



EMERGENCY MANAGEMENT OPPORTUNITIES FOR REMOTE INDIGENOUS COMMUNITIES IN NORTHERN AUSTRALIA

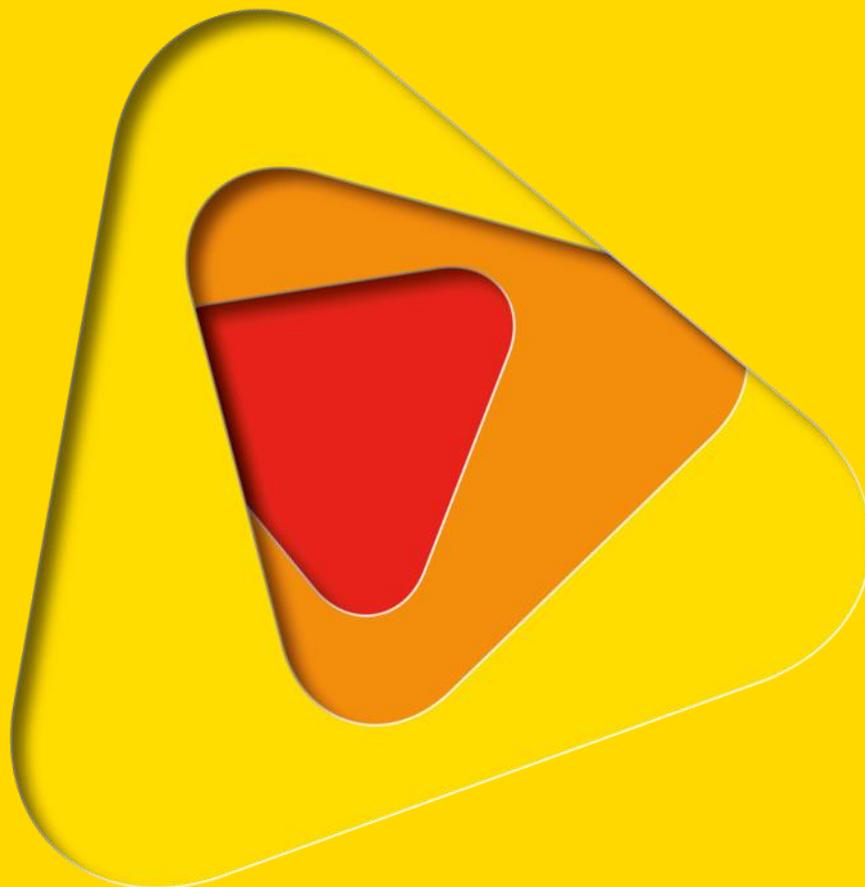
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Kamaljit K. Sangha^{1,2}, Andrew Edwards^{1,2} and Jeremy Russell-smith^{1,2}

