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Taylor D'Eramo Date

Exploring the Role of Collective Efficacy in a Community's Ability to Engage in Flood Measures in Urban Informal Settlements in Fiji

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By

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Bachelor of Science
University of North Carolina Wilmington
2020

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An abstract of
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Abstract

Exploring the Role of Collective Efficacy in a Community's Ability to Engage in Flood Measures in Urban Informal Settlements in Fiji By Taylor D'Eramo

With more than one billion people worldwide living in urban informal settlements, residents are vulnerable to flood risks due to inadequate drainage, high population density, and general poor housing construction, making them at higher risk for adverse health outcomes. Research has shown that positive collective efficacy beliefs and experiences with collective action can increase motivational investments for individuals and communities, and in turn have a positive impact on community and group development. However, collective efficacy research has predominately focused on group and community settings in high-income countries. There are limited studies on the impact that collective efficacy has on flooding for urban informal settlements. As a sub-study of Revitalising Informal Settlements and their Environments (RISE), this qualitative study aimed to explore the role that collective efficacy plays in a community's ability to engage in flood measures in urban informal settlements in Fiji. In total, 42 in-depth interviews with men and women were conducted in 10 settlements in Suva, Fiji. Thematic analysis was used to elicit key themes. The data indicated that the most salient enablers or barriers to collective efficacy in these settlements were strong leadership, social ties, past performance experiences, and expectations and unity around collective action. The findings showed that strong leadership and social ties within communities were seen as positive influences to engaging in flood related collective action. Additionally, positive experiences with previous forms of collective action for flood measures were enablers, while past negative experiences were a barrier to engaging in collective action. While participants expressed expectations around collective action for flood related measures, the findings were unclear as to whether expectations for people to contribute to flood related measures are enablers of collective efficacy. Programs intending to implement flood interventions need to consider the unique influencing factors to engaging in collective action for the settlements where they plan to work. Additionally, practitioners should determine if engaging in collective action for flood related measures are expected by communities.

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CHAPTER I: INTRODUCTION

Introduction and Rationale

More than one billion people worldwide live in informal settlements, and it's estimated that three billion people will be living in these conditions by 2050 (UN-Habitat, 2020). In Pacific Island Countries, about 50% of the population live in urban areas and roughly 15-20% of the population in Suva, Fiji lives in informal settlements (Devi, Lowry, & Weber, 2017). Urban informal settlements are characterized by having no land title or building regulations, unhealthy living conditions, extreme poverty, water supply contamination, and lack of other basic services, and they are known to be more prone to flooding and social exclusion (Saunders et al., 2016). Urban informal settlements are particularly vulnerable to floods due to general poor construction of houses and land planning, inadequate drainage, and high population density (De Risi et al., 2013). Residents living in these settlements are also more vulnerable to certain health conditions, and flooding exacerbates these risks. In addition to immediate and long-term health impacts, informal settlements have challenges of clean water, sanitation, environmental degradation, and overall public health limitations (Brown et al., 2018).

Collective efficacy (CE) is defined as a group's shared beliefs in their ability to organize, execute, and come together to achieve a common goal or action (Bandura, 1997). It is believed that a group's accomplishments rely not only on the knowledge and skills of the individual members, but also on the interactive dynamics of the group itself (Bandura, 2000). It has been shown that positive collective efficacy beliefs and experiences with collective action will yield higher motivational investment for individuals and communities, and they will be more likely to work through impediments and setbacks (Bandura, 2000).

Problem Statement

Individuals living in informal settlements are at higher risks of flooding disasters and events because of the characteristics of these communities, lack of infrastructure and resources, limited livelihood options, insecure housing, and lack of service provision (Sakai, Jurriens, Zhang, & Thornton, 2013). Much of the existing collective efficacy research has focused on the impacts of collective efficacy on groups and communities in high-income countries. There are limited studies on the impact that collective efficacy has on flooding for urban informal settlements and how this plays a role in a community's ability to engage in flood related interventions, and even fewer studies examine these topics in Fiji. Despite lack of research, certain sub-constructs of collective efficacy have been shown to facilitate flood related measures in a variety of settings, including Fiji (Aßheuer et al., 2013; Amoako, 2018; Yila et al., 2014). Research on these topics is needed to understand the factors that influence collective efficacy and how it impacts engagement in community level food related measures.

Purpose Statement

The purpose of this research was to qualitatively explore and better understand the role of collective efficacy in a community's ability to engage in flood related measures in urban informal settlements in Fiji, including determining what factors served as barriers or enablers to these behaviors. For the purpose of this study, "flood measures" will be used to refer to prevention, protection, and response measures. Prevention measures refer to acts taken before a flood to stop impacts or to keep a flood from happening, protection refers to measures taken during a flood to keep people and the community safe, and response refers to measures taken after a flood to respond to related impacts.

Research Question: *What role does collective efficacy play in a community's ability to engage in flood measures in urban informal settlements in Fiji?*

Significance Statement

This study will inform our understanding of collective efficacy and flooding in urban informal settlements in Fiji. The findings will contribute to a broader understanding of factors that may influence collective efficacy and how it impacts engagement in flood measures, including how individuals within a community work together to implement these measures and what factors are enablers or barriers to these measures. Additionally, findings can provide guidance to program implementers for interventions that aim to leverage collective efficacy or its sub-constructs to address flooding.

