

Disaster Prevention and Management

The effectiveness
of hazard risk
communication-
expert and community
perspective on Orewa
in Auckland,
New Zealand



Abstract

Hazard risk communication has arguably been a challenge, especially in communities which are susceptible to multiple hazards. Orewa was specially chosen for this research in order to provide a complete assessment of the effectiveness of communicating New Zealand's early warning strategy in a multi-hazard area. Two categories of surveys were undertaken; experts and academics in emergency management and disaster risk resilience and the Orewa community. A semi-qualitative indicator-based analysis was conducted with the normalization of index values which resulted in four (4) categories; risk perception, risk awareness, risk governance and uncertainty, trust and credibility. The resulting vulnerability index indicated that risk perception and uncertainty, trust and credibility ranked the highest, followed by risk awareness and risk governance. Risk perception had stark differences between what the community perceives as being most at risk from to what the experts deem to be the highest risk for Orewa. This has implications for policy directives as well as funding for risk reduction. Uncertainty, trust and credibility was another area which indicated conflicting sentiments between the community and experts. The community generally trusts decision-makers but the experts think they don't. This shows that the community is aware of their risks, but may not necessarily believe that the experts are providing enough efforts in what is of importance to them. Risk governance is not a vulnerable area to the experts as they have been actively engaging in hazards that they deem Orewa was most at risk from. Any breakdown in communication can have detrimental effects if multiple hazards were to occur at once in the case of Orewa.

Key Words:

Hazard risk communication, New Zealand, multi-hazard, risk perception, risk governance, risk awareness, uncertainty, trust, credibility, indicator based semi-qualitative analysis.

Policy Brief: The effectiveness of hazard risk communication- expert and community perspective on Orewa in Auckland, New Zealand

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1 Policy recommendations

In recent year, there have been considerable advances in data observation, modelling and analysis of natural hazard forecasting for disaster risk and reduction. However, the most important factor in risk reduction is, arguably, the ability to successfully communicate these natural hazard forecasts to the communities they will affect.

The small coastal community of Orewa in Auckland, New Zealand was selected in order to study hazard communication and risk reduction. Two surveys were undertaken; the first involving emergency management and Disaster Risk Resilience experts, together with academics. The second focused on members of the Orewa community.

Using the resulting data - and to target any deficiencies uncovered relating to hazard communication and risk reduction – the following is submitted for consideration:

1. A multi-hazard risk communication system may be beneficial in order to cover all the hazards the Orewa community feel are evident.
2. It is suggested that consideration be given to the varied cultures and languages of the community, as well as the high population of retirees and elderly, and where possible, hazard mitigation systems should be tailored accordingly. This will improve their perception and understanding of risks, thereby lowering their overall hazard risk. Instead of general public engagement sessions, age specific, gender specific, culture specific, and/or location specific engagement is suggested to enhance risk perception and reduce risk.

3. When assessing hazard risk, working to the specific demographics of an area and not relying solely on science-based hazard assessments would likely allow for more robust hazard risk mitigation. When undertaking risk assessments, we view it as important to consider the social structure (e.g. age, ethnicity and mobility) of a community and seek input from residents regarding the level and nature of risk they attribute to each hazard and why.
4. Continue to review the hazards facing Orewa as the community and the environment, population and social structure of the community changes.
5. 5 Involve the community. Strengthen collaboration between policy makers and the community, and consult with the community regarding what methods they would suggest, or prefer, to communicate hazard risk or mitigate hazard risk and do this early on in the process. Creating an enabling environment for community participation will ultimately serve to empower the community and get them involved in the issue rather than simply being informed of the issue.
6. Consider providing hazard event information to the community earlier so they can make informed decisions.
7. Clearly explain to the community the probability and levels of risks it may face at various points in time.
8. The initiation of more frequent preparedness exercises may be valuable, given a portion of the community survey respondents indicated they would find this beneficial. These exercises should be targeted to different groups to maximise involvement and success.

2 Context

Understanding natural hazard risk at a community level is essential for successful natural hazard risk reduction. (‘An examination of the effectiveness of hazard risk communication from the community’s perspective. The case of Orewa, New Zealand’ (Kuizon, 2018).

The data collected for the abovementioned thesis involved an expert opinion questionnaire (Indicator Based Semi-Qualitative Methodology or non-random sampling) and an Orewa community survey (random sampling). For the former, 10 experts from both academia and industry took part. Thirty Orewa residents participated in the community survey. Respondents of the community survey were asked questions regarding their perception of safety in relation to a list of hazards from the Integration Research of Disaster Risk’s 2014 Peril Classification and Hazard Glossary Framework (IRDR, 2014),

Orewa was chosen for this research in order to provide a complete picture of how New Zealand’s civil defence and emergency management (CDEM) and early warning mechanisms fit into a multi-hazard area.

Orewa is a long sandy beach and low-lying community along the east Auckland coast. It has a total population of approximately 8500 (Statistics New Zealand, 2013). It is estimated that 10,000 more people will move in to the Hibiscus Coast, of which Orewa is part, area as over 2700 homes are finished by 2023. (Stuff, July 2017) The median age of the resident population is 57.3 years (Statistics New Zealand, 2013); this is above the Auckland average of XX

Orewa surrounds the shallow Orewa River estuary. This area contains mangrove and saltmarsh that flows into the coast (Statistics New Zealand, 2013). Orewa Beach is known to have suffered from extensive coastal erosion in the past, due mainly to sea level rise. This is evident at high tide and the area experiences large waves up to 4 metres in height.

Adjacent to the coast line there are flood plains in low lying areas which quickly flood during heavy rains. Land located close to

the Orewa township, near the highway, is especially susceptible to flooding, especially when the nearby river estuary bursts its banks. The coastal inundation risk in Orewa affects a large area and substantially affects property, infrastructure, business, and transport, as well as endangering people’s lives (CDEM, 2015).

