Nations Environment Programme 2006) (see Table 1).

Interviews with BASARNAS core staff and the mentoring team from Singapore were conducted during INSARAG-related events. These were the INSARAG regional exercise in the Philippines, IER in Singapore and BASARNAS exercise events held in Indonesia in 2018. The documents submitted by BASARNAS to the INSARAG Secretariat for the application for IEC were also reviewed.

## BASARNAS's first IEC attempt, 2011–2014

BASARNAS has been very active in INSARAG activities since 2011, supported by strong leadership of the management at that time. In 2011, Indonesia, represented by BASARNAS, was selected as the Chair of the INSARAG Asia-Pacific Regional Group and hosted the Asia-Pacific regional meeting in Bali. At that time, BASARNAS started planning for IEC in 2014.

The increasing number of IEC/IER-classified USAR teams was becoming a challenge for the INSARAG network due to the heavy workload. The number of teams preparing for IEC increased and the existing IEC-classified teams started preparing for their five-year IER. In 2011, the Asia-Pacific region already had classified teams in Australia, China, Japan and Singapore, while Korea and another team from Australia were preparing for their IECs planned for 2012. The meeting discussed if the Asia-Pacific region should have more IEC teams or focus on capacity building of national USAR teams. The meeting reiterated that IEC was only for the internationally deployed teams (INSARAG 2011). It was difficult for the Asia-Pacific regional group to consider BASARNAS as an 'international' team because the team had only been deployed to the 2011 Great East Japan Earthquake.

Table 1: Ways to improve the effectiveness of capacity building.

Ways to improve effectiveness	Description
1. Identifying needs	Careful needs assessments are critical for priority setting and program design.
2. Clear objectives	There is a need for a clear understanding of the objectives of capacity building between providers (of technical assistance) and beneficiaries.
3. Capacity building approaches	A wide range of approaches is available to build capacities. Which approach will be most effective depends on the specific objective to be achieved.
4. Target the right people	Avoid a situation where the focus is put on a limited group (e.g. senior government officials, decision-makers).
5. Training of trainers	Providers can focus on training a smaller group of professionals who would be equipped to train others.
6. Institutionalisation	Providers should focus on institutionalising capacity building programs at regional and national levels.

Source: United Nations Environment Programme 2006

In the regional meeting, an assessment of the current capacity of the Indonesian team as the first step of capacity building was agreed (INSARAG 2011). BASARNAS sought the support of the INSARAG Secretariat for the capacity assessment. The request was conveyed to the IEC-classified team in the Netherlands (USAR NL), which conducted the assessment in March 2012. While the main objective was to assess BASARNAS national search and rescue capability, USAR NL provided advice on IEC classification. With BASARNAS's experience in responding to the disaster events within Indonesia, the USAR NL assessment team concluded that BASARNAS had certain skills but lacked other, necessary skills and equipment to conduct 'urban'-type search and rescue activities. Other challenges were identified such as management structures and medical and logistical issues (USAR NL 2012).

Although USAR NL conducted the capacity assessment, it was not done as an IEC mentor. Teams must submit APoE together with a mentor report to obtain a tentative IEC date. BASARNAS did not have a mentor and thus could not submit the APoE. Their planned IEC in 2014 was automatically postponed.

## BASARNAS's second IEC attempt, 2016–2019

In 2016, BASARNAS recommenced preparation for IEC. BASARNAS approached the Singapore Civil Defence Force (SCDF), the only IEC-classified team in Southeast Asia region at that time, for support as the IEC mentor. SCDF appointed a mentor with rich experience in search and rescue who visited Indonesia in November 2016 for informal discussions. An initial assessment of BASARNAS was conducted in January 2017. The assessment involved observation of a table-top exercise, discussions with the stakeholders and visits to training sites, paying attention to deployment systems and procedures in accordance with the INSARAG Guidelines. The mentor assessment report was completed recommending BASARNAS for IEC classification consideration (Maideen 2017). BASARNAS submitted the APoE and the mentor report to the INSARAG Secretariat in February 2017 and received the tentative IEC date in 2019.

In preparing for the IEC, BASARNAS has actively hosted INSARAG-related events since 2016. Events have included the Reception/Departure Centre workshop in Jakarta in March 2016, the INSARAG Asia-Pacific regional exercise in Jogjakarta in June 2016, the INSARAG team leaders meeting in Bali in September 2017 and the USAR coordination course in Jogjakarta in October 2018.

According to the Deputy Director for Cooperation of BASARNAS, hosting the INSARAG events was very useful to train many of their staff at one time.<sup>2</sup> While INSARAG regional exercises and the USAR coordination courses are held in other countries, only three or four participants from each country can attend. One of the mentoring team pointed out the benefits of hosting INSARAG events. The Indonesian Government was more aware of INSARAG and supported BASARNAS pursuing IEC classification.<sup>3</sup>

BASARNAS provided members to observe USAR teams in Korea in 2016 and the SCDF in Singapore in 2018 as IER observers. BASARNAS did not send any observers in their first attempt on IEC.