CHAPTER II: LITERATURE REVIEW

Defining Collective Efficacy

Collective efficacy (CE) is defined as a group's shared beliefs in their ability to organize, execute, and come together to achieve a common goal or action (Bandura, 1997). It has been shown that a group's accomplishments rely not only on the knowledge and skills of the individual members, but also on the interactive dynamics of the group itself (Bandura, 2000). CE frameworks closely mirror self-efficacy frameworks and function on a similar level as both are derived from social cognitive theory (Bandura, 2000; Goddard et al., 2004). Social cognitive theory states that individuals' and organizations' behaviors are influenced by the strength of their efficacy beliefs (Goddard et al., 2004).

Four sources of information for efficacy expectations include 1. performance accomplishments, 2. vicarious experience, 3. verbal persuasion, and 4. emotional arousal (Bandura, 1977). Performance accomplishments, also known as mastery experiences, are considered the most powerful source of efficacy expectations (Goddard et al., 2004). The literature suggests that successful performances increase efficacy beliefs, while failures lower efficacy beliefs (Bandura, 1977; Goddard et al., 2004). Vicarious experience is derived from observing others perform the intended tasks (Bandura, 1977). When seeing someone else perform well, the efficacy beliefs of the observer will increase (Goddard et al., 2004). Verbal or social persuasion is used to positively influence behavior by leading people to believe they are capable of overcoming difficult situations (Bandura, 1977). Lastly, emotional arousal refers to the levels of anxiety or excitement that can influence an individual's or group's beliefs about their own capability or that of the group (Goddard et al., 2004). It has been shown that when a group has higher levels of CE (i.e., greater efficacy expectations as informed by the

aforementioned sources of information), their motivational investment in their goals remains higher, their performance accomplishments are greater, and they are more likely to work through impediments and setbacks (Bandura, 2000).

Collective efficacy draws on multiple constructs including, but not limited to, social control, social capital, and social equity (Delea et al., 2018). Definitions of these constructs have been debated regarding what constitutes each one leading to differences among the definitions. Social control refers to "the capacity of a group to regulate its members according to desired principles" (Sampson, Raudenbush, Earls, 1997). An example of social control is the willingness of individuals to intervene for the common good of the community or neighborhood; research in a high-income country setting has indicated that people are unlikely to intervene in a community where the rules are unclear and there is little trust (Sampson, Raudenbush, Earls, 1997). Social capital refers to "strong social networks within the community that establish a sense of trust among community members and leaders and allow for acts of reciprocity" (Delea et al., 2018). Social equity refers to residents having equal access to opportunities, resources, or services within the community and ensuring that safety nets are in place during crises (Delea et al., 2018).

Multiple studies have examined the effects of collective efficacy on groups of people in different settings. A study on violent crime in 343 neighborhoods in Chicago looked at the association between collective efficacy and crime rates (Sampson, Raudenbush, & Earls, 1997). The findings showed that collective efficacy, or informal social control, social cohesion, and trust, were predictors of lower rates of violent crime (Sampson, Raudenbush, & Earls, 1997). Additionally, a study on 28 NCAA Division III basketball teams examined individual and group level influences of CE within each of the teams (Watson, Chemers, & Preiser, 2001). The results showed that there was a high level of agreement within teams in beliefs of collective efficacy,

and teams with strong leadership showed higher collective efficacy appraisals at the beginning of the season (Watson, Chemers, & Preiser, 2001). These findings indicate that collective efficacy is mitigated and influenced by leadership within groups. Another study looked at collective efficacy and the built environment in Los Angeles, hypothesizing that environmental factors within a community can be used as a foundation for neighborhood collective efficacy (Cohen, Inagami, & Finch, 2008). Results indicated that certain community features such as parks and alcohol outlets were positively and negatively associated with collective efficacy, respectively, and as such can influence health outcomes (Cohen, Inagami, & Finch, 2008). In a study using student and school level data from urban elementary schools to examine student achievement, findings showed that mastery experiences were a significant predictor of differences in teachers' collective efficacy perceptions between schools (Goddard, 2001). These findings are consistent with Bandura's sources of information for efficacy expectations, which include performance accomplishments or mastery experiences.

Urban Informal Settlements

Nearly one billion people worldwide are living in urban informal settlements and predictions have indicated that three billion people will be living in these conditions by 2050 (UN-Habitat, 2020). Challenges of clean water, sanitation, environmental degradation, and overall public health limitations have been shown to be exacerbated in informal settlements (Brown et al., 2018). These communities are characterized by having no land title or building regulations, unhealthy living conditions, extreme poverty, water supply contamination and lack of other basic services, and they are known to be more prone to flooding and social exclusion (Saunders et al., 2016). Inadequate sanitation is known to be a direct cause of diarrheal diseases and globally, diarrhea is the second leading cause of death among children under the age of 5

(CDC, 2015). The conditions residents are exposed to in these living situations make them more vulnerable to communicable diseases, higher incidence of respiratory infections, injuries, and mental disorders (Weimann & Oni, 2019).