¹Darwin Centre for Bushfire Research, Charles Darwin University

²Bushfire and Natural Hazards CRC

Corresponding author email: kamaljit.sangha@cdu.edu.au



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ABSTRACT

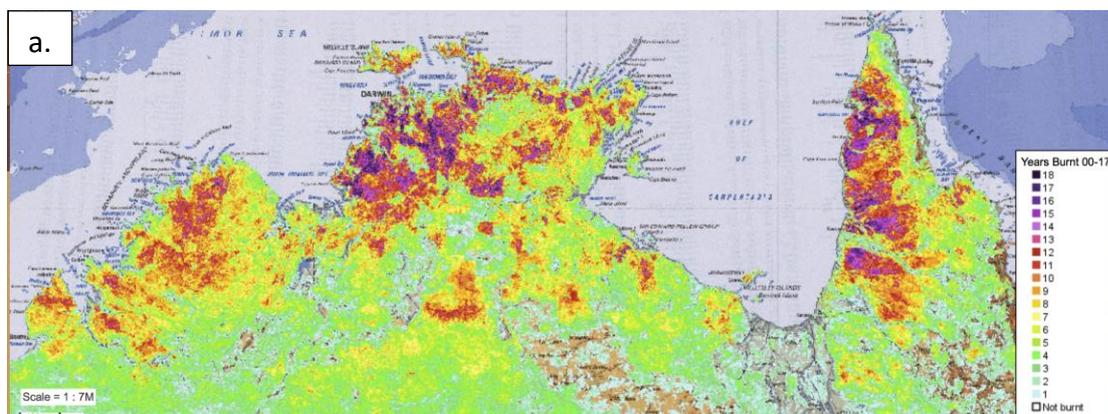
Despite frequent exposure to severe natural hazards including extensive bushfires, tropical cyclones and floods, remote Indigenous communities across northern Australia typically have little engagement in managing, mitigating or planning for such hazards. The BNHCRC scenario planning project explores how remote communities can effectively and sustainably mitigate the risks of natural hazards, and develop effective partnerships with emergency management (EM) decision-making processes. This research integrates and analyses EM resources and services available through various agencies responsible for remote locations, and related EM costs. The project provides opportunities for responsible agencies to engage and plan with remote communities to deliver efficient, cost-effective and culturally appropriate EM services. Scenario planning workshops, applying business as usual and enhanced risk mitigation scenarios, are underway involving active participation of multiple stakeholders including rangers from remote locations namely, Borroloola, Hermannsburg and Yuendumu, representatives from emergency services in the Northern Territory (NT Emergency Services, Fire and Rescue Services, Bushfires NT), the Northern and Central Land Councils, and other local organizations. Initial discussions with rangers and Traditional Owners from the selected remote communities, representatives from the relevant EM agencies, and other interested parties have indicated keen interest for participating in the project. Workshop discussions and associated data analyses will be presented, offering new insights into the delivery of cost-effective and improved EM services that can empower vulnerable remote communities.

Keywords: Natural hazards, Indigenous communities, Emergency services, Northern Australia, Rangers.

INTRODUCTION

Northern Australia, the region north of the Tropic of Capricorn, is at risk from extensive wildfires, cyclones, storms, and floods (Fig. 1a,b; Bushfire & Natural Hazards Cooperative Research Centre (BNHCRC) 2015). The average cost (from 2007-2016) of all the major natural hazard events across Australia is estimated at \$13.2bn per annum (the Australian Business Roundtable for Disaster Resilience and Safer Communities (ABR DRSC) 2017). For northern Australia, the average costs roughly equate to ~\$11bn/yr across the NT, WA and Qld for those natural hazards that occur mostly in the north i.e. cyclones costing about \$3.4bn/yr, floods \$7.3bn/yr and bushfires \$0.13bn/yr (the latter accounted for from WA only). These costs are expected to grow multi-fold over the coming years with an increase in frequency and severity of natural hazards (ABR DRSC 2017). Thus, the ABR DRSC (2017) has recommended a nationwide need to address mitigation of natural hazards and build community resilience.

To build resilience, an understanding of regional social and biophysical contexts is critical. Northern Australia supports about one million people, of whom ~14% are Indigenous (ABS 2016 census). Outside of major towns, Indigenous people comprise a much greater proportion of the total population (Fig. 2). In the Kimberley and Top End, about half of the population is Indigenous, and in very remote regions generally, more than 90% (Taylor 2006). Average population density in the region of about 0.75 persons/km² is low by Australian (3.0 persons/km²) and global standards (Archer et al. 2018). Moreover, the non-Indigenous population is mostly concentrated in coastal towns, mainly Broome, Darwin, Cairns, Townsville and Mackay.