BASARNAS submitted the Comprehensive Portfolio of Evidence in January 2019 to the INSARAG secretariat. BASARNAS is pursuing a 'medium' classification but is planning to upgrade this classification to 'heavy' when they are reclassified in five years.

## Achievements through the IEC process

The process of IEC presents opportunities to develop knowledge, skills and processes. BASARNAS achieved significant progress in vital structural areas.



BASARNAS team members discussing team structure with the mentoring team from Singapore.

Image: Mirza Khan

## Legal and logistical arrangements

The USAR NL assessment highlighted a lack of documentation required for classification (USAR NL 2012). BASARNAS had to show a legal authority to deploy teams internationally. To this end, the *Law of the Indonesian Government Act No. 29 Year 2014 on Search and Rescue* was made and is the basis for international deployment of BASARNAS teams (Indonesian Government 2014). According to BASARNAS, the Act provided a national policy and prioritised Indonesia's contribution to international disaster relief activities. BASARNAS established a memorandum of understanding with the Indonesian Air Force for the use of aircraft for international deployments. As a backup, BASARNAS is negotiating similar arrangements with airlines such as Garuda Indonesia and Lion Air (BASARNAS 2019).

## Team structure and personnel

To organise international team deployment, BASARNAS adopted a team structure with five components that align with the INSARAG Guidelines. These are management, search, rescue, medical and logistics (see Figure 1). The BASARNAS plan for international deployment is to meet the medium classification and, thus, deploy 57 personnel.

<sup>2</sup> Interview conducted on 28 June 2018 during the INSARAG Asia-Pacific Exercise in the Philippines.

<sup>3</sup> Interview conducted on 28 June 2018 during the INSARAG Asia-Pacific Exercise in the Philippines.

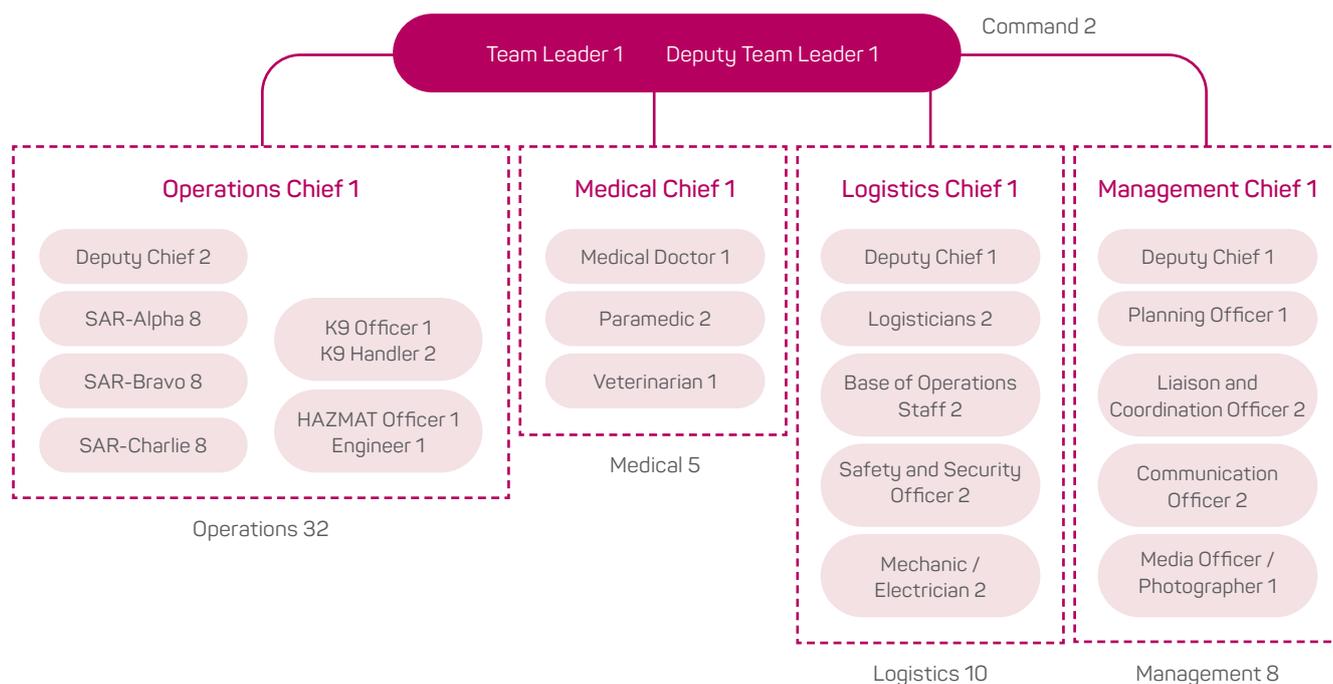


Figure 1: BASARNAS team structure to meet INSARAG medium-level team deployment.