Sustainable Development Goal (SDG) 11 focuses on making cities and human settlements inclusive, safe, resilient, and sustainable (United Nations, 2021). Most of the people living in urban informal settlements live in sub-Saharan Africa, central and southern Asia, and eastern and south-eastern Asia (United Nations, 2021). In the Oceania region, 23.7% of the urban population is living in informal settlements (United Nations, 2021).

A study done on informal settlements in South Africa found that a lack of sanitation infrastructure in these settlements will negate any further opportunities for health improvements even if other basic services are provided (Weimann & Oni, 2019). Additionally, it was noted that suitable drainage must be provided for the community in order for the environment to remain healthy and to prevent sources of infection and disease (Weimann & Oni, 2019). The same study found that community participation and social cohesion were important during times of infrastructure improvement due to tensions that arose when only portions of households received upgrades (Weimann & Oni, 2019).

Urban Informal Settlements in Fiji

There has been a significant increase of informal settlements in Pacific Island countries (PICs) (Saunders et al., 2016). In most informal settlements in PICs there is little or no basic water, sanitation, and hygiene (WASH) infrastructure in place for residents; rather services are self-built and managed (Saunders et al., 2016).

In Fiji, 50% of the population lives in cities or towns and close to 20% of the urban population resides in informal settlements (UN Habitat, 2016). With 250 informal settlements

across the country, three areas make up 90% of the informal settlement population: Greater Suva, Nadi, and Lautoka (UN Habitat, 2016). There have been multiple reasons for the increase in number of informal settlements as well as population increase within settlements, which include rural-urban migration, governments not providing adequate low-cost housing, unemployment, poverty and low wages, people losing their land leases and being forced to find informal housing as a replacement, difficulty obtaining land through proper channels, and rapid increase in land prices, housing prices, and rent in urban areas (UN Habitat, 2016). People living in these settlements struggle with minimal assistance from the government, and the social issues relating to these living conditions have been an ongoing problem (Naidu, Matadradra-Dolavale, Sahib, & Osborne, 2015). These social issues include lack of access to basic services such as education and health, challenges with infrastructure and roads, water and electricity supply shortages, inadequate waste and disposal sewerage, and income inequalities (Naidu, Matadradra-Dolavale, Sahib, & Osborne, 2015).

Flooding in Informal Settlements

Urban informal settlements are particularly vulnerable to floods due to general poor construction of houses and land planning, inadequate drainage, and high population density (De Risi et al., 2013). Rainfall induced flooding brings additional threats to high-density settlements on riverbanks and flood plains (De Risi et al., 2013). As mentioned previously, residents living in informal settlements are more vulnerable to certain health conditions, and flooding exacerbates these risks. Flooding and floodwaters not only cause immediate health risks to individuals, but also long-term health impacts (Paterson, Wright, & Harris, 2018). Immediate health consequences of floods include drowning, trauma, hypothermia, electrocution, and carbon monoxide poisoning (Paterson, Wright, & Harris, 2018). Additionally, some health risks can

occur days or weeks after a flooding event such as infections, respiratory diseases, mosquito borne illnesses, and mental health disorders such as post-traumatic stress disorder, anxiety, or depression (Paterson, Wright, & Harris, 2018). Because of these risks, prevention and preparedness knowledge are important to reducing incidence of disease and injury. For example, research in Kenya has found that in some informal settlements, residents are limited by income and knowledge on disaster preparedness in their preparation and implementation of protection measures for floods (Okaka & Odhiambo, 2019). Low adaptive capacity makes it difficult to prepare and respond to floods as they lack resources, support, and drainage facilities (Okaka & Odhiambo, 2019). Adaption strategies were determined by multiple factors including education levels, income, past flooding experiences, skills in disaster preparedness, communication between households, external household support, membership to social groups, and more (Okaka & Odhiambo, 2019).

Due to Fiji's topography, many of its towns and cities are located on the coast and along rivers, leaving them vulnerable to floods and storm surges due to frequent cyclones as they are in the Pacific Ocean's cyclone belt (UN Habitat). Individuals living in informal settlements in Fiji are often more prone to flooding disasters and events because of the characteristics of these communities, lack of infrastructure and resources, limited livelihood options, insecure housing, and lack of service provision (Sakai, Jurriens, Zhang, & Thornton, 2013).

Collective Efficacy and Flooding

Few studies discuss the impact that collective efficacy has on flooding for a community; however, some do assess the relationship between flooding and other, similar, social constructs such as social capital and social resilience (Aßheuer et al., 2013; Amoako, 2018; Yila et al.,

2014). Furthermore, even fewer studies discuss these concepts in reference to informal settlements or within Fiji (Amoako, 2018; Yila et al., 2014).