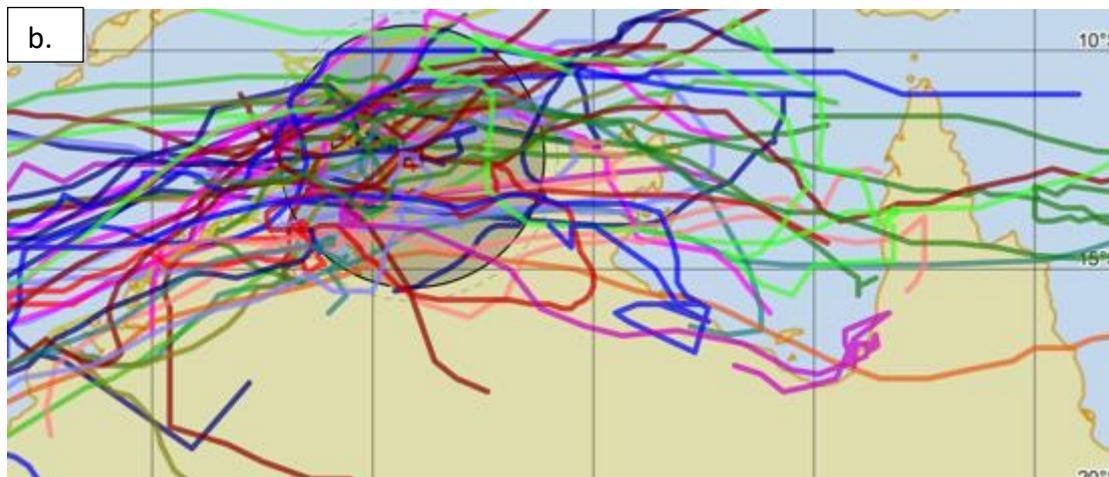


Fig.1. Frequent natural hazards in the north:
 a. Long-term fire frequency (2000-2017) across the north.
 b. Cyclone tracks (from 1970-2015) within 300 km radius from Darwin (source: Bureau of Meteorology).



Fig. 2. Distribution of Indigenous discrete communities in northern Australia (ABS 2016).

There is a distinct and seasonal distribution of cyclones and wildfires across the northern landscape. On average (1981/82-2012/13), coastal areas experience ~11 tropical cyclones every wet season (Dowdy et al. 2014) which are often associated with catastrophic wind speeds, storm surges and heavy flooding (Fig. 3). Sub-coastal and inland areas experience wildfires spreading over extensive areas (Fig. 1). Unlike more populous regional centres with the ready availability of emergency services and associated infrastructure, most isolated and remote communities lack emergency management (EM) amenities and, as such, are at heightened risk in the



event of significant hazardous events (NAILSMA 2014 ab, Sangha et al. 2017, Sithole et al. 2017). These issues are well recognized in national policy (CoA 2007, COAG 2011).

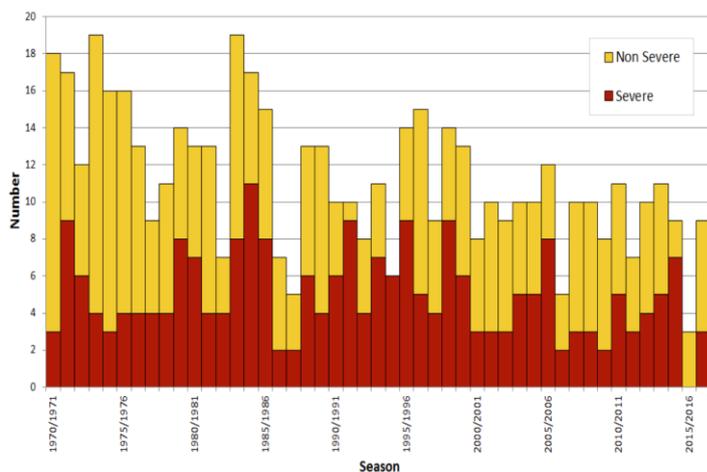


Fig. 3. Severe and non-severe tropical cyclones from 1970-2017 (Source: Bureau of Meteorology 2018)

To address this, we suggest that building the capacities of and empowering remote communities affords an obvious solution for better preparing for and managing natural hazard events. In particular, the existence of and substantial Government investment in Indigenous Ranger Groups (IRGs), for example through Working on Country and Indigenous Protected Area programs, provides a ready framework for utilizing and developing that capacity. Here, we report preliminary case study findings from three remote communities in the NT—Borroloola in the NT Gulf region; Hermannsburg and Yuendumu in central Australia—which explore these opportunities.