3 Analysis

The raw survey data was analysed using a standardized data set normalized index values. The survey questions were broken into the four categories of:

- Risk Perception;
- Risk Awareness;
- Risk Governance; and,
- Uncertainty/Trust/Credibility.

Results from the survey questions that related to participant characteristics and/or demographic information were not included in the four categories.

Index values were calculated based on a) number of respondents and b) the number of survey questions. Vulnerability, as seen in table 1 below, considers both of these factors.

Table 1: The vulnerability scores for the Orewa community survey dataset

Category	Index	Vulnerability
Risk perception	5.2	High
Risk governance	2.7	Low
Risk awareness	4.0	Moderate
Uncertainty/trust/credibility	4.9	High

4 Findings

Often in New Zealand, possibly due to budget and time constraints, hazard risk mitigation is targeted at the general community, and not at the individuals within that community. Communities by nature are very diverse, with different needs, different ages, and different vulnerabilities, and communication would likely be more effective if it were tailored to certain groups within the community.

The majority of community survey respondents do not speak English at home, and the age of

respondents ranged from 26-76, implying that the Orewa community features a large multi-ethnic and age-diverse population with varying needs.

4.1 Risk perception

Results from the community survey suggest that the community feels unprepared and is most at risk from storms/cyclones, while the experts surveyed believe that tsunami and flooding events pose a greater risk.

Often a major discrepancy such as this comes from perception and whilst the experts’ responses were likely based on data and science, the community’s responses to similar questions embodied personal experience as opposed to scientific data.

It is likely that the experts are the driving force behind policy and decision making. It is likely that the experts are more closely involved in decision-making and policy. The community, although they may be consulted on ‘top-priority’ hazard mitigation through budget consultations and the like, may not have the tools to fully understand those hazards affecting their community. This highlights a need:

1. To seek further input from the community regarding: what hazard types they feel they are most at risk from and why; and, their perceived level of preparedness for each hazard type.
2. For the risks associated with each hazard type (and explanations why this level of risk is assigned based on for example probability and consequences) to be communicated to the community.

The community’s perception of which risks they are susceptible to will determine how aware they are and enable focussed and effective preparedness measures to be implemented.

The normalized index analysis (table 1) shows that Risk Perception has the highest vulnerability score, indicating that risk perception is a significant issue facing the Orewa community.

4.2 Risk awareness

The community survey results suggest respondents have a high awareness of their risks, but report a negative experience when it comes to their general experience with hazard risk communication. They claim to generally receive information within an adequate time, but still require earlier dissemination of information to be even better prepared. They also do not trust the reliability of broadcast media. Survey results show almost one quarter of the respondents stated that they could benefit from more preparedness exercises.

There is an opportunity to tailor existing resources in ways which will prepare all members of the community for possible multiple hazards.

4.3 Risk governance

It is apparent that the community seeks more reliable information sources, as well as earlier information dissemination. This could be based on the previously mentioned results of the community’s risk perception. The experts most likely designed a hazard mitigation system that is best suited for the highest risk they deem Orewa to be facing (tsunami), whereas, within the community, people believe they experience a greater threat to a different hazard altogether (high tides, coastal erosion, flooding following heavy rain) and are therefore not receiving the support they may wish for those hazards.

This highlights the requirement for surrounding multi-hazard risk communication. Due to the susceptibility of Orewa to multiple hazards, it is possible hazard risk mitigation is focused on one or two hazards, and for others that were not seen as posing a high risk, limited mitigation measures have been developed.

The effects of climate change have resulted in a change in the hazards that many locations around New Zealand are facing and these hazards may continue to change. Similarly, the structure of the Orewa community, including age, education level, ethnicity, mobility etc., will continue to change with time and this can affect the perceived and actual risk. Therefore it would be beneficial to review

risk for each hazard in the area regularly to take into consideration the changing and evolving environment and community.

Another important consideration is the ability of those within a community to respond as instructed and how practical the hazard risk mitigation measures may be for different sectors of the community. An example of this was highlighted during the community survey. Orewa has a high rate of elderly persons residing along the coast at Orewa Beach. This section of Orewa is the first place a tsunami will affect and the measure put in place for evacuation is a generic route to higher ground (Hatfield's hill) 'on foot', which is not achievable for many of the elderly residents.

Risk governance should essentially provide a balance between risk assessment, risk management, and risk communication.

The normalized index analysis (table 1) shows that Risk Governance has the lowest Vulnerability score across the four categories, which indicates that risk governance is not the most pressing hazard communication category facing the Orewa community.

Consultation and collaboration with the residents would potentially allow for a more practical method of hazard risk reduction and possibly provide a solution for the perceived low rating of Risk Governance.

4.4 Uncertainty, trust and credibility

The community survey results suggests the people of Orewa have confidence in the Government-driven initiatives, with the majority willing to follow instructions based on uncertain scientific data.

They generally understand that the nature of hazard events is virtually unpredictable and "everyone is human at the end of the day", to quote one respondent. However the community survey results suggest that "better methods of communication" would give them more confidence in hazard risk communication.

The experts' survey rated the aspects of Uncertainty, Trust and Credibility as very low, suggesting that hazard communication in Orewa

is lacking. However, based on the community survey, there is a decent level of trust in the hazard risk information that is given, and the information providers themselves. This could suggest there is community understanding of the need and support for disaster risk reduction initiatives.

The normalized index analysis (Table 1) shows that Uncertainty/Trust/Credibility has a high Vulnerability score (second highest behind risk perception) which further indicates that there are areas to improve on within the Orewa community.

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