Studies among residents of informal settlements in Bangladesh and Ghana have noted the importance of social capital and social resilience in relation to floods. In slums in Dhaka, Bangladesh, social capital was found to be one of the most important social constructs during flooding (Aßheuer et al., 2013). Aßheuer et al. use the social capital definition by Portes, "the ability of actors to secure benefits by virtue of membership in social networks or other social structures" (Aßheuer et al., 2013; Portes, A. 1998). They found that due to slum dwellers experiencing crises every day, their support networks were well established and rooted in the community (Aßheuer et al., 2013). Because of this, overcoming single disaster events, such as severe flooding, could be handled by their access to various people within the community and resilience to move forward (Aßheuer et al., 2013). Additionally, research in urban informal settlements in Accra, Ghana observed that social resilience was important for responding and preparing for floods (Amoako, 2018). In this context, social resilience is defined as the ability to self-organize, learn and adapt, and residents in these communities continue to learn from their experiences and respond when needed based on their prior knowledge (Amoako, 2018).

Yila, Weber, and Neef examine the role of social capital in post-flood response and recovery among five village communities in the Ba District of Fiji during the 2009 and 2012 floods (Yila et al., 2014). The individuals or communities in Fiji with a large social network were in a better position to coordinate recovery and response efforts when faced with flooding disasters (Yila et al., 2014). Residents of downstream communities used four approaches to create and deploy social capital to facilitate disaster response and management: search and rescue, information, mutual assistance, and commercial cooperation (Yila et al., 2014). For

search and rescue, residents came together to help evacuate people, organize patrol teams, and worked together to repair community infrastructure, all of which was done by local villagers before being assisted by external agencies (Yila et al., 2014). Facilitation of information was another important function of social capital, as most community members learned of services from friends, relatives, neighbors, and other social ties (Yila et al., 2014). Mutual assistance was frequent during the emergency response and restoration phases of the disaster, where residents would offer short term loans, free housing and shelter, tools and equipment, childcare assistance, and exchange of free labor (Yila et al., 2014). Lastly, commercial cooperation was seen throughout the villages and played an important role for restoring the community. Some businesses were willing to make advanced payments to their workers and extend credit to customers, while other shops such as hardware stores ensured quick reopenings as this was important for the community to rebuild (Yila et al., 2014). All of these strategies helped build resilience at both household and community levels, and many felt that experiences related to the flood helped to bring them together (Yila et al., 2014). While this study examined social capital as opposed to collective efficacy, it demonstrates the importance of collective efficacy constructs during flooding events.

Despite the limited research on collective efficacy and flooding in informal settlements, studies have shown the importance of other related social constructs that CE draws from, such as social capital, social cohesion, social resilience, in times of flooding events and disasters (Aßheuer et al., 2013; Amoako, 2018; Yila et al., 2014; Weimann & Oni, 2019). Additionally, studies examining the role and effect of collective efficacy in group settings and communities have shown that strong leadership and mastery experiences yield higher CE appraisals (Watson, Chemers, & Preiser, 2001; Goddard, 2001). Other studies have indicated the importance of CE

for group performance indicators and lower crime rate (Goddard, 2001; Sampson, Raudenbush, & Earls, 1997). These findings support the need for further research on the role of collective efficacy in urban informal settlements as it relates to engaging in flood measures.

CHAPTER III: METHODS

Study Design

This qualitative study is part of the parent study Revitalizing Informal Settlements and their Environments (RISE), a randomized control trial that is taking place in 24 informal urban settlements in Makassar, Indonesia and Suva, Fiji. RISE started in 2017 and works at the intersection of health, the environment, and water and sanitation. The RISE trial works with communities to design and implement decentralized wastewater infrastructure (Leder, et al. 2021). The approach integrates urban design and urban water cycle planning and management to improve the quality of wastewater and stormwater before being released into the environment (Leder, et al. 2021). The intervention includes delivery of traditional water and sanitation services and the installation of infrastructure for flood management, which are intended to reduce exposure to fecal contamination (Leder, et al. 2021). This sub-study of the RISE trial used data that was collected from 10 informal settlements in Suva, Fiji during November 2020 as part of a photovoice study within RISE, which collected data on flood measures implemented by residents. The aim of the photovoice sub-study was to determine whether participants felt they could successfully implement flood related measures. The research described in this thesis was conducted, using the data from the photovoice sub-study, to understand the role that collective efficacy plays in a community's ability to collaboratively organize themselves, strategize, and implement community-level flood measures.

Participant Recruitment

The photovoice sub-study used a purposive sampling approach, in which existing data informed the selection of participants to ensure a range of perspectives were being gathered, including ensuring a mix of genders would be represented. This data included: age, gender,

occupancy status of the house, length of time living in the settlement, experience of adverse events during the last six months, experience of flooding directly outside or under the house in the last three months, and experience of flood water entering the house in the last three months. Study participants that were eligible for the photovoice study were approached and asked to volunteer by local in-country teams and were given culturally appropriate gifts as an incentive for participation.