BUILDING RESILIENCE IN REMOTE INDIGENOUS COMMUNITIES

2.1 CASE STUDIES

Each of the case study community (Fig. 4) is vulnerable to natural hazards, especially wildfires. Yuendumu and Hermannsburg are respectively located about 300km and 130km from Alice Springs. Borroloola, about 900km from the capital city Darwin, is also highly vulnerable to cyclones and associated flooding. Each community comprises 500-800 people.

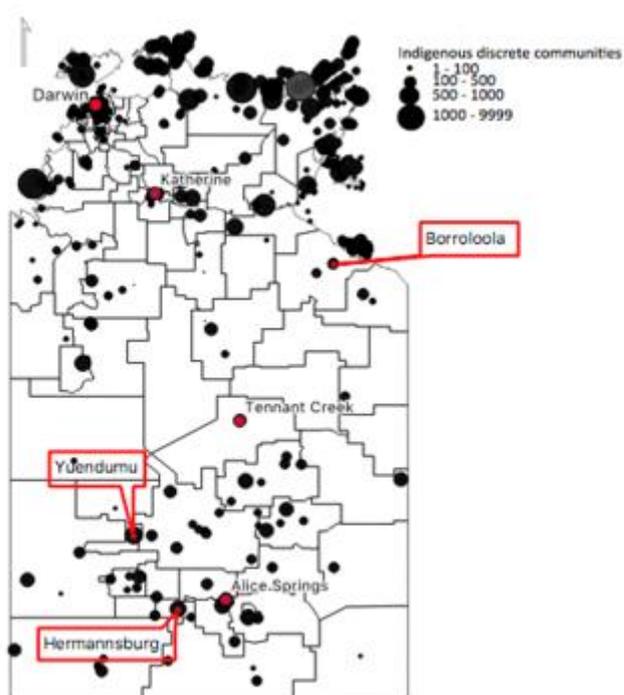


Fig. 4. Selected remote communities (marked in red box) in the NT and their relative distance from the capital city, Darwin, and another main town Alice Springs in the south.



2.2 APPROACH

We have engaged with IRGs from each community, commencing in September 2017. Respective IRG members are experienced and skilled in managing a variety of fire and other emergency related situations (e.g. land searches, vehicle break-downs). Initially, informal discussions were held with the Waanyi-Garawa IRG at Borroloola, our pilot case study. As a means for identifying key EM issues relevant to that local community, a questionnaire was developed collaboratively with the Waanyi-Garawa rangers for surveying the views of Borroloola community members, which were further discussed in a focus group meeting (FGM). Subsequently, preliminary FGMs were also held with IRG members in Yuendumu and Hermannsburg. An ethics approval was granted by Charles Darwin University, Darwin.

2.2 RESULTS - FOCUS GROUP MEETING OUTCOMES

FGMs with IRG members in all the three communities revealed that typically there is little involvement of local community members in managing or mitigating natural hazards, EM related decision-making processes, or services delivery. An exception concerns Hermannsburg (Table 1), where the Tjuwanpa women rangers are trained Northern Territory Emergency Services (NTES) volunteers and conduct preventative prescribed burning around the community. Details of identified emergency related issues and available resources are provided in Table 1.

There are limited infrastructure resources available for mitigating and managing natural hazards or emergency situations in respective communities (Table 1). Community access to these resources is restricted, and limited to agency personnel (police, NTES, Northern Territory Fire & Rescue Service (NTFRS)). IRG members also possessed limited knowledge about the content, or existence even, of respective community EM plans; in any event, these are not readily accessible given that they are available at local police stations (Table 1). Importantly, IRG and other local community members showed interest in being more involved with addressing fire, flood and related EM issues.