Image: BASARNAS (2019)

### USAR training

Capacity building of the BASARNAS was bolstered by additional equipment specific to search and rescue so teams can perform activities like mechanical shoring in shorter time and concrete breaching (cutting) to levels as specified in the IEC/IER Checklist. In addition, BASARNAS sent management and search and rescue personnel to SCDF for three intensive training sessions during 2018 for IEC preparation. In total, 64 staff completed the special training provided by SCDF (BASARNAS 2019). The mentor team also visited Indonesia to supervise exercises. For example, BASARNAS conducted a 36-hour simulation exercise in Jakarta in December 2018. The mentoring team evaluated the performance according to the IEC/IER Checklist. By then, the BASARNAS members were accustomed to using the newly introduced search and rescue equipment and the new training site was established in northern Jakarta.



Simulation exercise during the IER for the Singapore Civil Defence Force in 2018.

Image: Yosuke Okita

### Effects on domestic USAR teams

In January 2019, there were 3331 trained rescuers in BASARNAS headquarters as well as 38 search and rescue offices. A special unit, called BASARNAS Special Group (BSG), has 100 staff who are trained for complex rescue operations. The international deployment team is made up of officers from the headquarters and the BSG. This team represents three per cent of BASARNAS total search and rescue personnel (BASARNAS 2019).

In Indonesia, BASARNAS members from BSG team teach other BASARNAS personnel. BASARNAS established a certification system for domestic responders in 2018.

In this system, BSG members are deployed to domestic training events as trainers and certify local rescuers so they are exposed to international standards and USAR techniques. BASARNAS also recruits new members for international deployment from regional teams.<sup>4</sup> These arrangements ensure Indonesia has well-trained and well-qualified personnel to respond to emergencies and disasters.

<sup>4</sup> Interview conducted on 28 June 2018, during the INSARAG Asia-Pacific Exercise in the Philippines.

In 2018, two major earthquakes hit Indonesia in Lombok and Sulawesi. In Lombok, although the Indonesian Government did not request international search and rescue assistance, BASARNAS put information on the BASARNAS response and their needs on the Virtual On-Site Operations Coordination Centre. This was done immediately as BASARNAS was following INSARAG methodologies and was the focal point for INSARAG in Indonesia.<sup>5</sup> BASARNAS was also quick with deployment activities to the remote area. According to a medical doctor in BASARNAS who was deployed to the Lombok earthquake, the earthquake occurred at 18:46 (local time) and he got a call from BASARNAS at 20:00 to head to the military airport. At 04:00 the next day, loading had started and the team departed at 06:00. The 40-member USAR team, including the BSG members and six tonnes of equipment were transported by Indonesian Air Force aircraft to Lombok.<sup>6</sup> Although not an international deployment, BASARNAS showed the ability to gather and deploy the BSG team and equipment within a short timeframe with support from its response partners.

## Discussion

Table 2 summarises the actions taken by BASARNAS and their supporters as set out by the United Nations Environment Programme (2006) model on the effectiveness of capacity building.

Table 2 shows the IEC process facilitated the capacity building of BASARNAS. It helped them identify the gaps and ways to build team skills and capacities. It also motivated collaboration between BASARNAS members, the mentors and the government because of the shared goal. In this way, while IEC is designed as minimum and common standards for internationally deployed teams, the classification process led to the capacity building of domestic BASARNAS rescue personnel and systems.

This study indicates that the ‘cascading down’ effect of IEC does not always happen. BASARNAS developed a mechanism to translate INSARAG search and rescue techniques and standards to national and local levels in Indonesia. However, this mechanism is in its early stages and monitoring and future evaluation will better determine the achievements.

<sup>5</sup> Interview conducted through the email received on 24 August 2018.

<sup>6</sup> Interview conducted on 15 October 2018 in the margin of the International Seminar on Coordination in Emergency Response Management held by Gadjah Mada University and BASARNAS in Jogjakarta, Indonesia.

Table 2: Actions taken by BASARNAS and the supporters.

Ways to improve effectiveness	Actions taken by BASARNAS and the supporters
1. Identifying needs	The assessment conducted by USAR NL and SCDF identified gaps between BASARNAS operations and INSARAG standards (e.g. urban-specific search and rescue capabilities, logistical arrangement, documentation).
2. Clear objectives	BASARNAS and the mentor shared a common goal: building international standard search and rescue capability based on fulfilling Checklist items for successful IEC. The training facility, the team structure and search and rescue equipment were obtained in accordance with the INSARAG Guidelines.
3. Capacity building approaches	BASARNAS combined capacity building approaches (e.g. mentoring support, special training in Singapore for core members, hosting INSARAG-related events to train many of their staff) and used the IEC process to garner international support.
4. Target the right people	Training opportunities were not limited to senior officials and decision-makers.
5. Training of trainers	The core BSG members who are trained for IEC classification trained the domestic rescue personnel with the domestic certification system. New BSG members are recruited from regional teams.
6. Institutionalisation	

## Conclusion

The IEC process for BASARNAS was examined, and the standards that contribute to capacity building were identified. It is recognised that IEC activities contribute to the capacity building and establishment of effective USAR deployment systems. In this case study, BASARNAS introduced arrangements so that the international standards established by INSARAG and IEC become the national standards in Indonesia. In doing so, what was originally designed only for international teams can contribute significantly to domestic capacity building.



The USAR exercise in Jakarta in December 2018.

Image: Yosuke Okita

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