Data Collection

The original photovoice sub-study design involved targeting up to 50 households and asking them to take still footage using disposable cameras of ways they prevent, control, and mitigate floods, as well as protection measures they use to protect themselves, their family, and their home. These measures could include individual, household, or settlement flood measures. These photos were then discussed in qualitative interviews with participants. Local staff received training on photovoice from international researchers and were provided with supporting documentation, including qualitative interview guides, to lead and facilitate this research. Eight of the targeted households withdrew or did not give consent. The final number of participating households was 42 within the 10 settlements. Interviews were between 30-60 minutes and took place at the participant's home or in a communal location with other participating households. Interviewers obtained verbal and written consent prior to each interview.

IDI Guide Development

In-depth interviews (IDIs) were used in this study to gain insight into individuals' personal experiences with flood management. Using IDIs was appropriate in this study as some topics from the guide covered decision making, beliefs and perceptions, feelings and emotions, personal stories, and sensitive topics (Hennink, Hutter, Bailey, 2020). Interviews included time

to review the photos and reflect on what they captured. Participants were asked to rank the photographs of the flood management measures in order of effectiveness, ease of implementation, measures they were most proud of, and amount of resources required. Interviewers also asked a series of questions to capture factors influencing the implementation of the elicited flood protection, prevention, or response behaviors (e.g. where the behavior was learned, emotions and challenges during implementation, who participated in the implementation, etc.). The last part of the interview guide focused on how the community works together to protect themselves from floods, prevent flooding in their communities, or collaboratively respond to floods once they have occurred.

Data Analysis

All data were transcribed and then translated to English by in-country RISE team members who speak English and Fijian. Transcripts were then de-identified and uploaded into MAXQDA2022 for thematic analysis. A sample of 14 transcripts from across all 10 settlements were memoed for key issues, recurring themes, and to keep notes to develop inductive codes. Deductive codes were developed from the interview guide, Albert Bandura's self-efficacy theory, and Maryann Delea's collective efficacy framework (Bandura, 1977; Delea, et al. 2018). Once the codebook was developed, with definitions and examples for each code, codes were applied to the data set during detailed readings of the transcripts. As new codes emerged, they were iteratively added to the codebook and applied to earlier transcripts. Thematic analysis was used to identify main issues within the data and after all data were coded, analysis included thick descriptions of the codes, comparisons, and categorization (Hennink, Hutter, Bailey, 2020).

Ethical Considerations

Data analyzed in this study is part of the parent study RISE. The study protocol was approved by the Monash University Human Research Ethics Committee as well as the College Human Health Research Ethics Committee of Fiji National University. All study participants provided written consent prior to their participation in the study. This analysis uses de-identified data.

CHAPTER IV: RESULTS

Participant Characteristics

A total of 42 households from 10 settlements were interviewed from urban informal settlements in Suva, Fiji, with 50 participants. Participants ages ranged from 22 to 80 years old; 19 participants were female and 13 were male. Gender was not specified for 13 households.

Leadership

Leadership was found to be an important influencing factor for collective efficacy among the participating urban informal settlements in Fiji. Participants reported different types of formal and informal leadership that guided collective action for flood measures within communities, including official leadership such as a headman's or chairman's, informal leadership organized within smaller groups of neighbors, and committee leaders. Additionally, participants voiced wanting formal leadership when their settlements lacked it.

Official leadership in settlements was important in providing structure to the community in times of need. Headmen of settlements provided leadership to residents by directing collective action, providing needed tools and supplies, creating a sense of comfort knowing they are the one to go to after a flood, and delivering important messages regarding the situation.

> "When the village headman calls out the men and youths move together to try and clean everything out – when something like that [a flood] happens, we will try and take the women and children to a safer place and of course the elders"
>
> (Settlement J, Male)

> "Yes doing clean-up, once the community provided tools like spades and a few others to assist in digging and clearing of the drains"

(Settlement D, 27)

> "I usually said that when there's a flood, we are to go to the headman, that's when we are to prepare ourselves too in every household"

(Settlement J, Male, 67)

Other participants mentioned the importance of following direction from their headman or chairman, both for flood measures and general instructions within the community, and explained that residents would be reprimanded if they didn't.

> "In this community whatever has been delegated by the [village headman] or Chairman the rules in this community whatever is delegated by the two needs to be followed if not then a warning will be given if worse vacate"

(Settlement D)

Official leadership proved to be not only an important factor for enabling implementation of community-level flood measures when present, but also when absent in communities. Participants in communities without formal leadership noted that lack of leadership caused disorganization within their settlement.

> "The thing that's left is for this settlement to have a leader or head of community, because when there's no one to lead everyone is scattered"

(Settlement H, Male, 69)

In settlements without formal leadership, participants expressed wanting a headman to oversee the community and provide assistance in times of need, including during flood events.

> "What I think is, if there could be a headman of this settlement to go around when there's a heavy rain checking if everyone is ok and if there's a family that need help – we just need someone to oversee"
>
> (Settlement C, 80)

Informal leadership also occurred at individual levels at a smaller scale between groups of households. This happened when an individual or household would organize their own flood measures with their family, friends, or neighbors. This type of leadership seemed to be most common among relatives living in the same settlement as most people worked with their extended families and lived close to them. Some participants reported sharing ideas with neighboring households to improve overall flood measures in the area.