	Borroloola	Hermannsburg	Yuendumu
Rangers (number of participants in FGM)	Waanyi-Garawa (9-10)	Tjuwanpa Women Rangers (9)	Warlpiri Rangers and TOs (8)
Identified main hazards	Floods, storms, car accidents, bogged vehicles, cyclones and wildfires	Floods, wildfire, and road accidents	Road accidents, land searches and floods
Current management of natural hazards and emergency situations	NTFRS-FERG* unit and police deliver emergency services in the event of road accidents, wildfires, floods and cyclones. However, not many efforts on mitigating or managing natural hazards. Sea rangers have helped in the past during floods with their own boat.	NTES*, Police and NTFRS deliver emergency related services, involving local NTES volunteers (including some women rangers).	Police manages the main emergencies i.e. road accidents. Local council can help in controlling wildfires, if needed.
Rangers' current role in EM and services delivery	Rangers or locals are not involved in any decision-making or managing natural hazards or emergency situations. However, they often help locals at their own with vehicle break downs and land searches.	Rangers conduct preventive prescribed burning around the community, but are not confident of taking any lead role in EM situations such as wildfires, floods, etc. and may need further training. The local emergency agencies are supportive of the rangers to	Rangers and local members manage land searches at their own. But, the locals are not involved in decision-making or managing natural hazards or emergency situations.



		be involved in emergency related events.	
Rangers/Indigenous community members' willingness to participate in EM in the future	Willing to join NTFRS volunteer brigade, to mitigate bushfires in the community and help in other emergency events. Rangers had their first meeting with the NTFRS local area volunteer brigade personnel.	Three women rangers are already NTES volunteers, others are planning to join.	Ranger or the Elders themselves do not want to join. However, the youth, as suggested, needs to be involved in EM.
Engagement of local communities in managing or planning for emergency situations	Little or no formal involvement to date.	Some degree of engagement exists among the Emergency Agencies and the Tjuwanpa women rangers.	Little or no formal involvement to date. Rangers help their community members at their own especially in land searches.
Awareness of EM plan	EM plans are typically kept at the police station, and the locals have little idea of what they are about.		
Existing EM related resources	NTFRS has a FERG unit and NTES a rescue boat. Waanyi Garawa Rangers have a fire truck and Sea Rangers a boat.	NTES/NTFRS/Police have their own resources, with NTES having an established unit in the community. Tjuwanpa Rangers were also planning to buy a Grassfire Unit.	NTES established unit was reported to be non-functional. The local council owns a fire truck, but there are no other available emergency resources.



Rangers' EM and local area knowledges	Rangers and TOs have local knowledge especially of people and areas prone to wildfire, floods, etc., and know how to manage wildfires, floods and vehicle break downs. Moreover, community members confide in them.
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*NTFRS – Northern Territory Fire and Rescue Services; FERG – Fire and Emergency Response Group; NTES – NT Emergency Services.



DISCUSSION

Building community resilience in remote locations is a stated key requirement of the national 'Keeping our mob safe' policy framework addressing EM issues in remote Indigenous communities (CoA 2007). However, effective engagement of and partnership with local Indigenous communities is an ongoing challenge for NT EM agencies (NAILSMA 2014 ab, ABR DRCS 2017, Sangha et al. 2017). The BNHCRC-funded Scenario Planning project offers a significant opportunity for exploring options to engage with and empower remote communities with respect to mitigating natural hazards and managing emergency situations. Our initial FGMs clearly demonstrate the willingness and capabilities of respective IRGs to participate in local EM planning and decision-making processes. The next stage of this project includes facilitating discussions among all the stakeholders, i.e. local EM agencies, IRGs, local communities, and responsible Aboriginal Corporations to examine how and where rangers could be involved and what resources and training are required to support them.

Frequent exposure to natural hazards with limited EM-related resources in remote communities demand urgent attention at the state/territory and national level (COAG 2011). For example, in the NT, EM resources are largely limited to main towns (Darwin, Katherine and Alice Springs) and a few communities (Fig. 5; NTPFES 2016-17). Whereas, many remote communities, including large populations living in communities such as Daly River, Borroloola, and Robinson River, are exposed to significant flooding events, evacuations, or cut-off for months during the wet season. Alternatively, provisioning appropriate EM resources and involving community members at a local scale can offer long-term feasible on-site solutions (ABR DRSC 2017). A prime example concerns Arnhem Land IRGs whose fire management programs provide both effective wildfire management and deliver multi-fold socio-economic benefits and reduce government costs (Russell-Smith et al. 2013, Sangha et al. 2017). Development of locally inclusive, participatory EM models, backed by cost-benefit assessments, is required to enhance effective EM preparedness and manag



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