> "My husband told us as what is to be done [to prevent flooding] and he also shared his idea with other people and thought it is a good idea to do that and we did not tell the whole settlement about this response"
>
> (Settlement G, Female, 42)

Committee leaders provided additional leadership to settlements in a way that encouraged community involvement by holding meetings to discuss key issues, shared goals, and implementation plans; organizing community clean-ups; and helping with plans for flood measures for the settlement.

> "There is a committee for this village, there is an existing committee that some of us are a part of and often meet up and most of the time we discuss things that the village can do together, and with families to implement things that can help sustain this community"
>
> (Settlement C, Male, 73)

These meetings have allowed residents to provide leadership to their settlements by taking on community goals and establishing shared needs. While all participants were working towards an overall goal of preventing flooding in their communities, some participants mentioned specific shared goals that their settlement or neighborhood were trying to achieve such as footpaths and floodwalls. Additionally, committee leaders explained how they had gone beyond the committee meetings to reach others in their communities to see what was needed.

> "We the committee for this year have started visiting each household. To see what problems they are facing so we can help"
>
> (Settlement D, Male, 51)

Importance of Social Ties

Strong social ties within communities appeared enable engagement in collective action. When collective action was brought up for flood related activities, participants reported these actions were done mostly with their extended families from other households or with the households closest to them.

> "Also the clean-up of the settlement and the outside of our home with some of our neighbors. We always assist each other because many of us living here at the back tend to help each other in the cleaning of our surrounding when there's tidal flooding"
>
> (Settlement D, Female, 30)

Many other participants reported the same experiences reinforcing that it was common for households to work with their direct neighbors in clean up, digging of drains, raising houses, and other types of flood measures. Other participants discussed implementing these measures with their families, and for many this included others outside of their households due to strong family ties within the community.

> "For us here we are all related [umm], those are my sibling's children that helped out during the clean-up to protect us from flooding"
>
> (Settlement D, Female, 29)

> "Interviewer: Who all participated in the implementation of those response measures? Respondent: A friend from down here [neighbor], my husband, one of my sister's son who has now gone out to the sea to sail, someone else we go to church with came to help especially in the digging of the drain so that the water does not reach us"
>
> (Settlement C, Female, 40)

Due to family ties being a strong factor influencing flood-related collective action within communities, some participants reported feeling like they had no one to ask for help during times of need if they didn't have family nearby or if they were new to settlements and didn't know anyone in the area.

> "Some of the people they're relatives and that's how they help one another, but for us from other areas is very difficult"
>
> (Settlement E, Female, 42)

Influence of Past Performance Experiences

When asked about the benefits of working together for flood related measures, many participants expressed themes of getting actions done quicker, covering more ground, improving the surroundings, learning skills from others, and an overall ease of workload. When participants had engaged in positive collective action experiences in the past for flood measures, they reported wanting to continue working with others in their community.

> "The task when we work together brings, it eases the workload. It quickens the process and not time consuming and everything we do is better when done collectively, in unity"
>
> (Settlement D, Female, 30)

Negative performance experiences also had an impact on engaging in collective action. Some participants mentioned attempting to get their neighbors involved in community work such as clean-up campaigns and flood related workshops, but failing due to lack of participation. Participants explained situations where workshops were occurring in the community and they attempted to encourage others to attend but they would not show up.

> "Yeah, yeah I would call them and ask them to go up for the workshop because it will help you but he just keep saying yes yes but doesn't go"
>
> (Settlement E)

When situations like this would occur, it made participants question if others in their settlements truly cared about protecting their communities from floods the same way they did.

> "But when I try and ask for something to be done, nothing. That's a different kind of arrogance"
>
> (Settlement H, Male, 69)

Additionally, when past experiences have failed or participants felt like they had no other options, they would often take initiative for themselves and work alone. Some participants reported that a lack of help from the community was a reason for their preparedness and implementing measures independently. This mentality that there is no one to turn to when residents need help seemed to hinder collective action. Participants continued to work

independently rather than collaboratively, even if they had beliefs that working together would be more beneficial for their community.

> "First thing I think of is if I do not take any initiative, there won't be anyone else that will come and help us in the problem we face. That is why I am always prepared"
>
> (Settlement C, Female, 40)

Expectations Around Collective Action

Many participants expressed that it was normal for members of their settlement to come together and engage in collective action during times of need, such as for weddings, funerals, and building roads and houses. Participants explained how members of the community worked together and contributed money and/or time when possible for different needs.

> "This community is well known of working together, if there's a problem or a funeral in one of the family, we're all ready to assist, a contribution of $2 from each family, and this is all because it's known of people work together and care for each other needs"
>
> (Settlement D, 27)

> "When the road was been made then everyone worked together otherwise they do not help anyone"
>
> (Settlement G, Female, 33)

Most of the participants expressed the same normative beliefs about engaging in collective action when it came to flood related measures in their communities. Residents reported that people should be helping one another when there is a problem related to flooding, and that everyone in the community should be involved in whatever capacity they can.

> "The only I learnt is to help one another, to assist in whatever ways we can to overcome a problem. When one's going through a problem, we should be there ready to help, for us if we see someone that needed help in the community we also go and help"
>
> (Settlement C, 72)

> "Yes for those who can help if you have it you give it, if not then there's nothing to do. If they say $10 and all they have is $7 then that's what they'll give, everyone always assist in whatever ways they can"
>
> (Settlement F, Female, 35)

Other participants explained that it is normal for some residents not to participate, but they feel like they can't force them to help if they don't want to, creating a barrier to engaging in collective action.

> "Interviewer: When you work together to solve a problem is every household and residents involved in the effort?
> Respondent: Only a few – we can't force them but there are other families who do cooperate in order to improve the wellbeing of our community like clean-up campaign in the community, cleaning of the drain. There is just a few who does not cooperate [laughter]"
>
> (Settlement B, Male, 33)

> "Like here only some – some they don't. We do not want to force them because they have their rights"
>
> (Settlement I, Female, 33)

Unity for Collective Action

Unity was identified inductively as an issue that was mentioned repeatedly in the transcripts. Participants expressed the belief that unity should be present during flooding situations. Specifically, participants strongly reported wanting unity when it came to implementing flood measures in their communities and felt that unity would facilitate community members working together, which would in turn provide greater impact for their settlement.

> "If they have a willing heart to implement it [flood measures], to be united so that they can do something about their community, only if they have a willing heart, unity, unity within the settlement than only they can implement these measures"
>
> (Settlement D, Female, 30)

While there were similar beliefs reported by most of the participants, some participants noted that while they have these expectations and beliefs around collective action, cooperation and participation was not always present during times of flooding.

> "But the sense of cooperation to try and improve our community is not there"
>
> (Settlement H, Male, 69)

> "The thing that I learned here was if we were to work together for us to unite so we can improve our drainage, so we can be protected from floods and I believe there won't be any need to place the roofing iron and what not. For us to unite. The problem is we will always have our differences, if I dig my side others won't do theirs"
>
> (Settlement D, Male, 51)

CHAPTER V: DISCUSSION

This study explores the role that collective efficacy plays in a community's ability to implement flood measures in urban informal settlements in Fiji. Findings indicated that the most important components of collective efficacy that served as an enabler or barrier to implementing community-level flood measures in these settlements were strong leadership, social ties, past performance experiences, and expectations and unity around collective action. Social ties within communities were seen as positive influences to engaging in flood-related collective action, although where there were instances of weak social ties, participants had difficulty engaging in collective action efforts. Positive experiences with previous forms of collective action for flood measures was an enabler, while past negative experiences were a barrier to engaging in collective action. While participants expressed that working together for flood related measures should be expected, the findings were unclear as to whether expectations for people to contribute to flood related measures are enablers of collective efficacy.

The findings revealed that in settlements with strong leadership, community members were more likely to participate in collective action for flood related measures. These findings align with other research that has shown that leadership is an important factor for collective efficacy in communities (Watson, Chemers, & Preiser, 2001, Salinger et al., 2020; Delea et al., 2018). Within the RISE settlements in Suva, leadership was discussed in multiple ways, including formal leadership from headmen and chairmen, and leadership facilitated by committees. Similarly, a study done in Ethiopia looking at collective efficacy and water, sanitation, and hygiene showed that both leadership and community organization were important influencing factors for collective efficacy appraisals (Delea et al., 2018). The findings from our study also showed that in settlements that lacked formal leadership, there was often a sense of

disorganization, and community members voiced wanting a headman or someone to provide leadership to their settlement.

Findings also suggest that strong social ties enabled residents to engage in collective action, which is consistent with findings reported in other studies (Yila et al., 2014; Delea et al., 2018; Aßheuer et al., 2013). Similarly, in a study done in the Ba District of Fiji, communities with large social networks were found to be in a better position to coordinate response efforts to flooding disasters (Yila et al., 2014). In addition, results from a study in Bangladesh showed that social ties were important for slum residents' ability to handle and overcome flooding disasters as their social networks were well established and rooted in the community (Aßheuer et al., 2013). Additional findings from our study indicated that in settlements with strong social ties, households that were new to the community or were non-relatives had less participation in collective action and lower collective efficacy appraisals. Some participants reported feeling left out in their settlement when they recently moved to the area or they didn't have family members close by and felt like they had to work alone because of this lack of social network. These results are similar to evidence indicating that individuals with fewer weak ties, otherwise known as acquaintances, are less likely to mobilize effectively for collective action within their communities (Granovetter, 1983). Prior evidence has also suggested that for controversial innovations, mobilization strategies that focused on the activation of weak ties were more likely to "facilitate adoption of the goal" (Granovetter, 1983).

The study findings showed that past experiences with collective efforts for flood measures influenced future collective action and collective efficacy. These findings are consistent with Bandura's framework for dimensions of efficacy expectations (Bandura,1977). Positive experiences with past collective efforts for flood related measures were shown to enable

collective action. Participants reported positive mastery experiences with working together for flood measures, citing that it was both beneficial for them and the community as it decreased work time, increased productivity, eased the workload, and improved surroundings. Similarly, in urban informal settlements in Ghana, residents were able to learn from past experiences and respond to flooding when needed based on their prior knowledge (Amoako, 2018). In a study examining collective efficacy and student achievement, findings indicated that mastery experiences were strongly related to collective efficacy, and past performance was related to higher perceptions of CE (Goddard, 2001). Additionally, the findings from our study revealed that negative performance experiences lowered collective efficacy appraisals and were a barrier to collective action for flood measures. When participants tried to engage in collective action with other community members and failed or had a negative experience, these residents then stopped trying to get others to participate.

Most study participants believed that working together for flood related measures should be expected. However, it was clear that not all settlements engaged in collective action for flood related measures, despite participants reporting expectations around working together for these measures. Thus it was unclear whether these expectations for people to contribute to flood related measures were enablers.

Strengths and Limitations

A strength of this study included the participant recruitment to obtain a mix of genders and a wide age range. Ensuring both female and male participants were included and people from all age groups allowed for analysis of different perspectives within the communities. Additionally, recruiting participants from 10 communities in Suva, Fiji made it possible to obtain perspectives from multiple informal settlements that have different community-level

characteristics such as leadership roles or community groups. A primary limitation for the study was that the interview guide was originally developed to determine whether participants felt they could successfully implement flood related measures and not specifically for looking at collective efficacy and flooding in urban informal settlements. Because of this, all questions were not designed based on collective efficacy constructs. Additionally, data quality and richness were limited due to a lack of probing, and some questions from the interview guide were not asked.

Conclusion

The findings from this study suggest that leadership, social ties, past performance experiences, and expectations and unity around collective action inform collective efficacy appraisals and are influencing factors to engaging in collective action around flood measures in urban informal settlements in Fiji. These factors all played an important role as either a barrier or enabler to collective action for implementing flood measures within settlements. Despite settlements often displaying expectations regarding collective action for flood related measures, the findings showed that not all settlements engaged in this behavior. It is important for programs implementing flood interventions that rely heavily on collective action to take into consideration all sub-constructs of collective efficacy before starting the intervention, to determine if and how settlements work together.

CHAPTER VI: IMPLICATIONS & RECOMMENDATIONS

Implications

This study contributes and adds to existing knowledge on the role of collective efficacy in a community's ability to engage in flood measures in urban informal settlements. Our findings could have possible implications for future public health initiatives. As the number of people living in urban informal settlements continues to rise, and more than three billion people are estimated to be living in these conditions by 2050, it is important to understand the risks that are associated with flooding from living in these environments (Brown et al., 2018). Due to the conditions to which residents of informal settlements are exposed, they are more vulnerable to communicable diseases, injuries, and mental disorders (Weimann & Oni, 2019). Risk of flooding exacerbates these challenges and brings more health impacts to consider such as infections, trauma, and drowning (Paterson, Wright, & Harris, 2018).

Preventing floods and engaging in flood measures are vital public health initiatives for urban informal settlements globally, and specifically in Fiji. There are currently more than 250 informal settlements across the country and due to Fiji's topography, many of them are located on the coast and along rivers leaving them vulnerable to floods and storm surges from frequent cyclones (UN Habitat). If communities in Fiji do not have expectations for engaging in collective action for flood related measures, this could impact future public health initiatives that rely on strong collective efficacy and collective action efforts. Additionally, our findings indicated that strong leadership and social networks facilitated collective efficacy appraisals for engaging in flood related measures. In settlements where these two aspects may be lacking or non-existent, residents may struggle to participate in collective action towards flood initiatives. This can

prevent or inhibit communities from successfully implementing protection and prevention measures.

Recommendations

Research Recommendations

There is a need for further research on the role of collective efficacy and flooding in urban informal settlements in Fiji. While our study examined flood related measures, it is recommended that future research looks more closely at the types of behaviors communities engage in specifically for flood protection, prevention, and response. Additionally, continued research around expectations for engaging in collective action for flood related measures in urban informal settlements in Fiji is recommended, including the types of behaviors surrounding flooding. It is also recommended that future study designs focus on specific collective efficacy constructs and sub-constructs such as normative beliefs, social control, social cohesion, and social capital. These constructs will provide a better understanding of how communities work together to prevent flooding. Lastly, further research should be done to examine other influencing factors to collective efficacy and engaging in flood related measures within settlements such as gender, settlement conflict, ethnicity, and religion.

Program Recommendations

Programs intending to implement flood interventions should consider doing the following research in their program settlements before starting the intervention:

1. Measure collective efficacy to determine whether communities have high or low efficacy appraisals
2. Determine if engaging in collective action for flood related measures are expected by the community

3. Assess how communities work together, if at all, and what factors influence this
4. Determine the type(s) of leadership within communities and if formal leaders are active

While findings from this study can generate recommendations as seen below, it is important that programs take into consideration the specific settlement characteristics they are working in and understand the social constructs that influence how residents work together.

Based on the findings from this study, the following program recommendations can be made:

1. Establish committees or community groups to promote unity and social networks within settlements. Program implementers should understand the types of social networks within their communities and build off those relationships to effectively strengthen social ties.
2. Increase the number of positive performance accomplishments that residents experience during flood interventions by creating ways for them to practice and master these measures.

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